

2024

Report on Packaging Industry in India

14th August 2024



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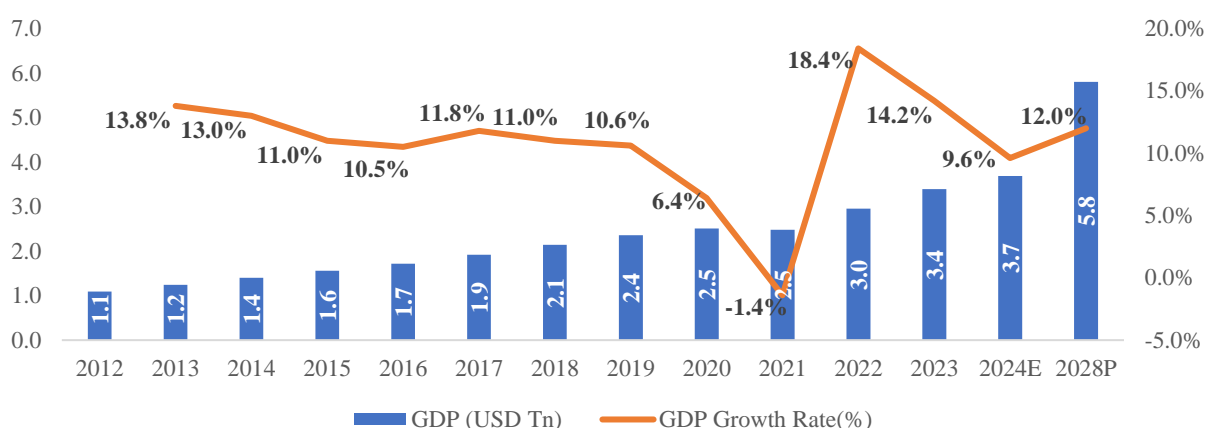
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1. Overview of Indian Economy

1.1 GDP and GDP Growth (real and nominal)- Historical, current & projected trajectory

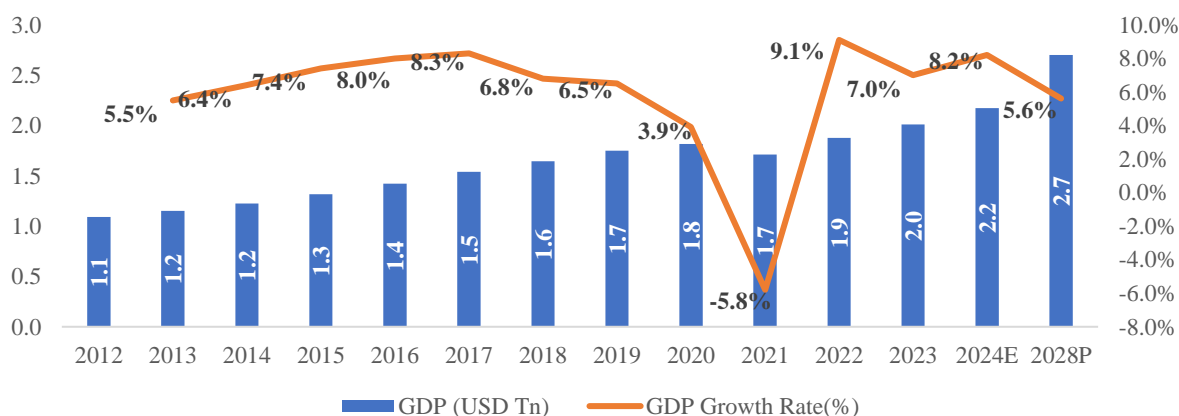
India is ranked fifth in the world in terms of nominal gross domestic product ("GDP") for FY 2024 and is the third-largest economy in the world in terms of purchasing power parity ("PPP"). India is expected to be a ~USD 5.8 trillion economy by FY 2028 and is estimated to become the third largest economy, surpassing Germany, and Japan.

Exhibit.1.1: India's GDP at Current Prices (Nominal GDP) (In USD Trillion) and GDP Growth Rate (%) (FY)



Source: RBI, Technopak Analysis
Note: 1USD = INR 80

Exhibit. 1.2: India's GDP at Constant Prices (Real GDP) (In USD Trillion) and GDP Growth Rate (%) (FY)



Source: RBI, Technopak Analysis
Note: 1USD = INR 80

India's nominal GDP has grown at a CAGR of 9.9% between FY 2015 and FY 2023 and is expected to continue this trend by registering a CAGR of ~11.3 % for the 5-year time-period from FY 2023 to FY 2028.

Since FY 2005, the Indian economy's growth rate has been nearly twice as that of the world economy, and it is expected to sustain this growth momentum in the long term. In the wake of COVID-19, India's nominal GDP contracted by 1.4% in FY 2021 followed by an 18.4% growth in FY 2022 and a 14.2% growth in FY 2023. It is expected to regain momentum and reach USD 5.8 trillion by FY 2028. Between FY 2023 and FY 2028, India's real GDP is expected to grow at a CAGR of 6.2%. It is also expected that the growth trajectory of the Indian economy will position India among the top three global economies by FY 2028.

Several factors are likely to contribute to this long-term economic growth. These factors include favorable demographics, reducing dependency ratio, rapidly rising education levels, steady urbanization, a growing young and working population, the IT revolution, increasing penetration of mobile and internet infrastructure, government policies, increasing aspirations, and affordability etc.

1.2 Private Final Consumption Expenditure

GDP growth in India is expected to be driven by rising Private Final Consumption Expenditure (PFCE). India is a private consumption-driven economy, where the share of domestic consumption is measured as PFCE. This private consumption expenditure comprises both goods (food, lifestyle, home, pharmacy, etc.) and services (food services, education, healthcare, etc.). The high share of private consumption to GDP has the advantage of insulating India from volatility in the global economy. It also implies that sustainable economic growth directly translates into sustained consumer demand for goods and services. India’s domestic consumption has grown at a CAGR of 10.8% between FY 2016 and FY 2023, while China’s growth during the similar period is estimated at 6.9% from CY 2015 to CY 2022.

In FY 2023, PFCE accounted for 60.9% of India’s GDP, which was higher than that in China (53.4%), but lower than other large economies such as Germany (73.0%), Japan (~77%) and UK (~83%) during a similar period of CY 2022. With the rapidly growing GDP and PFCE, India is poised to become one of the top consumer markets globally. It is estimated that the PFCE’s contribution to India’s GDP will be 60.3% for FY 2024.

Exhibit 1.3: Private Final Consumption Expenditure (In USD trillion) for Key Economies (CY)

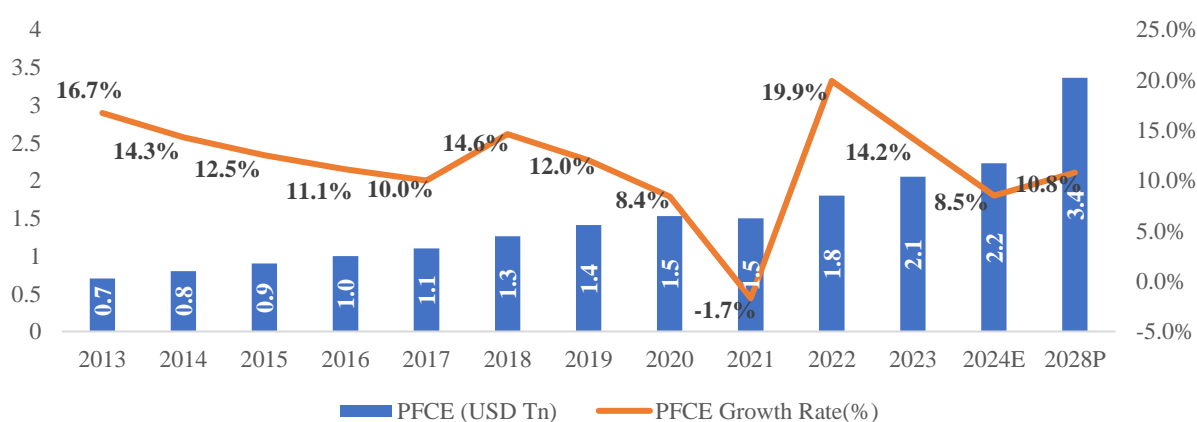
Country	2012	2015	2018	2019	2020	2021	2022	Contribution to GDP		CAGR 2015-2022
								2019	2022	
U.S.	13.6	14.9	16.8	17.4	17.3	19.3	21.1	81.0%	81.9%	5.1%
China	4.4	6.0	7.7	8.0	8.1	9.6	9.5	56.0%	53.4%	6.9%
Japan	4.9	3.4	3.8	3.8	3.8	3.8	3.3	74.5%	77.2%	-0.5%
Germany	2.6	2.4	2.9	2.8	2.8	3.1	3.0	72.2%	73.0%	3.1%
India	0.7	1.0	1.4	1.5	1.5	1.8	2.1	61.0%	60.9%	10.8%
Brazil	2.0	1.5	1.6	1.6	1.2	1.3	1.6	85.1%	81.5%	0.8%
U.K.	2.3	2.5	2.4	2.4	2.2	2.6	2.6	83.0%	82.9%	0.3%
World	55.7	55.3	63.0	64.1	62.4	70.3	71.5	73.0%	70.5%	3.8%

Source: World Bank, RBI, Technopak Analysis

* For India, CY 2012 refers to FY 2013 and so on, India Data in FY

Note: 1USD = INR 80

Exhibit 1.4: India’s Private Final Consumption Expenditure (Nominal) (In USD trillion) (FY)



Source: RBI, Ministry of Statistics and Program Implementation, Technopak Analysis,

Note: 1 USD = INR 80

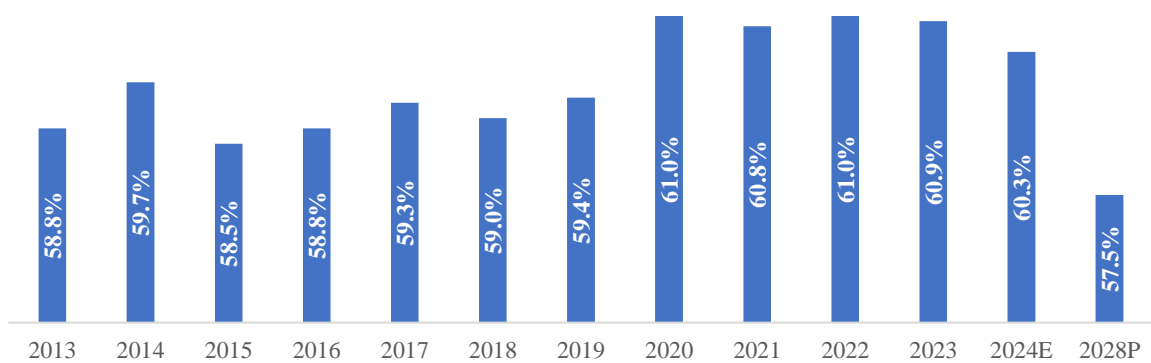
PFCE in India has exhibited varying y-o-y growth rates over the past few years. FY 2021 witnessed a significant contraction in PFCE growth, with a y-o-y rate of -1.7% largely due to the slowdown caused by the COVID-19

pandemic. Data for FY 2024 estimates a substantial rebound, with a growth rate of 8.5%, reflecting an anticipated revival in consumer demand as the economy recovers from the pandemic-induced downturn. With projected growth rates of 10.8% in FY 2028, a sustained positive trajectory for PFCE is forecasted in India.

Private Final Consumption Expenditure to India's GDP

A high share of private final consumption expenditure to GDP indicates that an economy is driven by consumer spending, which can be a positive sign for economic growth. However, if the share of private consumption expenditure is excessively high, it may lead to inflationary pressures and an unsustainable economy. India's share of PFCE to GDP has increased over the years, reaching 60.9% in FY 2023, up from 58.5% in FY 2013. According to the Ministry of Statistics and Program Implementation, the share of India's PFCE to GDP is expected to decrease from 60.3% in FY 2024 to approximately 57.5% by FY 2028.

Exhibit 1.5: Share of Private Final Consumption Expenditure to India's GDP (Nominal) (%) (FY)

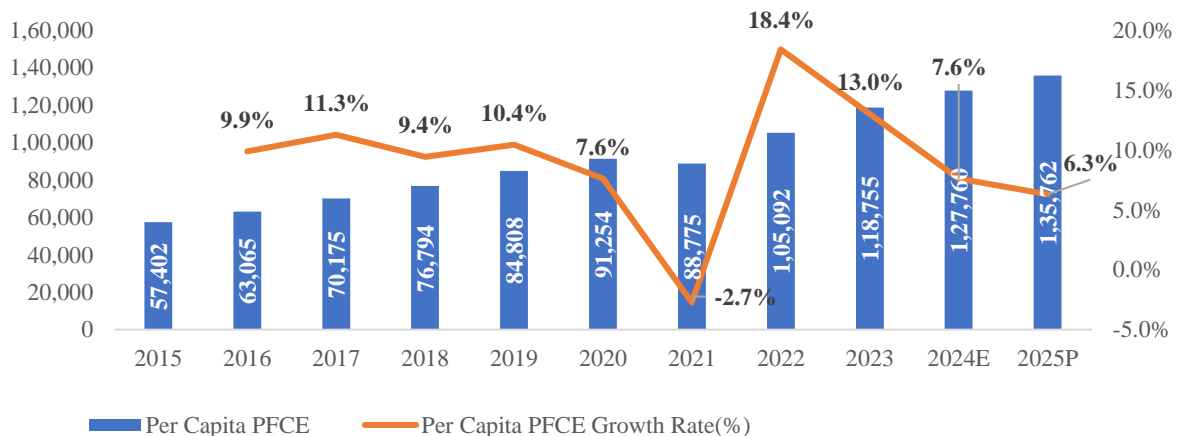


Source: Ministry of Statistics and Program Implementation

1.3 Per Capita Final Consumption Expenditure

India's Per Capita Final Consumption Expenditure had shown significant growth pre-COVID. In FY 2020, the average Per Capita Final Consumption expenditure was estimated at INR 91,254 a steep increase from INR 76,794 in FY 2018. Due to the emergence of COVID-19 in FY 2020, there was an approximately 2.7% drop in the Per Capita Final Consumption Expenditure to INR 88,775 in FY 2021. However, it recovered during FY 2023 to INR 1,18,755 and is estimated to reach INR 1,27,760 in FY 2024.

Exhibit 1.6: India's Per Capita Consumption Expenditure (Current Prices) and Growth (%) (In INR) (FY)

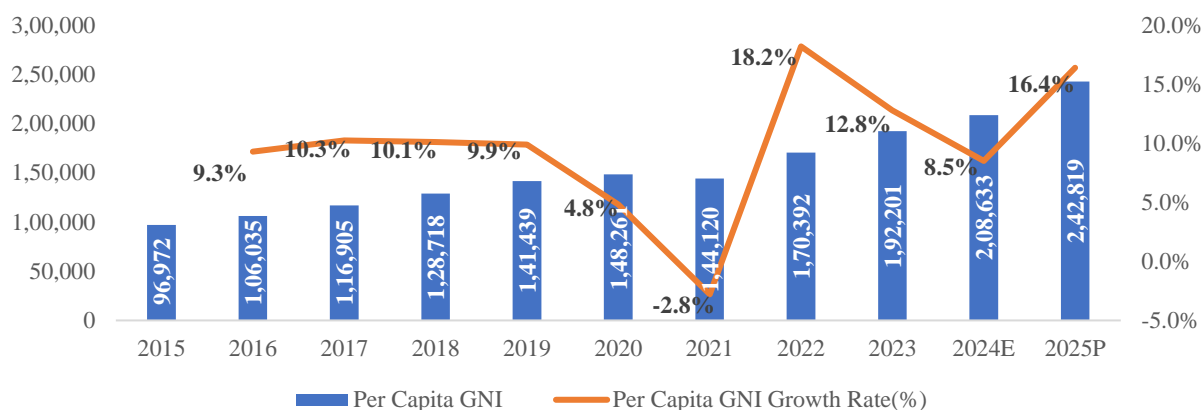


Source: Ministry of Statistics and Program Implementation, Technopak Analysis

1.4 Evolution of per capita income

India's income growth is one of the strongest drivers for higher private consumption trends. Gross National Income (GNI) is the total amount of money earned by a nation's people and business which includes GDP plus the income received from overseas sources whereas GDP is the total value of all goods and services produced within a nation for a set period. In recent years, the rate of growth of per capita GNI has accelerated, indicating that the Indian economy has been growing at a faster rate. The per capita GNI for India stands at INR 1,92,201 in FY 2023, marking a ~49.3% increase from INR 1,28,718 in FY 2018, exhibiting a CAGR of 8.3% during the period.

Exhibit 1.7: India's GNI Per Capita (INR) (Current Prices) And Y-O-Y Growth Trend (%) (FY)



Source: Ministry of Statistics and Program Implementation, Technopak Analysis

1.5 Key Growth Drivers for Economy

1. Demographic profile of India

India has one of the youngest populations globally compared to other leading economies. The median age in India is estimated to be 29.5 years for CY 2023, as compared to 38.5 years and 39.8 years in the USA and China respectively and is expected to remain under 30 years until CY 2030. With a growing young population, there is an increasing demand for premiumization. The younger population is naturally predisposed to adopting the latest trends and exploration, given their educational profile and exposure to media and technology. This presents an opportunity for domestic consumption in the form of branded products and organized retail.

Exhibit 1.8: Median Age: Key Emerging & Developed Economies (CY 2023)

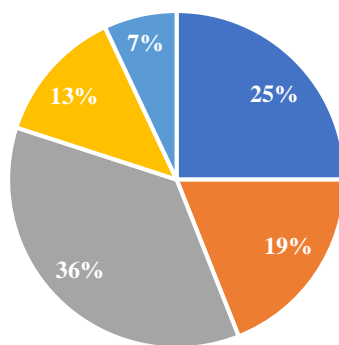
Country	India	China	USA	Singapore	Russia	South Korea	Canada	UK
Median Age (Yrs.)	29.5	39.8	38.5	38.9	41.5	45	42.4	40.6

Source: World Population Review

More than half of India's population falls in the 15-49-year age bracket

As of April 2024, India is the most populated country in the world, home to 1.44 billion people, which is approximately one-sixth of the world's population. About 54% of the total population falls within the 15 to 49 years age group, while 80% of the population is below 50 years old. This demographic distribution highlights that India's youth and working-age population contribute to positive demographics.

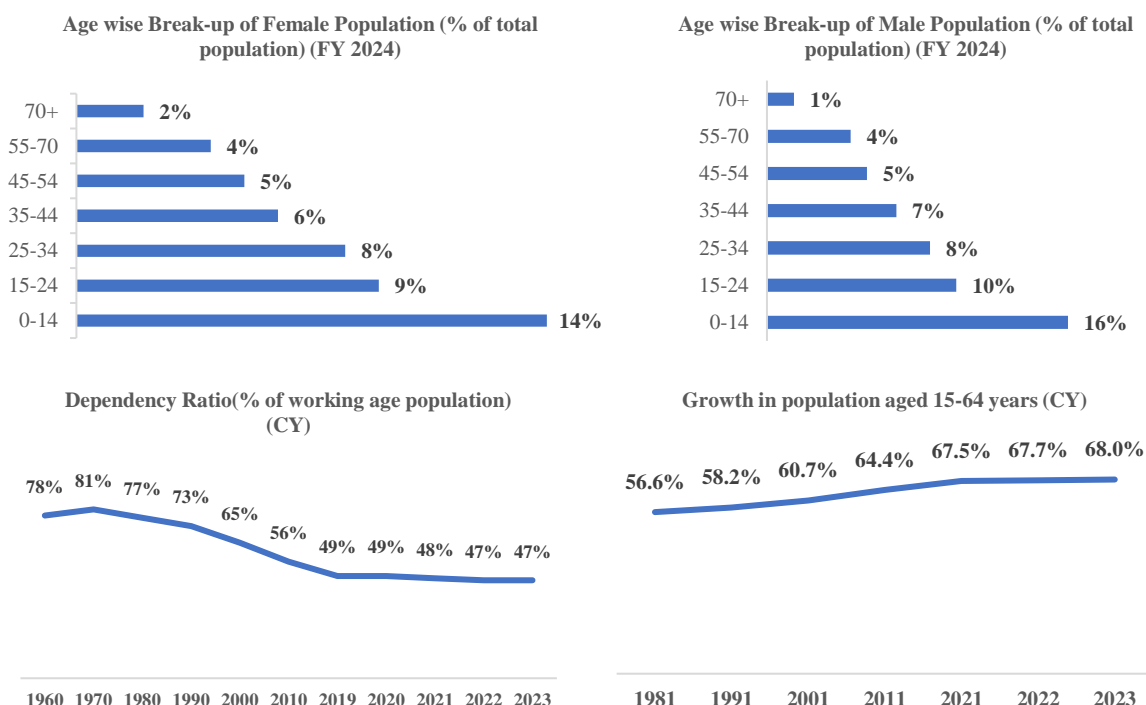
Exhibit 1.9: India's Population Distribution, by Age (%) (FY 2024)



■ <15 ■ 15-24 ■ 25-49 ■ 50-65 ■ 65+

Source: World Bank and Technopak Estimates

Exhibit 1.10: Age Dependency Ratio



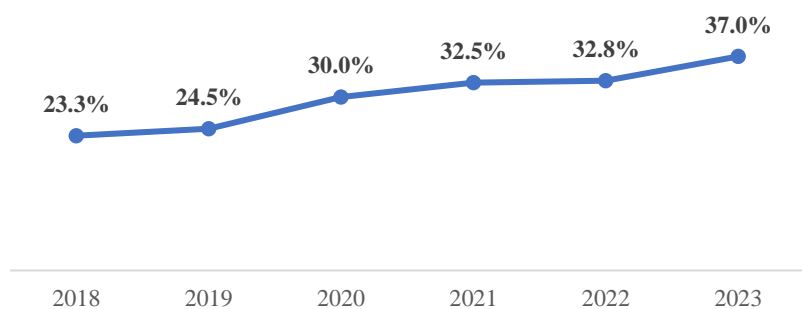
Source: Census of India 2011, World Bank, MOSPI; Age-wise break up of population not adding up to 100% due to rounding off
 Note: Dependency Ratio and Growth in population aged 15-64 years are in CY. CY 2022 for India refers to FY 2023 data and so on.

2. Women Workforce

Numerous factors, including better healthcare and greater media focus, are allowing women in India, in both urban and rural areas, to exercise greater influence on their families and society. The most important factor, however, is educational opportunity. Additionally, this increase of women in the workforce has led to a shift in household activity patterns, including an upward trend towards purchase of branded products, including fashion and lifestyle.

The female labour force participation rate in the country has improved significantly by 4.2 percentage points from 32.8% in FY 2022 to 37.0% in FY 2023. This significant jump is an outcome of the decisive agenda set by the government for ensuring women’s empowerment through policy initiatives aimed at their long term socio-economic and political development. Policies and legislations in these areas have been driving government’s ‘women-led development’ agenda in India.

Exhibit 1.11 Participation of Women in Workforce Aged 15 Years and Above (%) (FY)

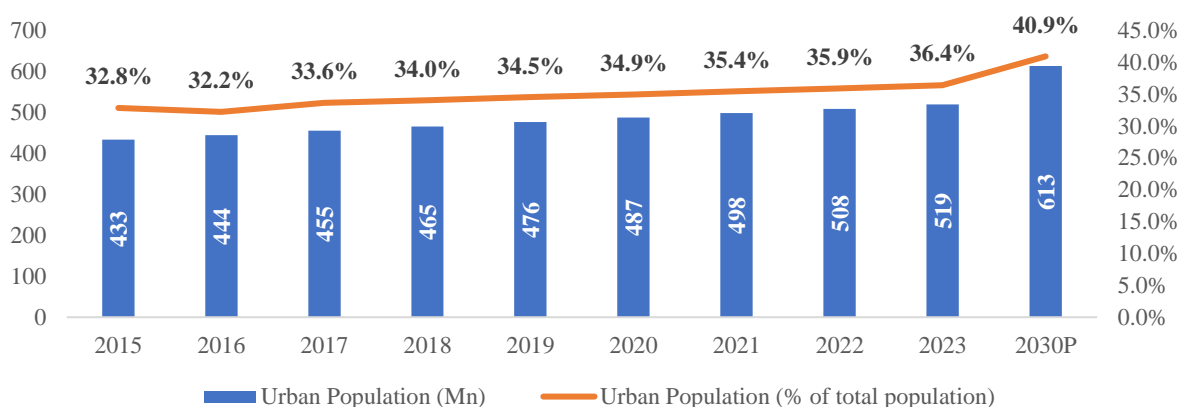


Source: Periodic Labor Force Survey (PLFS), MOSPI

3. Urbanization

Urbanization is one of the most important pillars of India's growth story, as these areas serve as the core drivers for consumption. India had the second-largest urban population in the world (in absolute terms) at 519 million in CY 2023, ranking only below China. Indian urban system constitutes ~11% of the total global urban population. However, only ~36% of India's population is classified as urban, compared to a global average of ~57%. It is the pace of India's urbanization that is a key trend fuelling India's economic growth. Currently, the urban population contributes 63% to India's GDP. Looking ahead, it is estimated that ~41% (613 million) of India's population will be living in urban centres by CY 2030.

Exhibit 1.12: India's Urban Population (In Million) and Increasing Urban Population as a Percentage of Total Population Over the Years (CY)



Source: World Bank, Technopak Analysis

Exhibit 1.13: Urban Population as Percentage of Total Population of Key Economies (CY 2023)

Country	World	India	China	USA	Singapore	Russia	Malaysia	Vietnam	UK
Urban Population Share	57%	36%	65%	83%	100%	75%	79%	39%	85%

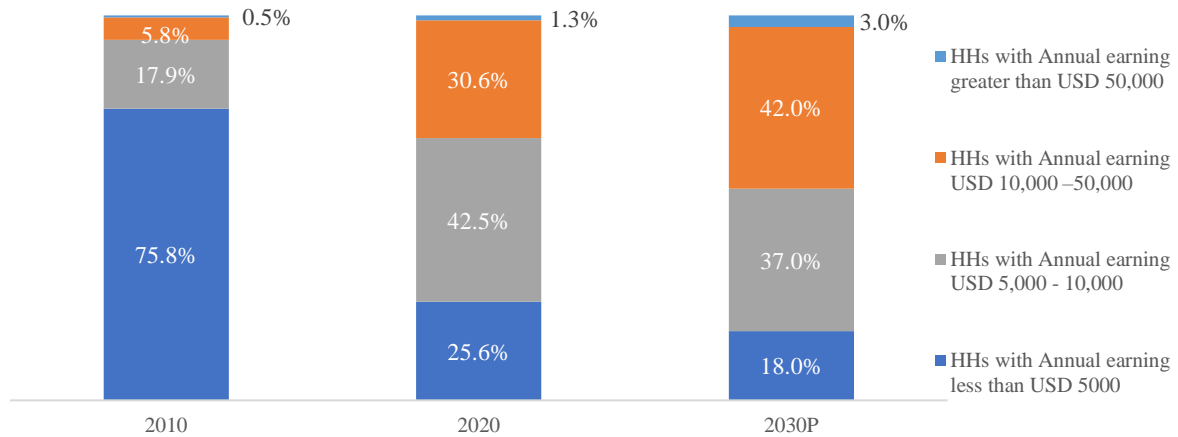
Source: World Bank

4. Growing Middle Class

The increase in number of households with annual earnings ranging from USD 10,000 to USD 50,000 is poised to drive the Indian economy by fostering demand for a wide array of goods, improved services, housing, healthcare, education, and more. Households with an annual income between USD 10,000 and USD 50,000 constituted a minor portion, accounting for 5.8% of the total population in FY 2010. This share increased to ~34.5% in FY 2023 and is expected to continue in the same vein, rising to 42% of the total population by FY 2030. The expanding middle-class sector in India is accompanied by a growing appetite for premiumization across

various sectors, including goods and services, construction, housing services, financial services, telecommunications, and retail.

Exhibit 1.14: Household Annual Earning Details (FY)

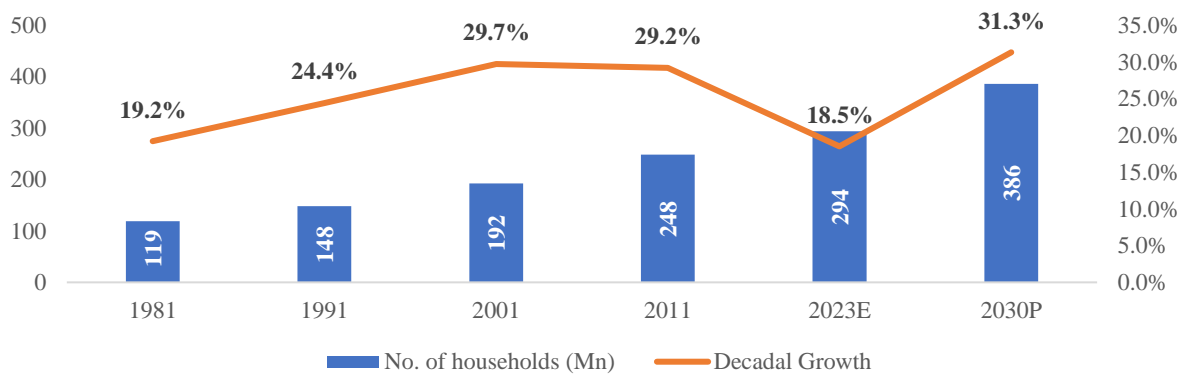


Source: EIU, Technopak Estimates
 Note: 1 USD= INR 80

5. Nuclearization

The growth in the number of households exceeds population growth, indicating an increase in nuclearization in India. Average household size has reduced from 5.3 in FY 2001 to 4.2 in FY 2023 and is further projected to reduce to 3.9 by FY 2030. In 2011, 69% of households had less than five members, compared to 62% in FY 2001. The growth in the number of nuclear families is leading to an increase in the number of households, thereby creating a strong demand for housing units and discretionary expenditure in India. Possible factors for the decline in the growth rate of number of households between 2011 and 2023 could be the COVID-19 crisis, economy recession leading to low income, increase in real estate prices etc.

Exhibit 1.15: Total number of households in India (In Million) and Decadal Growth Over the Years (%) (FY)



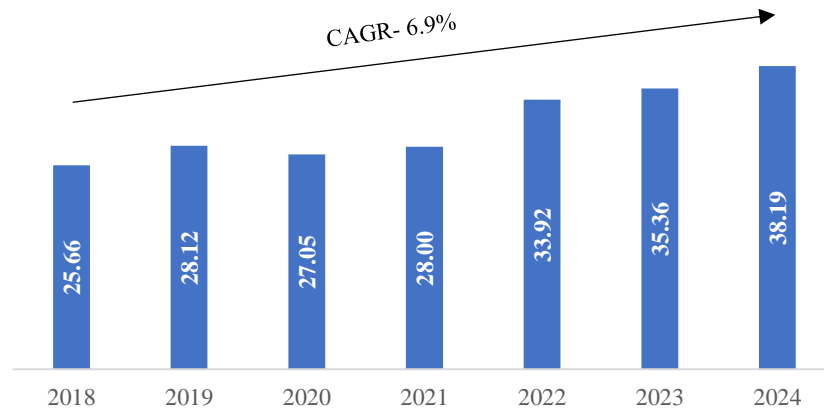
Source: Census, Technopak Analysis
 Note: Decadal growth for period 2011-2023E reflects a 15-year period and 2023E-2030P reflects 7-year period

6. Manufacturing in India gaining traction

Manufacturing has emerged as one of the high growth sectors in India, with the better performance of key sectors like automotive, engineering, chemicals, pharmaceuticals, and consumer durables. Contributing around 14% to India's GDP in FY 2024, it is poised to grow to approximately 21%-22% in the next 5 years. According to the Department for Promotion of Industry and Internal Trade (DPIIT), India received a total foreign direct investment (FDI) inflow of USD ~44.42 billion in FY2024 and manufacturing exports reached their highest ever annual exports of USD 447.46 billion with 6.03% growth during FY 2023, surpassing the previous year FY 2022 record exports of USD 422 billion.

The manufacturing Gross Value Added (GVA) at current prices was INR 25.66 trillion in FY 2018, which has reached to INR 38.19 trillion in FY 2024 at a CAGR of 6.9% over the period. Furthermore, the Indian manufacturing sector is experiencing a surge in investments with various government initiatives such as 'Make in India,' and the Production-linked incentive (PLI) scheme.

Exhibit 1.16: Manufacturing GVA at Current Prices (In INR trillion) (FY)



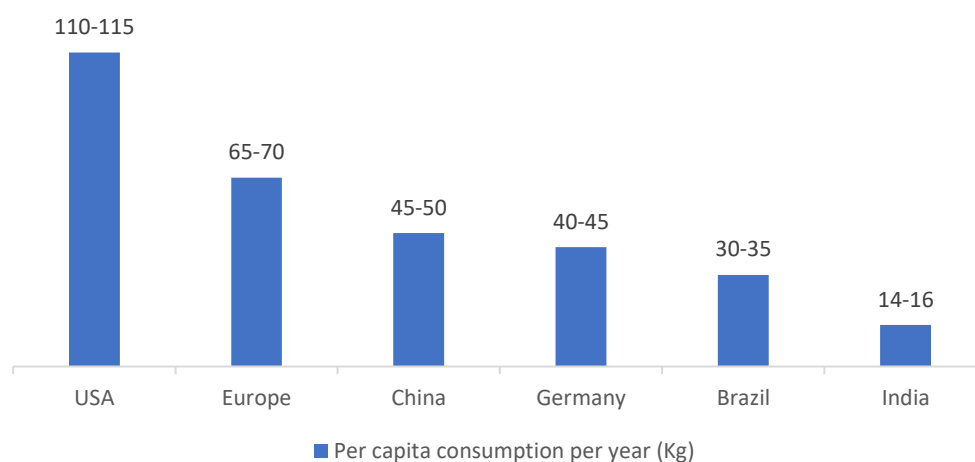
Source: RBI

1.6 Comparison of per capita packaging consumption in India vs other countries, Key Affluency Trends and Few Economic Indicators from a Manufacturing/Industrial Standpoint

Per capita packaging consumption

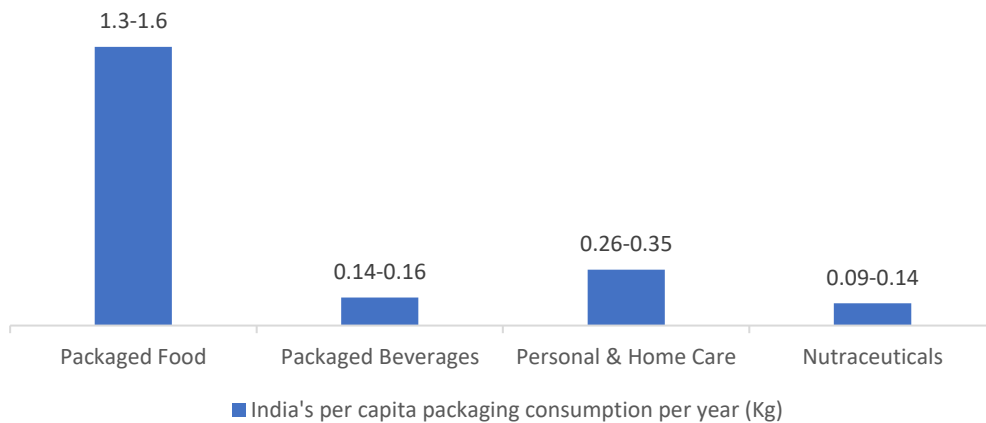
The per capita packaging consumption defines the packaging requirements of individuals in different countries based on factors such as per capita income, per capita consumption, and various demographic trends. These factors determine the demand for packaging materials in different countries.

