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USED BEVERAGE
CARTONS MANAGEMENT
STUDY
2022

Executive Summary

Tetra Pak beverage cartons enable the distribution of liquid and food items by providing optimal shelf life which helps in maintaining the freshness, flavours, and nutritional content of such products under ambient temperature or refrigerated conditions. The rising popularity of packaged food and products is driving the demand for such cartons. The global average market for beverage cartons was valued at USD 16.51 billion in 2020, and it is anticipated to reach USD 22.44 billion by 2028. Beverages cartons are categorized as paper-based packaging and are made of approximately 70% paperboard, 25% polymers, and 5% aluminium. The cartons made of long, strong paper fibres provide strength and stability, and can be recycled several times into paper products. The thin layer of polymer or plastics in beverage cartons can be blended with other polymers or with the aluminium component and turned into new products such as roofing tiles, crates, industrial pellets, and more. Each material component of beverage cartons is recyclable if processed properly along the value chain.

In India, Tetra Pak started its operations in 1987 creating numerous job opportunities and introducing advanced technology tailored for the Indian market. Over the last 30 years, the company has introduced and advanced many packaging formats in different sizes and prices to suit consumer requirements. However, with the increasing demand and consumption of these cartons, the environmental effects, such as littering, energy consumption, and greenhouse gas emissions, cannot be ignored. To mitigate these effects, Tetra Pak actively engages in collection, sorting, and recycling of used cartons to prevent them from ending up in landfills. Through its recycling efforts, Tetra Pak not only helps reduce the burden on landfills but also contributes to the conservation of valuable natural resources, such as paper fibres. By recovering and recycling paper from used cartons, Tetra Pak promotes a more sustainable and circular approach to packaging, wherein materials are reused and repurposed, thereby minimizing the need for virgin resources. Tetra Pak's commitment to environmental sustainability extends beyond recycling initiatives. The company continues to invest in research and development to further reduce the environmental footprint of its packaging materials and processes. This includes efforts to enhance the recyclability of cartons, reduce energy consumption in production, and minimize greenhouse gas emissions throughout the entire lifecycle of its products. Tetra Pak has been fulfilling its extended producer responsibility (EPR) voluntarily for more than 18 years and has been continuously working with recyclers across the South Asian region to develop solutions, technologies, and applications for UBCs. Through constant interactions and partnerships with recyclers, Tetra Pak aims to improve the level of active sorting of UBCs and reduce mixed waste recycling, making the recycling process more effective, efficient, and economical.

As part of a strong commitment of Tetra Pak to protect the planet and promote a low carbon circular economy, Tetra Pak continues to strengthen the collection and recycling chain for used beverage cartons, and in this regard, Tetra Pak conducts a UBC management study every three years to get a status update on the infrastructure efforts and design appropriate interventions to further strengthen the ecosystem. This study was commissioned to The Energy and Resources Institute (TERI), India for Tetra Pak India Private Limited (TPIPL) with the sole objective to understand and analyse the management of UBC in 22 Indian cities. Earlier, the studies were conducted in 2011, 2015, and 2018. The overarching objective of the study was to explore the perceptions of waste collectors on UBC management and evaluating the quantity of UBCs collected for recycling with mixed paper waste through small scale and large-scale

dealers to formulate appropriate strategies for enhancing the recycling rates of UBCs.

The sub-objectives of the study included:

» Study the current quantum of Tetra Pak UBC getting procured/retrieved at the waste dealers' level.
» Understand the value chain and the economics involved in Tetra Pak UBC collection and recycling.
» Assess the actual quantum of Tetra Pak UBC reaching the paper mills which recycle paper from low grade paper waste.
» Assess the quantum of pulping rejects from low-grade paper waste at paper mills.
» Understanding the composition of paper waste and quantity of Tetra Pak UBC reaching dumpsites in the surveyed cities covering one vehicle each from domestic, commercial, and institutional area.
» Gauge, what critical stakeholders (low grade paper waste dealers and recycling paper mills) believe, is needed to upscale collection and recycling—economics, awareness, infrastructure, etc.