Exhibit 1.17: Per Capita Packaging Consumption (Includes Rigid and Flexible Packaging) for Key Economies (In Kg) (CY 2021)



Source: Secondary Research

Exhibit 1.18: India's per capita packaging consumption in end-use segments (CY 2021)



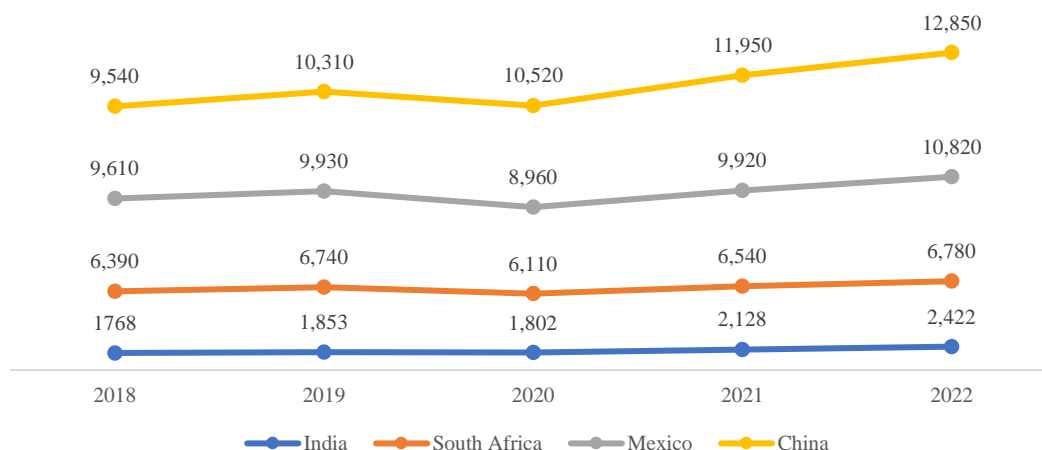
Source: Technopak Analysis

Key affluency trends and comparison for key economies which helps in defining the Rigid Plastic Packaging Household Consumption

Key affluency trends which help in defining the household consumption for any economy include-per capita income, per capita private final consumption expenditure (PFCE), the share of urban population, and the percentage of working age population in those countries. These attributes help determine the daily requirements and consumption habits of people and their capacity to spend on household activities. Higher per capita income translates to higher purchasing power, allowing individuals to spend more on various goods and services, thereby reflecting consumer spending behavior and preferences. Similarly, the rise in urbanization and working age population is associated with higher standards of living and greater access to resources owing to the changes in their socio-economic lifestyles. This shift towards urbanization and a higher proportion of the working age population results in an increased preference for packaged products over loose, open products. This is driven by factors such as increased awareness about health and hygiene, sustainability, convenience, and customization, ultimately providing growth impetus to rigid plastic packaging industry to deliver better packaged products in terms of safety and other concerns.

Higher per capita income indicates greater disposable income available for spending on goods and services, including packaged products. China had the highest per capita income of USD 12,850 in CY 2022, followed by Mexico with USD 10,820 in CY 2022, among these economies driving higher investment in packaging infrastructure and innovation. However, CAGR for India was the highest between CY 2018 to CY 2022 with growth rate of 8.2% as compared to China (7.7%), Mexico (3.0%) and South Africa (1.5%) during the similar period.

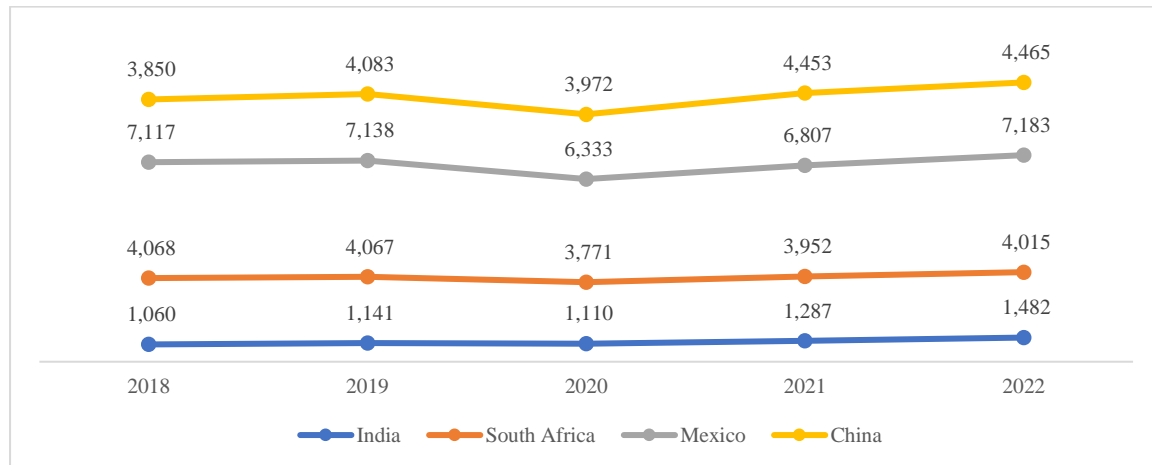
Exhibit. 1.19: Comparison of GNI Per Capita for China, India, Mexico, and South Africa (In USD) (CY)



Source: World Bank, 1 USD= INR 80

Per capita PFCE directly reflects consumer spending behaviour and preferences, creating opportunities for packaging companies to innovate and cater to evolving consumer demands. In CY 2022, Mexico recorded the highest PFCE at USD 7,183, considering its per capita income of USD 10,280. In comparison, China had a PFCE of USD 4,465, aligned with its per capita income of USD 12,850 within these economies. However, the higher GNI growth rate of India directly reflects the higher PFCE growth rate as well with CAGR of 8.7% for the period between CY 2018 to CY 2022 as compared to China (3.8%), Mexico (0.2%) and South Africa (-0.3%) during the similar period.

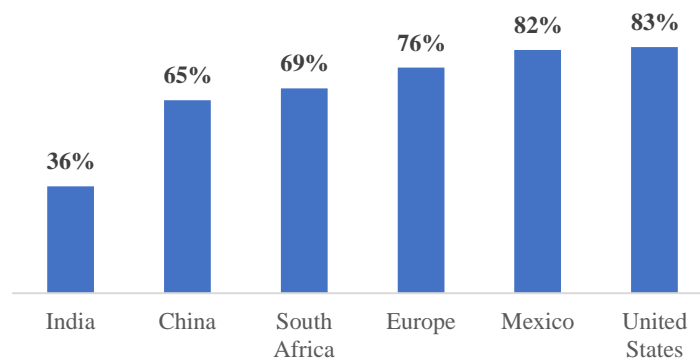
Exhibit. 1.20: Comparison of per capita PFCE for China, India, Mexico, and South Africa (In USD) (CY)



Source: World Bank, 1 USD= INR 80

As urbanization rates increase, urban populations tend to exhibit different consumption patterns compared to rural areas, favouring packaged products for their convenience, variety, and perceived quality. This trend drives the demand for packaged products, consequently stimulating growth in the packaging market. In CY 2023, US boasted the highest share of urban population at 83%, in contrast to India with a lower share of 36% in the same year, among these economies.

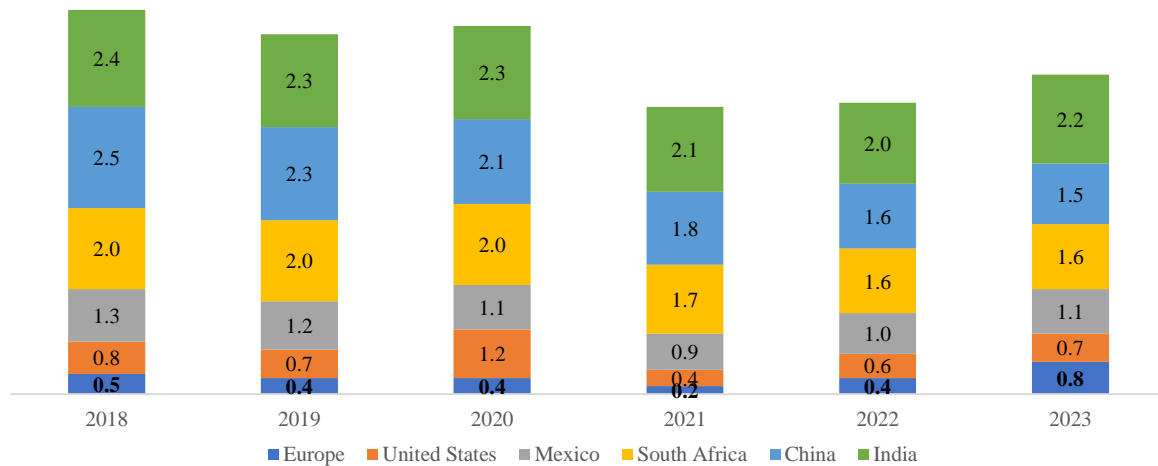
Exhibit. 1.21: Comparison of Urban Population share for China, India, Mexico, South Africa, US and Europe (%) (CY 2023)



Source: World Bank

India has exhibited the fastest growth rate of more than 2% y-o-y in urbanization in the past years as compared to other economies as shown in the table below. It is assumed that it will continue to show similar growth rates in the coming years as well and one of the major reasons implying it is that India has a major scope to shift towards urbanization due to a lower share in urbanization among these economies.

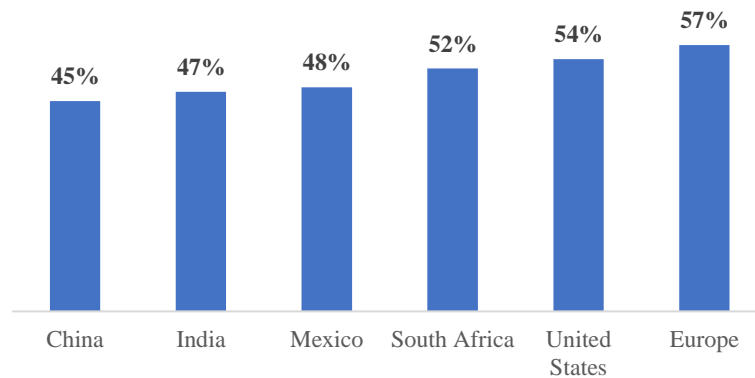
Exhibit. 1.22: Comparison of Urban Population growth rate over the years for China, India, Mexico, South Africa, US and Europe (%)



Source: World Bank

The working-age population indicates the earning potential within households, contributing to higher consumption levels. Moreover, individuals in this demographic group have busier lifestyles, leading them to prefer packaged products for convenience and time saving. Among these economies, Europe has the highest percentage of working age population of 57% followed by US which has 54% of working age population.

Exhibit. 1.23: Comparison of Percentage of Working Age Population for China, India, Mexico, and South Africa (%) (CY 2023)



Source: World Bank

Manufacturing/Industrial Perspective on Economic Indicators :

China

- In 2023, the manufacturing value added (MVA) as a percentage of GDP in China was ~ 26%.
- The cumulative production of plastic products in China amounted to 74.89 million tons in CY 2023, showcasing a substantial 3% rise as compared to the previous year. In December 2023, China experienced an increase in plastic product production, reaching approximately 6.98 million tons. This represents a 2.8% year-on-year growth and a 4.2% month-on-month rise.
- China is set to construct over 20 petrochemical projects to produce raw materials for various products, including plastic packaging, clothing, and detergents, contributing to significant production capabilities for packaging companies.

- China is significantly involved in producing considerable quantities of plastics, aiding in generating revenues from trade exports, thereby creating significant production capacities for various packaging companies. In CY 2023, China's plastic and article exports reached approximately USD 131 billion, showing an -8% degrowth compared to the USD 143 billion valuation in CY 2022.
- Some Mergers & Acquisitions /Investments in China:
 - In August 2022, Amcor added a new facility in Jiangyin, China to further expand its network of innovation centers. The new center would provide packaging technology and more environment friendly material science to Asia-Pacific, supporting regional prosperity and innovation.
 - In May 2022, US investment group Carlyle acquired all the shares of the Chinese cosmetic packaging manufacturer HCP Packaging (HCP). HCP, which has its headquarters in Shanghai, has ten production and manufacturing sites in China, the USA, Mexico, and Europe. HCP also invests in and conducts research into sustainable packaging solutions. The investment company uses its industry expertise in the industrial and consumer sectors to speed up HCP's operations and widen its client base.
 - In December 2022, Amcor Plc. announced the opening of its newly constructed manufacturing facility in Huizhou, China. The company invested around USD 100 million in the plant, which measures around 600,000 sq. ft, making it the largest flexible packaging plant in the country.

India

The positive developments in the manufacturing sector, driven by production capacity expansion, government policy support, heightened M&A activity, and PE/VC-led investment, are creating a robust pipeline for the country's sustained economic growth in the years to come. Contributing ~14% to the nation's GDP in FY 2024, the manufacturing sector plays a significant role in the Indian economy as India is gradually progressing on the road to Industry 4.0 through the Government of India's initiatives like the National Manufacturing Policy which aims to increase the share of manufacturing in GDP to 25% by 2025 and the PLI scheme for manufacturing which was launched in 2022 to develop the core manufacturing sector at par with global manufacturing standards.

- The Union government approved a new PLI scheme for the food processing sector with a budget outlay of INR 109 billion (USD 1.46 billion) to provide incentives disbursed over six years until 2026-27.
- In FY 2024, India received a total foreign direct investment (FDI) inflow of USD 44.42 billion, attracting many foreign investments.
- In April 2024, the Manufacturing Purchasing Managers' Index (PMI) in India stood at 58.8, indicating growth in economic trends in the manufacturing sector (*Purchasing Managers Index is a measure of the prevailing direction of economic trends in manufacturing based on monthly survey of supply chain managers across industries, covering both upstream and downstream activity)
- The export of the top 6 major commodities (Engineering goods, Petroleum products, Gems and Jewellery, Organic and Inorganic chemicals, and Drugs and Pharmaceuticals) stood at USD 295.21 billion in FY 2023.
- Mergers & Acquisitions/Investments in India:
 - In FY 2023, BCS Globals, a UAE based food & beverage company, forayed into the Indian energy drink market with the launch of one-of-its kind brand Wox and has planned to introduce a diversified product portfolio.
 - In FY 2023, inspired by Japanese beauty secrets, Keomi Beauty recently kick-started its journey in the Indian beauty and skincare space this year.
 - In May 2023, PET film manufacturer Polyplex Corporation have agreed to sell a 24.2 percent stake to Dubai based AGP Holdco Limited for an aggregate consideration of Rs 1379.47 Cr.
 - In December 2022, Reliance Group launched its FMCG brand "Independence" in Gujarat, which will bring a wide choice of high quality and affordable products including edible oils, pulses, grains, packaged foods, and other daily need products.
 - In December 2022, Hindustan Unilever Limited announced its foray into the "Health and Wellbeing" category through strategic investments in Zywie ventures Private Limited (OZiva) and Nutritionlab Private Limited (Wellbeing Nutrition).
 - In March 2022, Canadian investment firm Brookfield Asset Management Inc. signed an agreement to pick a minority stake in Jindal Poly Films Ltd. for Rs 2,000 Cr.

Mexico

- In CY 2023, The Manufacturing Value Added (MVA) as a percentage of GDP in Mexico was ~ 20%.

- Mexico's plastics production has grown steadily at an average of ~5.27% annually since CY 2018. The cumulative local production capacity of plastics and resins in Mexico amounted to USD 28.22 billion in CY 2022 and is expected to reach USD 28.73 billion in CY 2023. However, Mexico's total imports of plastics is much higher than local production and accounted for USD 41.52 billion in CY 2022.
- The total exports of plastics in the country amounted to USD 17.72 billion in CY 2022 and were expected to reach USD 18.04 billion in CY 2023.

South Africa

- In CY 2023, the Manufacturing Value Added (MVA) as a percentage of GDP in South Africa was ~ 13%.
- Some Mergers & Acquisitions/Investments in South Africa:
 - In July 2021, the Austrian plastic packaging manufacturer ALPLA Group acquired South Africa-based packaging manufacturer Verigreen Packaging. This acquisition aimed to expand ALPLA's presence in South Africa and provide access to market segments previously unexplored by the group in the region.
 - In May 2021, Huhtamaki, a leading manufacturer of sustainable packaging solutions, announced its plans to establish a new manufacturing unit in KwaZulu-Natal, South Africa. This initiative reflects Huhtamaki's commitment to expanding its operations and presence in the South African Market.

USA

- In CY 2021, the Manufacturing Value Added (MVA) as a percentage of GDP in USA was ~ 11%.
- Some Mergers & Acquisitions/Investments in USA:
 - In January 2024, Mauser Packaging Solutions acquired all the assets of Consolidated Container Company LLC. engaged in a manufacturing and distribution of industrial containers and provider of recycling and related services for the value \$56.0M.
 - In January 2024, TricorBraun Inc. acquired New Zealand based ITA Management Services Pty Ltd engaged in the manufacturing and distribution of plastic packaging products for food, beverage, nutraceutical, pharmaceutical, agriculture, chemical, and industrial sectors.
 - In January 2024, Container Services Inc. acquired Apex Plastics specializing in custom and proprietary blow-moulded bottles, containers and shapes.
 - In 2023, A new Bertolli branded extra virgin olive oil has been launched in the USA in an Organic variant that comes in a 100% recycled plastic bottle. This new launch is available in 750ml plastic bottle and is in line with the environmental responsibility trend.
 - In October 2023, Greif Inc., a U.S. manufacturer of industrial packaging products and services, acquired PACKCHEM Group SAS, a French manufacturer of small plastic containers and barrier & non-barrier jerrycans and for a transaction value of USD 538 Billion, thereby enhancing its product portfolio through horizontal expansion.
 - In March 2022, CP Flexible Packaging announced acquisition of Bass Flexible Packaging Inc., a Lakeville, Minn. based packaging maker for both the confectionery and health and beauty markets.
 - In April 2022, Sealed Air, ExxonMobil, and Ahold Delhaize USA announced their collaboration on an advanced recycling initiative, the first of its kind in the U.S. The project recycles flexible plastics from the food supply chain and remakes them into new, certified circular food-grade packaging.
 - In May 2022, Berry Global Group and Taco Bell announced partnering toward a more circular approach to sustainable packaging with the launch of a new clear, all-plastic cup containing mechanically recycled post-consumer resin (PCR). The recycled HDPE used in the new cup contains food-grade content from products such as recycled milk jugs.
 - In June 2022, American Packaging Corporation (APC) announced that it would open a new 275,000-square-foot Center of Excellence manufacturing facility in Cedar City, Utah.

Germany

- In CY 2023, the Manufacturing Value Added (MVA) as a percentage of GDP in Germany was ~ 19%.

- In April 2022: Mondi launched new packaging solutions for the food industry at AnugaFoodTec in Cologne, Germany. Two-tray packaging products provide recyclable options for fresh food manufacturers, which would help to reduce food waste.
- In May 2022, with many successful product launches in the UK, Coveris launched its new dairy packaging developments to FachPack 2022 in Nuremberg, Germany, one of Europe's leading packaging events.
- In 2022, Germany-based consumer goods company Henkel has invested in a stretch-blow moulder from filling and packaging firm KHS, featuring preferential heating capabilities, in an effort to increase its polyethylene terephthalate (PET) bottle production. The KHS system has the capacity to process up to 21,700 bottles an hour.
- Some Mergers & Acquisitions/Investments in Germany:
 - In March 2022: The ALPLA Group acquired the recycling company Texplast from the FROMM Group and all of its shares in the joint venture PET Recycling Team Wolfen. The international company would increase its annual processing volume in Germany to 75,000 tons of PET bottles.
 - In 2022: PACCOR Packaging GmbH, Germany was acquired by Færch Plast A/S, Denmark. PACCOR is a leading international player in the packaging industry, offering integrated packaging solutions mainly for the food industry. This acquisition aligns with Faerch's strategy for creating circularity in food packaging and will accelerate sustainable packaging solutions in the European dairy sector
 - In 2022: Rudolf Dankwardt GmbH, Germany was acquired by Lafayette Mittelstand Capital, Luxembourg. Rudolf Dankwardt provides manufacturing and packaging solutions to the cosmetics industry.

France

- In CY 2023, the Manufacturing Value Added (MVA) as a percentage of GDP in France was ~ 9.7%.
- Some Mergers & Acquisitions/Investments in France:
 - In April 2022, PACCOR, a developer of rigid packaging solutions, decided to start making DuoSmart cups in France by the end of the year. The investment by PACCOR France intends to diversify output while also assisting the company's transition to a circular economy.
 - In May 2022, Coca-Cola in France has announced that the company will launch a new, universal 250ml returnable glass bottle for its Fuze Tea, Tropic, Sprite, Fanta, and Minute Maid brands in hotels, restaurants, and cafes. They join the Coca-Cola Original, Coca-Cola Zero, and Coca-Cola Cherry brands in their iconic 330ml bottles, also historically made of returnable glass.
 - In June 2022, Saverglass, an industrial group of French origin specializing in the production and decoration of luxury and high-end glass bottles for the wine and spirits industry, announces the doubling of the glass production and the increase of the decoration capacities of its plant located in Acatlan de Juarez near Guadalajara, by early 2023 to meet demand in the Americas.
 - In November 2022, Verallia acquired 100% of the capital of Allied Glass. The Group had announced the signature of a binding agreement with an affiliate of Sun European Partners LLP to acquire Allied Glass.

Brazil

- In CY 2023, the Manufacturing Value Added (MVA) as a percentage of GDP in Brazil was ~ 13.4%.
- In November 2022, the Brazilian Plastics Institute, in partnership with Think Plastic Brazil and ApexBrasil (the Brazilian Trade and Investment Promotion Agency), launched a new online platform. Leading manufacturers are actively making informed decisions regarding ingredient sourcing and manufacturing techniques to align with the sustainability trend. Unilever, for instance, introduced refill packs for OMO liquid laundry detergent using 50% recycled plastic, resulting in 70% less plastic usage overall.
- Some Mergers & Acquisitions/Investments in Brazil:
 - In May 2022, The Ardagh Group announced the location of its first glass production facility in Brazil. The factory will be based in Juiz de Fora, Minas Gerais, and will cater to leading clients in the growing Brazilian market, providing sustainable glass packaging.
 - In January 2024, Valgroup MG Industria De Embalagens Flexiveis Ltda acquired Mirvi Brasil Ltda., a manufacturer of plastic caps and covers primarily for the food industry in South America.

- In March 2024, America Embalagens, a subsidiary of Evora S.A. acquired Pochet do Brasil, a leading Brazilian manufacturer of rigid plastics packaging products primarily for the beauty and cosmetic industry.

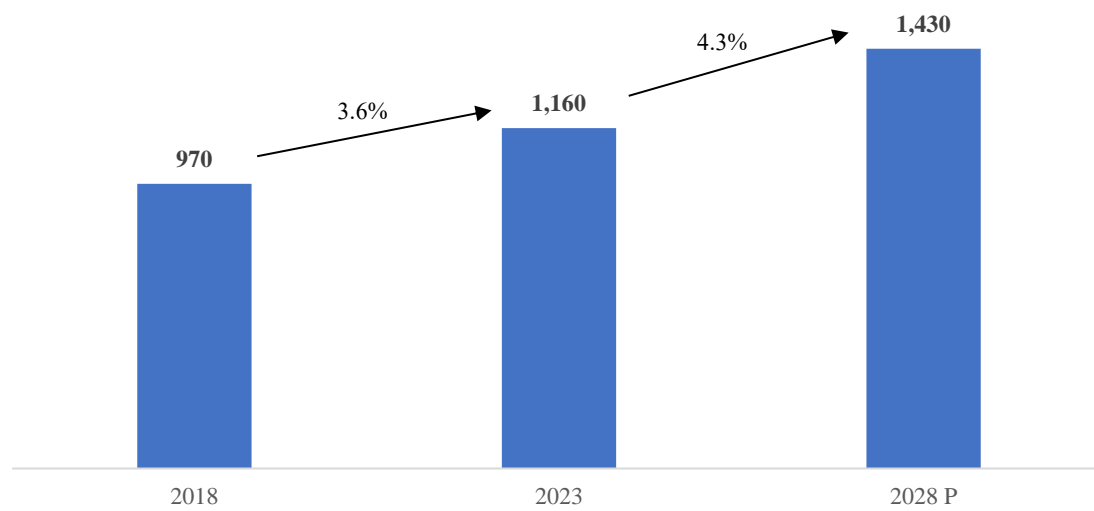
These economic indicators reflect a growth in the manufacturing sector, particularly in FMCG and Pharmaceuticals, across key economies. This growth contributes to increased demand in the packaging sector, presenting new opportunities in the rigid packaging industry.

2. Overview of the Global Packaging Industry

2.1 Global Market Overview

The packaging industry plays a critical role in the global economy. Encompassing a vast range of materials and applications, it ensures the protection, transportation, and presentation of countless products. The global packaging market held substantial value, estimated at USD 1,160 billion in CY 2023 and despite rising input cost or uncertain macroeconomic factors, it is projected to grow at a CAGR of 4.3% to reach a market size of USD 1,430 billion by CY 2028. This growth is majorly driven by the growing population and rising income levels in the developing economies.

Exhibit 2.1 Global Packaging Market Size (In USD Billion) (CY)



Source: Secondary Research, Technopak Analysis

2.2 Types of Packaging Material and Share

The global packaging market encompasses various types of packaging based on the material used like metal, glass, plastic, paper, corks, and caps. Paper packaging includes various products like packaging boards, kraft paper, and other types of packaging papers. Plastic is an in-demand material and a growing choice in the industry, playing a significant role in packaging, especially in industries like food, beverages, and oil, due to their performance, durability, and cost-effectiveness. Plastics come in different grades and material combinations such as polyvinyl chloride, polypropylene, and polyethylene, depending on the specific needs of the product being packaged. The global packaging industry is segmented based on two types, one is by material type and the other is by product type.

Packaging type based on material:

Based on the material type it can be segmented into 5 major segments:

Rigid Plastic: Composed of sturdy plastics like polyethylene terephthalate (PET) and High-density polyethylene (HDPE), this category offers robust protection and clarity. Prevalent rigid plastic products like water bottles, detergent containers, and buckets are formed through processes like injection molding and blow molding, resulting in durable end products. Rigid plastics are used in almost all types of industries including Food and Beverage industry, Personal care industry, Alco-beverage industry, E-commerce industry, Pharmaceutical industry, Agro-chemical industry.

Flexible Packaging (Plastic & Paper): This segment utilizes lightweight, adaptable plastics like polyethylene (PE) and polypropylene (PP). Perfect for bread bags, food wraps, pouches, paper envelopes, e-commerce packaging and others. Flexible plastics are produced through processes like film extrusion. These flexible films create a lightweight barrier against moisture and air, keeping contents fresh. Flexible plastic packaging is most widely used in the Food and Beverage packaging industry, and somewhat in other industries like Personal and Home care. While flexible paper takes shape as wrapping materials, bags, and labels. Production involves pulping

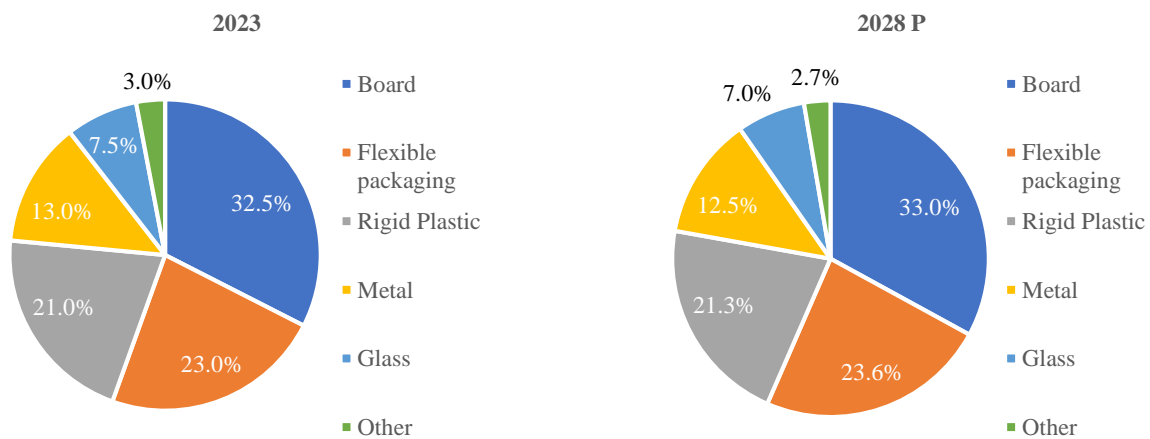
wood and forming it into sheets. Flexible paper packaging usage alone is less as compared to flexible plastic, this is mostly used in multi-layer packaging by the E-commerce industry.

Paperboard: This segment is derived from wood pulp. Paperboard, a thicker variant, forms cereal boxes and shoe cartons. The resulting paperboard often showcases printed information, are lightweight, recyclable, often considered to be biodegradable choices. Paperboard packaging is used by the E-commerce industry and food and beverage industry as well as it forms the outer packaging for Personal care and Pharmaceutical Industry.

Glass: This inert and transparent material is made from silica sand. Glass jars and bottles, widely used for food and beverages, are formed through blowing molten glass. Glass's chemical resistance makes it perfect for sensitive products and those requiring high heat treatment during processing, while also allowing clear product visibility. The most widely application of glass can be seen in the Alco-beverage industry and other industries include Personal care and Pharmaceutical industry.

Metal: Offering superior protection and extended shelf life, metal packaging utilizes aluminum, steel, or tin. Common examples include aluminum cans for beverages and food, steel drums for industrial products, and tin cans for food preservation. Metal is shaped through processes like rolling and stamping. It is ideal for heat resistance, light protection, and long-term storage. Metal packaging is used by Paints and Adhesive industry, Chemicals and oil industry along with Pharmaceutical and food and beverage industry to name a few.

Exhibit 2.2 Global Packaging Type and Share (%) by Value for Material Type (CY)



Source: Secondary Research, Technopak Analysis
 Note: Flexible packaging includes plastic & paper materials

Exhibit 2.3 Packaging Material Product Type

Paper board	• Product type: Courragted boxes, paper boxes
Flexible Packaging	• Product type: Shrink films, wrappers, pouches, bags- paper and plastic, envelopes
Rigid Plastic	• Product type: bottles, jars, trays, tubs, cups, pots
Metal	• Product type: Foil, tubes, containers, cans, closures
Glass	• Product type: Bottles, jars, jug, vials
Other	• Product type: wooden boxes, cloth bags, jute bags, etc.

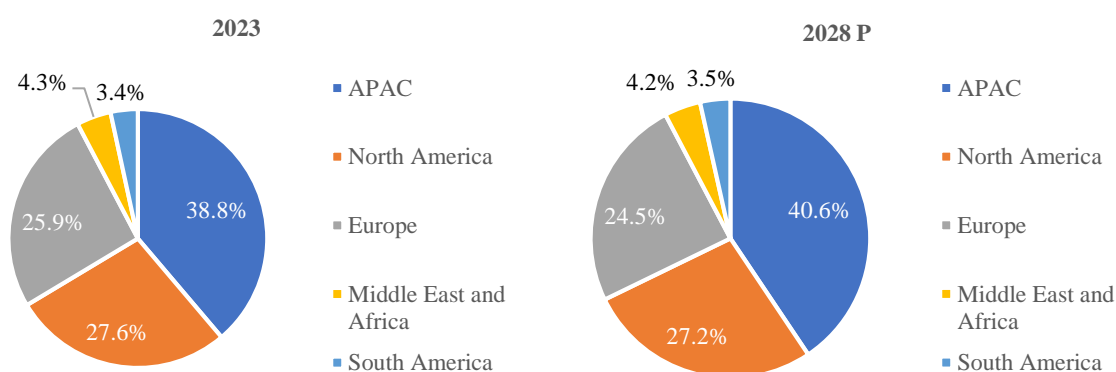
Source: Secondary research

In the global packaging industry, board has the highest share of ~32.5% in CY 2023 (USD 377.0 billion) and is expected to see an upward growth to reach ~33% by CY 2028 (USD 471.9 billion) growing at a CAGR of ~4.6%. This is primarily due to the growing e-commerce industry which uses cardboard boxes as it is tertiary packaging. This is followed by flexible packaging as the second largest with a share of ~23% in the market in CY 2023 (USD 266.8 billion) and is expected to reach at ~23.6% by CY 2028 (USD 337.7 billion) growing at a CAGR of ~4.8%. Flexible packaging includes flexible plastic and paper packaging. Flexible plastic was 75% of the total flexible packaging market in CY 2023 (USD 200 billion) and it is growing faster as compared to paper packaging, which is relatively a smaller market (USD 66.7 billion). This is followed by rigid plastic packaging with a share of ~21% in CY 2023 (USD 243.6 billion), growing at a CAGR of ~ 4.5% by CY 2028 (USD 304.2 billion). In plastic packaging out of the two Rigid and Flexible plastic packaging, rigid plastic packaging is more recyclable as compared to the flexible plastic packaging. The share of glass is expected to decrease by CY 2028 (USD 100.1 billion) to reach 7% from 7.5% in CY 2023 (USD 87.0 billion) due to the heavy weight and inert nature of glass, the rigid plastic market share stands to benefit from this as an alternative material to glass.

2.3 Key Market by Geography

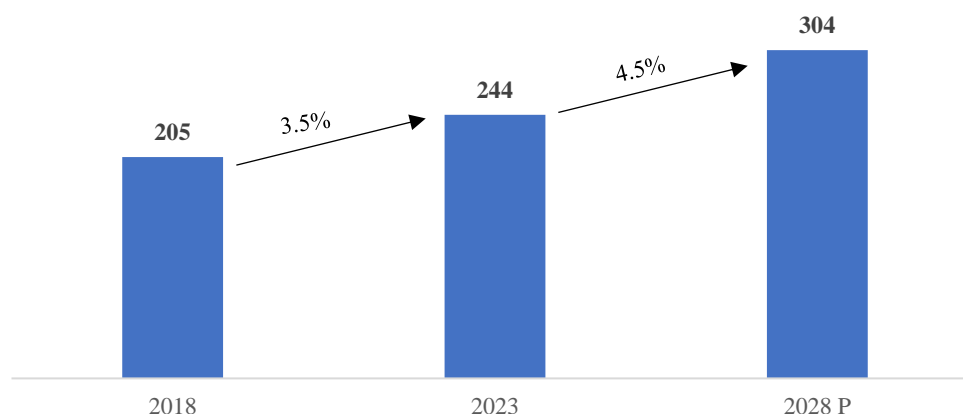
The global packaging industry is set to experience significant growth, particularly in developing regions. The Asia Pacific region is projected to exhibit robust growth, with an estimated CAGR of ~ 5.2% from CY 2023 to CY 2028 and is expected to maintain its position as the largest market, with a market share of 40.6%. Within the region, countries such as India and China are emerging as key players in this growth trajectory. Growth in the developing economies like China and India is on account of their growing food and beverage, FMCG, and personal care industries. For India, another factor contributing to this growth is the expanding end user industries along with the rapid growing e-commerce industry due to the increasing digital consumer base and growing online shopping trend. Another factor that contributes to the growth is the manufacturing sector in Asian markets which increases the need of packaging. China is emerging as a leading player in the region, with India also growing at a fast pace. Followed by APAC, North America is the second largest region with a share of around ~27.6%. In the North America region, the USA alone contributed around 60% of this share. The share of Middle East, Africa, and Europe is expected to decrease in the next 5 years by CY 2028 in the global packaging industry while there is growth in the South America region following a similar path as the Asian market, however, is too small in value.