The methodological approach involved identifying cities with the highest sales of beverage cartons spread across the Northern, Southern, Eastern and Western parts of India, conducting primary survey with various stakeholders across the value chain. The sample size per city included 22 waste collectors, 14 small-scale dealers, and 7 large-scale dealers. The primary survey was carried out through questionnaire seeking information from stakeholders involved in the management of UBCs across the cities. The survey also included 10 recyclers/paper mills across India using mixed paper waste to understand the fate of UBC being received at the paper mills within mixed paper fractions. Analysis at the dumpsites was conducted in each of the identified cities to quantify the amount of UBCs reaching the disposal sites/landfills. Local agencies/NGOs engaged actively in the field of solid waste management were identified with the help of TPIPL in each city to carry out on ground data for collection and survey.

The study revealed that UBCs are being collected by ragpickers, small-scale waste-paper dealers, and large-scale dealers and are then sent to recycling units. The outcomes of the study revealed the percentage of large-scale dealers dealing with UBCs and it is found that in cities like Kochi, Chandigarh, Shimla, Delhi, Lucknow, Pune, Kolkata, Mumbai, and

Chennai 100% of the surveyed large-scale dealers were engaged in the collection of UBCs indicating an enhanced collection rate and further sending it to recyclers/paper mills for processing, thereby reducing the amount of UBCs reaching the landfill sites.

According to the Ministry of Housing and Urban Affairs (MoHUA), in 2021 roughly 7% of municipal solid waste (MSW) consisted of paper and cardboard waste with an estimated recovery rate of 60%. The quantity of paper and cardboard which was recovered in 2021 was 2,222,850 tonnes,[1] which corresponds to nearly 57% recovery. Hence, the paper recovery rate for waste paper in India is assumed at 57% for calculations within this report.

Further to this analysis, material flow of used beverage cartons was developed to analyse the quantum of UBC reaching the landfill site and UBC being recycled through inactive (informal sector) and active recycling (through interventions of Tetra Pak). It was observed that 62% of the total UBCs are getting recycled whereas the remaining 38% are uncollected or unrecovered. The detailed material flow analysis is depicted below.
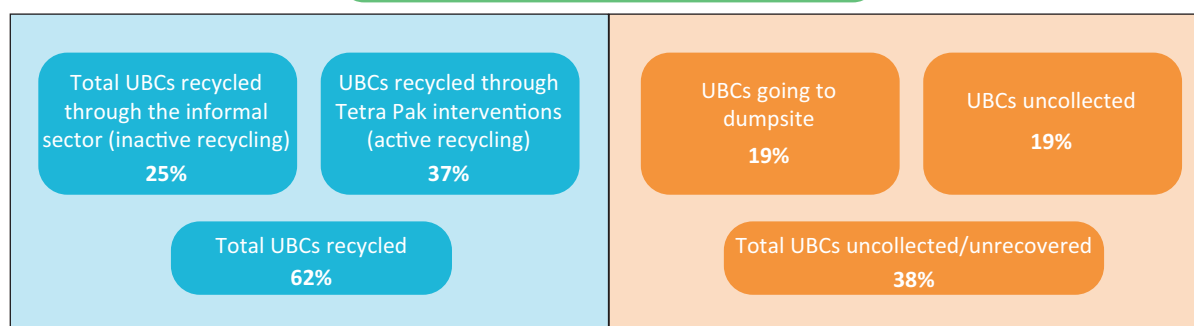
Thus, as a part of this study, the value chain and economics involved in the collection and recycling of UBC were identified and was observed that the recycling rates of UBCs have increased over the past

studies conducted in 2011, 2015 and 2018 wherein the recycling rate where 29%, 43% and 54%, respectively. The recycling rate obtained during the course of study for post-consumer cartons (PCC) is 62%, owing to the interventions of Tetra Pak in collaborating with various recyclers in strengthening the collection and recycling of UBCs by providing adequate infrastructure and technological solutions for dealing with UBCs along the value chain. As a result, the disposal of UBCs mixed with paper at dumpsites has decreased, and a separate collection and recycling chain for UBCs has been strengthened. Further, based on the extrapolation of data along with secondary research and consideration of over 1000 cities, (based on Central Pollution Control Board waste recovery data on pan-India level, population Census, and paper recovery rate) in India, the overall national recycling percentage is about 45%, implying that for every two UBC, one is recycled.