Exhibit 2.4 Global Packaging Market Share (%) Split by Value for Key Geographies (CY)



Source: Secondary research, Technopack BOK

Exhibit 2.5 Global Rigid Plastic Packaging Market Size (In USD Billion) by Value (CY)



Source: Secondary research, Technopak Analysis

India is the fastest growing country in the Rigid Plastic Packaging Market (RPP) globally

India is the fastest growing RPP market globally as the CAGR of global rigid plastic packaging from CY 2023 to CY 2028 is estimated to be ~ 4.5% while India's RPP market is growing at a CAGR of ~7.0% during the same period. The markets with largest market share in CY 2023, USA (USD 43.5 billion) and China (USD 40.5 billion) are growing with a CAGR of ~3.1% and ~4.4% respectively from CY 2023 to CY 2028 while India (USD 12.6 billion) is the fastest growing with a CAGR of ~7.0% during the same period. India's RPP market accounted for ~5.2% of the global RPP market in 2023 and it is estimated to increase to 5.3% by CY 2028. This growth is contributed by growing packaged food, personal care, pharmaceuticals, FMCG, and other industries in the nation due to the rise in demand within these industries owing to the increased population and increasing disposable income.

Exhibit 2.6 Key countries Rigid Plastic Packaging CAGR (%) by Value (CY)

Key countries	CAGR 2018-23	CAGR 2023-28P
India	5.1%	7.0%
China	4.18%	4.40%
Canada	3.35%	3.60%
Japan	2.95%	3.10%
US	2.82%	3.10%
Germany	2.19%	2.40%
UK	1.95%	2.20%

Source: Secondary research, Technopak BOK

Note: India's growth rate is based on FY market size

2.4 Key Growth Drivers and Trends

1. Economic and Demographic Growth: Global economic expansion will be driven by growing consumer markets, particularly in emerging economies. Despite potential disruptions like the Russia-Ukraine war and tariff disputes, rising income levels are expected to empower consumers, especially in packaged goods. Additionally, urbanization in key markets like China and India will boost consumer spending, favouring global brands. Aging populations, notably in Japan, will drive demand for healthcare products, necessitating tailored packaging. Moreover, the rise in single-person households underscores a demand for smaller portion sizes and convenience features like seeable or microwavable packaging.

2. Embracing Sustainability in Packaging: In recent years, there has been a notable shift in the consumer preference for sustainable packaging and this trend is evident in both government policies and consumer preferences. The European Union has been at the forefront, emphasizing circular economy principles and targeting plastic waste reduction. Strategies such as exploring alternative materials, investing in bio-based plastics, and improving recycling processes are gaining momentum. Brands are increasingly prioritizing packaging that demonstrate their commitment to sustainability, while innovative technologies like high-barrier pouches and

intelligent packaging are helping minimize food waste and ensuring product safety throughout distribution chains, and brands are on the lookout for recyclable packaging materials. Hence, this could be a growth driver for packaging material like paper and rigid plastic which can be easily recycled and become a preferred choice of packaging by the brands and consumer. Embracing this trend that can pave the way for transformational innovation and lead to a surge in rigid packaging.

In line with the growing emphasis on sustainable packaging, leading industry players are demonstrating significant progress in key environmental metrics. Manjushree achieves 98% recyclability for its products and 100% waste recycling and reuse, while TPAC Packaging reports 100% product recyclability. All seven companies implement PCR/Closed Loop Recycling, reflecting the industry's shift towards circular economy principles. These efforts align with changing consumer preferences and regulatory pressures, positioning companies like Manjushree to capitalize on the demand for eco-friendly packaging solutions. Manjushree Technopak Ltd is one of the few RPP players in India to have closed loop recycling capabilities as of March 31, 2024.

Exhibit 2.7 Comparative Analysis of Sustainability Indicators among key packaging players

Parameters	Manjushree	Alpla	Silgan	Logoplast	Berry	Weener Plastics	TPAC Packaging
Current Recyclable Products/ Recyclability	98%	89%	91%	85%	86%	92%	100%
Waste recycled & reused %	100%	n/a	54%	81%	59%	81%	n/a
PCR/Closed Loop Recycling	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Secondary Research, Technopak Analysis

3. Changing Consumer Trends:

- **E-commerce Retail Surge:** The global online retail market is rapidly expanding due to increased Internet and smartphone penetration. There is a surge in the D2C brands opting for online offerings as consumers are increasingly favoring online purchases, driving demand for secure packaging solutions, particularly in corrugated board formats and rigid plastic packaging, to facilitate safe shipping through complex distribution channels.
- **On-the-Go Consumption:** With westernization in the growing economies like India and a large population lifestyle shift, there are growing number of individuals consuming products like food, beverages, and pharmaceuticals while on the move, fueling demand for convenient and portable packaging solutions, with flexible plastics emerging as key beneficiaries.
- **Convenience Shopping:** With a shift towards single person living, especially among younger demographics, there is a trend towards more frequent grocery shopping in smaller quantities for categories like staples and food products, while in other categories like daily essentials, home and personal care and other categories a shift to larger pack is seen where consumer is shifting towards a habit of stocking or buying due to better offers or convenience resulting in increased basket size, boosting convenience store retailing and the demand for packaging formats across categories.
- **Health Consciousness:** Consumer interest in health is on the rise, leading to healthier lifestyle choices and increased demand for packaged goods such as healthy foods, beverages (e.g.- gluten-free, organic/natural, portion-controlled), non-prescription medicines, and nutritional supplements. This increasing demand from the food and beverage industry will drive the growth of the packaging industry too.

4. Technological Advancement and Trends: Technological innovations are revolutionizing the production of packaging materials, ushering in lightweight, durable, and cost-effective solutions. Some key advancements in the packaging industry include:

- Light weighting of rigid plastic packaging without impacting the pack performance.
- Innovation and production of 100% bio-based plastic bottles.
- Incorporation of barrier technology in rigid plastic packaging to protect products from environmental factors.
- In-mold labeling technology for plastic production to improve cost-effectiveness.
- Downgauging and diameter reduction in cans to reduce material usage.
- Peelable membranes in cans to enhance openability, safety, and convenience.

- Modified atmospheric packaging and nanostructure multi-layered films technology to enhance performance and sustainability.
- Smart packaging refers to advanced technologies used to enhance functionality and efficiency and consumer experience. These technologies include RFID tags, sensors, QR codes, and augmented reality features etc. For instance, sensors embedded in packaging to monitor temperature and humidity levels, RFID tags enabling supply chain monitoring.
- Color changing QR codes to check for product authenticity, giving consumers and brands more control over the product and preventing counterfeit.
- Narrow neck press and blow (NNPB) and advanced blow and blow (ABB) processes to improve glass distribution, strength, and reduce weight, lowering production costs significantly.

These technological strides are helping meet consumer demands for safer, more convenient packaging and are also helping the brands to take ownership of their brands, fueling growth in the global packaging industry.

- 5. Trade Globalization:** With globalization on the rise, brands within the fast-moving consumer goods (FMCG) sector are expanding internationally to tap into high-growth sectors and markets. India has the opportunity to cash in on the “China Plus One” strategy as more firms seek to diversify their supply chains by adding an alternative manufacturing or sourcing location to China. Many global companies have recently announced investments in India adding to the idea. In addition to this, industry consolidation through mergers and acquisitions is reshaping the competitive landscape, leading to streamlined packaging strategies among conglomerates.
- 6. Merger and Acquisitions:** Mergers and acquisitions (M&A) are acting as a growth catalyst in the global packaging industry. These strategic partnerships help companies combine resources, extending their reach across new markets and bolstering their technological expertise. Consolidation helps in acquiring specialized skills or production facilities, large players have the requisite finances to invest, which helps them to adapt to changing consumer trends and cater to a wider audience. Additionally, M&A foster economies of scale, allowing companies to streamline production and become more cost-effective. This consolidation within the packaging sector is creating a more dynamic and competitive landscape, well-equipped to address the demands of a globalized marketplace.

2.5 Challenges

- 1. Economic and Market Conditions:** Economic fluctuations and market uncertainties have led to supply shortages and price volatility in the packaging industry. The first half of fiscal year 2023 saw intermittent supply shortages and fluctuating prices of resins and raw materials due to market dynamics. These Changes in market dynamics, including the Russia-Ukraine conflict, have disrupted the supply chain.
- 2. Inflation impact:** Higher rates of inflation have a substantial impact on the packaging industry, particularly in terms of energy, fuel, and labor costs. Inflationary pressures, especially in Europe and the United States, have prompted central banks to increase interest rates, resulting in higher interest expenses for companies with variable rate debts denominated in currencies like the U.S. dollar and Euro. These inflationary trends have also influenced consumer demand and customer destocking in the fiscal year 2023.
- 3. Environmental concerns:** The global packaging industry faces a significant challenge due to mounting environmental concerns regarding resource usage. The heightened awareness of environmental issues stems from the widespread use of non-biodegradable materials like plastic and the overconsumption of resources such as paper, leading to environmental harm like pollution and habitat destruction. The impact of plastic packaging is of particular concern as it persists in the environment and poses threats to wildlife. While efforts are underway to improve recycling rates, only certain packaging materials like paper, cardboard, and rigid plastics are easily recyclable, while others, notably certain types of plastics, present greater recycling challenges. This underscores the urgent need for the industry to innovate and meet the changing needs of the consumer. This involves the use of new materials or sustainable packaging products that are also cost effective.
- 4. Regulatory challenges:** The tightening regulatory landscape poses challenges for industry players as they must adapt to comply with new standards and requirements while maintaining profitability and competitiveness. Compliance with evolving regulations often requires significant investments in research, development, and infrastructure to ensure packaging materials meet the required environmental and safety standards. This adds complexity and costs to the industry, further emphasizing the need for innovation and sustainability initiatives to navigate the regulatory landscape effectively.

While plastic and bio plastic have some strict regulatory frameworks, some global examples are as below:

- **The British Retail Consortium (BRC)** and the Institute of Packaging Professionals (IoP) (now known as the Packaging Society) have jointly developed the BRC/IoP Global Standards for Packaging and Packaging Materials. Certification from BRC/IoP indicates that a packaging company's material meets the quality and safety standards outlined in these global standards.
- The American Society for Testing and Materials (ASTM) has established standards like ASTM D6400 - 04, which outlines specifications for compostable plastics. This standard helps determine if plastics and plastic products will decompose effectively, comparable to known compostable materials.
- **The Standards for Composability EN 13432:2000 set out in the European Standard** lay out criteria for packaging that can be composted and biodegraded. It confirms that packaging meeting compostable criteria is suitable for composting, and those meeting anaerobic digestion criteria are fit for that method of organic recovery.
- In India, there are several regulations and standards in place that are applicable to the plastic packaging industry including the 'Food Safety and Standards (Packaging and Labelling) Regulations', 'Extended Producer Responsibility', and 'the Bureau of Indian Standards (BIS)' to name a few, for detailed information about the same refer chapter 4.

3. Overview of the Indian Packaging Industry

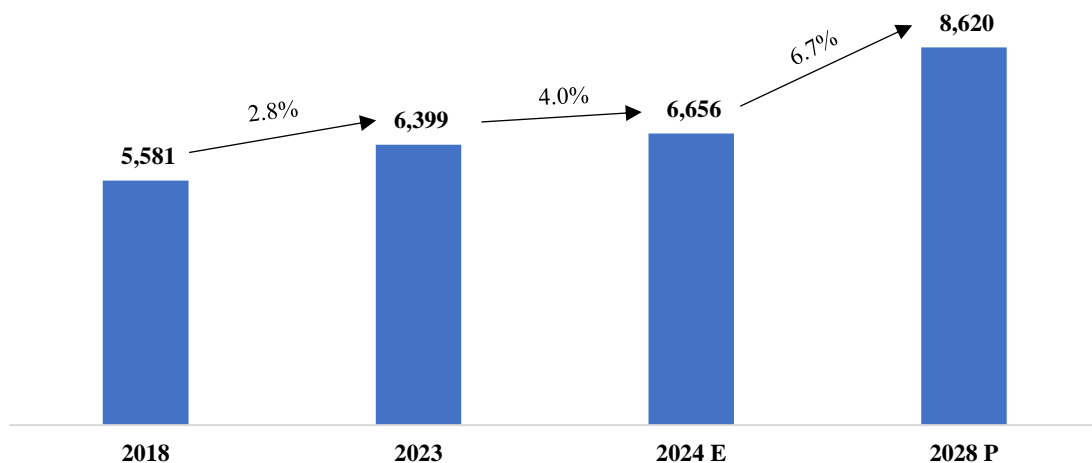
3.1. Indian Packaging Market

India's packaging industry is a vital and rapidly transforming sector, mirroring the nation's expanding consumer base, and evolving industrial landscape. This approximately USD 80 billion market encompasses a wide range of materials, formats, and applications, catering to diverse end-use sectors. From food and beverage giants to pharmaceutical companies and e-commerce retailers, efficient and innovative packaging solutions play a crucial role in product protection, preservation, branding, and consumer convenience.

In FY 2023, the Indian packaging market was valued at INR 6,399 billion, growing at a CAGR of 2.8% from INR 5,581 billion FY 2018. The market is estimated to reach INR 6,656 billion in FY 2024 growing at a rate of 4.0% in the last financial year. The market is further projected to grow at CAGR of 6.7%, to reach a market size of INR 8,620 billion in FY 2028.

This robust growth is driven by various factors such as rising disposable incomes, urbanization, increased demand for processed and packaged goods, and a thriving e-commerce sector. Moreover, government initiatives focused on organized retail and food safety are further propelling demand for high-quality, standardized packaging solutions.

Exhibit 3.1: Indian Packaging Market Size – By Value (In INR Billion) (FY)

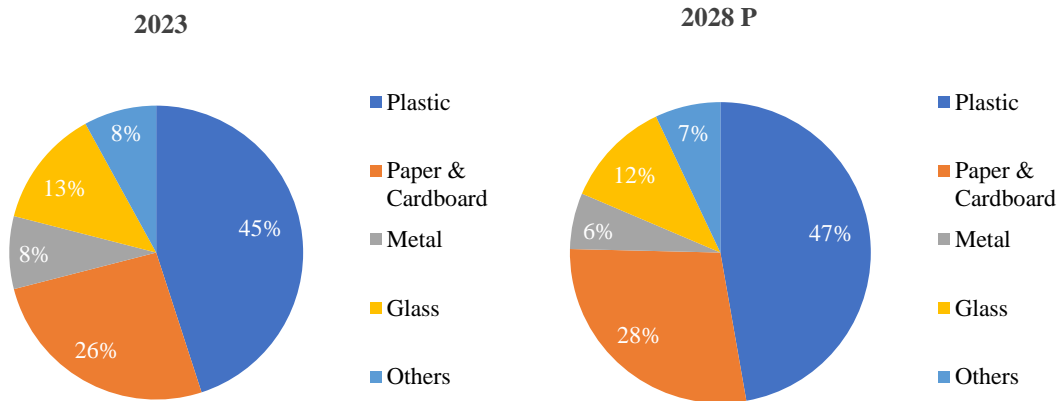


Source: Technopak Analysis, Secondary Research
 Numbers in percentage represents CAGR
 Note: 1USD= INR 80

3.2. Indian Packaging Market - By Material

Packaging encompasses a wide range of material types across paper board, metals, plastic, wood, glass, and other materials. However, amongst all the substitutes available, 'Plastic Packaging' is emerging as the fastest growing trend in the packaging industry. Plastics today form the foundation of our “convenience consumer culture.” Traditional materials like paper boards, metals, wood, and glass have been replaced by plastics in many applications due to their favourable cost-to-performance ratio.

Exhibit 3.2: Indian Packaging Market Size – By Material Type – By Value (FY)



Source: Secondary Research, Technopak Analysis
 Note: Other includes Cloth, Jute and Wood

Plastic: Plastic packaging dominates the Indian packaging industry, holding a substantial share of 45% in the overall market in FY 2023. Manufactured through various processes like blow moulding, injection moulding, rotomolding, and extrusion, plastic packaging comes in a multitude of flexible and rigid forms. This dominance can be attributed to its versatility, cost-efficiency, lightweight characteristics, and moldability into diverse forms. Various initiatives by the Indian government along with regulations such as Extended Producer Responsibility and the ban of single use plastics in India have enforced a focus on innovation and recyclability in plastic packaging, particularly rigid plastics. Rigid plastics are better placed to meet the developing Indian stringent regulations due to their existing recycling infrastructure and higher recyclability ratios, making them an ideal packaging material in the future as well. Notably, Indian consumers show a marked preference for rigid plastic packaging due to its reusability. This preference aligns well with cultural practices of repurposing containers for household storage, which adds value beyond the initial product purchase. Bags, bottles, containers, films, and pouches are among the examples widely used across industries such as food and beverage, pharmaceuticals, personal care, and e-commerce.



Paper & Paperboard: Paper and paperboard packaging offer environmentally conscious option within the Indian packaging industry, comprising a significant 26% share in FY 2023. This segment provides diverse solutions including cartons, boxes, corrugated packaging, and paper bags, which are prominently used in the food and beverage, e-commerce, and industrial sectors. Sustainability drives innovation in this sector, leading to an emphasis on recycled content paperboard and the development of coated paperboard for improved moisture and grease resistance. Additionally, folding carton boards, constructed from layers of fibrous wood pulp and

sometimes coated with polyethylene and aluminum foil for durability, are popular paper-based products with widespread applications across key industries like food and beverage (including cereals, snacks, and dry goods), e-commerce (for shipping boxes), industrial packaging, and pharmaceuticals.



Metal: Metal packaging, primarily utilizing tinplate and aluminum, remains a vital solution for products demanding long shelf-life, superior barrier properties, and robust protection. It accounted for 8% of the packaging market in FY 2023. Metal packaging finds extensive application across various sectors, including beverages, processed foods, paints, chemicals, industrial oils, and lubricants. Furthermore, it serves as a favored choice for personal care items such as deodorants and shaving creams, as well as for insecticides and spray paints. Collapsible metal tubes are a prevalent packaging option for toothpaste, ointments, and select adhesives. The aesthetic appeal and perceived quality of metal packaging makes it a sought-after option for high-end products like cosmetics, gourmet foods, and specialty beverages. Moreover, the recyclability of metal, particularly aluminum, highlights its attractiveness from a sustainability standpoint. Its high recyclability rates align with the growing emphasis on environmentally friendly packaging solutions.



Glass: The Indian glass packaging market maintains a significant presence and accounted for 13% of the packaging market in FY 2023, drawing on its traditional strengths while adapting to modern market demands. Valued for its inert properties, recyclability, and premium image, glass packaging remains a key solution across sectors such as food and beverage, pharmaceuticals, and cosmetics. However, despite its inherent advantages, the market faces evolving challenges. Competition from alternative materials, notably plastic and, in specific applications, metal, necessitates continuous innovation within the glass packaging sector. Additionally, growing environmental consciousness places scrutiny on glass manufacturing's energy-intensive nature.

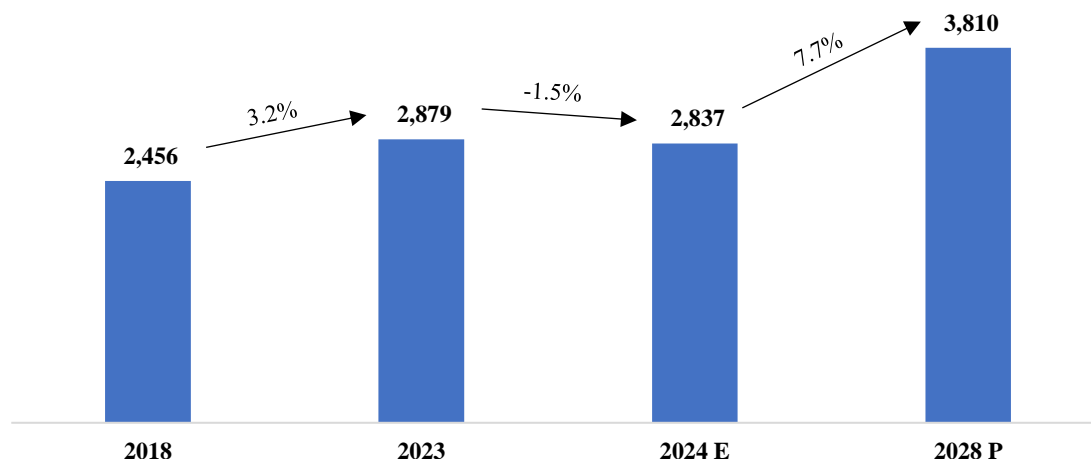


3.3. Indian Plastic Packaging Market

In FY 2023, the Indian plastic packaging market was valued at INR 2,879 billion and had witnessed a growth of 3.2% from a market size of INR 2,456 billion in FY 2018. The market is estimated to reach INR 2,837 billion in FY 2024. This temporary degrowth can be attributed to factors such as fluctuating raw material pricing and industry-wide efforts towards lightweighting of packaging. It's important to note that while volume growth has

continued, the growth in terms of value has been subdued due to raw material pricing dynamics and pass-through mechanisms in the industry. The market is further projected to grow at a CAGR of 7.7% in the next four years to reach a size of INR 3,810 billion in FY 2028. This growth will be driven by the expanding consumer goods sector, rising urbanization, and changing consumer preferences. As one of the fastest-growing economies in the world, India's growing middle class and increasing disposable incomes have fueled the demand for packaged products across various industries, including food and beverages, pharmaceuticals, personal care, and consumer durables.

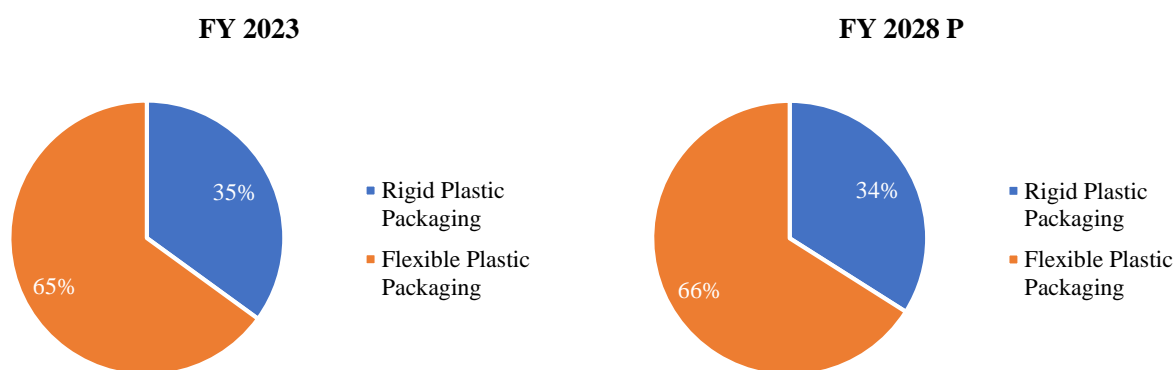
Exhibit 3.3: Indian Plastic Packaging Market Size – By Value (In INR billion) (FY)



Source: Technopak Analysis, Secondary Research
 Note: 1USD= INR 80

Based on product type, the Indian plastic packaging market is segmented into two categories, Rigid Plastic Packaging and Flexible Plastic Packaging.

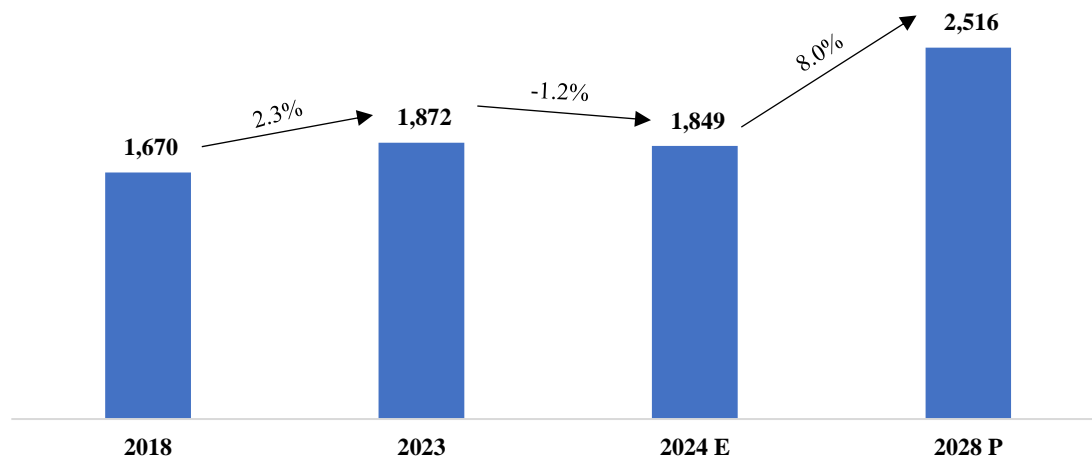
Exhibit 3.4: Indian Flexible Plastic Packaging Market Size – By Value (in INR billion) – By Type(FY)



Source: Technopak Analysis, Secondary Research

1. Flexible Plastic Packaging (FPP): Flexible plastic packaging leverages pliable plastic films or laminates, such as polyethylene (PE) and polypropylene (PP), often combined with aluminum foil or paper. Accounting for 65% of the plastic packaging market in FY 2023, the FPP market was valued at INR 1,872 billion and is estimated to reach INR 1,849 billion in FY 2024. The market is further projected to grow at a CAGR of 8% in the next four years to reach a market size of INR 2,516 billion. This versatile packaging format can be easily shaped into various pouches, bags, wraps and films. Its adaptability, lightweight nature, and excellent barrier properties make it an ideal solution for diverse products, including food (chips, snacks, frozen items), personal care (pouches, sachets), and numerous industrial applications.

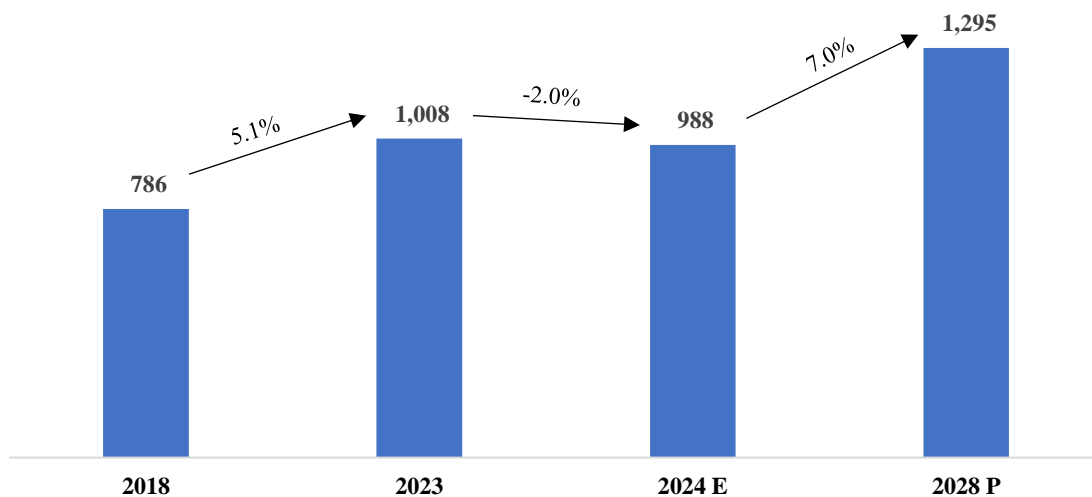
Exhibit 3.5: Indian Flexible Plastic Packaging Market Size – By Value (in INR billion) – By Type (FY)



Source: Technopak Analysis, Secondary Research

2. Rigid Plastic Packaging (RPP): Rigid plastic packaging, constructed from robust materials like polypropylene (PP), polyethylene terephthalate (PET), high-density polyethylene (HDPE), and polyvinyl chloride (PVC), commands a significant 35% share of the plastic packaging market in FY 2023 valued at INR 1,008 billion. The Indian RPP market has a large Total Addressable Market (TAM) with a current market size of INR 988 billion as of FY 2024 which is expected to grow at a CAGR of 7% to reach a market size of INR 1,295 billion in FY 2028. RPP’s strength and protective qualities make it ideal for safeguarding fragile items, accommodating larger volumes, and conveying a premium look and feel. It is widely used in beverages (water, soda, juices), food containers (yogurt, ice cream, processed food), household products (detergents, cleaning supplies), personal care (shampoo, hair oils), and pharmaceuticals products.

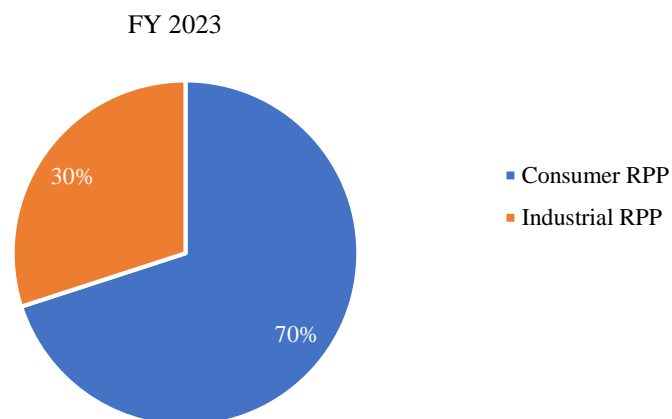
Exhibit 3.6: Indian Rigid Plastic Packaging Market Size- By Value (in INR Billion) – By Type (FY)



Source: Technopak Analysis, Secondary Research

The rigid plastic packaging sector addresses two key segments: Consumer and Industrial. In FY 2023, rigid plastic packaging for the consumer segment dominated 70% of the market, focusing on aesthetically pleasing containers, tubs, and bottles designed to capture consumer attention at the point of sale. These products emphasize visual appeal and user convenience. Industries utilizing consumer rigid plastic packaging include Food and Beverage, Personal Care, Household Products, Pharmaceuticals etc. Conversely, rigid plastic packaging for industrial segment, while less prominent, is critical for its operational role. This segment includes durable, functional solutions such as drums and stackable bins, designed to ensure the secure transport and storage of bulk materials across the supply chain. Key industries employing industrial rigid plastic packaging are Chemical and Petrochemical, Automotive, Agriculture, Construction, Electronics, and Medical and Laboratory.

Exhibit 3.7: Indian Rigid Plastic Segmentation - By Usage Type (by Value) (FY)



Source: Technopak Analysis, Secondary Research

The Consumer Rigid Plastic Packaging Market in India is further divided into below mentioned product categories:

- 1. Containers:** This segment includes versatile, often reusable, general-purpose containers that cater to the storage of a wide range of items, from food to household goods. These containers come in various shapes and sizes, with functional lids or closures enhancing their utility. Jars, predominantly cylindrical and constructed from clear plastic, are strategically designed to display products such as jams and cosmetics, providing consumers with clear visibility of the contents. Additionally, bottles, which serve as the primary packaging for liquids and beverages, are available in multiple shapes and sizes. They are manufactured from PET for its superior clarity or HDPE for its enhanced durability, all featuring a narrow neck with a secure cap to ensure ease of handling and storage. Some of the players in this category are Manjushree Technopak, WEPL, Creative Plastics and others. While, Manjushree Technopak Ltd is the largest consumer RPP player in the containers category in terms of revenue with a pan-India presence in FY 2023.



- 2. Preforms:** Preforms serve as the initial form of plastic containers. They are intermediate products that are blown into PET containers depending on the end-use. They are commonly used in the production of PET bottles for beverages. Innovations include preforms designed specifically for unique bottle shapes, as well as integration of recycled PET material. Players like TPAC, Manjushree Technopak, Chemco group and a few others are present in the category. Amongst which, Manjushree Technopak Ltd is the largest consumer RPP player in the preforms category in terms of revenue with a pan-India presence in FY 2023.



- 3. Caps and Closures:** An essential component in rigid plastic packaging, caps and closures are primarily manufactured from PP and HDPE. These closures come in various formats, including screw caps, dispensing caps, and child-resistant designs, ensuring product integrity. Innovations focus on lightweighting, improved

sealing, anti-counterfeit measures, and promoting recycling-friendly designs. Some of the players present in this category are Manjushree Technopak, Ltd, ALPLA, SI Secure Industries, Creative Plastics. Amongst which, Manjushree Technopak¹, is the largest consumer RPP player in the caps and closures category in India in terms of revenue in FY 2023.

¹Note: -The full-year revenue from operations of Hitesh Plastics Pvt. Ltd. (the acquired entity) has been considered for Manjushree Technopak's position in the caps and closures segment.

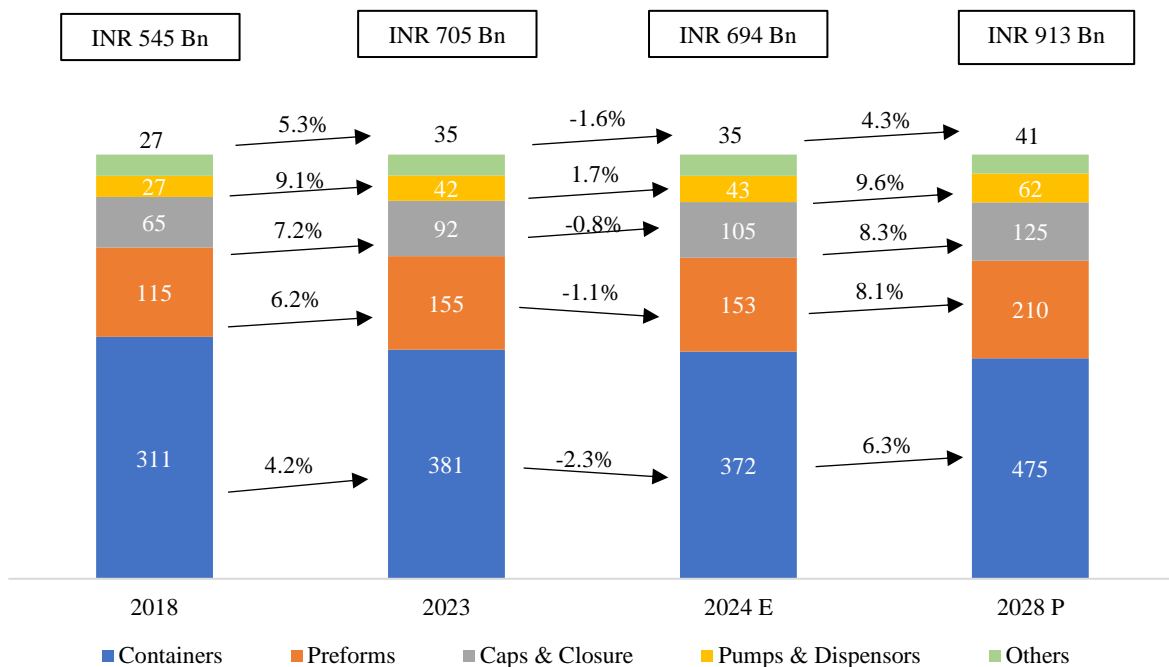


4. **Pumps and Dispensers:** Found in liquid product packaging, PP and HDPE are the primary materials for pumps and dispensers. Innovations include precision dosing, designs reducing residual product waste, and ensuring compatibility with varying product viscosities. Players like ALPLA, Mold-Tek, ITPL and Manjushree Technopak are present in this category. Amongst which, Manjushree Technopak Ltd is the largest consumer RPP player in the pump & dispensers category in India in terms of revenue in FY 2023



5. **Others:** Others include categories like trays, clamshells and pails, commonly used in fresh produce and meat packaging, PET, PP, and EPS (to a declining extent) are prevalent materials for this category. PET is favored for the premium presentation, PP for its flexibility, and EPS for its traditional low cost. Innovations focus on maintaining freshness, optimizing product visibility, increasing the use of recycled content, and exploring viable compostable alternatives.

Exhibit 3.8: Indian Consumer Rigid Plastic Packaging Market Size – By Product Type (FY)

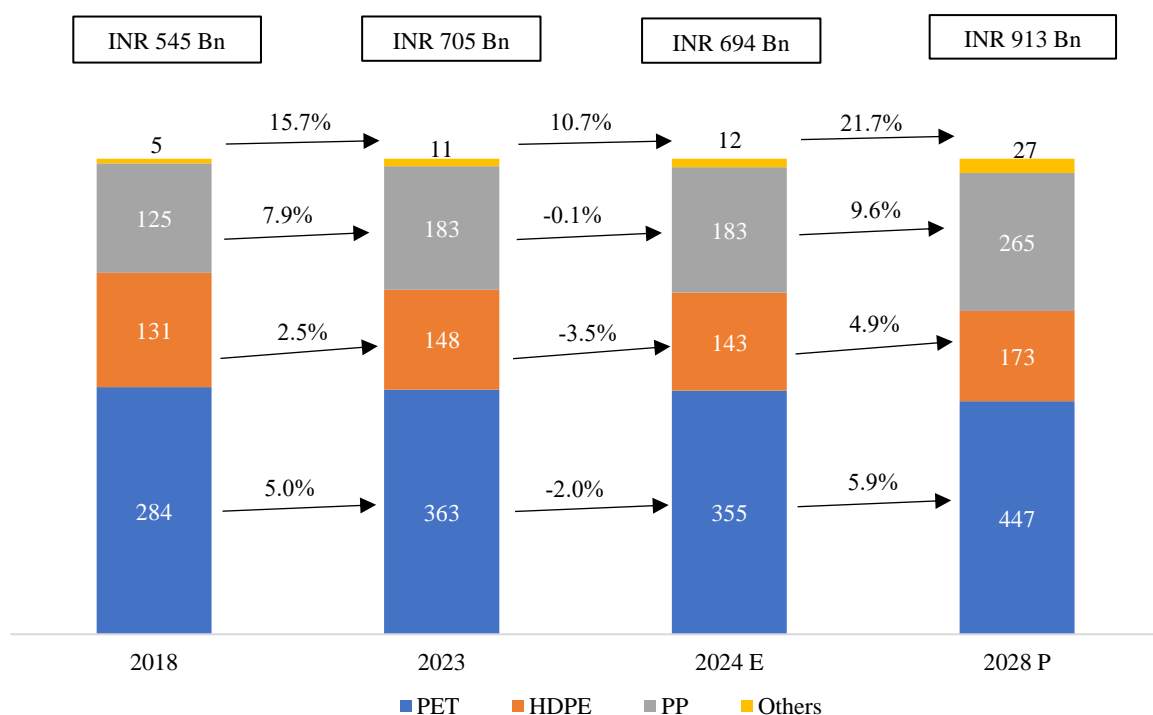


Source: Technopak Analysis, Secondary Research
 Note: Others include Trays, Clamshells, and Pails

The Consumer Rigid Plastic Packaging Market in India is further divided into below mentioned material categories:

- PET:** Polyethylene terephthalate, also known as PET, is a popular material often used for rigid plastic packaging. PET is used for bottling beverages like water, soda, and juice, as well as certain food items. It is also utilised for packaging non-food items such as cleaning products. It is commonly used due its light weight, durability against breakage, and easy recycling.
- HDPE:** High density polyethylene (HDPE) is another commonly used material in rigid plastic packaging. HDPE is favoured for its longevity, sturdiness, and resistance against chemicals, making it an appropriate packaging material for sectors such as pharmaceuticals and personal care. Due to its sturdiness and endurance for impact and temperature changes, it is also preferred for items that need safeguarding while being stored or transported. Like PET, HDPE too can be recycled, promoting sustainable packaging methods.
- PP:** Polypropylene (PP) is valued for its versatility and resistance against chemicals and heat. Its transparent qualities offer visibility of the contents, and high adaptability in manufacturing processes like injection moulding and thermoforming make it one of the top rigid plastic packaging solutions across various industries, from food pre to household chemicals.
- Others- Bioplastics, Tritan, Coex, PCR plastic:** With the increased focus on sustainability, companies are trying to innovate and differentiate their products to respond to evolving market trends and customer expectations. These packaging materials are gaining traction and seeing increased adaption in rigid plastic packaging as they provide a greener option compared to conventional plastics. Bioplastics originate from sustainable biomass sources like sugarcane, cellulose, or corn starch, providing an alternative to regular plastics made from fossil fuel. Tritan, on the other hand, it a form of copolyester which is BPA-free with properties such as clearness, durability, and ability to resist stains and odours. It is commonly used for packaging items such as baby bottles and food storage containers. Coextruded Plastics (Coex) are produced by extruding multiple layers of various polymers at the same time to produce a unified composite material. It is most used in food packaging to prolong shelf life and increase product protection. Lastly, Post-Consumer Recycled (PCR) Plastic is plastic recycled from consumer waste and turned into new products. Its resin is most utilised in rigid plastic packaging to minimise the environmental effects of plastic waste.

Exhibit 3.9: Indian Consumer Rigid Plastic Market Segmentation - By Material (FY 2023)



Source: Technopak Analysis, Secondary Research

Others include Bioplastics, Tritan, Coex, PCR plastic

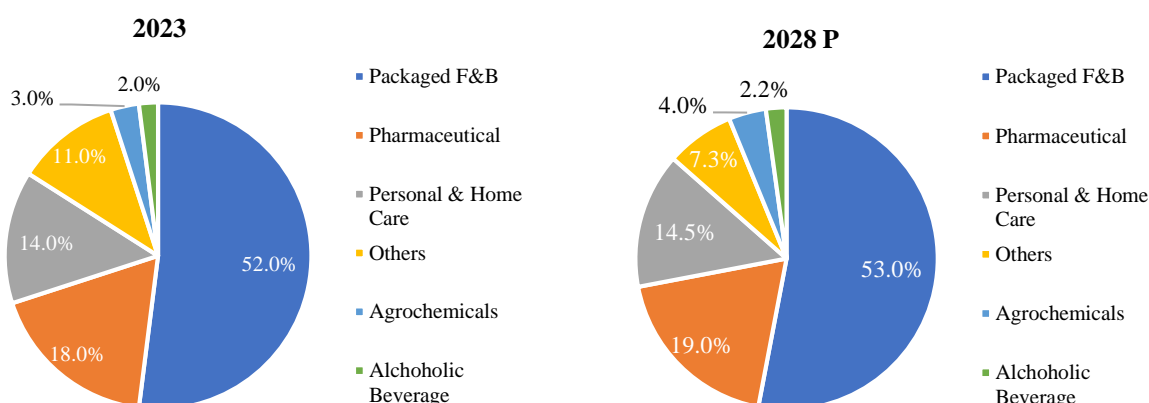
3.4. Major contributing industries as customers

The packaged Food & Beverages (F&B) segment dominates the Indian plastic packaging market, accounting for 52.0% share in FY 2023 and a projected share of 53.0% in FY 2028. This significant share can be attributed to the growing demand for packaged and convenience foods, driven by changing lifestyles, urbanization, and rising disposable incomes of the Indian population. The F&B segment encompasses a wide range of products, including packaged snacks, beverages, dairy products, and ready-to-eat meals, all of which require packaging solutions to ensure product safety, freshness, and prolonged shelf life.

Following closely, the pharmaceutical segment holds the second-largest share, with 18.0% in FY 2023 and a projected share of 19.0% in FY 2028. The packaging requirements in this segment are driven by stringent regulations and the need for robust packaging solutions that ensure the integrity, safety, and efficacy of medications and healthcare products. The increasing focus on healthcare and the growth of the pharmaceutical industry in India contribute to the consistent demand for packaging solutions in this segment.

The Personal & Home Care segment maintains a 14.0% share in both FY 2023 and is projected to reach a market share of 14.5% in FY 2028. This segment includes packaging for products such as cosmetics, skincare, household cleaners, and detergents. The stable share reflects the steady demand for these products, fueled by rising consumer awareness, increasing disposable incomes, and the growing popularity of branded and premium personal care products in the Indian market. Apart from the major end-user categories, additional segments such as Alcoholic beverages, Agrochemicals, Industrial Chemicals, Paints & Adhesives, Automotives, and Electronics collectively constituted the remaining 16% of the market share.

Exhibit 3.10: Indian Plastic Packaging Market (By Value) - By End-User Industry (FY)

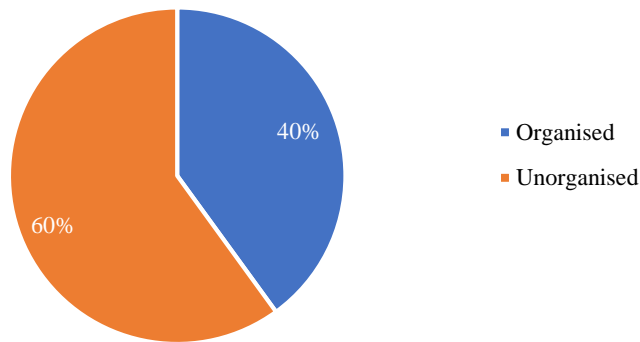


Source: Technopak Analysis, Secondary Research

3.5. Key Players in the Consumer Rigid Plastic Packaging Industry

The Indian consumer rigid plastic packaging (RPP) market is characterized by a distinct divide between organized and unorganized players. The organized sector accounts for ~40% of the total Consumer RPP market share, while the remaining 60% is held by the unorganized sector. The Consumer RPP packaging industry in India is highly fragmented with the unorganized sector representing 60% of the market share in terms of revenue in FY 2023

Exhibit 3.11: Indian Consumer RPP market segmentation – by Market Type (FY 2023)

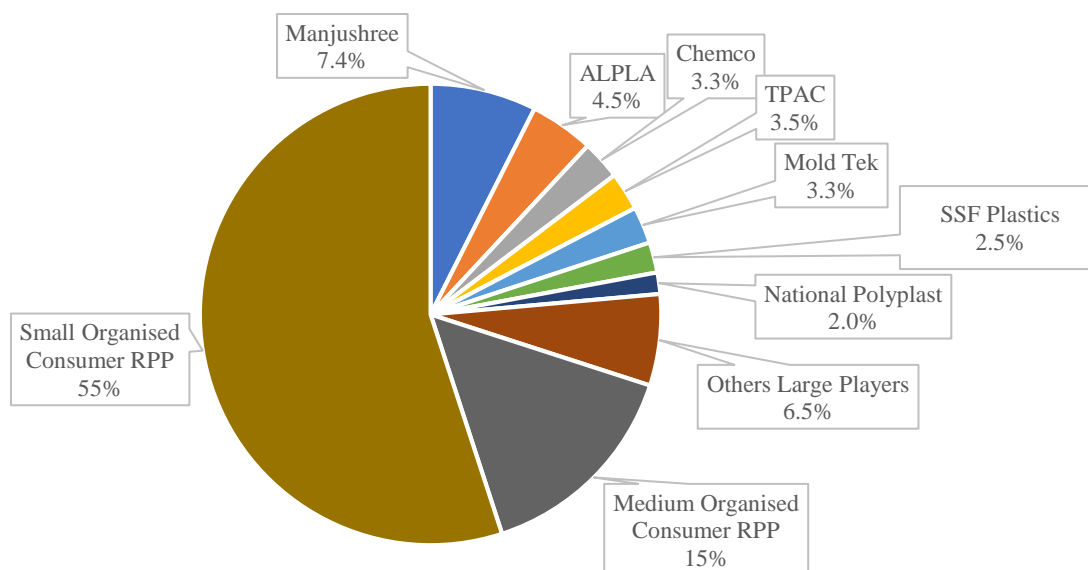


Source: Technopak Analysis, Secondary Research

Within the Organized Indian consumer RPP market, the large players accounted for ~30% of the market share in FY 2023 and the remaining 10% is accounted by the smaller players. This 30% landscape is further fragmented, with Manjushree Technopak Ltd. having the highest market share in terms of revenue of 7.4% in FY 2023 in the organised consumer RPP industry in India, (INR 20,973.39 million), which was 1.7 times the market share in terms of revenue of the second largest player in India. In FY 2024 Manjushree Technopak's estimated market share in terms of revenue is 7.6% in the organized Indian consumer RPP industry. Further, In FY 2024 Manjushree Technopak's estimated market share in terms of revenue (including revenue of Oriental Containers* on a proforma basis) is 8.8% in the organized consumer RPP industry in India and their CAGR of revenue from operations was 3.40 times the growth of the Indian consumer RPP market from FY 2022 to FY 2024. They were also the only Indian RPP player with presence in all five product categories of Preforms, Containers, Pumps and Dispensers, Caps and Closures and Recycle as of March 31, 2024. In terms of market share it is followed by Alpha, holding a market share of 4.5%. The next five prominent players, including TPAC, Chemco, Mold Tek, SSF Plastics and National Polyplast, collectively account for 11.6% of the market. Other large, organized players, such as SNJ Synthetics Ltd, Weener Group, SI Secure Industries, Alpha, Innovative Tech Pack Ltd. (ITPL), Hitech Corporation and Avi Global Plast Pvt. Ltd, collectively account for 6.4% of Consumer RPP market.

[Note *: MTL acquired the business of 'manufacturing, trading and sale of plastic closures and preforms' from Oricon Enterprises Limited ("Oriental Containers")]

Exhibit 3.12: Market Share of Key Players in the Organized Consumer RPP Market- By Revenue (FY 2023)



Source: Technopak Analysis, Secondary Research

Note: ALPLA, ALPLA India, ALPLA India Pvt Ltd.-all are identified as the same entity in the report.

Despite the current fragmentation, industry experts anticipate a shift in the coming years, with a gradual consolidation of the RPP market through mergers and acquisitions. The larger organized players are expected to acquire smaller unorganized entities, thereby expanding their market share, and enhancing their operational efficiencies. This anticipated consolidation is driven by several factors, including economies of scale, access to advanced technologies, and the need for better compliance with evolving regulatory standards. As the Indian economy continues to grow and consumer demands for packaged goods increase, the organized RPP players are poised to capitalize on this opportunity by leveraging their financial strength, technological capabilities, and supply chain networks. It is estimated that the share of the organized segment within the consumer RPP industry in India is expected to increase from 40% to over 48% between FY 2024 and 2028. This underscores the growing dominance of organized players and the ongoing transformation of the RPP market landscape.

Moreover, the unorganized sector often faces challenges in terms of limited access to capital, outdated machinery, and inconsistent product quality, making it increasingly difficult for them to compete effectively in the long run. By joining forces with larger organized entities, these smaller players can benefit from access to better resources, modern manufacturing facilities, and streamlined distribution channels. Furthermore, the consolidation trend is likely to be fueled by the increasing emphasis on sustainability and environmental regulations in the packaging industry. Organized players with greater financial resources and technical capabilities are better positioned to invest in eco-friendly packaging solutions, recycling initiatives, and sustainable manufacturing processes, thereby gaining a competitive edge over their unorganized counterparts.

Overall, while the Indian RPP market currently exhibits a high degree of fragmentation, the industry is poised for a transformative shift towards consolidation, driven by the ambitions of organized players to expand their market share and capitalize on emerging opportunities through strategic M&A activities.

3.6. Key growth drivers for the packaging industry and rigid packaging industry

1. Demographic and Lifestyle Shifts: India's expanding middle class wields significant spending power. With rising discretionary incomes, they prioritize convenience and quality in packaged foods, beverages, and personal care items. The middle class also demonstrates a growing appetite for premium product experiences. This creates a lucrative market for packaging that utilizes superior materials, high-quality printing techniques, and sophisticated design, even for everyday products. Additionally, urbanization and smaller household sizes fuel the demand for portion-controlled packaging. Single-serve formats in both flexible and rigid materials are becoming increasingly popular. Hectic lifestyles also influence consumer choices, leading to a greater demand for ready-to-eat meals and snacks that require packaging solutions focused on ease of use, convenience, and on-the-go functionality.

- 2. Shift from Unorganized:** The Indian packaging industry is currently undergoing a significant transformation, moving away from its traditional and fragmented structure towards a more organized landscape. This shift is evident in the rise of prominent market leaders in various segments, indicating a notable change within the sector. However, despite this progress, a substantial portion of the industry is still held by unorganized players, accounting for ~60% of the Consumer RPP market. Many of the packaged products in India lack differentiation in their packaging, leading to intense competition among smaller regional players primarily focused on pricing and cost competitiveness. Customers in this segment often engage with multiple suppliers for the same product category to mitigate risks on the supply side. As a result, smaller players are facing increasing competitive pressures in a rapidly changing industry landscape. This presents an opportunity for organized players to consolidate their foothold in the market, leveraging their scale and capabilities to capitalize on emerging market dynamics. Indeed, industry experts anticipate a gradual consolidation of the RPP market through mergers and acquisitions in the coming years. Larger organized players are expected to acquire smaller unorganized entities, expanding their market share and enhancing operational efficiencies. This consolidation is driven by factors such as economies of scale, access to advanced technologies, and the need for better regulatory compliance. As an example, Manjushree Technopack Ltd, a prominent RPP player, strategically expanded its portfolio through acquisitions. They acquired players like Hitesh Plastics, the second largest player in the specialized caps and closures category in India in 2022, Classy Containers and Pearl Polymers. Manjushree Technopack Ltd also acquired National Plastics Industries Limited, the only player in pumps & dispensers market in India in 2019.
- 3. Organized Retail:** The rise of organized retail is transforming the in-store shopping experience. To stand out in a crowded marketplace, visually appealing packaging that grabs attention and effectively communicates brand identity is essential. This translates into an increased investment in high-quality printing, eye-catching packaging, labeling, and innovative design solutions that elevate products on the shelf and drive consumer choice. Rigid plastic packaging offers unique advantages in this environment, aligning with the modern retail formats that increase value of product presentation and growing aspirations to consume better quality products.

 - **Product Visibility:** Transparent rigid plastics allow for clear product display, enhancing appeal, and building consumer trust.
 - **Enhanced Shelf Presence:** Rigid plastics' structural strength allows for unique shapes and designs that stand out from flexible packaging options.
 - **Branding Potential:** The printability of rigid plastic provides a broader canvas for eye-catching graphics and detailed product information.
- 4. Booming E-commerce:** India's e-commerce sector is experiencing exponential growth, significantly impacting the packaging industry. The need for secure and durable packaging designed to withstand complex shipping networks is paramount. The rapid growth of e-commerce has increased demand for rigid plastic packaging, addressing challenges in shipping and consumer expectations. Rigid plastic crates and containers provide superior protection against damage during transit, crucial for fragile or high-value items. Additionally, specialized closures offer tamper-evidence, enhancing consumer trust. This trend underscores the essential role of rigid plastic packaging in the expanding e-commerce sector.
- 5. Premiumization:** The consumer trend towards premiumization is driving significant growth in the rigid plastic packaging sector. This preference for quality and enhanced product experiences aligns perfectly with the advantages offered by rigid plastic:

 - **Quality Perception:** Consumers often associate rigid plastic containers with a sense of higher quality compared to certain flexible packaging options. This perception of sturdiness and durability contributes to a premium feel.
 - **Aesthetics:** Rigid plastics offer flexibility in design, allowing for unique shapes and textures not easily achieved with some flexible materials. Additionally, their superior printability enables the incorporation of eye-catching graphics and detailed product information, further enhancing the premium image desired by brands.
- 6. Growth of packaged food and beverage market:** The growth of the packaged food and beverage industry in India has been a significant catalyst for the rigid plastic packaging sector. As consumer preferences lean towards convenience and longer shelf-life products, there has been a notable surge in demand for packaged food and beverage items. This surge directly translates into an increased need for robust packaging solutions, driving growth in the rigid plastic packaging industry.

3.7. Key trends and recent development in the rigid packaging industry

Rigid plastic packaging (RPP) is a dominant force in the Indian packaging landscape. Driven by key advantages like cost-effectiveness, adaptability, and a growing consumer preference, RPP is steadily replacing traditional materials such as glass, metal, and even some forms of flexible packaging across diverse industries. Key trends driving the growth and transformation of the RPP sector include:

1. **Coca-Cola's Affordable Small Sparkling Package (ASSP) Initiative:**

Coca-Cola India has introduced 100% recycled polyethylene terephthalate (rPET) bottles in a 250ml ASSP format in Odisha, demonstrating a significant shift towards sustainable packaging solutions. This move aligns with the industry trend of increasing the use of recycled materials and reducing environmental impact. The ASSP bottles are designed to be lightweight, resulting in a 36% reduction in emissions compared to traditional virgin PET packaging. Furthermore, the switch to rPET for the ASSP solution achieves a 66% decrease in carbon footprint compared to standard non-ASSP packaging made from virgin PET. This initiative is part of Coca-Cola's global "World Without Waste" program, which aims to make bottles with 50% recycled content by 2030 and make all packaging recyclable by 2025. The company's efforts in India, including partnerships for PET collection and recycling, reflect the rigid packaging industry's growing focus on circularity, sustainability, and innovative packaging formats that cater to specific market needs while prioritizing environmental responsibility.

2. **Application-Specific Standard Products (ASSP):** ASSPs refer to packaging formats (bottles, jars, and containers) developed with specific applications in mind. They are meticulously designed to adhere to industry standards, ensuring compatibility with existing filling and labeling lines, and providing consistent performance characteristics. Unlike fully custom packaging, ASSPs focus on functionality and standardization. Few examples of ASSPs in action include:

- **Rigid Plastic Packaging (RPP) for Spices, Sauces, and Similar Products:** Manufacturers like Manjushree Technopack Ltd offer standardized RPP jars and containers in many sizes, shapes, and materials. This enables manufacturers to quickly and cost-effectively package their products while focusing on functionality.
- **PET Bottles for Beverages:** The bottled water industry (brands like Bisleri, Kinley, and Aquafina) rely heavily on standard PET bottle formats with minor design variations for branding. This ensures a reliable and cost-effective packaging solution across the industry.
- **PET Jars for Honey, Edible Oils, and Spreads:** Brands like Dabur and Saffola leverage standard PET jar designs, allowing them to focus on product quality and marketing efforts instead of reinventing packaging formats.

Through the utilization of pre-designed, standardized formats, ASSPs eliminate the need for extensive research and development, including tooling and mold creation expenses. This expedites product launches by bypassing prolonged design and testing phases. Furthermore, ASSPs introduce standardization that optimizes production processes, facilitating higher production volumes and simplified scaling. They inherently comply with industry standards for compatibility with filling and labeling equipment, as well as essential regulations concerning food safety, transportation, and shelf life.

3. **Lightweighting:** In the Indian RPP market, there is a notable trend towards lightweight packaging. This shift is primarily driven by cost-saving opportunities associated with reduced material usage. Additionally, lightweight packaging aligns with sustainability goals, as it reduces carbon footprint and waste generation. Furthermore, it offers logistical benefits such as decreased shipping costs due to lower fuel consumption and space requirements. Major players like Coca-Cola and PepsiCo have continuously reduced the weight of PET beverage bottles over the years. Similarly, Marico has reduced the weight of its Parachute oil bottle and cap by 7% and 2%, respectively.

Achieving lightweighting in packaging involves utilizing thinner yet durable materials, optimizing design for maximum protection with minimal material, and employing advanced manufacturing techniques to reduce waste and enhance efficiency. However, it's crucial to ensure that lightweighting maintains product integrity during transit and storage. Addressing consumer perceptions about lighter packaging is also vital to maintain a positive brand image and consumer trust.

4. **The Shift from Glass and Metal:** The packaging industry is witnessing a shift from metal and glass to increased demand for plastic products, and rigid plastic is one of the most sustainable packaging substrates, as it offers 100% recyclability making it an environment friendly packaging solution. RPP's inherent versatility, design flexibility, and cost advantages underpin this transition. In the beverage sector, plastic bottles have captured significant market share from legacy glass formats. Similarly, iconic brands like Kissan Ketchup and Maggi Sauces have embraced squeezable RPP formats in place of traditional glass bottles. This shift highlights

the ability of RPP to drive cost optimization and user convenience. Other examples of product categories that have gradually shifted from glass/metal packaging to plastic packaging.

Product	Traditional Material	Current Trend
Milk/Edible Oil	Glass/Metal	3/ 5 Layer Film Pouches
Toiletries (Soap/ Shampoo)	Paper/Glass	Plastic Pouches / Films
MPCG (Cement/Fertiliser)	Jute	PP / HDPE Woven Sack
Toothpaste	Metal	Plastic Lamitubes
Liquor	Glass	Recycled PET
Aerated Beverages	Glass	PET Bottles
Paints and Agrochem	Metal	Recycled PET/ HDPE

5. **Affluence and Evolving Consumer Behavior:** Rising disposable incomes and a growing middle class fuel a shift among Indian consumers. Key changes include:
 - **Upsizing:** Increased purchasing power enables consumers to transition to larger pack sizes. Examples include shampoo bottles.
 - **Form Shifts:** Demand increases for innovative and ergonomic packaging shapes that prioritize convenience and visual appeal. For instance, soaps are transitioning to body washes.
 - **High-Value Penetration:** Affluent consumers drive growth in premium segments, demanding high-quality, aesthetically superior RPP solutions. Products like air fresheners and room fresheners have created a new demand for products that didn't exist 5-10 years before.
 - **Increased Basket Sizes:** RPP's versatility supports expanded product ranges and bundle offerings, boosting overall sales. An example is washing machine liquids in larger packs.
 - **Cross Selling:** Rigid plastic packaging's adaptability and convenience lends it well to cross-selling strategies. For example, complementary products, such as shampoo and conditioner sets can be bundled together effectively in rigid plastic containers, driving additional sales opportunities.

6. **PET and HDPE Dominance:** PET and HDPE maintain a dominant position within India's rigid plastic packaging (RPP) sector, particularly in the beverage, food, and personal care markets. This dominance stems from the materials' cost-effectiveness, versatile forming capabilities, inherent durability, and established recycling infrastructure. However, growing sustainability pressures may disrupt this trend, driving increased exploration of alternative materials such as bioplastics to align with evolving consumer and regulatory demands for eco-friendly packaging solutions.

7. **Thin-Walled Containers:** The growth of organized retail favors lightweight, thin-walled RPP containers optimized for shelf display and consumer appeal, especially in the packaged food sector. Thin-walled plastic containers have seen a huge demand boost both in packaged goods as well as retail trade sectors. New categories like margarine, cheese spreads, fruit yoghurt, and frozen desserts have been launched that primarily use this packaging format. Furthermore, there has been a growing demand for these thin-walled containers from categories like salads, mushrooms, cut and semi-processed vegetables, and meat products. The demand for these plastic containers can be attributed largely to the growth in organized retailing with the increased penetration of freezers that allow consumers to view and select the products themselves, thus requiring effective packaging formats suitable to this requirement.

8. **Alternative Materials:** Bioplastic alternatives are now available for almost every conventional plastic material and corresponding application. Bioplastics have the same properties as conventional plastics and offer additional advantages, such as a reduced carbon footprint and additional waste management options like composting.

9. **Regulatory Landscape as a Catalyst for Growth**
 The evolving regulatory landscape in India presents a significant opportunity for the rigid plastic packaging (RPP) industry. The Plastic Waste Management Rules, 2016, establish stringent guidelines for plastic waste management and recycling. These regulations position RPP at the forefront of sustainability efforts, aligning with growing consumer and brand demands for eco-friendly packaging solutions. Investments in infrastructure, collection systems, and waste management processes not only ensure compliance but also drive innovation and operational efficiencies. By proactively addressing extended producer responsibility (EPR) obligations, RPP companies can differentiate themselves in the market. This regulatory push creates new

business opportunities in recycling and circular economy initiatives, positioning compliant companies to capture increased market share in the shift towards sustainable packaging.

3.8. Innovation and Technology in RPP

Technological advancements and a focus on sustainability are reshaping the RPP landscape:

- 1. Recycled Content:** Driven by both consumer demand and regulatory shifts, RPP manufacturers in India are increasingly integrating recycled polyethylene terephthalate (rPET) into their product lines, fostering a more circular economy. For example, collaboration between Manjushree Technopack Ltd and Ganesh Ecosphere to co-develop and provide packaging products with up to 100% dosage of recycled plastic. For example, the 100% recyclable all plastic pumps with no metal or glass ball components first introduced by Manjushree Technopack Ltd in 2021.
- 2. Barrier Technologies:** Advances in barrier technology allow rigid plastic packaging (RPP) to provide the protection required by products sensitive to oxygen, moisture, light, and other factors that compromise shelf life. For example, oxygen barriers are achieved through multi-layer structures incorporating materials like EVOH (Ethylene Vinyl Alcohol) or Nylon, crucial for preserving the freshness of beverages such as juices and flavored milk, along with oxygen-sensitive pharmaceuticals. Active oxygen scavengers integrated into the plastic matrix mitigate product oxidation, benefiting beer bottles and perishable sauces or processed foods. Moisture barriers are facilitated by coatings like silicon oxide deposited on plastic surfaces, essential for protecting moisture-sensitive pharmaceuticals and powdered products. Additionally, desiccants integrated into closures or packaging directly are commonly used to combat humidity for items like vitamins and supplements. Aseptic Packaging is another example of these barrier technologies used in packaging industries. Ongoing advancements also explore specialized barrier technologies for carbonated beverages to retain fizz and enhance the barrier properties of recycled PET for broader application, reflecting the industry's commitment to continuous innovation in meeting diverse packaging needs and preserving product integrity.
- 3. Tamper-Evident Solutions:** Rigid plastic packaging innovations increasingly prioritize tamper-evident designs. New cap solutions incorporate visible indicators of tampering, addressing both product safety and consumer confidence. These tamper-evident features are integrated with a focus on material efficiency, with lightweight constructions ensuring resource optimization. Further innovations have resulted in double tamper-evidence capabilities for products requiring enhanced security, alongside non-littering designs for a positive sustainability impact.



- 4. Process Optimization:** Manufacturers are integrating process optimizations for efficiency gains in rigid plastic production. The adoption of zero-cooling technology within Injection Stretch Blow Molding (ISBM) processes by Manjushree Technopack Ltd has resulted in measurable cycle time reductions of 15-25% and tangible energy savings. They also designed and delivered high cavitation high productivity molds for one of their pharmaceutical customers within 58 days, which typically takes over 90 days for completion.
- 5. Design Innovation:** RPP manufacturers in India are prioritizing functional and aesthetic design features, ranging from easy-pour spouts and resealable lids to visually striking shapes and textures, enhancing brand appeal on the shelf. For instance, Prabhat Polymers has introduced innovative packaging solutions with ergonomic grip designs and tamper-evident closures, providing both functional and visual appeal. Another leading player in the RPP industry, Manjushree Technopack Ltd, has introduced 2-liter bottles with handles for the liquor industry (USL) and an angular neck in Extrusion Blow Molding (EBM) for Harpic (a cleaning product).



6. **Mono-material Structures:** Simplified RPP designs consisting of a single material type are becoming increasingly prevalent in the Indian market to bolster recyclability and sustainability. Companies like Amcor have introduced mono-material packaging solutions for various products, including food and beverages. In FY 2021, Manjushree Technopack Ltd was the first to introduce 100% recyclable all plastic pumps with no metal spring and glass ball, reducing the complexity of the recycling process and enabling a more circular economy.

3.9. Key risks and challenges faced by the rigid packaging industry

The packaging industry continually grapples with various challenges, including cost constraints, design complexity, regulatory compliance, and environmental sustainability. Shifting economic conditions and evolving consumer preferences further compound the industry's need to adapt to a dynamic environment.

1. Environmental and Sustainability Concerns

The rigid plastic packaging industry is confronted with mounting pressure to address environmental concerns as awareness of plastic pollution escalates globally. Pressure from regulators, consumers, and environmental organizations has intensified, necessitating a shift towards sustainable practices. For instance, companies like Coca-Cola have committed to using recycled plastics in their packaging to reduce environmental impact. Additionally, innovations in biodegradable alternatives, such as compostable packaging materials made from plant-based polymers, are gaining traction. Furthermore, promoting effective waste management and recycling initiatives, like Nestlé's partnership with TerraCycle for recycling certain "hard-to-recycle" baby food plastic packaging, has become imperative for industry players to mitigate their environmental footprint. Rigid plastics have an advantage over flexible plastics as it is more recycle-friendly and comparatively has a higher recyclability rate than end-consumers.

2. Competition and Cost Pressures

Intense competition characterizes the rigid packaging industry in India, with both domestic and international players vying for market share. This competitive landscape often leads to price wars and margin pressures, challenging manufacturers' profitability and hindering investments in innovation and sustainability initiatives. As seen in the beverage sector aggressive pricing strategies by major players like PepsiCo and Coca-Cola exert downward pressure on packaging prices, further intensifying competition

3. Raw Material Volatility

The rigid packaging industry is susceptible to fluctuations in raw material prices, particularly crude oil, and natural gas, which significantly impact production costs. Fluctuations in crude oil prices in response to geopolitical tensions or market dynamics directly influence the cost of petrochemical-based plastic resins. Consequently, managing raw material price volatility and ensuring a stable supply chain poses considerable challenges, affecting cost predictability and profitability for industry players.

4. Technology Advancements

Staying abreast of technological advancements is imperative for rigid plastic packaging manufacturers to remain competitive. Innovations in packaging materials, production processes, and design play a pivotal role in meeting evolving market demands. For instance, advancements in barrier coatings and recyclable materials enhance product performance and sustainability. Failure to adopt such technologies may result in a competitive disadvantage and loss of market share for manufacturers.

5. Changing Consumer Preferences

Consumer preferences are evolving towards eco-friendly, sustainable, and innovative packaging solutions, posing a continuous challenge for the industry. Brands that fail to align with these changing preferences risk

losing market relevance and consumer trust. For example, the rise of zero-waste stores and packaging-free products reflects growing consumer consciousness about environmental sustainability. Consequently, industry players must innovate to meet these demands while balancing cost-effectiveness and product quality

4. Regulatory Environment in Packaging Industry

4.1 Comparison - India, the USA, and Europe Packaging Regulations

Plastic pollution has become a global concern, with nations around the world grappling with the challenge of managing the ever-increasing volumes of plastic waste. Some common regulations and standards that are often applicable in the packaging industry include:

- **Food contact regulations:** These regulations govern the materials and substances that can come in contact with food products to ensure they are safe for consumption. Examples include the FDA (Food and Drug Administration) regulations in the United States and the EU regulations on food contact materials.
- **Recycling and waste management regulations:** Several countries have regulations governing the recycling and disposal of packaging materials to reduce environmental impact. These regulations may include requirements for labeling, recycling symbols, and minimum recycling rates.
- **Packaging waste directive (EU):** This directive sets targets for recycling and recovery of packaging waste and requires member states of the European Union to take measures to prevent packaging waste and promote recycling.
- **Toxic substances regulations:** Regulations may exist to limit or ban the use of certain toxic substances in packaging materials, such as heavy metals or specific chemicals known to be harmful to human health or the environment.
- **Product safety regulations:** Packaging materials must often meet safety standards to ensure they do not pose a risk to consumers or the environment. This may include regulations related to sharp edges, choking hazards, or chemical safety.
- **Labeling regulations:** These regulations dictate what information must be included on packaging labels, such as product ingredients, nutritional information, recycling instructions, and safety warnings.
- **Child-resistant packaging regulations:** Some products, particularly those containing hazardous substances, may be required to use child-resistant packaging to prevent accidental ingestion by children.
- **Transportation regulations:** Packaging materials must often meet certain standards to safely transport goods without damage or contamination. This may include regulations related to strength, stability, and compatibility with transportation modes.
- **ISO standards:** Various ISO (International Organization for Standardization) standards exist related to packaging materials, processes, and quality management systems, providing guidelines for best practices in the industry.
- **Sustainability initiatives:** While not always legally mandated, there is a growing trend towards sustainable packaging practices. Many companies voluntarily adhere to standards such as FSC (Forest Stewardship Council) certification for paper products or using biodegradable and compostable materials.