On the basis of the analysis conducted for each city, few of the key recommendations that can enhance the recycling rate of used beverage cartons are suggested below:

1. Over the last 3 years, Tetra Pak India's interventions have enabled an increase in the formalized active collection rates in multiple cities. The resilience of this model is strengthened if informal sector and UBC market is well established amongst all the

Material Flow of Used Beverage Cartons in 2021

Total UBCs recycled through the informal sector (inactive recycling) **25%**

UBCs recycled through Tetra Pak interventions (active recycling) **37%**

Total UBCs recycled **62%**

UBCs going to dumpsite **19%**

UBCs uncollected **19%**

Total UBCs uncollected/unrecovered **38%**

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[1]   https://mohua.gov.in/upload/whatsnew/627b833ecac62Circular-Economy-in-waste-management-FINAL.pdf

small- and large-scale dealers. Active collection of UBCs and collaborating with recycling units can help in promoting the collection and recycling of UBCs across the value chain. Hence, it is important to develop a stronger network of waste dealers as waste collectors are willing to collect UBCs if they receive better economic returns.

2. About 25% of the generated UBCs are getting recycled inactively in the informal chain along with other mixed waste paper categories, which demonstrates the high recycling potential of the cartons and the high value of the fibre content. Therefore, it should be recognized as a separate category within multilayer plastic packaging waste to facilitate further expansion in recycling. This is also in line with the recent EPR guidelines of the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, to promote recycling for recyclable formats as a preferred approach rather than end of life solutions.

3. Chandigarh, Pune, Mysuru and Bengaluru have a recycling rate (both active and informal combined) of over 90%. This high recovery rate can be attributed to the dedicated work undertaken by Tetra Pak India partner organizations in these cities. It was observed that these cities have a dedicated UBC collection centre. A similar model may be replicated or attempted in other cities of higher UBC generation such as Kolkata and Ahmedabad.

4. The acceptability of UBCs by the paper mill is essential in establishing a proper market for acceptability of UBCs amongst waste dealers. This could be achieved through awareness generation and segregation of UBCs at the source itself, along with advancement in technological solutions and infrastructure. In order to produce good grade quality of paper, the waste dealers should ensure provision of clean materials to paper mills.

5. It was also observed that the UBC market was better established in cities which were within a radius of 300 km from a paper mill as the cost of transporting UBC to paper mills was significantly less. Cities such as Jammu, Srinagar, Dharamshala find it difficult to transport UBCs to Tetra Pak partner paper mills, while the paper mills within their vicinity do not have the technology to recycle the multi-layer packaging of UBCs. Hence, in order to increase the recyclability of UBCs pan-India, setting up smaller machines within the existing paper mills to recycle UBC can also be explored.

6. Majorly, of all the cities surveyed, the key challenges as highlighted by waste collectors, small-scale dealers and large-scale dealers for not engaging in the collection of UBC was the lack of awareness on segregation of UBCs at source level. Active efforts by the stakeholders involved across the value chain such as government, non-governmental organizations, and industries can overcome this gap and could enhance the collection and recycling rate of UBCs that are littered and do not enter the value chain. The potential of this is massive and may help achieve a recycling rate of over 70%, since in 2021 almost 19% of the UBCs remained unaccounted.

7. In cities such as Delhi, Faridabad, Hyderabad, Srinagar, Lucknow, Pune, Mysuru, Chennai, Mumbai, Kurnool, Bengaluru the amount of UBCs reaching dumpsites have reduced substantially in comparison to the previous study conducted in 2018, because of improved collection and recycling infrastructure of UBC. Increase in the prices of UBCs along with mixed paper also supported the increase in collection.

8. The study and management of UBCs to identify the collection and recycling rate should be repeated every three years to assess the improvements in the active and inactive recycling rates. This will help Tetra Pak in increasing collection and recycling and thus enable to achieve better efficiency, which is in sync with the Government of India's vision as well.

9. There is a need for developing market/ opportunities for recycled products made of UBCs to further lead to increase in collection and recycling percentage for UBCs.

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