In the USA, the regulatory landscape for plastic packaging and waste management is marked by a combination of federal and state-level initiatives. One significant development is the US Plastic Pact, launched in 2020, which brings together businesses, NGOs, government agencies, and research organizations with the vision of transitioning towards a circular economy for plastics. Additionally, the Microbead-Free Waters Act of 2015 prohibits the manufacturing, packaging, and distribution of certain cosmetics and non-prescription drugs containing microbeads, addressing a specific aspect of plastic pollution. However, the lack of a comprehensive federal policy has led to a patchwork of state-level regulations, such as the National Park Service bottle ban in 2022, aimed at phasing out single-use plastics in national parks, and California's plastic packaging bill, which requires packaging to be recyclable or compostable. While these initiatives are commendable, the absence of a cohesive national strategy poses challenges in terms of consistency and enforcement.




In contrast, the European Union has taken a more wholesome approach to tackle the issue of plastic packaging and packaging waste. The European Plastic Strategy, adopted in 2018, is part of the EU's broader Circular Economy Action Plan. This strategy sets ambitious targets, including recycling 70% of packaging waste by 2030 and 65% of municipal waste by 2035. Additionally, the Single-Use Plastics Directive (EU) 2019/904 aims to reduce the impact of certain plastic products on the environment, while the Packaging and Packaging Waste Directive (PPWD – Directive 94/62/EC) lays down measures to prevent the production of packaging waste and promote reuse, recycling, and other forms of recovering packaging waste. The European Union was also the first in the world to introduce and implement Extended Producer Responsibility. The EU's approach is further strengthened by initiatives like the Plastic Bags Directive, which mandates reducing plastic bag consumption, and the Plastics Packaging Levy, a national contribution based on the amount of non-recycled plastic waste. These comprehensive regulations demonstrate the EU's commitment to addressing the plastic packaging and waste

challenge. However, specific regulatory set targets for different types of plastics and certain intricacies still lack from their overall plan of action.

When it comes to India, the country has not only implemented several notable initiatives to tackle the issue of plastic waste management, but also deep dived into the specifics of plastic waste management and plastic packaging with the cornerstone Plastic Waste Management Rules and the introduction of Extended Producer Responsibility Regime. These provide categorisation of different kind of plastics along with specific regulatory targets and guidelines for various stakeholders in the system. They have also introduced a ban on Single-Use Plastics with low utility and high littering potential, effective from 2022 and the various subsequent amendments of the rule focus on different areas, including the latest amendment of 2024 focusing on microplastics and biodegradable plastics. These measures aim to hold manufacturers, producers, imports, and business owners accountable for the entire life cycle of their products. In addition to this, various initiatives such as the India Plastics Pact, a public-private initiative, brings together businesses, government, and NGOs to foster circularity principles in the plastics industry.




Below is a brief comparison between India, EU, and the US to better understand the plastic packaging and waste management environment in the three regions-

Exhibit 4.1: Current Recycling Rates for Plastic Waste in India, European Union, and USA

	India 	EU 	US 
Current Recycling rate for plastic waste	<ul style="list-style-type: none"> Nearly 50% of plastic waste collected and processed, via recycling (2023) 	<ul style="list-style-type: none"> Nearly 32.5% of plastic waste is recycled (2018) 	<ul style="list-style-type: none"> Nearly 5-6% of plastic waste recycled (2021)

Source: Technopak Analysis, Secondary Research

Exhibit 4.2: Regulations for Plastic Packaging and Waste Management in India, European Union, and USA

Parameter	India 	EU 	US 
Prescriptive Regulations	<ul style="list-style-type: none"> Solid Waste Management Rules ratified in 2016 for firms, municipalities, and households Plastic Waste Management Rules from 2016 incl. Extended Producer Responsibility, ban on Single Use Plastic with low utility & high littering potential, from 2022, and other amendments in 2018, 2021, and 2024 respectively 	<ul style="list-style-type: none"> Plastic Bags Directive on reducing plastic bag consumption, amended in 2015 with 2018, 2019, 2025, including specified targets The Packaging and Packaging Waste Directive (PPWD – Directive 94/62/EC) laying down measures to prevent the production of packaging waste, and to promote reuse of packaging and recycling and other forms of recovering packaging waste Plastics Packaging Levy, national contribution based on amount of non-recycled plastic waste Extended Producer Responsibility regulations mandatory for all European countries that must be translated into national laws by 2025 	<ul style="list-style-type: none"> Microbead-Free Waters Act, 2015, prohibits rinse-off cosmetics and non-prescription drugs manufacturing, packaging, distribution, incl. sets of deadlines Plastic packaging bill of California, requiring packaging to be recyclable or compostable, creation of a \$5 billion relief fund by the plastic industry for communities affected by plastic pollution- both by 2032
Regulation regarding single use plastics	<ul style="list-style-type: none"> Ban on the manufacture, import, stocking, distribution, sale and use of identified single use plastic items, which have low utility and high littering potential, all across the country since July 1, 2022 (Plastic Waste 	<ul style="list-style-type: none"> Single-Use Plastics Directive (EU) 2019/904 - Single Use Plastic Ban ban on selected single use plastics since July 2021 	<ul style="list-style-type: none"> National Park Service bottle ban, 2022, to phase out single-use plastics by 2032 & find alternatives Ban on sale of single use plastic on public land, national parks by 2032

	Management Rules, Amendment 2021)		
Regulatory Recycling targets – plastic packaging	<ul style="list-style-type: none"> Year wise targets as a % of EPR set for minimum level of recycling of plastic waste across different categories of plastic packaging (Guidelines on EPR vide PWM (Amendment Rules) 2022)- 2024-25: 30-50% 2025-26: 40-60% 2026-27: 50-70% 2027-28 onwards: 60-80% Higher bound targets for rigid packaging respectively In addition to this, the regime sets specific targets for specific stakeholders that EPR targets, namely- Producers, Importers, and Brand Owners and also lists down specific responsibilities for other stakeholders involved 	<ul style="list-style-type: none"> 50% by weight by 2025 55% by weight by 2030 of plastic packaging waste must be recycled (Directive 94/62/EC) 	-
Regulatory Reusability targets- plastic packaging	<ul style="list-style-type: none"> Target for reuse of rigid plastic packaging by Brand Owners (BO) as a % of rigid plastic packaging in products sold annually: Case i: Rigid plastic packaging with volume or weight equal more than 0.9 lt. or kg. but less than 4.9 lt. or kg. as the case may be- 2025-26: 10% 2026-27: 15% 2027-28: 20% 2028-29 onwards: 25% Case ii: Rigid plastic packaging with volume or weight equal more than 0.9 lt. or kg. but less than 4.9 lt. or kg. as the case may be- 2025-26: 70% 2026-27: 75% 2027-28: 80% 2028-29 onwards: 85% 	-	-
Regulatory Recycled content portion targets- plastic packaging	<ul style="list-style-type: none"> Year wise targets for mandatory use of recycled plastic content in plastic packaging as a % of plastic manufactured for the year across different categories of plastic packaging (Guidelines on EPR vide PWM (Amendment Rules) 2022)- 2024-25: 5-30% 2025-26: 5-40% 2026-27: 10-50% 2027-28 onwards: 10-60% Higher bound targets for rigid packaging respectively 	<ul style="list-style-type: none"> 35% of recycled content for plastic packaging by 2030, and 65% by 2040 respectively (Revised PPWD) 	<ul style="list-style-type: none"> No country wide rule; California: 10% by 2027 30% by 2028 65% by 2032

Additional regulatory goals	-	<ul style="list-style-type: none"> • Headline target to reduce packaging waste by 15% by 2040 per Member State per capita, compared to 2018 • Ensure all packaging is reusable or recyclable in an economically feasible way by 2030 (Revised PPWD, November, 2022) • EU countries must collect 90% of packaging materials separately by 2029 (Environment Committee) through setting up of deposit return systems (DRS) • By 2029, member states must ensure the separate collection of at least 90% per annum of single-use plastic bottles and metal beverage containers. To achieve that target, they are required to set up deposit return systems (DRSs) for those packaging formats 	-
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Source: Technopak Analysis, Secondary Research

Note: Targets discussed under time India includes specific targets for Producers (P), except for reusability targets which are specific to brand owners (BO) for **Rigid Plastic Packaging**

Note: The reuse of rigid plastic packaging in food contact applications is subject to regulation of Food Safety and Standards Authority of India

Note: EEA- European Environment Agency; EPA- US Environment Protection Agency

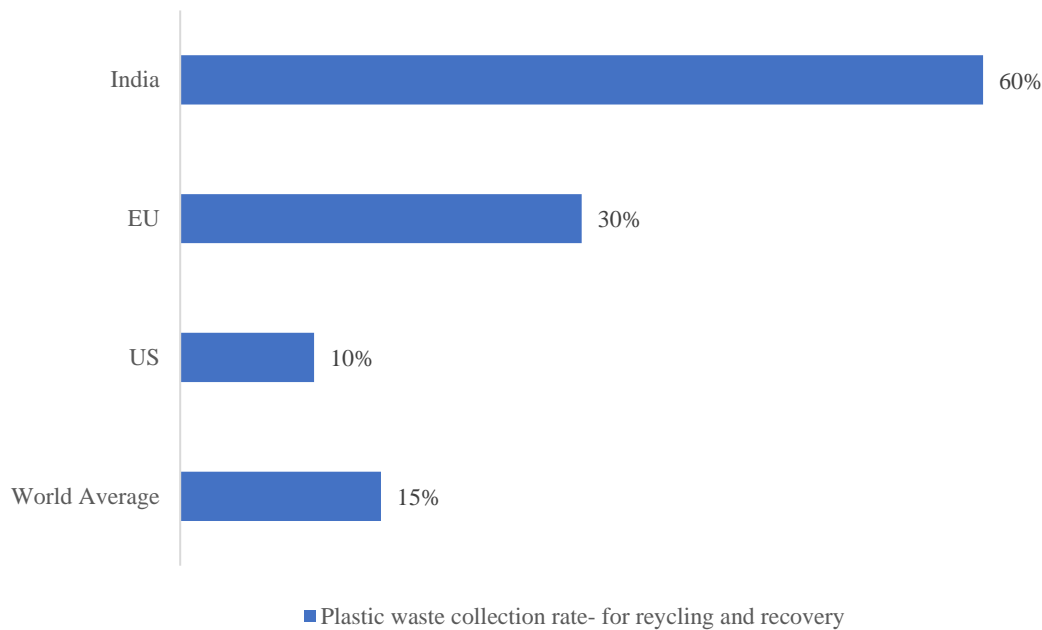
Exhibit 4.3: Guidelines for Plastic Packaging and Waste Management in India, European Union, and USA

Parameter	India 	EU 	US 
Awareness	<ul style="list-style-type: none"> • India Plastics Pact – public/private initiative bringing together businesses, government, NGOs fostering circularity principles 	<ul style="list-style-type: none"> • Circular Economy Action Plan, adopted 2015 • Plastic Strategy, adopted in 2018, part of EU’s circular economy action plan • European Green Deal, 2019 	<ul style="list-style-type: none"> • US Plastics Pact, 2020, joining businesses, NGOs, government & research institutions to work together towards a circular economy for plastics
Guideline Recycling targets – plastic packaging	<ul style="list-style-type: none"> • 50% of plastic packaging should be recycled by 2030 (India Plastic Pact) 	-	<ul style="list-style-type: none"> • 50% of plastic packaging should be effectively recycled or composted by 2030 (US Plastic Pact)
Guideline Reusability targets- plastic packaging	<ul style="list-style-type: none"> • 100% of plastic packaging to be reusable, recyclable or compostable by 2030 (India Plastics Pact) 	-	<ul style="list-style-type: none"> • 100% of plastic packaging to be reusable, recyclable or compostable by 2025 (US Plastic Pact)
Guideline Recycled content portion targets- plastic packaging	<ul style="list-style-type: none"> • 25% of average recycled content across all plastic packaging by 2030 (India Plastics Pact) 	-	<ul style="list-style-type: none"> • Achieve an average of 30% recycled content or responsibly sourced, bio-based content by 2025 (US Plastics Pact)
Other guideline goals	-	<ul style="list-style-type: none"> • Recycling 70% of packaging waste by 2030 (European Green Deal) • Recycling 65% of municipal waste by 2035 (Circular Economy Action Plan) 	-

Source: Technopak Analysis, Secondary Research

India is making significant progress in the plastic packaging and waste management industry owing to the presence of a large informal sector workforce engaged in collecting, sorting, recycling, and selling valuable plastic materials, along with the ongoing efforts of collaboration between the government and private sector, and the evolving regulatory framework. One of India's most significant achievements in this area is already visible with its high rate of plastic waste collection for recycling and recovery, estimated to be around 60%. This is higher than the global average of 15% and even surpasses the rates in developed regions like the EU (30%) and the US (10%).

Exhibit 4.4: Plastic waste collection rate- for recycling and recovery comparison



Source: Technopak Analysis, Secondary Research

Key regulations in India for the packaging industry

The packaging industry in India has emerged as a vital component of the country's manufacturing sector, catering to the ever-growing demands of diverse end-user segments. As consumer preferences evolve and environmental concerns gain prominence, the regulatory landscape surrounding packaging, particularly plastic packaging, has undergone significant transformations. The Indian government has instituted a comprehensive set of regulations to address the environmental challenges posed by plastic packaging waste. The centrepiece of these efforts is the Plastic Waste Management (PWM) Rules, 2016, and its subsequent amendments in 2018, 2021, 2022, and 2024 consecutively.

Exhibit 4.5: Timeline of the PWM Rules in India



Source: Technopak Analysis, Secondary Research

Key highlights of the Plastic Waste Management Rules:

- **Plastic Waste Management Rules, 2016:** This comprehensive set of rules by the Ministry of Environment, Forest and Climate Change aims to regulate the manufacture, use, and disposal of plastic products, including packaging materials. It mandates the generators of plastic waste to take steps to minimize generation of plastic waste while also mandating the responsibilities of local bodies, gram panchayats, waste generators, retailers, and street vendors to manage plastic waste. It mandates the use of recycled plastics, sets recycling targets, and introduces the concept of Extended Producer Responsibility (EPR) for plastic waste management.
- **Plastic Waste Management (Amendment) Rules, 2018:** The amended Rules laid down the phasing out of Multilayered Plastic (MLP) which are “non-recyclable, or non-energy recoverable, or with no alternate use.” They also prescribed a central registration system which were to be evolved by Central Pollution Control Board (CPCB) for the registration of the producer/importer/brand owner. While a national registry was prescribed for producers with presence in more than two states, a state-level registration was also prescribed for smaller producers/brand owners operating within one or two states.

- **Plastic Waste Management (Second Amendment) Rules, 2021:** These amendments prohibited identified single use plastic items by 2022 and increased the thickness of plastic carry bags from 50 to 75 microns from 30th September 2021 and to 120 microns from 31st December 2022, respectively.
- **Plastic Waste Management (Amendment) Rules, 2022:** These amendments further strengthen the EPR regime by introducing specific targets for the recycling of plastic packaging waste and mandating the use of recycled plastics in various applications. All obligated entities of EPR were also told to register on the central registration system as evolved by the Central Pollution Control Board (CPCB).
- **Plastic Waste Management (Amendment) Rules, 2024:** These amendments highlight significant efforts to address plastic pollution in India, particularly by targeting microplastics and setting stricter criteria for biodegradable plastics.

Other common Indian regulations and standards applicable in the packaging industry include:

- **Food Safety and Standards (Packaging and Labelling) Regulations, 2011:** These regulations, under the Food Safety and Standards Act, 2006, specify the types of materials that can be used for packaging food items, including plastics. They also outline requirements for labeling, ensuring consumer safety and transparency.
- **Legal Metrology (Packaged Commodities) Rules, 2011:** These rules regulate the packaging and labeling of packaged commodities, including requirements for net quantity declarations, ensuring fair trade practices, and preventing malpractices.
- **Drugs and Cosmetics Rules, 1945:** These rules, under the Drugs and Cosmetics Act, 1940, provide guidelines for the packaging of pharmaceutical and cosmetic products, ensuring safety, quality, and efficacy.
- **Bureau of Indian Standards (BIS) Standards:** BIS has established several standards for plastic packaging materials, including specifications for materials, dimensions, testing methods, and safety requirements.

4.2 India's EPR Regime and its impact on the packaging Industry

Extended Producer Responsibility (EPR), which falls under the regime of Plastic Waste Management Rules, 2016, in India is a cornerstone of India's evolving policy framework for plastic waste management. EPR mandates that producers, brand owners, importers and plastic waste processors of plastic packaging are accountable for its collection and sustainable disposal. This approach shifts the burden of waste management from municipalities to the entities that bring packaging materials into the market. By placing financial and operational responsibility for end-of-life product management on producers, this regime is driving transformative changes within the packaging industry.

The EPR Guidelines covers the following with respect to plastic packaging-

- Reuse
- Recycling
- Use of Recycled Plastic Content
- End of life disposal

Obligated Entities of EPR:

- **Producer (P)** of plastic packaging
- **Importer (I)** of all imported plastic packaging and/ or plastic packaging
- **Brand Owners (BO)** including online platforms/marketplaces and supermarkets/retail chains other than those, which are micro and small enterprises as per the criteria of Ministry of Micro, Small and Medium Enterprises, Government of India
- **Plastic Waste Processors (PWPs)** except cement kilns and road construction

Key components of India's EPR regime include:

- **Phased Collection Targets:** Producers are obligated to collect and ensure the recycling or environmentally sound disposal of escalating percentages of plastic waste they generate.
- **Financial Mechanisms:** Companies can either establish in-house collection and recycling systems or collaborate with Producer Responsibility Organizations (PROs).
- **Penalties for Non-Compliance:** Failure to meet EPR targets can result in financial penalties and reputational damage.

In June 2020, the Unified framework for EPR proposed three implementation models which are under discussion stage. This includes a system of plastic credit, through Producer Responsibility Organizations (PRO) and setting up a fee-based mechanism. The new draft framework also has provisions to impose stringent penalties on producers if they fail to meet their targeted collection. The government is pushing for more evidence-based mechanisms so that authorities can monitor how companies undertake EPR obligations.

PROs (Producer Responsibility Organizations) work closely with stakeholders throughout the product-to-waste value chain, including brand owners, retailers, recyclers, and municipalities, to fulfill their missions. Their responsibilities include:

- **Waste Prevention and Consumer Awareness:** PROs work to educate consumers about waste prevention and promote sustainable practices.
- **Litter Prevention and Recycling:** They collect and recycle packaging waste to reduce litter and promote environmental responsibility.
- **Eco-Design Improvement:** PROs collaborate with stakeholders to improve the eco-design of products and packaging, aligning with life-cycle analyses and changing consumer habits.
- **Municipal and Waste Management Cooperation:** They work with municipalities and waste management companies to establish efficient collection and sorting systems based on administrative, territorial, and demographic factors.
- **Support for Circular Economy Development:** PROs invest in R&D to advance new circular economy sectors focused on reduction, reuse, and recycling, enhancing the value chain from collection to recycling.

These complementary missions help PROs drive sustainability and environmental responsibility across the entire product lifecycle. Karo Sambhav is one such PRO which is India's first producer-governed and owned PRO.

The Guidelines on EPR for plastic packaging vide PWM (Amendment) Rules, 2022, on 16th February 2022 stipulate mandatory targets on EPR, recycling of plastic packaging waste, reuse of rigid plastic packaging and use of recycled plastic content for the various obligated entities of EPR.

Exhibit 4.6: Plastic Packaging Categories covered under EPR:

Category I	Rigid Plastic Packaging
Category II	Flexible Plastic Packaging of single layer or multilayer (more than one layer of different kind of plastic), plastic sheets or like and covers made of plastic sheet, carry bags, plastic sachet or pouches
Category III	Multi-layered plastic packaging (at least one layer of plastic and at least one layer of material other than plastic)

We discuss the stipulated targets for **Producers (P)** below-

EPR targets:

Eligible Quantity in MT (Q1) shall be the average weight of plastic packaging material (category wise) sold in the last two financial years (A) plus average quantity of pre-consumer plastic packaging waste in the last two financial years (B) minus the annual quantity (C) supplied to the entities covered under sub-clause 4(iii) in the previous financial year as given below-

$$Q1 \text{ (in MT)} = (A+B) - C$$

Exhibit 4.7: Plastic Packaging Categories covered under EPR: Extended Producer Responsibility Target

Plastic packaging category	Year	EPR target (as a percentage of Q1- category-wise)
I	2021-22	25%
II	2022-23	70%
III	2023-24	100%

Obligation for recycling:

The producer shall ensure minimum level of recycling (excluding end of life disposal) of plastic packaging waste collected under EPR target, category-wise, as given below-

Exhibit 4.8: Minimum level of recycling (excluding end of life disposal) of plastic packaging waste as a % of EPR target

Plastic packaging category	2024-25	2025-26	2026-27	2027-28 onwards
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I	50	60	70	80
II	30	40	50	60
III	30	40	50	60

Obligation for use of recycled plastic content:

The producer shall ensure use of recycled plastic in plastic packaging category-wise as given below-

Exhibit 4.9: Mandatory use of recycled plastic in plastic packaging (% of plastic manufactured for the year)

Plastic packaging category	2024-25	2025-26	2026-27	2027-28 onwards
I	30	40	50	60
II	10	10	20	20
III	5	5	10	10

End of Life Disposal

- (i) Only those plastics, which cannot be recycled will be sent for end-of-life disposal such as road guidelines issued by Indian Road Congress or Central Pollution Control Board from time to time.
- (ii) The producers shall ensure end of life disposal of the plastic packaging waste only through methodologies specified in Rule 5 (1) (b) of Plastic Waste Management Rules, 2016.

Rigid Plastics Best Placed to Meet EPR Targets

Exhibit 4.10: Rigid Plastic Packaging best placed to meet EPR Targets

Category per EPR	(As Recycling target (2025))	Recycled Content Target (2025)	Current Recycling Rates	Feasible Recyclability	Reusability
I-Rigid Plastics	50%	30%	>60% for PET	100%	100%
II- Flexible Packaging	30%	10%	<10%	Technically feasible, commercial viability lowdown-recycled into other applications such as road construction, waste-to-energy, downcycling and upcycling	Not reusable
III- MLP	30%	5%	0-0.5%		Not reusable

The extended producer responsibility (“EPR”) regulations in India are more stringent compared to the United States. For instance, all bottles are required to contain 30% recycled plastic by 2026 and 80% of the RPP waste is targeted to be recycled by 2028. These regulations together with the growing awareness among consumers have increased the demand for higher-value recycling applications. Further, industry participants have increased focus on increasing the PCR content in their products and adopting other innovative recycling improvements and technologies.

India's regulations and initiatives are poised to become more stringent and detailed with time. While the country demonstrates a strong commitment to addressing plastic packaging and waste management, there is still room for improvement. Challenges such as inadequate infrastructure, lack of public awareness, and the need for better enforcement mechanisms persist. Additionally, the informal sector workforce, which plays a crucial role in plastic waste management, often operates in precarious conditions with limited access to protective equipment and social safety nets.

To address these challenges and further strengthen India's plastic waste management efforts, the following measures could be considered:

- **Investment in modern waste management infrastructure:** Establishing efficient collection, sorting, and recycling facilities across the country can enhance the capacity to handle plastic waste effectively.

- **Formalization and integration of the informal sector workforce:** Recognizing and formalizing the role of waste pickers and traders can improve their working conditions, provide social security benefits, and foster greater collaboration with formal waste management systems.
- **Promotion of sustainable alternatives:** Encouraging the development and adoption of environment friendly alternatives to single-use plastics, such as biodegradable or compostable materials, can reduce the burden of plastic waste.
- **Public awareness and education campaigns:** Increasing public awareness about the importance of proper waste disposal, recycling, and the environmental impact of plastic pollution can foster behavioural change and promote sustainable practices.
- **Collaboration and knowledge sharing:** Fostering international cooperation and knowledge exchange with other nations and organizations can facilitate the adoption of best practices and innovative solutions for plastic waste management.

Impact on the Packaging Industry



Extended Producer Responsibility (EPR) is prompting significant changes in how packaging is designed, manufactured, and recovered in India. The following key areas demonstrate the transformative impact of EPR:

- **Sustainable Design:** Companies are reimagining packaging to enhance recyclability and reduce complexity, shifting away from hard-to-recycle multi-materials. Manjushree Technopack Ltd is also one of the leading companies in sustainable packaging and environmental, social, and governance (“ESG”) standards in terms of use of renewable power and recycled plastic in India as of March 31, 2024. In 2022, **Manjushree Technopack Ltd.**, partnered with the Indian Institute of Science, Bengaluru, to innovate sustainable plastic packaging solutions. Their collaboration aims to upcycle and recycle thermoplastics for use in various rigid plastic packaging, focusing on transitioning from non-recyclable to recyclable monolayer materials.
- **Recycled Content:** The emphasis on incorporating recycled plastics into packaging has stimulated the recycling ecosystem and created a market for collected waste. **ALPLA** collaborated with Coca-Cola India to launch Kinley, India's first packaged drinking water brand using 100% recycled PET (rPET) bottles. At the same time, Manjushree Technopack Ltd also collaborated for 100% rPET bottles for Coca-Cola in North India, they are one of the leading sustainability-driven packaging solution providers. These bottles, made entirely from recycled food-grade plastic, represent a crucial step toward a circular economy. Manjushree Technopack has also been the first to be successful in achieving up to 100% PCR content in packaging solutions in India. Similarly, **WEPL** provides low-impact alternatives such as Post-Consumer Recycled (PCR) and circular polymers to minimize the use of fossil feedstock, targeting 100% recyclability, reusability, or refill ability by 2025.
- **Investment in Waste Management:** Companies are investing in waste collection infrastructure, collaborating with PROs and municipalities, and exploring advanced recycling technologies to achieve EPR goals. **Chemco Group**, for instance, integrates recycled ocean plastics into their products and operates recycling plants across India. They source post-consumer materials like bottles and caps to enhance sustainability. **Manjushree Technopack Ltd** has also partnered with Saahas Zero Waste (SZW), a social enterprise, to collect plastic waste in Bengaluru and other cities, handling 38 tons of waste daily across multiple locations. This partnership brings structure to India's informal waste collection system. Manjushree Technopack Ltd also has an in-house recycling facility with capability for PP/HDPE recycling. In a similar effort, **Tetra Pak** recycles 54% of its cartons annually, converting them into paper and other products. The company aims to achieve a 100% recycling rate and has identified four recycling partners across India with the technology to convert cartons into different products.
- **Innovation:** EPR encourages the exploration of alternative materials like bio-based and biodegradable options, as well as reusable and refillable packaging models. For instance, **Ecovative Design** introduced innovative, mycelium-based packaging solutions that use mushroom roots to create biodegradable and compostable materials, reducing the reliance on non-renewable resources. **ALPLA** collaborated with various partners to develop future-oriented packaging materials using alternative inputs such as cellulose, sugar cane, and sunflower seed hulls.

Actions and Commitments by End Use Segments:

Exhibit 4.11: Actions and Commitments by End Use Segments:






Sector		Action and Commitments
	Fast Moving Consumer Goods (FMCG)	Since 2019, Hindustan Unilever (HUL) has been incorporating post-consumer recycled (PCR) content into rigid bottles (PET and HDPE) of brands such as Vim, Surf Excel, Vaseline, Love Beauty and Planet, Lifebuoy, Pears and Sunsilk. Post-consumer recycled (PCR) LDPE content across all shrink wraps and overwraps is at least 70% and 50% respectively.
	Fast Moving Consumer Goods (FMCG)	LDPE Bundling shrink wraps of ITC's B Natural Juices contain 25% recycled content. ITC's Fiama handwash PET bottles contain 50% recycled content. The company has successfully enhanced the PCR (post-consumer recycled plastic) content in Fiama Shower Gel bottles from 30% to 50% rPET, thereby resulting in reducing virgin plastic use without affecting product integrity and consumer experience.
	Fast Moving Consumer Goods (FMCG)	For the Navratna brand, Emami uses 25% and 40% recycled Polyethylene terephthalate (rPET) in primary and secondary packaging, respectively.
	Fast Moving Consumer Goods (FMCG)	30 ml and 70 ml PET bottles of Marico's Nihar Shanti Amla hair oil contains 20% recycled content, an increase from 10% in 2021. Marico has switched the sleeves for its 40 ml and 90 ml polypropylene (PP) bottles of Nihar Naturals hair oil from PVC to PET-G.
	Fast Moving Consumer Goods (FMCG)	Became the first Indian consumer goods company to achieve a 100% plastic waste-neutral status in 2022, recycling approximately 27,000 metric tons of post-consumer plastic waste in the 2021-22 financial year. In 2023, the company reached a "plastic waste positive" status, collecting, processing, and recycling 35,000 metric tons of post-consumer plastic waste—more than the amount of plastic used in its product packaging.
	Fast Moving Consumer Goods (FMCG)	Remains compliant with the Indian government's EPR guidelines, collecting, processing, and recycling more than 23,000 metric tons of plastic packaging waste, exceeding the EPR guidelines' requirements. P&G has also embraced the use of recycled materials in its packaging, such as recycled plastics for its Baby Care and Feminine Care products.
	Beverages- Non Alcoholic	Launched the "World Without Waste" initiative in 2018, committing to make 100% of its packaging recyclable globally by 2025. The initiative aims to use at least 50% recycled materials in packaging by 2030 and collect and recycle a bottle or can for each one sold by 2030. Coca-Cola India recently launched Coca-Cola in 100% recycled plastic (rPET) bottles in smaller pack sizes, including 250 ml and 750 ml bottles.
	Bottled Water and Soft Drinks	Bisleri has replaced the full body PVC shrink sleeve labels on carbonated soft drinks bottles with BOPP center panel labels. HDPE caps of Bisleri water bottles now weight 1.35 grams instead of 1.50 grams, resulting in 489 metric tonnes of plastic reduction for FY 22-23.




	Wines and Spirits	Aims for 100% of its packaging to be reusable, recyclable, or compostable by 2025. The company introduced recycled and recyclable neck tags in various Indian states to educate consumers on its sustainability initiatives and #OneForOurPlanet campaign.
	Adhesives and Sealants	Utilizes PCR plastics in its packaging to promote circularity and reduce reliance on virgin plastics. The company continues to explore alternative materials and redesigns its packaging to minimize the use of multi-layered plastic (MLP).

Source: Secondary Research

In addition to 100% recyclability targets, food & beverage end-user segment, which contributes ~ 45% of the total plastic packaging in India, have set absolute reduction and recycled material goals. Further, due to stringent environmental and waste management rules and regulations globally, brands are increasingly pledging to reduce plastic waste and move towards 100% recyclable packaging

Exhibit 4.11: Reduction and Recyclability Goals by Different Food and Beverage Players

	Reusable, recyclable, compostable goal	Virgin plastic reduction	Post-consumer recycled content	Plastic re-use / re-fill rate
	100% by 2030 (89% in 2023)	20% by 2030 (-6% in 2023)	50% by 2030 (10% in 2023)	20% by 2030 (10% in 2023)
	100% by 2025 (92% in 2023)	20% by 2025 (15% in 2023)	30% for all materials by 2025, (27% in 2023). 25% for recycled plastic by 2025, (17% in 2023)	No target (2% in 2023)
	95% by 2025 (83.5% in 2023)	33% by 2025 (14.9% in 2023)	30% by 2025 (9.3% in 2023)	No target (1% in 2021)
	100% by 2025 (90% in 2022)	20% by 2025 (-3.5% in 2021)	50% for all materials by 2030, (25% recycled material in packaging in 2022), 25% for recycled plastics by 2025 (15% of PET used was recycled PET in 2022)	25% by 2030 (~14% of total beverage volume was served in reusable packaging in 2022)
	100% by 2025 (84% in 2023)	50% by 2040, with a 30% deduction by 2030 (-3% in 2023 vs 2020)	100% by 2040 (58% in 2023)	No target (4% in 2021)

	100% by 2025 (87% in 2022)	20% reduction in use of virgin plastic by 2030 vs 2021	No target (21% in 2022)	No target
	100% by 2025 (20% in 2022)	25% by 2025 (-11% in 2021)	30% by 2025 (1% in 2022)	No target
	~98% or more by 2025 (96% in 2023)	5% by 2025 (-2.3% in 2023) 25% for rigid plastics by 2025 from 2020 baseline (9% in 2023)	5% plastics by 2025 (1.4% in 2023)	No target

Source: Secondary Research

Note: reusable goals mean they aim to create products or packaging that can be used multiple times without losing their functionality, a recyclable goals indicate that the company intends to design products or packaging materials that can be collected, processed, and turned into new products after their initial use, and compostable goals refer to designing products to break down naturally into organic matter when placed in a composting environment; Virgin plastic reduction refers to the effort to decrease the use of newly produced or “virgin” plastic materials and Post-consumer Recycled content is made from products or packaging that have already been used by consumers and are collected for recycling; Plastic re-use/ refill rate refer to using plastic items multiple times and measuring how often people choose to refill/reuse plastic items rather than purchasing a new one respectively

4.4. Comparing sustainability across the different forms of packaging

Sustainability initiatives and growing consumer demand for environmentally responsible products are driving a paradigm shift in the packaging sector. With the aim of minimizing environmental impact, businesses are seeking packaging solutions that reduce resource consumption, promote a circular economy, and optimize performance throughout the product lifecycle.

Multifaceted Considerations

Evaluating packaging sustainability necessitates a holistic approach that extends beyond any single factor. While recyclability is essential, a truly sustainable solution requires analysis of the entire value chain, including material sourcing, production, transportation, end-of-life options, and energy efficiency. The choice is often a nuanced balance of trade-offs.

Key Packaging Materials and their Sustainability Profiles

Metal (Primarily Aluminium)

- **Infinite Recyclability:** Aluminium boasts one of the highest recycling rates among packaging materials. Nearly 75% of all aluminium ever produced is still in use today.
- **Energy-Intensive Production:** Producing virgin aluminium from bauxite ore is incredibly energy-demanding, requiring around 15 kilowatt-hours of electricity per pound. This process results in significant greenhouse gas emissions.
- **Contamination Concerns:** Alloys used to enhance aluminium’s strength or properties can complicate end-of-life recycling if not carefully separated. Contamination can severely limit the potential uses for the recycled material.

Glass

- **Infinite Recyclability:** Glass can be recycled repeatedly without losing quality; however, colour sorting and the removal of contaminants are critical to preventing degradation in the recycled material.
- **Energy-Intensive Production:** Manufacturing glass from raw materials requires substantial energy, with furnaces operating at temperatures exceeding 1500 degrees Celsius.
- **Weight and Fragility:** Glass is significantly heavier than plastic alternatives, increasing transportation costs and associated carbon emissions. Its fragility leads to a breakage loss rate during transportation and handling.

Multi-layer Packaging (MLP)

- **Superior Barrier Properties:** The layered design (often combining plastics, foils, and paperboard) provides exceptional protection against oxygen, moisture, and light, significantly extending food shelf life and reducing waste.
- **Material Efficiency:** MLP uses significantly less total material than alternatives while achieving the same protective functions.
- **Recycling Complexities:** The inseparable layers of MLP make traditional recycling virtually impossible. Their disposal often involves landfilling, incineration (contributing to air pollution), or limited use in low value downcycling applications.

Plastics:

- **Lightweight and Efficient:** Plastic packaging's high strength-to-weight ratio maximizes product protection while minimizing material use and transportation emissions.
- **Recyclability:** The recyclability of plastics varies greatly between types. PET and HDPE have established recycling streams, while others lack robust infrastructure.
- **Innovation Focus:** Advancements in recycled plastic content (rPET, rHDPE), the development of bio-based plastics, and improved sorting technology offer promising improvements in plastic packaging's sustainability profile.

Flexible Plastics-

- **Adaptability:** Flexible plastics can be moulded into different sized and shapes, making them usable for packaging of an array of products.
- **Lightweight and Space-Efficient:** Flexible Plastics are usually lightweight and can be compressed when empty, requiring less space during storage and transportation.
- **Cost Effective:** Flexible Plastics are generally less expensive to produce than other packaging materials, positioning themselves as an economical choice for producers.

However, flexible plastics propose several challenges with respect to limited recycling and reusability, and durability.

Rigid Plastics-

- **Recyclability:** Rigid plastics, such as PET bottles, have higher recyclability rates than flexible plastics due to easier end of life disposal, waste sorting, and existing infrastructure for recycling.
- **Material efficiency:** Even though rigid plastic uses more material than flexible plastics, they tend to have more durability leading to a longer product shelf life, fewer replacements, and ultimately overall less waste production.

Plastic: A Sustainable Perspective

Plastic's negative environmental image stems largely from single-use flexible plastic pollution. However, when analyzing the entire lifecycle, modern, responsibly designed plastic packaging offers distinct sustainability advantages:

- **Energy Efficiency:** Plastic production generally requires less energy compared to glass or metal. This translates to reduced greenhouse gas emissions.
- **Resource Conservation:** The lighter weight of plastics reduces material usage. Advancements such as thin-walled containers and lightweight caps further contribute to resource savings.
- **Transportation Optimization:** Reduced weight per package in plastic packaging results in significant fuel savings and lower carbon emissions during transportation.
- **Extended Shelf-life:** Plastics' barrier properties and innovative formats help minimize food waste, a significant contributor to environmental burdens.

Rigid plastic, particularly single-layered plastic, stands out as one of the most sustainable packaging substrates when considering key factors such as recyclability, reusability, carbon footprint, and packaging cost. For example, PET, PP and PE resins can be completely recycled. Its high recyclability rating, including 100% recyclability for single-layered plastics, positions it as an environmentally friendly packaging solution. The material's durability, structural integrity, and reusability potential allow for multiple use cycles before recycling becomes necessary.

Rigid plastic's lower carbon footprint and top-tier cost-effectiveness make it an economically viable option for widespread adoption in the packaging industry.

The combination of these attributes enables rigid plastic to outperform alternative materials in several aspects. Its lightweight nature and high strength-to-weight ratio allow for efficient packaging functions while minimizing material consumption, leading to reduced transportation costs and associated emissions. Rigid plastic's chemical resistance and moldability enhance its versatility across various packaging applications. Contrary to common perceptions, rigid plastic packaging demonstrates notable environmental benefits, significantly reducing overall environmental costs compared to alternatives due to its efficient material utilization and lower energy requirements in production and transport. These factors have contributed to packaging applications becoming a major consumer (~59%) of plastic in India, underscoring its importance in the sector's sustainability efforts

Exhibit 4.11: Comparison of different packaging substrates

	Cost per unit	Barrier requirement	Convenience	Lower carbon footprint	Recyclability	Recycled content	Bio-degradability
Rigid Plastics	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓
Flexible Plastic	✓✓✓	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓
Glass	✓	✓✓✓	✓✓	✓✓	✓✓	✓✓✓	✓
Aluminium	✓✓	✓✓✓	✓✓	✓✓	✓✓✓	✓✓✓	✓✓
Paper	✓✓	✓✓	✓✓	✓✓✓	✓✓	✓	✓✓✓

Source: Technopak Analysis & Secondary Research
 ✓✓✓ - Best in Class ; ✓✓ - Good ; ✓ - Poor

Plastic packaging can be more sustainable compared to alternative materials like glass, metal, and multi-layer packaging (MLP) when considering factors such as energy consumption, greenhouse gas (GHG) emissions, and resource utilization throughout the product lifecycle. In addition to this, India's stringent EPR regime is pushing the industry towards a circular economy. For instance, regulations for mandatory recycled plastic content use are driving the demand for Post Consumer Recycled (PCR) Plastic. The regime is pushing the stakeholders towards working together to create supportive infrastructure. Considering the existing infrastructure and recyclability rates, rigid plastics are best placed to meet EPR targets in India.

5. Analysis of the Customer/User Industry in India

The packaging industry in India is driven by the country's flourishing economy, rapid urbanization, heightened consumer awareness, and evolving consumer preferences. This industry plays a pivotal role in safeguarding products, enhancing their market appeal, and ensuring convenience for consumers across various sectors such as FMCG, pharmaceuticals, agrochemicals, personal care, electronics, and alcoholic beverages. These sectors require packaging of diverse types and sizes for their products and the growth, demand and supply of these industries directly impact the growth of the packaging industry. With increasing focus on environmental sustainability, regulatory compliance, and technological advancements, the industry is witnessing a shift from traditional packaging materials to innovative solutions like smart packaging and eco-friendly alternatives. With these factors at play, the Indian packaging industry is poised for continued growth and transformation in the years ahead.

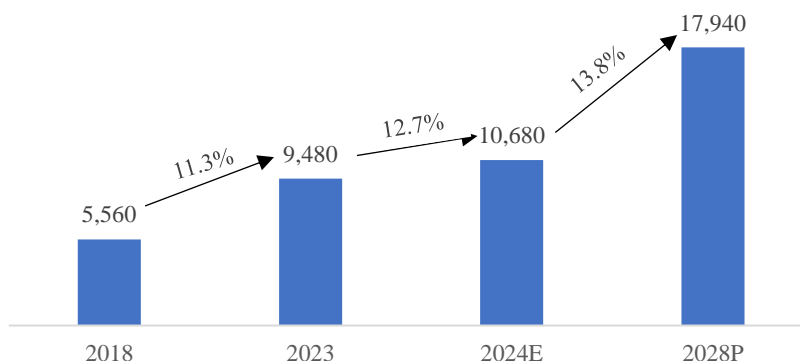
5.1 Overview of the FMCG Industry in India

Packaged Food (Includes Packaged Beverages and Nutraceuticals)

Indian packaged food and packaged beverage market was valued at INR 5,560 billion in FY 2018 and reached to INR 9,480 billion in FY 2023, growing at a CAGR of ~11.3%. It is projected to reach INR 17,940 billion by FY 2028, growing at a CAGR of ~13.6% between FY 2023 and FY 2028. However, PET packaging industry experiences several seasonal trends particularly driven by seasonality in beverages demand as in summer & warm months and holiday seasons like Christmas and other festivals. There is an increased need for PET bottles and containers for higher consumption of CSD(carbonated soft drinks) , juices and bottled water. Also, during harvest seasons the demand for PET packaging increases to preserve items like fruits, vegetables and other perishable goods to extend the shelf life of these products. But the reverse trend is generally observed during winter and cold seasons which impact not only the production of PET packaging corresponding to decreased demand but also the transportation and logistics disrupting the supply chains.



Exhibit 5.1 Indian Packaged Food and Packaged Beverages Market (in INR Billion) (FY)



Source: Technopak Analysis, Secondary Research

Note: Packaged Food & Beverage market includes Packaged Staples, other Packaged Food, Packaged Dairy (Fresh), Packaged Meat, Nutraceuticals and Packaged Beverage)
Packaged Beverages, does not include Alcoholic Beverages

Packaging plays a vital role in branding and marketing, providing an avenue for companies to differentiate their products through design, convenience features, and information transparency. It plays a critical role in the packaged food and packaged beverages market, serving as the bridge between producers and consumers to

preserve product quality, extend shelf life, and ensure safety during transport. Some of the key players in packaged food industry are Britannia, Nestle India, ITC etc. and in the packaged beverages industry are PepsiCo, CocaCola, Parle Agro etc.that holds the major market share in the packaged food and packaged beverages industry that requires packaging materials to sell their products. Manjushree Technopak's customers are industry leaders in India across all its end-use applications. It is a supplier to each of the top four players, by market share, in the Packaged Beverages industry, each of the top five players, by market share, in the Packaged Food industry and four out of top five players in the Nutraceuticals industry.

Exhibit 5.2 Share of Some Key Players in Packaged Food and Packaged Beverages Market (in terms of Revenue)

Packaged Food Players	Market Share (FY 2023)	Market Share (FY 2024)
Parle Products	~2.5%	NA
Nestle India	~2.5%	~3.1%
Britannia	~2.5%	~2.2%
ITC Limited	~2.3%	~2.2%
Hindustan Unilever	~2.2%	~2.0%

Note: For market share calculation only packaged staples & other packaged food market size is taken into consideration)

Packaged Beverages Players	Market Share (FY 2023)	Market Share (FY 2024)
Varun Beverages Ltd. (Pepsi Co)	~24.9%	~27.3%
Hindustan Coca Cola Beverage (Coca-Cola)	~24.4%	NA
Parle Agro	~6.7%	NA
Bisleri International	~4.4%	NA

Note: For market share calculation only packaged beverage market size is taken into consideration)

Nutraceuticals Players	Market Share (FY 2023)	Market Share (FY 2024)
Hindustan Unilever	~31.7%	~25.9%
Abbott India	~11.4%	~9.9%
Dabur India	~4.2%	~3.1%
Amway India	~2.7%	NA
Himalaya India	~0.1%	NA

Source: Secondary Research, Technopak Analysis, NA= Not available

Note: For market share calculation only Nutraceuticals market size is taken into consideration)

Note: For HUL, ITC, Dabur segment wise revenue has been considered for market share calculations

Key Growth Drivers of Packaged Food and Packaged Beverages Industry in India

- 1. Demographic change is powering a rise in demand for packaged products-** Growing youth workforce urbanisation, and the rise in the middle-class population are principal drivers of the consumption of packaged food in India. Other influencing factors include the evolution of the Indian households, from a multi-generational, extended family households to single occupant or nuclear family units. These changes mean time constraints for primary processing and preparation of food, favouring a shift from unbranded to branded products which offer consistent, assured quality and convenience.
- 2. Gradual expansion of modern retail including e-commerce-** While the current share of modern retail in packaged food sales remains small, this share has slowly increased over the last few years and will continue to grow moving forward. The quality of retail shelves and customer interface of modern retail, in both brick and mortar and e-commerce, aid the growth of packaged food for their ability to introduce new categories of packaged foods, creating advocacy for latest trends and offering more choice to consumers facilitating changes in shopping habits.
- 3. Increased in-home consumption during COVID-19-** Food retail is the only category within overall retail that registered a 6-7% growth in the year FY 2021, given the negative impact of COVID-19 on the overall consumption across all other product categories. In-home consumption of food products soared initially during

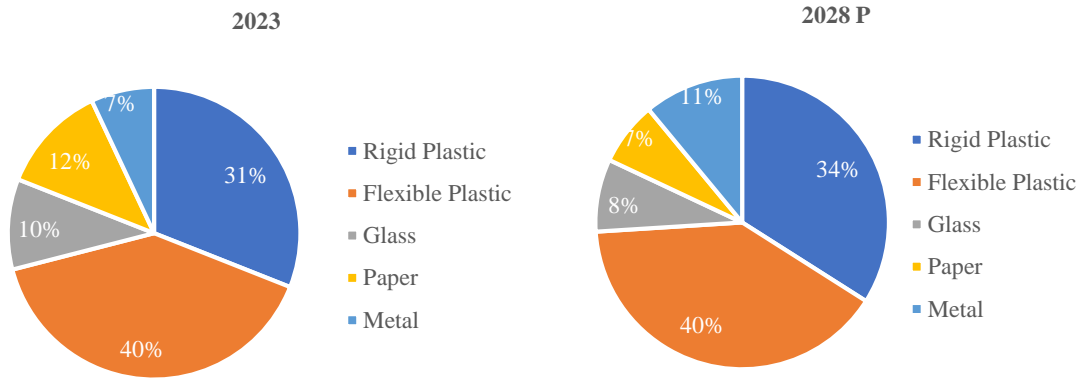
COVID induced lockdown and thereafter also remained elevated with consumers working from home, significantly increasing both the frequency and quantity of food consumed at home.

- 4. Demand for convenience, on-the-go and nutrition category-** Post-COVID consumer behaviour has not only accentuated the need to seek convenience in packaged food, but also preventive health benefits like immunity and nutrition. The various products under packaged food market are getting healthier and aim towards providing nutrition in some form. Consequently, the nutraceutical industry is expected to witness an increase in demand due to rising health awareness. Packaged food market is also driven by themes which have positively impacted various segments of the market. Some of the themes are on-the-go (fruit-based beverages, milkshakes, lassi etc.), wellness (fruit bars, health drinks), convenience (RTE/RTC, set curd), indulgence (ice-cream, premium cookies), snacking (frozen food snacks), and daily nutrition (packaged fresh milk, processed fruits, and vegetables).
- 5. Government policies supporting food processing-** The food production and processing industry is now accorded as a high focus and priority sector for the government and multiple schemes / initiatives have been launched to bolster growth in this sector. These include allowing FDI up to 100%, under the automatic route in the food processing industry, and initiatives such as 'Food Parks' to address value chain weaknesses.
- 6. Consumer's mindset shifting towards healthy beverage options-** This can be seen by the demand for carbonated drinks going down over the last few years while sales of low sugar variants, juice etc continue to grow. Millennials are driving up the demand for new and healthy categories such as 100% juice, Kombucha and Functional Bottled water as alternatives for carbonated beverages.
- 7. Rising Penetration of distribution and e-commerce in Tier 2 and 3 cities-** Increased demand for FMCG and packaged food in Tier 2 and 3 cities has forced companies to look beyond Tier 1 cities and has led to brands strengthening their distribution and e-commerce presence in these areas specifically. They are doing this by investing in last-mile delivery logistics and building their e-commerce presence to reach new consumers.
- 8. Demand from millennials for new and different kinds of exotic beverages from around the world-** Probiotic drinks like Kombucha and Yakult have gained demand as an alternative to carbonated beverages, especially among millennials, because of their various health benefits. These beverages are not new inventions, they are traditional and natural beverages from around the globe. There are many home-grown brands operating at a small scale selling these innovative beverages through e-commerce platforms. Since these beverages are not shelf stable, large beverage players find it difficult to launch such products specially to service the disperse demand. These beverages often require specialized packaging solutions to maintain their integrity and freshness which encourages PET bottles that can hold fermentation pressures and preserve the beverages viability. However, managing the logistics is more complex requiring refrigeration and expedited shipping to maintain product quality which can be majorly handled and controlled by large players to meet the evolving consumer preferences.

Share of the Market in Packaged Food and Packaged Beverages Industry- By Material Type

The market for packaged food is broadly divided into five categories based on the type of material: Rigid Plastic, Flexible Plastic, Glass, Paper, and Metal. Out of these, flexible plastic is the most popular material used in food packaging owing to its attributes such as recyclability and reusability followed by rigid plastic. Flexible plastic packaging contributed 40%, followed by rigid plastic which accounting for ~31% in the packaged food market for FY 2023.

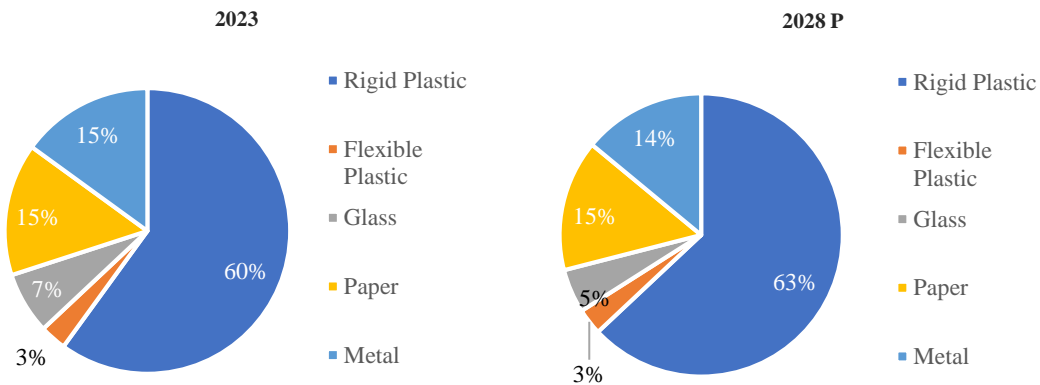
Exhibit 5.3 Share of Packaged Food Market - By Material Type (FY)



Source: Technopak Analysis, Secondary Research

The market for packaged beverages is broadly divided into five categories based on the type of material: Rigid Plastic, Flexible Plastic, Glass, Metal & Paper. Out of this rigid plastic is the most popular material used in packaged beverages owing to its attributes such as recycling, and reusability followed by metal and paper which assures less spillage. In the fiscal year 2023, rigid plastic packaging dominated the packaged beverage market, comprising approximately 60% of the total. Metal and paper packaging each contributed around 15%, highlighting their significant but smaller roles in the industry.

Exhibit 5.4 Share of Packaged Beverages Market - By Material Type (FY)



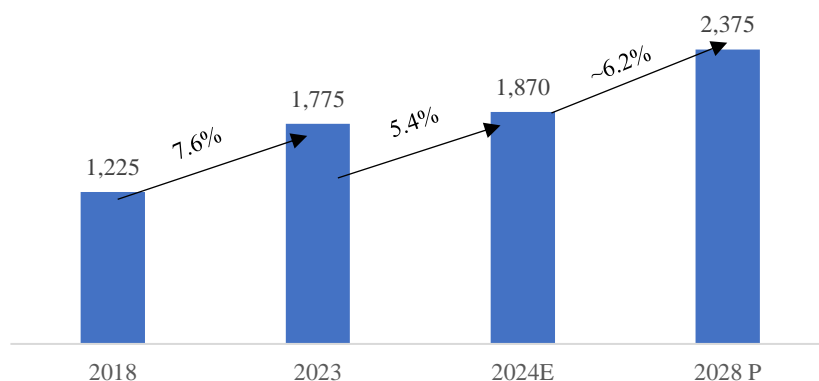
Source: Technopak Analysis, Secondary Research

Non-Food FMCG (Includes Beauty & Personal Care and Home Care)

Indian non-food FMCG market was valued at INR 1,225 billion in FY 2018 and reached INR 1,775 billion in FY 2023, growing at a CAGR of ~7.6%. It is projected to reach INR 2,375 billion by FY 2028, growing at a CAGR of ~6.0% between FY 2023 and FY 2028.



Exhibit 5.5 Indian Non-Food FMCG Market (in INR Billion) (FY)



Source: Technopak Analysis, Secondary Research

The packaging industry is pivotal in the personal care, beauty, and homecare markets, significantly influencing product success and consumer satisfaction as it not only protects products from contamination and damage but also enhances their aesthetic appeal and usability by enabling companies to communicate their values, such as luxury, eco-friendliness, or efficacy, directly to consumers. Some of the key players in beauty & personal care industry are HUL, Godrej Consumer Products Ltd., Reckitt Benkiser, Dabur etc. and in the homecare, industry are HUL, Nirma, P&G etc. that holds the major market share in the beauty & personal care and homecare industry that requires packaging materials to sell their products. Manjushree Technopak is a supplier to each of the top four players, by market share, in the Personal Care industry, four out of the top five players, by market share, in the Home Care industry.

Exhibit 5.6 Share of Some Key Players in Beauty & Personal care and Homecare Market (in terms of Revenue)

Beauty & Personal Care Players	Market Share (FY 2023)	Market Share (FY 2024)
Hindustan Unilever	~12.3%	~11.9%
Wipro Consumer Care	~4.9%	NA
Godrej Consumer products	~4.4%	~4.4%
Dabur	~2.7%	~2.8%

Homecare Players	Market Share (FY 2023)	Market Share (FY 2024)
Hindustan Unilever	~12.0%	~11.7%
Nirma	~6.4%	~5.6%
Reckitt Benkiser India	~4.9%	NA
Procter and Gamble Home Products	~4.0%	NA
Rohit Surfactants	~3.8%	NA

Source: Secondary Research, Technopak Analysis, NA= Not Available

Note: For HUL, Godrej, Dabur, Wipro, P&G segment wise revenue has been considered for market share calculations.

Key Growth Drivers of Non-Food FMCG Industry in India

- 1. Increasing demand for eco-friendly and natural products-** With growing environmental concerns and a focus on health and hygiene, consumers are gravitating towards eco-friendly and natural products. This shift in consumer preference towards green and organic goods, despite potentially higher costs, drives demand for organic and natural products across home care and personal care categories along with already available products in these categories in the market thus, increasing the demand in volume and value.
- 2. Modern retail emerging as a complimentary channel for growth of home and personal care products-** The FMCG sector has transitioned to be retailed through organized channels, owing to factors such as growth of modern retail, change in consumption habits, and increase in the number of brands present in the market. The modern Indian consumer, especially in metro and mini metro cities, has adopted modern retail and e-

commerce channels, leading to a shift away from traditional ways of retailing. The home and personal care sector has benefitted from retail becoming organized as brands are able to tap into multiple regions on the back of modern retailers having nation-wide presence. E-commerce further enhances this reach for home and personal care brands as some of the e-commerce marketplaces are serving ~80% of the serviceable pin codes in India.

- 3. Increased focus on rural penetration and consumption-** The penetration and consumption of FMCG products has gradually experienced an increase from rural regions because of increasing awareness, rising disposable incomes, and improvement in communication and connectivity. The non-food FMCG segment, especially the home and personal care category, has seen an uptick in rural markets showing growth impetus in the non-food FMCG category.
- 4. Emergence of COVID-19 pandemic-** The COVID-19 pandemic had a huge impact on home care products as people have become more concerned about hygienic living and housekeeping that has boosted the overall demand of home care products in the market.

MTL vs FMCG Peers

Manjushree Technopak Limited shows a revenue CAGR of 20% for FY 2022-24, outperforming the FMCG companies average of 9% for the same period. Additionally, the company demonstrate an EBITDA CAGR of notable 26% for FY 2022-24, which significantly outperforms the FMCG peer average of 17% for the same period.

Exhibit:5.7- Revenue and EBITDA CAGR Comparison of Manjushree Technopak Limited vs. FMCG Companies

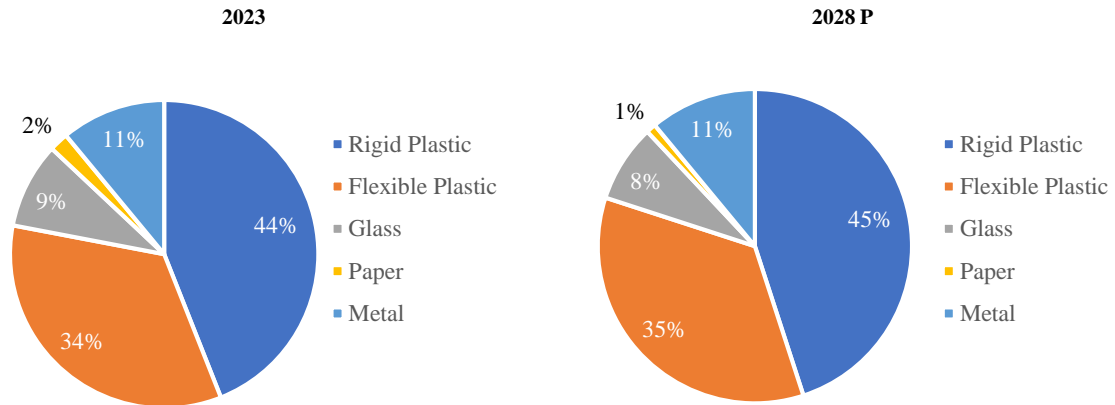
	Revenue CAGR FY 2022-24	EBITDA CAGR FY 2022-24
Manjushree Technopak Ltd	20%	26%
FMCG companies average	9%	17%
Tata Consumer Products	11%	15%
Brittania	9%	20%
Relaxo	5%	-1%
HUL	9%	6%
Godrej	7%	11%
Dabur	7%	3%
Marico	1%	10%
Jyothy Labs Ltd	12%	39%
Page Industries	9%	29%
Nestle	14%	12%
Campus activewear	10%	-7%
Bikaji	20%	67%

Source: Technopak Analysis, Secondary Research

Share of the Market in Non-Food FMCG Industry- By Material Type

The market for beauty and personal care packaging is broadly divided into 5 categories based on the type of material: - Rigid Plastic, Flexible Plastic, Glass, Metal and Paper. Out of these, rigid plastic is the most popular material used in beauty & personal care packaging owing to its attributes of recyclability and reusability, followed by flexible plastic. The rigid plastic packaging attributed to ~44%, followed by flexible plastic accounting for ~34% in the beauty and personal care packaging market for FY 2023.

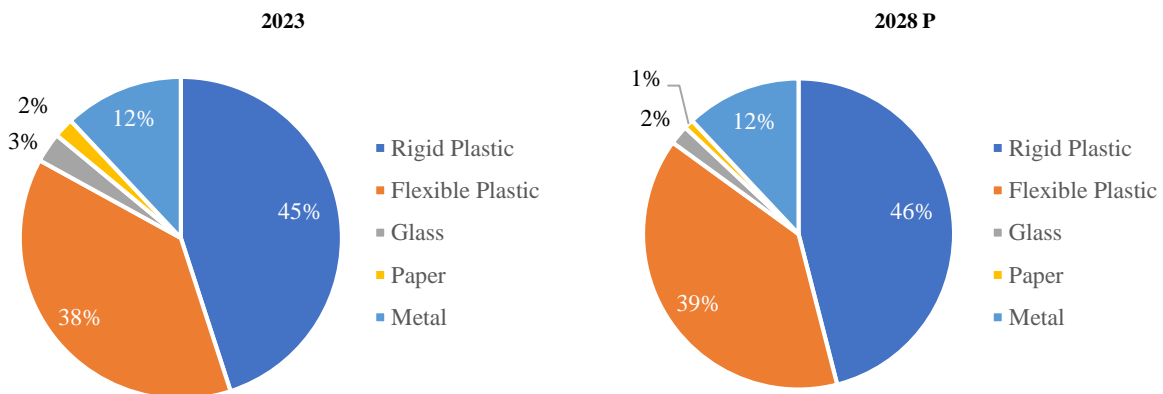
Exhibit 5.8 Share of the Beauty & Personal Care Market- By Material Type (FY)



Source: Technopak Analysis, Secondary Research

The market for homecare packaging is broadly divided into 5 categories based on the type of material: Rigid Plastic, Flexible Plastic, Glass, Metal and Paper. Out of these, rigid plastic is the most popular material used in homecare packaging owing to its attributes of recyclability and reusability, followed by flexible plastic. The rigid plastic packaging attributed ~45%, followed by flexible plastic which accounted for ~38% in the homecare packaging market for FY 2023.

Exhibit 5.9 Share of Homecare Market- By Material Type (FY)



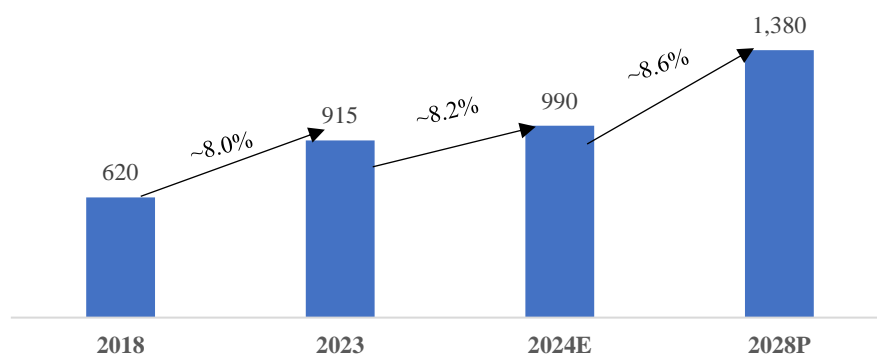
Source: Secondary Research and Technopak Analysis

Paints and Adhesives

Indian paints and adhesives market was valued at INR 620 billion in FY 2018 and reached INR 915 billion in FY 2023, growing at a CAGR of ~8.0%. It is projected to reach INR 1,380 billion by FY 2028, growing at a CAGR of ~8.5% between FY 2023 and FY 2028.



Exhibit 5.10 Indian Paints and Adhesives Market (in INR Billion) (FY)



Source: Technopak Analysis, Secondary Research

Packaging solutions for these products must protect against environmental factors like moisture and air, which can degrade quality and effectiveness and innovations in this sector include airtight and resealable containers, child-resistant caps, and user-friendly applicators, which enhance convenience and safety for both consumers and professionals. Some of the key players in the paints and adhesives industry are Asian paints, Berger paints, Kansai Nerolac, Pidilite etc. that holds the major market share in the paints and adhesives industry that requires packaging materials to sell their products. Manjushree is a supplier to each of the top five players, by market share in the Paints & Adhesives Industry.

Exhibit 5.11 Share of Some Key Players in Paints and Adhesives Market (in terms of Revenue)

Paints Players	Market Share (FY 2023)	Market Share (FY 2024)
Asian Paints	~37.4%	~35.6%
Pidilite	~12.9%	~12.5%
Berger Paints	~11.5%	~11.3%
Kansai Nerolac	~7.7%	~7.5%
Akzo Nobel	~4.2%	~4.0%

Source: Secondary Research, Technopak Analysis

Key Growth Drivers of Paints and Adhesives Industry in India

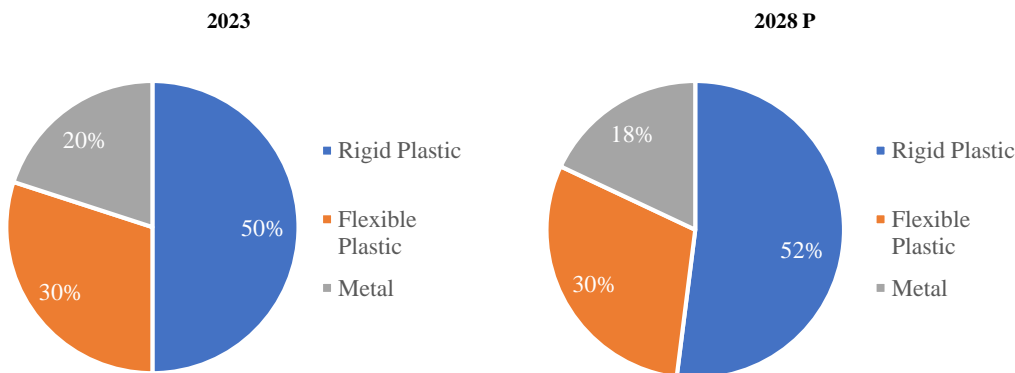
- 1. Rapid urbanization-** The need for housing and commercial spaces is escalating as India's urban population continues to grow. As of FY 2023, 36% of India's population resided in an urban setup. It requires more construction to accommodate the rising population leading to a surge in construction activity. This fuels the demand for paints and adhesives for both interior and exterior applications, contributing to the growth of the paints and adhesives market.
- 2. Infrastructure Development-** The Indian government's focus on infrastructure development is creating significant opportunities for the paint and adhesives market. Large-scale projects such as smart cities, highways, public transportation etc. require durable and protective paints and adhesives coatings for various surfaces. The emphasis on infrastructure by the Indian government contribute highly to the demand for paints and adhesives.
- 3. Residential and commercial renovation-** In addition to the new construction, the renovation and repairing of existing structures are common in India as homeowners and businesses seek to upgrade and modernize their properties to be in line with the prevailing trends of colour, designs, and constructions. These trends add to the demand for paints and adhesives as consumers invest in new paintings and coatings solutions.
- 4. Expansion of retail distribution network-** The expansion of retail distribution networks, including paint and hardware stores, home improvement centres, and e-commerce platforms, improves accessibility and

availability of paints and adhesives to consumers across urban and rural areas. Enhanced distribution channels facilitate market penetration and contributes to the growth of the paints and adhesives industry.

Share of the Market in Paints & Adhesives Industry- By Material Type

The market for paints and adhesives packaging is broadly divided into three categories based on the type of material: Rigid Plastic, Flexible Plastic and Metal. Out of these, rigid plastic is the most popular material used in paints & adhesives packaging owing to its attributes of recyclability and reusability, which assures less spillage and low cost of production. Rigid plastic packaging attributed ~50%, key player like Manjushree Technopak Ltd is also expanding their presence in the fast-growing Paints and Adhesives Industry under the RPP category. This is followed by flexible plastic that accounted for ~30% in the paints and adhesives packaging market for FY 2023.

Exhibit 5.12 Share of Paints & Adhesives Packaging Market- By Material Type (FY)



Source: Technopak Analysis, Secondary Research

Major Trends in Packaging within the FMCG Industry

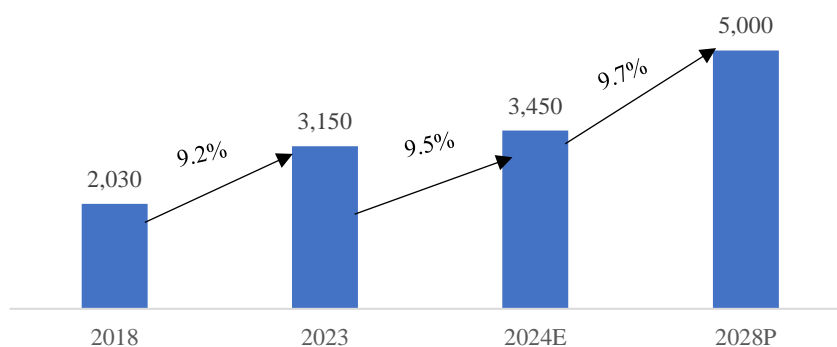
- 1. Rise in Demand for Eco-Friendly Solutions-** Sustainability concerns are driving the FMCG industry towards adopting eco-friendly packaging materials. E-Brands are increasingly adopting eco-friendly packaging materials to reduce environmental impact and meet consumer expectations for sustainability. The rise in the demand for sustainable solutions is leading to an increased application of biodegradable and recyclable materials and an overall increase in the development of innovative green packaging options. The market for sustainable FMCG packaging is expected to grow and contribute to the overall market growth.
- 2. Advancements in Packaging Technologies-** Technological innovations such as smart packaging and automation are offering FMCG companies new avenues of growth. These advancements enhance efficiency and precision in the packaging process, facilitating high-quality production. Brands are leveraging digital printing technologies and variable data printing to create personalized packaging designs, enhancing consumer engagement, brand loyalty, and product differentiation in the crowded FMCG market.
- 3. Significant Expansion of E-commerce Industry-** Rapid growth in e-commerce platforms, offering a wide range of products, is acting as a significant contributor to the market expansion of the FMCG packaging market. These platforms enable brands to personalize packaging based on consumer preferences, special occasions, and promotional events, fostering a sense of connection with the brand, encouraging social media sharing, and extending brand visibility. In addition to this, packaging solutions that offer ease of use, portability, and on-the-go consumption (such as single-serve packaging formats, portion-controlled packs, resealable pouches, and grab-and-go packaging designs) are in demand across various FMCG categories as they reduce shipping costs, minimize waste, and enhance the overall supply chain efficiency.
- 4. Innovative Materials and Textures-** FMCG brands are experimenting with innovative packaging materials, textures, and finishes to create unique sensory experiences and tangible interactions with products. Matte finishes, soft-touch coatings, embossed textures, and metallic accents add a premium look and feel to packaging designs, enhancing shelf appeal and brand perception.

5.2 Overview of the Liquor and Spirits (Alcohol Beverages) Industry in India

Indian alcohol beverage market is the third largest market in the world after China and Russia. It is also the 2nd largest spirits market in the world. Indian alcohol beverage market was valued at INR 2,030 billion in FY 2018 and reached to INR 3,150 billion in FY 2023 growing at a CAGR of ~9.2%. It is projected to reach INR 5,000 billion by FY 2028 and grow at a CAGR of ~9.7% for the period between FY 2023 to FY 2028.



Exhibit 5.13 Indian Alcohol Beverages Market (in INR Billion) (FY)



Source: Technopak Analysis, Secondary Research

Note: The word “Alcohol Beverage” can be interchanged to “Liquor and Spirits” for the purpose of this report.

The packaging industry in the alcoholic beverages market is a dynamic and vital component that influences product preservation, consumer appeal, and brand differentiation. The industry is also embracing sustainability, with a focus on lightweight materials, recyclable packaging, and reducing carbon footprints. Some of the key players in the alcoholic beverages industry are United Spirits, Pernod Ricard, Radico Khaitan etc. that holds the major market share in the alcoholic beverages industry that requires packaging materials to sell their products. Manjushree Technopak's customers in Alcoholic beverage industry are leaders in India and Manjushree is a supplier to four out of the of the top five players, by market share, in the Alcohol Beverages Industry.

Exhibit 5.14 Share of Some Key Players in Alcoholic Beverages Market (in terms of Revenue)

Alcoholic Beverages Players	Market Share (FY 2023)	Market Share (FY 2024)
United Spirits	~8.8%	~7.5%
Pernod Ricard India	~7.9%	NA
United Breweries Ltd.	~5.3%	~5.3%
Radico Khaitan	~4.0%	~4.5%
Allied Blenders and Distilleries	~2.3%	~2.2%

Source: Secondary Research, Technopak Analysis, NA- Not Available

Key Growth Drivers of Alcohol Beverage (alco-beverage) Industry in India

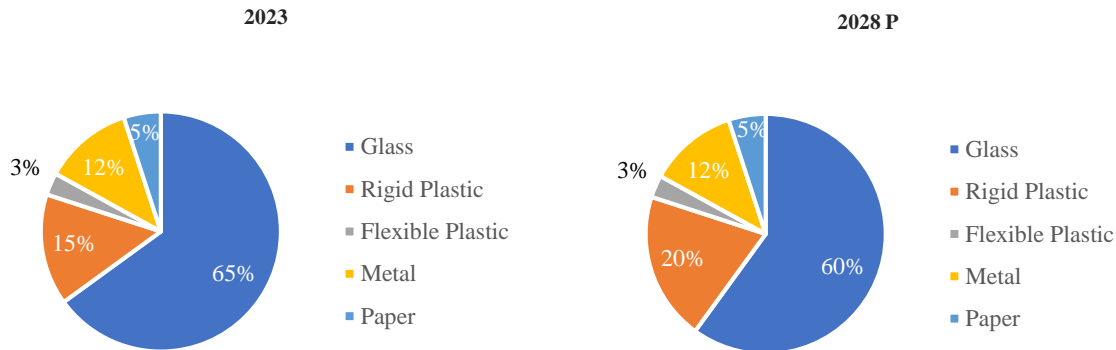
1. **Indian alco-beverage industry is leveraging demographic dividend, growing income level and rapid urbanization to be one of the fastest growing markets in the world-** The Indian alco-beverage industry has been one of the fastest growing markets in the world owing to the expanding population, favorable demographics, growing middle class, rising disposable income levels, greater preference for premium food and drink experiences, and greater acceptance of alcoholic beverages in social circles. With a growing number of people joining the work force sooner than in the past, together with changing lifestyles and dismantling of social barriers to consumption of alcohol, and increased liquor consumption in rural areas, the market is witnessing significant growth in India. These factors will also result in consumers choosing to upgrade to more quality offerings.
2. **Premiumization of alco-beverages in India-** Premiumization is the most prominent trend across all sub-segments of Indian alco-beverage sector. The trend of premiumization is prevalent across the value chain, including launch of new products, branding of shelf space in retail outlets, and company outreach to its customers through multiple marketing initiatives. Moreover, with the rise in disposable incomes, consumers are upgrading their preferences, resulting in higher demand for products from prestige, premium, and luxury segments. Rapid urbanization is also leading to spur in aspirational values of people, driving consumption of premium alco-beverage brands.
3. **Prominence of new channel of sales-** Post pandemic, new channels of sales such as home delivery and limited e-commerce have gained prominence. Convenience and better purchase experience with higher comfort level for women, make home delivery a promising channel of sales. Home delivery can improve the penetration of alco-beverage industry as the number of outlets remain limited in India. Nonetheless, comprehensive regulations are essential to effectively tap into the capabilities of this medium
4. **Growth of in-home consumption-** Recently, there's been a discernible change in consumer drinking preferences, with a trend towards more consumption at home. Consumers can spend lesser amount of money and consume more premium alcoholic beverages while drinking at home compared to drinking at restaurants, hotels, pubs, and bars.
5. **Reduction in social taboos around alcohol consumption and social drinking-** In recent times, the attitude towards alcohol consumption has been changing due to globalization, rising prosperity, and changing consumer demographics. A greater share of the young population and the rising influence of social media has led to acceptance of alcohol consumption across genders and age groups. It has become common for families to sit together and drink on special occasions and certain festivals. Rapid urbanization has also led to increasing alco-beverage consumption within the metropolitan and tier 1 cities. There has been a shift in trend from binge drinking to social drinking among friends, professional settings as well as in families. As participation of women in workforce increases, along with their disposable incomes, women are increasingly indulging in alco-beverage consumption.
6. **Favorable excise policies can drive growth in Indian alco beverage market-** Multiple states are coming up with favorable excise policies which promote better customer experience and revenue maximization. There are opportunities to set up attractive retail outlets at prominent locations including malls and airports. States are revisiting the excise policies to rationalize tax structure and recover the revenue losses through higher sales, facilitating the growth of the Indian alco-beverage market.

Share of the Market in Alcohol Beverage Industry- By Material Type

The market for alcohol beverage packaging is primarily categorized into five categories based on the type of material: Glass, Rigid Plastic, Flexible Plastic, Metal and Paper. Among these, glass is the most popular material used in alcohol packaging owing to its attributes of recycling, reusability, and neutral reactivity. Following glass, rigid plastic packaging holds significant importance which are made from recycled PET, are more spatially efficient and much lighter than glass bottles and further helps in cutting business costs by upto 60% as well. Henceforth, a shift towards RPP from glass bottles will be seen evidently in the coming years owing not only to its durability but also less availability of glass material due to environmental concerns. The glass packaging contributed ~65% of the total share followed by rigid plastic which accounted for ~15% in FY 2023.



Exhibit 5.15 Share of Alcohol Beverage Packaging Market - By Material Type (FY)



Source: Technopak Analysis, Secondary Research

Key Trends towards Packaging in Alcohol Beverage Industry

- 1. Preparation of e-commerce placements-** Post COVID-19 crisis, digital transformation has leveraged different sectors to continue their operations without failing and alcohol beverage industry has been one of them. Packaging now needs to be appealing not only on retail shelves, but also on digital platforms. Besides aesthetics, brands also focus on secondary packaging to ensure the products reach customers safely, while also enhancing the unboxing experience
- 2. Sustainable Packaging-** Consumers are becoming more conscious of their purchase decisions along with making eco-friendly switches, forcing the manufacturers to introduce sustainable and eco-friendly alternatives for alcohol beverages packaging.
- 3. New Wave Plastic Packaging-** Plastic packaging, particularly food-safe and BPA-free options, are commonly used for containers and are lighter than glass. In traditional wine packaging, the bottles are bulkier and heavier, requiring additional packaging to secure the item. Unlike traditional glass bottles, plastic containers are lighter and more convenient to handle. Recycled PET plastic is becoming a preferred choice for its sustainability credentials. It offers the durability and safety required for packaging alcoholic beverages while reducing environmental impact and enhancing logistics efficiency.

5.3 Overview of the Pharmaceutical Industry in India

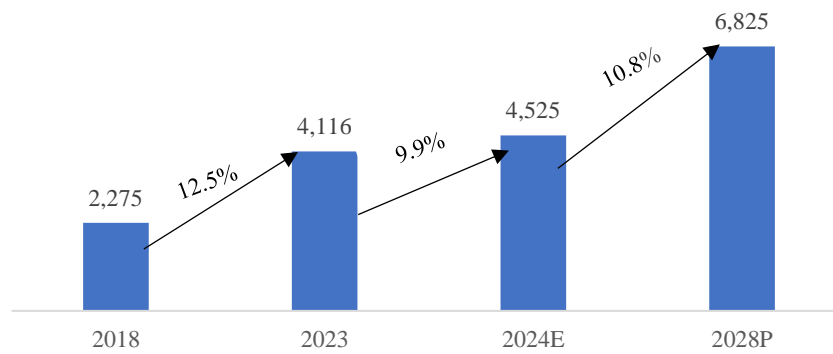
The Indian pharmaceutical industry is the world's 14th largest by value. In FY 2023, the Indian pharmaceutical market reached a substantial size of INR ~4,116 billion. The market is almost equally divided between the export and domestic segments. India supplies over 50% of Africa's requirement for generics, ~40% of generic demand in the US and ~25% of all medicine in the UK. It also supplies 60% of the global vaccine market, making it one of the pharmaceutical hubs of the world.

Indian Pharmaceutical Market

The Indian pharmaceutical market was valued at INR ~2,275 billion in FY 2018 and reached INR ~4116 billion in FY 2023, growing at a CAGR of ~12.5%. It is projected to reach INR 6,825 billion by FY 2028, growing at a CAGR of ~10.8% for the projected period.



Exhibit 5.16 Indian Pharmaceutical Market (in INR Billion) (FY)



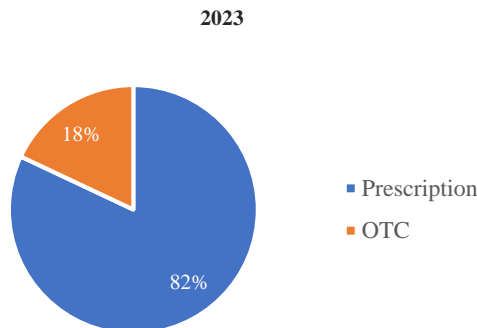
Source: Technopak Analysis, Secondary Research

Indian pharmaceutical market by type of drugs

The Indian pharmaceutical market can be segmented on the type of drugs sold, which includes prescription drugs and OTC drugs. Prescription drugs further comprise of generic drugs (including branded generics and ordinary generics) and branded patented drugs. Prescription drugs as the name suggests are drugs which can be sold only through a valid medical prescription from a registered doctor. Over the counter (OTC) drugs can be dispensed without any prescription and sold at regular retail stores as well. OTC drugs are free from any prescription or pricing regulation.

As of FY 2023, generic drugs accounted for 75% of the total Indian market, with over-the-counter (“OTC”) drugs and branded patented drugs accounting 18% and 7%, respectively.

Exhibit 5.17: OTC vs Prescription Drugs Share India Pharmaceutical market



Source: Technopak Analysis

The packaging industry in the pharmaceutical market is a critical component that ensures the safety, efficacy, and integrity of medications while complying with stringent regulatory standards by providing packaging solutions

designed to protect products from contamination, tampering, and environmental factors such as light, moisture, and air. and a strong emphasis on child-resistant and tamper-evident packaging to enhance safety. Some of the key players in the pharmaceuticals industry are Sun Pharma Industries, Abbott, Mankind, Cipla etc. that holds the major market share in the pharmaceuticals industry that requires packaging materials to sell their products. Manjushree is a supplier to four out of the top five players in the pharmaceuticals industry .

Exhibit 5.18 Share of Some Key Players in Pharmaceutical Market (in terms of Revenue)

Pharmaceuticals Players	Market Share (FY 2023)	Market Share (FY 2024)
Sun Pharma Industries Limited	~10.7%	~10.7%
Cipla Ltd.	~5.5%	~5.7%
Zydus Lifesciences	~4.2%	~4.3%
Mankind Pharma Limited	~2.1%	~2.3%
Abbott India Limited	~1.3%	~1.3%

Source: Secondary Research, Technopak Analysis

Key Growth Drivers of Pharmaceutical Industry in India

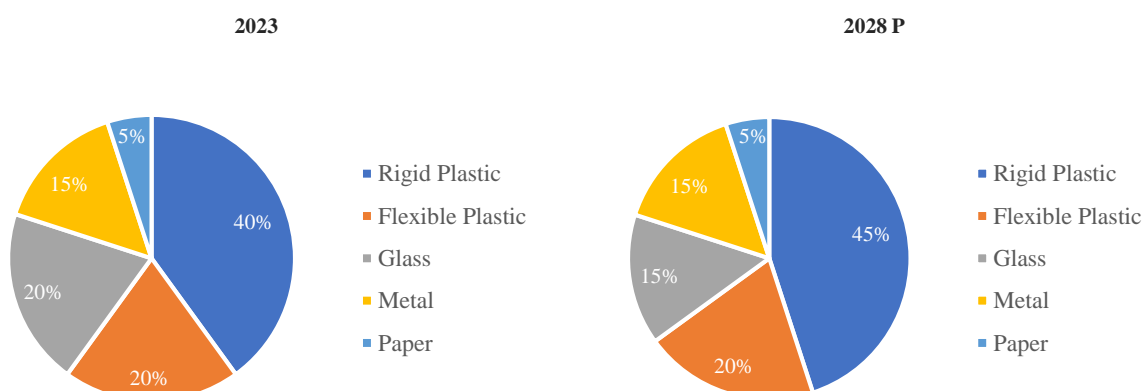
- 1. Low base of health expenditure-** India has a very low base of health expenditure as compared to the other markets of the world. As of 2020, the share of medical expenditure as percentage of GDP was almost one-fourth of the world average. The share of private out of pocket expenses is also one of the highest in the world.
- 2. Increasing Income level-** There has been a steady growth of income in India, being one of the fastest growing economy post liberalizations. The growing size of Indian middle class is one of the primary drivers of the overall growth.
- 3. Increasing urbanization and growth of mega cities-** Increasing urbanization and growth of mega cities has encouraged the move of a significant portion of the population to urban areas, facilitating easier access to healthcare services. This has also reduced the cost of reaching consumers and expanded the market for pharmaceutical products.
- 4. Increasing population and age profile of the population-** India's population will continue to grow at close to 1% per annum. As per the ageing profile, almost 10% of the population is at the age of 50 or above. Increasing population as well as the ageing of the current population will increase the patient pool leading to an increased demand and further growth opportunities.
- 5. Increasing prevalence of chronic lifestyle diseases-** The share of non-communicable chronic diseases which require continuous medication will increase in the overall mix. As per government surveys, prevalence of Diabetes is already at 11.4%. It is projected that over 134 million individuals would be affected by diabetes by 2045.
- 6. Enhanced Medical Infrastructure-** There is a growing trend in increased investment in medical infrastructure leading to higher access and a bigger market for medicines. The overall government expenditure on the health sector is very low. The current share of government expenditure on health is close to 2.1% of GDP. As per the 15th finance commission recommendation, the government is set to target expenditure on healthcare equivalent to 2.5% of the GDP by 2025. However, despite the relatively low government expenditure on healthcare, initiatives to enhance access, particularly in tier II and rural markets, are driving growth in the pharmaceutical sector.
- 7. Growing Prevalence of Self-Care to drive OTC segment-** As per industry estimates, more than 50% of the population is practicing self-care which is a big opportunity for healthcare products available without prescription. The consumer healthcare segment has the potential to show growth in double digits provided pharmaceutical companies can differentiate their products and improve accessibility.
- 8. Growth in Specialized and Upcoming Categories-** The market for specialized products, including patented products, biologics, and adult vaccines offer opportunities for high growth. Market-shaping activities by

pharmaceutical companies can increase the acceptability of new age medicines and drive overall category growth.

Share of the Market in Pharmaceutical Industry- By Material Type

The market for pharmaceutical packaging is broadly divided into five categories based on the type of material: - Glass, Rigid Plastic, Flexible Plastic, Metal and Paper. Among these, rigid plastic is the most popular material used in pharmaceutical packaging owing to its attributes such as recycling and reusability. Following rigid plastic, glass and flexible plastic packaging are also widely used in the pharmaceutical industry, offering benefits such as less spillage and low cost of production. The rigid plastic packaging attributed ~40% of total share followed by flexible plastic and glass which accounted for ~20% each in FY 2023.

Exhibit 5.19 Share of Pharmaceutical Packaging Market - By Material Type (FY)



Source: Technopak Analysis, Secondary Research

Key Trends towards Packaging in Pharmaceutical Industry in India

- 1. Sustainability Initiatives-** Pharmaceutical companies are adopting sustainable packaging solutions such as using recyclable materials, reducing packaging waste, and optimizing packaging design for resource efficiency to minimize environmental impact and meet regulatory requirements.
- 2. Anti-Counterfeiting Technologies-** To ensure and enable authentication and verification of product authenticity throughout the supply chain, advanced anti-counterfeiting technologies such as holograms, covert markers, and digital watermarks are being integrated into pharmaceutical packaging to combat counterfeit drugs and protect brand integrity.
- 3. Single-Use Packaging-** Single-use packaging formats such as pre-filled syringes, vials, and ampoules are gaining popularity due to their convenience, accuracy, and reduced risk of contamination. They are acknowledged for their ability to reduce drug wastage by preventing overfilling, eliminating dosing errors, and minimizing the risk of contamination. These packaging formats enhance patient safety and support the growing demand for self-administered medications and enable rapid drug delivery during emergencies.
- 4. Patient-Centric Packaging-** As personalized medicine becomes more prevalent, there is a growing emphasis on patient-centric packaging designs that enhance medication adherence, ease of use, and patient safety. Packaging features such as easy-to-open blister packs, color-coded labelling, and clear dosage instructions help improve patient compliance and outcomes.
- 5. Child-Resistant and Smart Packaging-** Integration of smart technologies such as RFID (Radio-Frequency Identification) tags, NFC (Near Field Communication), and QR codes enable pharmaceutical companies to track and trace products throughout the supply chain and facilitates patient engagement through features like medication reminders and dosage tracking. In addition to preventing accidental ingestion by children,

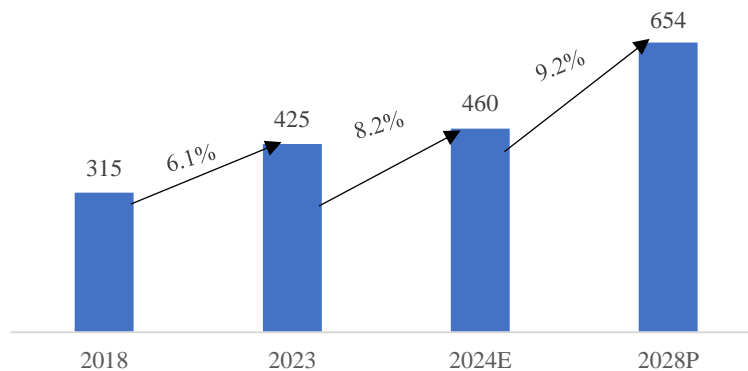
pharmaceutical companies are increasingly using child-resistant closures and packaging designs to help reduce the risk of accidental ingestion by children and enhancing safety.

5.4 Overview of Agrochemicals Industry in India

The Indian agrochemicals market is the fourth largest market in the world after US, Japan, and China. In FY 2018, market was valued at INR 315 billion, experiencing steady growth over the years to reach INR 425 billion in FY 2023, showcasing a CAGR of ~6.1%. It is projected to reach INR 654 billion by FY 2028, growing at a CAGR of ~9.2% for the period between FY 2023 to FY 2028.



Exhibit 5.20 Indian Agrochemicals Market (in INR Billion) (FY)



Source: Technopak Analysis, Secondary Research

The packaging industry in the agrochemicals market plays a vital role in ensuring the safe storage, transport, and application of products such as pesticides, herbicides, fertilizers, and fungicides. Packaging solutions must effectively protect these chemicals from environmental factors like moisture, light, and air to maintain their efficacy and stability over time by using durable materials such as high-density polyethylene (HDPE) and multi-layered barriers that prevent leaks and resist corrosion. Some of the key players in the agrochemicals industry are Coromandel International Ltd., PI Industries Ltd., Sharda Cropchem Ltd. etc. that holds the major market share in the agrochemicals industry that requires packaging materials to sell their products.

Exhibit 5.21 Share of Some Key Players in Agrochemicals Market (in terms of Revenue)

Agrochemicals Players	Market Share (FY 2023)	Market Share (FY 2024)
Coromandel International Limited	~35.5%	~30.1%
PI Industries Limited	~15.3%	~16.0%
Sharda Cropchem Limited	~7.9%	~5.7%
Meghmani Organics Ltd..	~4.5%	~2.3%
Bharat Rasayan Ltd.	~2.9%	~2.3%

Source: Secondary Research, Technopak Analysis

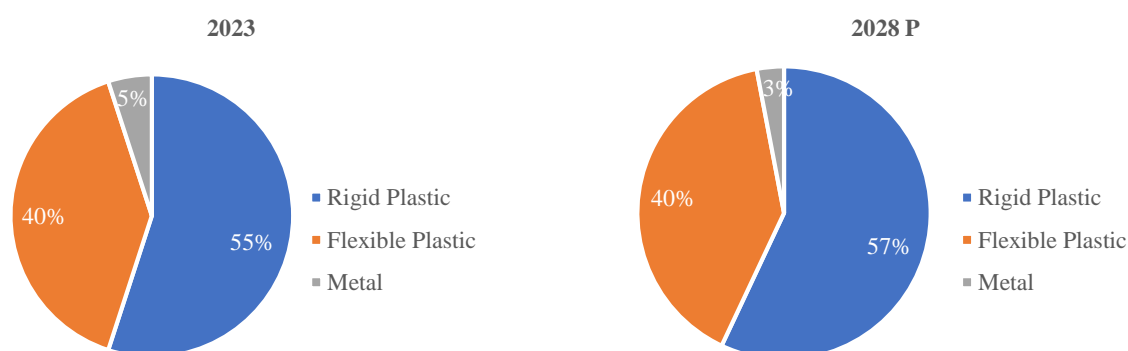
Key Growth Drivers of Agrochemicals Industry in India

- 1. Increase in horticulture and floriculture production-** Fruits and vegetables contribute approximately 90% of the total horticulture produce in India. Due to rapid urbanization and a shift towards nutritious and healthy diets in the domestic market, along with export promotion of horticulture products, it is crucial to avoid horticulture crop losses. Since horticulture is a higher margin business, it is expected to contribute more to the growth of crop protection chemicals. Similarly, floriculture is another segment in terms of providing growth avenues, resulting in increased demand of crop protection chemicals tailored to these crops in India.
- 2. Increasing Food Demand-** With the estimated growth of population to 1.7 billion by 2050, Indian food grain demand is estimated to reach a volume of 355 million tons by 2030. Due to the reducing arable land, small land holdings, and low consumption of pesticides per hectare, the requirement for increasing farming productivity is crucial to meet the overall domestic demand in the country. This would require optimum usage of farm productivity by enhancing inputs like agrochemicals.
- 3. Shrinking agriculture land-** Rapid urbanization has led to a reduction in agricultural land, intensifying the need for improved crop yield per hectare. To have improved crop yield in the limited agricultural land, crop protection chemicals such as herbicides, insecticides, and fungicides, are expected to be used extensively by farmers to combat pests and diseases.
- 4. Increased usage of bio-pesticides-** Bio-pesticides are pesticides with biodegradable content which avoids crop losses by means of not affecting the soil fertility. Globally, the bio-pesticides market is growing at a CAGR of 10-15%, whereas the bio-pesticides segment in India constitutes only ~3%-4% of the Indian crop protection market. However, growing awareness regarding numerous eco-friendly approaches and the increasing use of integrated pest management (IPM) methods for crop protection are providing lucrative opportunities for the growth of bio-pesticides in the Indian agrochemical industry.
- 5. Government Budgetary and Policy Support-** The government raised its agricultural credit to INR 20 trillion with an emphasis on dairy, fisheries, and animal husbandry in the union budget FY 2023-24. In addition to this, the growing adoption of institutional credit to provide credit facilities to farmers in rural areas is continuously increasing. The availability and low-interest rates of farm loans, coupled with higher minimum support prices (MSP) for crops have encouraged farmers to invest in agrochemicals to improve their crop yields.

Share of the Market in Agrochemicals Industry- By Material Type

The market for agrochemical packaging is broadly divided into three categories based on the type of material: Rigid Plastic, Flexible Plastic & Metal. Out of these, rigid plastic is the most popular material used in agrochemical packaging owing to its attributes such as recycling, and reusability followed by flexible plastic which assures less spillage and low cost of production. Rigid plastic packaging attributed ~55% followed by flexible plastic, accounting for ~40% in the total agrochemical packaging market for FY 2023.

Exhibit 5.22 Share of Agrochemicals Packaging Market - By Material Type (FY)



Source: Technopak Analysis, Secondary Research

Key Trends towards Packaging in Agrochemicals Industry

- 1. Convenience and User-Friendly Design-** Features such as resealable closures, ergonomic handles, and precise dispensing mechanisms enhance convenience and reduce product waste therefore, user-friendly packaging designs that prioritize ease of handling, transportation, and application are gaining importance in the agrochemicals industry.
- 2. Advanced Barrier Technologies-** Advanced barrier technologies are being incorporated into agrochemical packaging to protect products from moisture, oxygen, light, and other environmental factors. Barrier films and coatings help maintain product integrity and extend shelf life, ensuring efficacy and safety.
- 3. Innovative Dispensing Systems-** Innovative dispensing systems such as aerosols, sprayers, and metered-dose devices, are being integrated into agrochemical packaging to improve accuracy, efficiency, and safety during application. These systems enable precise dosing and reduce the risk of over-application or under-application.
- 4. Bulk Packaging and Bulk Handling Solutions-** Bulk packaging formats and handling solutions are gaining popularity in the agrochemicals industry to streamline logistics, reduce packaging waste, and optimize storage space. Intermediate bulk containers (IBCs), bulk bags, and drum liners offer cost-effective and efficient packaging options for bulk quantities of agrochemicals.
- 5. Regulatory Compliance and Labeling-** With evolving regulatory compliance requirements for agrochemical packaging, manufacturers must ensure compliance with regulations related to agrochemical packaging, including labelling, hazard communication, and child-resistant features. Staying updated on regulatory changes is essential to ensure product safety and market access.

6.Operational Benchmarking

6.1 Key Players and Manufacturing Capabilities

The Indian packaging industry is a very fragmented industry. The packaging industry has domestic players like Manjushree, Mold-Tek as well international players like Thai Plaspac, Alpla India and others who have established themselves in India over the years. These companies, with extensive experience and strategic plant locations nationwide, play a crucial role in sectoral growth. Their extensive networks allow these players to be cost competitive, enabling them to produce billions of units annually and offer diverse packaging solutions demonstrates their importance in meeting market demands and driving innovation within the industry. Manjushree Technopack Ltd. is the largest rigid plastic packaging (“RPP”) player in India in terms of installed capacity (2,13,355.52 MT p.a.) as of March 31, 2024 operating in the consumer rigid plastics industry. They are the only pan-India RPP player with the largest number of manufacturing facilities as on 31st March, 2024, with close proximity to their customers that are located in major industrial hubs in India. Manjushree Technopack was the only player to offer one-stop solutions across all five product categories in FY 2023 and also the only pan-India RPP player with close proximity to the entire customer base of India as of 31st March 2024. Manjushree Technopack with focus on operational efficiency, has leveraged advanced technical capabilities and has achieved the one of the lowest manufacturing costs, (which is a sum of direct material and manufacturing costs incurred in the production process) in the Indian consumer RPP industry in FY 2023.

Exhibit 6.1: Key Players and their Manufacturing Capabilities and Manufacturing Cost in India

Player Name	Inception Year	Manufacturing Capacity (annually)	Number of Plants	Manufacturing Cost	Location of Plants
Manjushree Technopack Ltd	1987	2,13,355.52 Metric Tonnes	23	74.1%	Amritsar, Bangalore, Baddi, Guwahati, Jalgaon, Kanpur, Manesar, Nandyal, Pantnagar, Silvassa, Vizag, others
Alpla India Private Limited	2006	1,17,000 Metric Tonnes	8	74.3%	Himachal Pradesh, Uttarakhand, Telangana, Tamil Nadu, Dadra Nagar Haveli, Assam
Thai Plaspac Packaging India Private Limited	2018	40,000 Metric Tonnes*	5	80.0%	Haridwar-2, Silvassa, Dadra, Umbergaon
Chemco Plastic Industries Private Limited	1996	1,00,000 Metric Tonnes	10	70.9%	Silvassa, Vadodara, Halol, Sanand, Daman, Mumbai, UAE, Bahrain
Mold-Tek Packaging Limited	1986	50,000 Metric Tonnes	10	72.1%	Telangana-5, Daman, Maharashtra, Karnataka, Uttar Pradesh, Andhra Pradesh
SSF Plastics India Private Limited	1985	40,000 Metric Tonnes	13	69.0%	Daman, Vasai, Baddi, Dehradun
National Polyplast (India) Private Limited	1992	80,000 Metric Tonnes	7	83.2%	Faridabad, Hasur-2, Pondicherry, Chennai, Himachal Pradesh, Tamil Nadu
SNJ Synthetics Limited	1996	31,000 Metric Tonnes	2	85.9%	Ahmedabad, Hyderabad
Weener Empire Plastics Limited	1960	NA	7	NA	NA
Secure Industries Private Limited	1999	NA	3	NA	Telangana (2), Harayana
Creative Plastics	1986	3.65 billion containers	5	NA	Assam, Haridwar, Indore, Daman, Pondicherry
Innovative Tech Pack Limited	1989	NA	3	82.1%	Rudrapur, Baddi, Guwahati

Alpha Packaging Private Limited	1980	15,000 Metric Tonnes PET bottles 2,492 million preforms 3,500 Metric Tonnes POF shrink film 24,000 Metric Tonnes polymer	NA	74.1%	NA
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Source: Company website, annual reports, secondary research

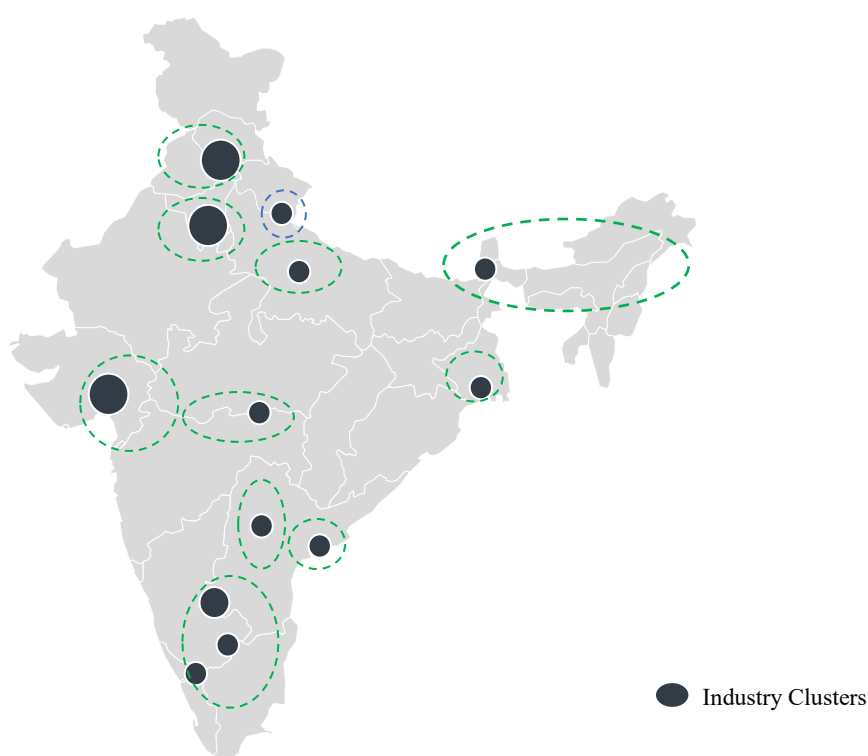
Note: Gaurav container is a part of Chemco group, Data for individual entity is not available

NA refers to Not Available

*TPAC manufacturing capacity for India

Manufacturing Cost: (COGS + Manufacturing expenses) / Revenue from Operations – FY 2023

Exhibit 6.2: Major Industry Clusters in India



Source: Technopak Analysis & Secondary Research

Exhibit 6.3: Key Players and their geographical presence in India

Players	North	South	West	East
Manjushree Technopak Ltd	✓✓	✓✓	✓	✓
Alpla India Private Limited	✓	✓	✓	✓
Thai Plaspac Packaging India Private Limited	✓		✓	
Chemco Plastic Industries Private Limited			✓✓	
Mold-Tek Packaging Limited	✓	✓✓	✓	
SSF Plastics India Private Limited	✓	✓		
National Polyplast (India) Private Limited	✓	✓		
SNJ Synthetics Limited			✓	✓

Weener Empire Plastics Limited	NA	NA	NA	NA
Secure Industries Private Limited	✓	✓		
Creative Plastics	✓	✓	✓	✓
Innovative Tech Pack Limited	✓			✓
Alpha Packaging Private Limited	NA	NA	NA	NA

Source: Technopak Analysis & Te

✓ - up to two facilities in that region and ✓✓ - more than two facilities in that region

NA – Information not available

6.2 Product Category Overview

In the packaging industry, product categorization can be done based on the packaging type: Rigid and Flexible packaging. Rigid packaging includes materials like plastic or glass bottles and metal cans, paper boxes, etc., perfect for items such as drinks, cosmetics, medicines, personal care, and others. Flexible packaging, on the other hand, consists of material like plastic pouches and shrink-wrap films, paper bags, foil, etc used for snacks, frozen foods, online purchases, and dairy products. Both types cater to diverse needs and ensure products stay safe and easy to use from production to delivery. Key players considered for benchmarking are mostly into rigid packaging except few players like ALPHA, Chemco group and Essel Propack that deal in both the categories.

Exhibit 6.2: Key Players Revenue (In INR Million) and Share of Export Vs Domestic (%) In FY 2023

Key Players	Revenue	Exports	Domestic
Manjushree Technopak Ltd	20,963	4%	96%
Alpla India Private Limited	12,662	4%	96%
Thai Plaspac Packaging India Private Limited	7,755	14%	86%
Chemco Plastic Industries Private Limited	7,299	16%	84%
Mold-Tek Packaging Limited	7,299	0.7%	99.3%
SSF Plastics India Private Limited	5,987	2%	98%
National Polyplast (India) Private Limited	4,240	-	100%
SNJ Synthetics Limited	2,837	-	100%
Weener Empire Plastics Limited	2,461**	3%	97%
Secure Industries Private Limited	1,854	4%	96%
Innovative Tech Pack Limited	1,584	NA	NA
Alpha Packaging Private Limited	1,132	1%	99%

Source: Company website, annual reports, secondary research

Note: ** refers to FY 2022 annual data

* Pertain to consolidated figures

6.3 Product Portfolio by Business Unit (BU)

The packaging industry can be further segmented on product category and business unit, as well as the base material used, such as plastic, paper, glass, and metal. Plastic packaging uses material like polyethylene (PET), polypropylene (PP), polyethylene terephthalate (PET), and polystyrene (PS), which can be further classified as flexible and rigid plastic packaging, respectively. Metal packaging consist of metal cans, foils, etc., using materials like aluminium, steel, and tin. Paper packaging consists of corrugated boxes, paper bags, etc. Similarly, glass and other packaging materials can be defined by unit.

The packaging industry in India is very fragmented, with players operating across one or more business segment like containers, preforms, caps & closures and pumps & dispensers serving various industries like food and beverage, home, and personal care, pharmaceutical, beauty and cosmetics, among others. Companies within this sector often expand their presence into fast-growing and emerging categories to capitalize on new market

opportunities. For instance, in the containers category, Manjushree Technopak Ltd have expanded their presence in fast growing and emerging categories such as nutraceuticals, and paints and adhesives.

The plastic packaging units dominate the landscape, producing an extensive range of products such as PET bottles, HDPE containers, and flexible packaging solutions. Manjushree Technopak Ltd. serves a marquee customer base which encompasses almost all consumption categories in India, enabling them to cater to a wide range of end consumers and benefit from the growing consumption trends in India. Manjushree Technopak Ltd is the only player of this scale in terms of revenue and installed capacity and was ranked first in India in FY 2023 across all their five product categories, i.e., first in containers, first in preforms, first in pumps and dispensers, first in caps and closures¹ and first in recycle (in-house recycling of post-consumer plastic waste made of PP and HDPE), in terms of revenue in the consumer RPP industry. It is also the only pan-India RPP player with five preforms manufacturing facilities and an installed capacity of 1,07,208 metric tons as on March 31, 2024.

¹Note: -The full-year revenue from operations of Hitesh Plastics Pvt. Ltd. (the acquired entity) has been considered for Manjushree Technopak's position in the caps and closures segment.

Exhibit 6.3: Key Players Product Portfolio by Business Unit (FY 2023)

Key Players	Containers	Preforms	Caps and closure	Pumps and Dispensers	Recycling	Others
Manjushree Technopak Limited	✓	✓	✓	✓	✓	
Alpla India Private Limited	✓		✓	✓		
Thai Plaspac Packaging India Private Limited		✓	✓			
Chemco Plastic Industries Private Limited	✓	✓	✓		✓	Net, loofah, technical textile, bubble wraps, shrink films
Mold-Tek Packaging Limited	✓			✓		
SSF Plastics India Private Limited	✓		✓		✓	
National Polyplast (India) Private Limited	✓	✓			✓	Crates, display racks
SNJ Synthetics Limited	✓	✓				
Weener Empire Plastics Limited	✓		✓			
Secure Industries Private Limited			✓			
Creative Plastics	✓		✓			
Innovative Tech Pack Limited	✓		✓	✓		
Alpha Packaging Private Limited	✓	✓	✓			

Source: Company website, annual reports, secondary research

Note: (✓)Refers to presence in categories

In plastic packaging, Rigid Plastic Packaging is a widely preferred packaging type by other end-user industries like Food and Beverage, Personal care, Pharmaceutical, Agro chemical, Home care, Paint and Adhesives and others. Companies like ALPLA, Mold-Tek, Manjushree Technopak and others caters to more than one end-user industry. Manjushree Technopak Ltd has a well-diversified product portfolio and they cater to the widest range of applications in the consumer RPP industry. Manjushree Technopak Limited is a derivative of the consumer

industry given its presence across wide range of end industries including food and beverages, home care, personal care, alco-beverage, paints and adhesives, pharmaceuticals, nutraceuticals, dairy, and agrochemicals. They are one of the leading companies in terms of revenue for the beverages category in India, with a strong and growing presence in the home care and personal care categories in FY 2023. Also, among the set of peers mentioned below, they are the largest consumer RPP provider to the beverages industry in FY 2023 and one of the key suppliers to customers in the CSD, juices and bottled water industries in FY 2024.

Exhibit 6.4: Key players end user industry matrix

Player	Food	Beverages*	Alcoholic Beverages	Personal Care and Beauty	Pharmaceutical	Agrochemicals	Home Care	Paints and Adhesives	Lubricant and Oils	Dairy
Manjushree Technopack Ltd	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ALPLA	✓	✓		✓	✓	✓	✓		✓	✓
TPAC	✓	✓			✓					
Chemco	✓	✓		✓	✓	✓	✓		✓	✓
Mold-Tek	✓	✓			✓	✓		✓	✓	
SSF Plastics	✓			✓	✓		✓		✓	
National Polyplast	✓	✓								✓
SNJ	✓	✓	✓		✓	✓				
WEPL	✓	✓		✓	✓		✓			
SI Secure Industries		✓	✓		✓					✓
Creative Plastics	✓			✓	✓		✓			
ITPL	✓	✓	✓	✓	✓					
ALPHA	✓	✓		✓	✓	✓		-	-	✓

Source: Company website, annual reports, secondary research

Note: (✓) Refers to presence in categories

*Beverages does not include alcoholic beverages

Rigid Plastic Packaging uses different type of substrates for different products like caps and closure are generally made from HDPE and PP, Preforms are made from PET, Sprays and Pumps made from PP and HDPE. ALPLA, Manjushree Technopack, WEPL are some of the companies to offer a wide range of these substrates. Manjushree Technopack Ltd is one of the few Indian consumers RPP player to have strong capabilities across most substrates in terms of installed capacity, in FY 2023 and they were the largest provider of PET based consumer RPP solutions in FY 2023.

Exhibit 6.5: Key Players Product Matrix

Player	Product Type	Size	Material Type
Manjushree Technopack Ltd	Caps and closures	-	HDPE, PP, PET
	Preforms	-	PET
	Containers	XS-XL	HDPE, PP, PET, rPET, COEX
	Sprays and pumps	-	HDPE, PP
ALPLA	Bottles	S-XL	COEX, HDPE, rPET, PET, PP
	Jars and Containers	S-XL	HDPE, PET, COEX
	Tubes	XS-S	LDPE, MDPE, HDPE
	Pharmaceutical Packaging		HDPE, rHDPE, PET

	Caps and Closures	-	PP, COEX, HDPE, LDPE
	Pumps		
	Cans	S-M	COEX, HDPE, PET
TPAC Packaging	Preforms	S-XL	PET
	Bottles	S-XL	PET
	Jars	XS-L	PET
	Pharmaceutical packaging	XS-M	-
Chemco	Preforms	M-XL	PET
	Bottles	XS-XXL	PET, PP, PC, PETG, TRITAN
	Jars and Containers	XS-M	PET
	Pharmaceutical Packaging		PET
	Caps and Closures	-	-
Mold-Tek	Jar and Containers	XS-XXL	-
	Pharmaceutical packaging	-	-
	Pumps	-	-
	Sanitizer packs	-	PP
SSF Plastics	Bottles	S-XL	PET,
	Jars and Caps	-	-
	Pharmaceutical packaging	XS-M	PET, PP
National Polyplast	Preforms	S-XL	PET
	Crates	-	HDPE
	Display Racks	-	-
	IML Containers	-	-
SNJ Synthetics Ltd	Jars	XS-L	-
	Preforms	XS-L	PET
	Bottles	XS-XL	-
	Pharmaceutical packaging	XS-M	-
WEPL	Cream Jars	XS-M	HDPE, PP, PET, PET G
	Bottles	XS-L	HDPE, PP, PET
	Pharma Packaging	XS-M	HDPE, LDPE, PET, PP, LLDPE, PE
	Closures and dispensing	-	PP, HDPE, LDPE
	Roll Ons	XS	PET, PVC, HDPE, PP, SAN
SI Secure Industries	Caps and closures	-	-
Creative	Pharmaceutical packaging	XS-M	-
	Jars	S-XL	-
	Bottles	S-XL	HDPE, PP
ITPL	Jar and Containers	-	HDPE, PP
	Bottles	-	-
	Caps and closures	-	PP
	Dispenser	-	-

ALPHA	Bottles	XS-XL	Glass, PET, HDPE, Board
	Flexible dairy pouch	-	-
	Pharmaceutical packaging	XS-M	PET
	Pesticide Bottle	M-XXL	HDPE, PET
	Caps and closures	-	PET, PP
	Preforms	S-XL	PET

Source: Company website, annual reports, secondary Research

Sizes - (XS: <150 ml, S:150 ml-350 ml, M: 350 ml -500 ml, L: 500 ml-1 L, XL: 1 L- 10 L, XXL: >10 L)

LLDPE- Linear Low-density Polyethylene LDPE- Low-density Polyethylene, HDPE- High-density Polyethylene, rHDPE- Recycled High-Density Polyethylene, PC- Polycarbonate, PETG- Polyethylene Terephthalate G, SAN-Styrene-acrylonitrile resin, PP- Polypropylene, PVC- Polyvinyl chloride, PET-Polyethylene Terephthalate, COEX- Co-extruded, MPED- Medium Density Polyethylene

6.4 Certifications and Patents held by Key Players

Certification plays a pivotal role in the Indian packaging industry, ensuring products meet quality standards and adhere to regulatory requirements. Given that the packaging industry is largely led by packaging that directly interacts with products, stringent control and monitoring are necessary to uphold integrity throughout the supply chain. These certifications ensure and signify a dedication to quality, sustainability, and safety, impacting every aspect of an organization, from product development to market expansion. They enhance reputation, build customer loyalty, and minimize risks.

Exhibit 6.6: Certifications And Patents Held By Key Players

Player	Certification and Patents
Manjushree Technopack Ltd	<ul style="list-style-type: none"> • ISO 14001:2015 • ISO 9001:2015 • FSSC 22000 • DMF • SEDEX Compliant • GMP certified • LEED Gold certification • Golden Peacock Sustainability Award
ALPLA	<ul style="list-style-type: none"> • ISO 9001 • FSSC 22000 • ISO 14001 • OHSAS 18001 • ISO 50001 • ISO 15378 • ISO 8317
TPAC Packaging	<ul style="list-style-type: none"> • ISO 9001:2015 • ISO 22000
Chemco	<ul style="list-style-type: none"> • FSSC 22000 • ISO 9001:2015 • TUV Nord ISO 22000 • GMP Certified • SEDEX complaint • Ukas Management System • FDA registered
Mold-Tek	<ul style="list-style-type: none"> • ISO 9001-2015 • ISO 15378:2017 • US-DMF and Health Canada DMF • 3 registered patents and 4 filings pending
SSF Plastics	<ul style="list-style-type: none"> • ISO 9001:2015
National Polyplast	<ul style="list-style-type: none"> • FSSC 22000 • ISO 9001:2015 • ISO 14001:2015 • IATF 16949:2016
SNJ Synthetics Ltd	<ul style="list-style-type: none"> • ISO 22000

WEPL	<ul style="list-style-type: none"> • ISO 9001 • ISO 14001 • BRC Packaging Certification • SEDEX Compliant • CDP Certification
SI Secure Industries	NA
Creative Plastics	<ul style="list-style-type: none"> • ISO 22000/PAS 223 • SEDEX Compliant
ITPL	<ul style="list-style-type: none"> • ISO 9001:2009 • ISO 22001:2005 • SEDEX Complaint • DMF
ALPHA	<ul style="list-style-type: none"> • ISO 9001:2008 • ISO 9001:2008

Source: Company website, annual reports, secondary research

6.5 Key Innovations and Technology in Indian Packaging Industry

In the growing consumer goods landscape, the packaging industry faces unprecedented demands. Consumers now seek packaging solutions that offer distinctiveness, cost-effectiveness, and stringent sustainability standards. Brand owners and retailers alike are demanding packaging suppliers to provide more cost-efficient products while maintaining high standards of quality and performance. Meanwhile, multinational corporations are actively pursuing packaging innovations that align with their worldwide environmental and sustainability objectives. In this fiercely competitive environment, innovation and technology help packaging industry players meet these evolving demands and maintain a competitive edge in the market.

To meet these evolving demands and maintain a competitive edge, industry players are investing heavily in innovation and technology. Research and development (R&D) efforts focus on developing cutting-edge solutions, addressing market trends, and meeting consumer preferences. This has led to innovations such as lightweighting, recyclable materials, and biodegradable packaging. Companies are also collaborating with stakeholders to innovate processes that reduce costs and ensure sustainable practices. Players like Manjushree Technopack Ltd exemplifies this approach. Their partnership with the Ganesha Ecopet Pvt Ltd makes them the only Indian consumer RPP player to enter into a strategic partnership for the sourcing of recycled PET products as on March 31, 2024. Ganesh Ecosphere group is one of the largest PET bottles recyclers in India as of FY 2024. Moreover, Manjushree's continuous work on innovation and co-development projects with customers has enabled them to achieve one of the lowest turnaround times in the Indian consumer RPP industry as of March 31, 2024. To further enhance their innovation capabilities, Manjushree Technopack has established strategic partnerships for proprietary mold designs, which contribute to faster turnaround times and accelerate innovation cycles. This multifaceted approach to innovation and collaboration positions Manjushree as one of the leaders in meeting the dynamic needs of the RPP market.

Exhibit 6.7: Key Innovations, Technologies Used, and R&D Spends by Key Players

Players	Key Innovation	Technology	R&D
Manjushree Technopack Ltd	<p>Use of Modified Atmospheric Packaging to increase the shelf life for Food & Beverage products.</p> <p>Use of foaming processes to reduce packaging weight</p> <p>Manufacturer of recyclable valves for two-way caps designed specifically for inverted bottles</p>	<p>Extrusion blow molding</p> <p>Injection molding</p> <p>Foaming technology</p> <p>Compression molding</p> <p>Barrier co-extrusion molding</p> <p>Recycled plastic layer</p>	<p>Manjushree Technopack Ltd in collaboration with Ganesha Ecosphere group to co-develop and provide packaging products made from up to 100% recycled plastic</p> <p>Manjushree Technopack Ltd has signed a MOU with IISc, Bengaluru to establish centre of excellence for upcycling and</p>

			recycling and create innovative solutions to convert waste into rigid plastic packaging
ALPLA	Created a one-piece child-resistant closure helping streamline production	Cube Technology Moulding Technologies- Injection, extrusion blow, injection moulding -preforms, injection stretch blow moulding	NA
TPAC Packaging	NA	Moulding Technologies- Injection, extrusion blow, PET, In-mould labelling	NA
Chemco	NA	Injection molding equipment	They have a dedicated 20-member team to carry out R&D throughout the operations
Mold-Tek	Incorporation of unique QR coded labelling to prevent counterfeiting	Injection blow moulding In-mould labelling	In-house research and development of moulds and in-house tool room for designing and development of moulds for new products located in Hyderabad
SSF Plastics	Introduced tamper-evident caps with intricate anti-counterfeiting designs	Injection molding machines specialized in running high cavitation FHR moulds	NA
National Polyplast	Working on innovations for light weighting, lower carbon footprint packaging solutions	All-electric machines and precise high-speed robots are utilized for production	NA
SNJ Synthetics Ltd	NA	High-speed injection molding Injection molding	NA
WEPL	Innovated the world's first 100% recyclable valve for squeeze bottle Cif eco-refill for lightweight recyclable refills	Automation and injection molding machines	NA
SI Secure Industries	Worked with customer requirement to change the 1810 long neck to 1881 short neck	NA	NA
Creative Plastics	Developed HDPE bottles using ISBM technology, replacing conventional EBM methods to reduce product weight by 10-20%, which minimized energy consumption, and lowers cost	Injection blow molding Operates equipment ranging from 2H X 2S to 6H X 2S Injection stretch blow molding	NA
ITPL	NA	ISBM, EBM, IM	NA
ALPHA	They are working with research institutes to introduce and adapt new technologies for weight reduction	Injection molding machines	The company has established a technical centre for R&D purposes

Source: Company website, annual reports, secondary research

Note: NA refers to Not Available

6.6 Sustainability and Recycling initiatives

As the Indian packaging industry is growing, the importance of sustainability in the packaging industry is becoming increasingly evident. Manufacturers and retailers of fast-moving consumer goods in India are actively exploring innovative packaging solutions aimed at enhancing circularity. These efforts underscore a dual commitment: Meeting corporate sustainability goals and aligning with the evolving expectations of Indian consumers, advocacy groups, and regulatory bodies.

In the Indian context, there is a noticeable expansion in regulations governing the sustainability aspects of packaging. This includes initiatives aimed at increasing the proportion of recyclable materials used in packaging and mandating higher levels of recycled content, reflecting the country's growing emphasis on environmental conservation and sustainable development. Manjushree Technopack Ltd is one of the few RPP players to have both product and recycling capabilities in India as of 31st March 2024. They are the first and only Indian RPP player to fully own and operate a greenfield, captive recycling plant with a potential capacity of 6000 metric tons per annum as of March 31st, 2024.

Exhibit 6.8: Key Players Sustainability Initiatives and Recycling Ability

Player	Sustainability Initiatives	Recycling Abilities
Manjushree Technopack Ltd	<ul style="list-style-type: none"> Reduced their energy and water consumption per tonne of production Collects post consumed plastic waste Incorporated rainwater harvesting ability to reserve 60 million litres of water 40% of energy used is sourced from renewable sources 	Manjushree Technopack Ltd has a greenfield captive recycling unit in Bidadi with a capacity to produce 6,000 metric tonne of PP, HDPE recycled resin annually, with a quality comparable to that of virgin materials
ALPLA	<ul style="list-style-type: none"> Utilizing renewable resources as a power source, 28% of energy is from renewable resources. As per FY 23, ALPLA has saved 4,250 tonnes of CO2e Researching and using alternative input materials like cellulose, sugar cane, sunflower seed hulls for packaging 	ALPLA global recycling network comprises 13 plants with total output capacity of 3,50,000 tonnes of PCR material
TPAC Packaging	<ul style="list-style-type: none"> Promotion of sustainable materials, energy efficiency, waste reduction, and carbon footprint reduction in the paper and packaging industry through initiatives like recycling programs and education campaigns 	TPAC Packaging utilizes rPET in production of personal care products
Chemco	<ul style="list-style-type: none"> Incorporation of recycled ocean plastic into products Operating recycling plants nationwide and sourcing post-consumer materials like bottles and caps for sustainability 	Chemco group uses 40% of rPET in its preform production
Mold-Tek	<ul style="list-style-type: none"> Utilizing renewable source of energy and taking measure to reduce the existing power consumption by changing from hydraulic machines to electrical machines Increased the reuse of plastic material from 7.8% in FY 2022 to 9.38% in FY 2023 	Mold-Tek recycled 852 Metric Tonnes of plastic in FY 2023
SSF Plastics	<ul style="list-style-type: none"> Opting renewable energy as a power source Set a target to convert all moulding machines from hydraulics to hybrid 	SSF Plastics process 2,500 tonnes of PCR annually
National Polyplast	NA	NA
SNJ Synthetics Ltd	NA	NA
WEPL	<ul style="list-style-type: none"> Offers low-impact alternatives like post-consumer recycled material and circular polymers to reduce fossil feedstock usage Set a target to increase the use of renewable energy from 54% to 90% by 2030 	Use of post-consumer recycled product and circular polymer
SI Secure Industries	<ul style="list-style-type: none"> The company is exploring alternative option of energy source at its plant location 	NA
Creative Plastics	<ul style="list-style-type: none"> Utilization of technology to reduce power consumption per bottle by reducing its weight 	NA

ITPL	<ul style="list-style-type: none"> Company has developed technology for reprocessing mixed plastic waste and converts them into usable product 	NA
ALPHA	<ul style="list-style-type: none"> Initiatives taken to conserve natural resources used in production by improving operational efficiencies Promotion of sustainable business practices amongst stakeholders Trying to reduce emission levels of industrial waste and effluents Recycles 20% of its PET bottles in its facilities 	ALPHA uses 20% of recycled PET in its PET bottle production

Source: Company website, annual reports, secondary research,
rPET: Recycled PET, PCR: Post consumer recycled, PP: Polypropylene, HDPE: High-density Polyethylene
NA refers to Not Available

6.7 Mergers and acquisitions in Packaging Industry

Mergers and acquisitions (M&A) play a crucial role in the packaging sector, driving expansion, creativity, and a competitive advantage. These strategic moves enable firms to diversify their offerings, enhance efficiency, and penetrate new markets and technological frontiers. Furthermore, M&A activities strengthen the industry by forming robust entities equipped to meet evolving consumer demands. They also advance environmental goals by championing sustainable and green packaging alternatives.

Cost optimization is a key consideration in M&A decisions within the packaging industry. Companies often seek to leverage economies of scale and streamline operations to improve their overall cost structure. In this context, freight cost emerges as a particularly important element. Freight cost is an important element in the overall cost structure of the packaging industry and geographic proximity plays a crucial role in client acquisitions. By strategically expanding their geographical presence through M&A, companies can reduce transportation expenses and improve their ability to serve clients efficiently across different regions.

In essence, M&A activities are instrumental in reshaping the packaging sector, promoting progress and ecological responsibility within a vibrant marketplace. In the year 2023, the total value of M&A transactions in India's packaging industry reached approximately INR 1,660 crores. In the rigid plastic packaging industry, Manjushree Technopack recently acquired Oriental Containers in July 2024, which will strengthen its position in the industry in terms of revenue and market share in the caps and closures category. This further presents an opportunity for significant market potential for both preforms and containers in regions like Goa and Odisha.

Exhibit 6.9: Mergers and Acquisitions in the Rigid Plastic Packaging Industry

Target	Acquirer	Year (CY)	Amount (INR Million)	Stake	Industry type
Oricon Enterprise (Oriental Containers) *	Manjushree Technopack Ltd	2024	5,200	-	Rigid
Parekhplast	Shriji Polymers	2022	200	100%	Rigid
Hitesh plastics	Manjushree Technopack Ltd	2022	-	100%	Rigid
Classy Kontainers	Manjushree Technopack Ltd	2021	3,500-4,000	-	Rigid
Pearl Polymer	Manjushree Technopack Ltd	2020	-	-	Rigid
Amtor Rigid Plastic India	ALPLA	2020	-	-	Rigid
National Plastic	Manjushree Technopack Ltd	2019	-	100%	Rigid
Axiom Propack Pvt Ltd	Guala Closures Group	2017	-	100%	Rigid

*: MTL acquired the business of 'manufacturing, trading and sale of plastic closures and preforms' from Oricon Enterprises Limited ("Oriental Containers")

The below table provides a snapshot of credit ratings for companies in the packaging industry as of 2023. These ratings indicate the financial strength and creditworthiness of each company.

Exhibit 6.10: Key Players Presence Across Categories and Recycling Capabilities FY 2023

Product Categories	Key industry participants
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Containers	Manjushree Technopack Ltd., ALPLA, Chemco
Preforms	Manjushree Technopack Ltd., TPAC, National Polyplast
Caps and Closures	Manjushree Technopack Ltd., ALPLA, SSF Plastic
Pumps and Dispensers	Manjushree Technopack Ltd., ALPLA, Mold-Tek
Recycling	Manjushree Technopack Ltd., Mold-Tek, SSF Plastics

Source: Company website, Annual reports, Secondary research

Exhibit 6.11: Credit Ratings of Key Players for FY 2023

Company	2023		
	Long Term	Short Term	Month
Manjushree	CRISIL AA- (Stable)	CRISIL A1+	June, 2023
Alpla India	NA	NA	NA
Mold-Tek Packaging	ICRA A+ (Stable)	ICRA A1	May, 2023
Chemco Plastic	CRISIL A+ (Stable)	CRISIL A1	May, 2023
TPAC Packaging	NA	NA	NA
SSF Plastics	CRISIL A (Stable)	CRISIL A1	May, 2023
National Polyplast	CRISIL BB+ (Stable)	CRISIL A4+	NA
WEPL	ICRA A- (Stable)	ICRA A2+	January, 2023
SNJ Synthetics	CARE BBB- (Stable)	CARE A3	July, 2023
Secure Industries	ICRA BBB- (Stable)	ICRA A3	August, 2023
Innovative Tech Pack Limited	CRISIL BBB- (Negative)	NA	March, 2023
Alpha Packaging	CRISIL BBB+ (Stable)	CRISIL A3+	NA

Source: Secondary Research

7. Financial Benchmarking

7.1. Revenue from Operations

The key measure of a company's financial performance lies in its revenue from operations, serving as the primary indicator of its business success and income generation. Manjushree Technopak Ltd. is the fastest growing among the top 6 players in the industry on the basis of revenue CAGR during FY22-24. In FY 2022, Manjushree Technopak was the largest consumer RPP player in India by revenue. This position was maintained in FY 2023, with the company's revenue from operations was almost double that of the second-largest RPP player in India.

Manjushree Technopak market share in organised consumer RPP market in terms of revenue increased from 5.3% to 7.4% between FY 2019 to 2023. It is estimated that market share of Manjushree Technopak has reached 7.6% and 8.8% (including revenue of Oriental Containers are on a proforma basis) in FY 2024. Their large-scale operations enable them to benefit from procurement efficiencies, lower cost of production, ability to invest in continuous innovative and sustainable solutions, and the ability to sustain key customer relationships.

Exhibit 7.1: Revenue from Operations (In INR million) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	14,670	20,963	21,170
Large Players (revenue > INR 4,000 million)			
Alpla India Private Limited	10,450	12,662	NA
Mold-Tek Packaging Limited	6,315	7,299	6,986
Chemco Plastic Industries Private Limited	5,720	7,299	NA
Thai Plaspac Packaging India Private Limited	5,440	7,755	NA
SSF Plastics India Private Limited	5,238	5,987	NA
National Polyplast (India) Private Limited	3,038	4,240	NA
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	2,461	NA	NA
SNJ Synthetics Limited	2,178	2,837	NA
Secure Industries Private Limited	1,440	1,854	NA
Innovative Tech Pack Limited	1,580	1,584	1,424
Alpha Packaging Private Limited	1,335	1,132	NA

Source: Annual Reports, Secondary Research, Technopak Analysis, MCA reports

NA: Not Available, Na (1): Cannot be calculated due to unavailability, negative numerator, denominator, or both.

7.2. Material Margin

Exhibit 7.2: Material Margin (%) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	40.5%	36.5%	41.6%
Large Players (revenue > INR 4,000 million)			
Alpla India Private Limited	36.9%	34.0%	NA
Mold-Tek Packaging Limited	40.4%	40.3%	43.2%
Chemco Plastic Industries Private Limited	40.2%	38.3%	NA
Thai Plaspac Packaging India Private Limited	34.8%	32.2%	NA
SSF Plastics India Private Limited	39.8%	38.4%	NA
National Polyplast (India) Private Limited	25.5%	24.1%	NA
Median Value	38.4%	36.1%	
Other Large Players (revenue < INR 4,000 million)			

Weener Empire Plastics Limited	43.6%	NA	NA
SNJ Synthetics Limited	23.4%	23.3%	NA
Secure Industries Private Limited	40.4%	39.4%	NA
Innovative Tech Pack Limited	34.6%	33.6%	37.9%
Alpha Packaging Private Limited	40.9%	37.9%	NA
Median Value	40.4%	35.7%	

Source: Annual Reports, Technopak Analysis

Material Profit = (Revenue from operations - COGS)

Material Margin = Material Profit / Revenue from operations

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

7.3. EBITDA and EBITDA Margin

EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) is a key financial metric used to evaluate a company's profitability and performance relative to its peers, providing valuable insights for benchmarking against industry standards.

Exhibit 7.3: EBITDA (In INR million) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	2,357	2,935	3,733
Large Players (revenue > INR 4,000 million)			
Alpa India Private Limited	1,066	1,120	NA
Mold-Tek Packaging Limited	1,207	1,354	1,332
Chemco Plastic Industries Private Limited	991	1,276	NA
Thai Plaspac Packaging India Private Limited	771	947	NA
SSF Plastics India Private Limited	826	899	NA
National Polyplast (India) Private Limited	285	339	NA
Median Value	909	1,033	
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	321	NA	NA
SNJ Synthetics Limited	204	237	NA
Secure Industries Private Limited	203	282	NA
Innovative Tech Pack Limited	111	118	136
Alpha Packaging Private Limited	108	64	NA
Median Value	203	178	

Source: Annual Reports, Secondary Research, Technopak Analysis, MCA reports.

EBITDA = (PBT + Finance Cost + Depreciation & Amortization) - Other Income

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

Exhibit 7.4: EBITDA Margin (%) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	16.1%	14.0%	17.6%
Large Players (revenue > INR 4,000 million)			
Alpa India Private Limited	10.2%	8.8%	NA
Mold-Tek Packaging Limited	19.1%	18.6%	19.1%
Chemco Plastic Industries Private Limited	17.3%	17.5%	NA
Thai Plaspac Packaging India Private Limited	14.2%	12.2%	NA
SSF Plastics India Private Limited	15.8%	15.0%	NA
National Polyplast (India) Private Limited	9.4%	8.0%	NA
Median Value	15.0%	13.6%	
Other Large Players (revenue < INR 4,000 million)			

Weener Empire Plastics Limited	13.1%	NA	NA
SNJ Synthetics Limited	9.4%	8.3%	NA
Secure Industries Private Limited	14.1%	15.2%	NA
Innovative Tech Pack Limited	7.1%	7.5%	9.5%
Alpha Packaging Private Limited	8.1%	5.7%	NA
Median Value	9.4%	7.9%	

Source: Annual Reports, Secondary Research, Technopak Analysis, MCA reports.

EBITDA Margin = EBITDA/Revenue,

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

7.4. PAT and PAT Margin

Profit after tax (PAT) and PAT margin are essential metrics used to assess a company's profitability after accounting for all operating and overhead expenses, providing insights into the effectiveness of its operations.

Exhibit 7.5: PAT (INR Million) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	708	592	1,408
Large Players (revenue > INR 4,000 million)			
Alpla India Private Limited	260	242	NA
Mold-Tek Packaging Limited	637	804	666
Chemco Plastic Industries Private Limited	481	625	NA
Thai Plaspac Packaging India Private Limited	-93	-41	NA
SSF Plastics India Private Limited	318	486	NA
National Polyplast (India) Private Limited	83	92	NA
Median Value	289	364	
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	100	NA	NA
SNJ Synthetics Limited	46	62	NA
Secure Industries Private Limited	53	80	NA
Innovative Tech Pack Limited	-74	-14	18
Alpha Packaging Private Limited	7	-30	NA
Median Value	46	24	

Source: Annual Reports, Secondary Research, Technopak Analysis, MCA reports.

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

Exhibit 7.6: PAT Margin (%) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	4.8%	2.8%	6.6%
Large Players (revenue > INR 4,000 million)			
Alpla India Private Limited	2.4%	1.9%	NA
Mold-Tek Packaging Limited	10.1%	11.0%	9.5%
Chemco Plastic Industries Private Limited	8.4%	8.6%	NA
Thai Plaspac Packaging India Private Limited	-1.7%	-0.5%	NA
SSF Plastics India Private Limited	6.1%	8.1%	NA

National Polyplast (India) Private Limited	2.7%	2.2%	NA
Median Value	4.4%	5.1%	
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	4.0%	NA	NA
SNJ Synthetics Limited	2.1%	2.2%	NA
Secure Industries Private Limited	3.6%	4.3%	NA
Innovative Tech Pack Limited	-4.7%	-0.9%	1.2%
Alpha Packaging Private Limited	0.5%	-2.6%	NA
Median Value	2.1%	0.6%	

Source: Annual Reports, Secondary Research, Technopak Analysis, MCA reports.

$PAT\ Margin = PAT / (Revenue\ from\ Operations + Other\ Income)$

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

7.5. Return on Equity

Return on equity (ROE) evaluates a company's ability to generate profits from shareholders' equity, indicating management efficiency and potential returns for shareholders. It is a key metric for assessing financial performance and investor confidence.

Exhibit 7.7: Return on Equity (%) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	7.9%	6.2%	14.0%
Large Players (revenue > INR 4,000 million)			
Alpa India Private Limited	12.8%	10.6%	NA
Mold-Tek Packaging Limited	13.9%	14.4%	11.2%
Chemco Plastic Industries Private Limited	25.3%	24.8%	NA
Thai Plaspac Packaging India Private Limited	-2.7%	-1.1%	NA
SSF Plastics India Private Limited	12.2%	15.7%	NA
National Polyplast (India) Private Limited	7.9%	8.0%	NA
Median Value	12.5%	12.5%	
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	7.2%	NA	NA
SNJ Synthetics Limited	10.5%	12.2%	NA
Secure Industries Private Limited	13.6%	17.0%	NA
Innovative Tech Pack Limited	-21.1%	-4.2%	5.0%
Alpha Packaging Private Limited	1.0%	-4.8%	NA
Median Value	7.2%	4.0%	

Source: Annual Reports, Technopak Analysis

$Return\ on\ Equity = Profit\ after\ Tax\ (PAT) / Shareholder's\ Equity$

Figures of Manjushree Technopak Ltd, Mold-Tek, Alpha Packaging and of Thai Plaspac Packaging are consolidated, rest all are standalone.

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

7.6. Return on Capital Employed

ROCE (Return on Capital Employed) is a metric that assesses a company's efficiency by evaluating its profitability in relation to the capital invested to generate profits. It provides a dependable measure of a company's performance over extended time frames. Manjushree Technopak's EBITDA margin and ROCE was 14.0% and 11.7%,

respectively, in FY 2023 which was higher than the peer average 11.9% and 11.1% respectively in the Indian RPP industry estimated during the same period.

Exhibit 7.8: Return on Capital Employed (%) (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	11.7%	11.7%	17.0%
Large Players (revenue > INR 4,000 million)			
Alpla India Private Limited	5.8%	5.2%	NA
Mold-Tek Packaging Limited	19.1%	18.0%	14.7%
Chemco Plastic Industries Private Limited	23.9%	24.1%	NA
Thai Plaspac Packaging India Private Limited	-0.3%	1.6%	NA
SSF Plastics India Private Limited	13.5%	14.1%	NA
National Polyplast (India) Private Limited	10.6%	10.1%	NA
Median Value	12.05%	12.10%	
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	7.1%	NA	NA
SNJ Synthetics Limited	23.2%	19.9%	NA
Secure Industries Private Limited	10.5%	14.1%	NA
Innovative Tech Pack Limited	0.1%	5.1%	11.1%
Alpha Packaging Private Limited	3.6%	-1.7%	NA
Median Value	7.10%	9.60%	

Source: Annual Reports, Technopak Analysis

Return on Capital Employed = $(PBT + Finance Cost) / (Equity + Short Term Borrowings (excluding WC Loan) + Long Term Borrowings)$

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

7.7. Working Capital Cycle

The working capital cycle represents the time it takes for a company to convert its current assets into cash to cover its short-term liabilities. It measures the efficiency of a company's operations and its ability to manage its cash flow effectively, influencing its liquidity and overall financial health.

Exhibit 7.9: Working Capital Days (FY)

Player	2022	2023	2024
Manjushree Technopak Limited	111	76	75
Large Players (revenue > INR 4,000 million)			
Alpla India Private Limited	93	65	NA
Mold-Tek Packaging Limited	145	105	135
Chemco Plastic Industries Private Limited	105	150	NA
Thai Plaspac Packaging India Private Limited	86	71	NA
SSF Plastics India Private Limited	133	120	NA
National Polyplast (India) Private Limited	122	95	NA
Median Value	114	100	
Other Large Players (revenue < INR 4,000 million)			
Weener Empire Plastics Limited	52	NA	NA
SNJ Synthetics Limited	81	68	NA
Secure Industries Private Limited	66	76	NA
Innovative Tech Pack Limited	-6	9	11
Alpha Packaging Private Limited	87	130	NA
Median Value	66	72	

Source: Annual Reports, Technopak Analysis

Working Capital Cycle= Inventory Days+ Receivable Days – Payable Days

*Inventory Days= (Inventory/COGS)*365*

*Payable Days= (Accounts Payable/COGS)*365*

*Receivable Days= (Accounts Receivable/Revenue from operation)*365*

Note: NA: Not Available, Na (1): cannot be calculated due to one of the figures being 0, unavailability, negative numerator, denominator, or both.

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