



Rajasthan

Plastic Waste Inventorisation Study of the State



CEE

Centre for Environment Education

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Acknowledgement

Every day in our life we use numerous products. All of these products turn into waste, when they are expired, unpacked, broken or thrown away, this is what is called 'Waste'. This phenomenon of mindless consumption, unnecessary packaging, and increasing accumulation of goods is adding into waste in the world every day. At least 3.5 million tons of plastic and solid waste is created every day around the globe. This number of wastes is 10 times bigger than the amount a century ago, according to World Bank researchers. There is not only one type of waste, there are various types of waste. Plastic is one among them and ever increasing; plastics although it contribute to economic growth, their current production and use pattern, on a linear model of 'take-make-use-dispose', is a primary driver of natural resource depletion, waste environmental degradation, climate change, and has adverse effect on human health. Therefore, today if we have dreams of a more liveable and better world as a reality then we will have to look at our consumption patterns, packaging products, more circular economy driven approaches and putting value to waste.

We at CEE would like to thank Rajasthan State Pollution Control Board (RSPCB) for giving us this opportunity to do the plastics waste Inventorisation study and analyse details of plastic waste processing, manufacturing, and recycling units in the state along with details of raw material used, sources of raw material, the capacity of recycling plastic waste, types of waste generated, and their respective quantities and come up with a report including an action plan for better management of solid and plastic waste in the state. We would like to recognize Shri Naveen Mahajan, IAS, Chairman and Shri B. Praveen, IAS, Member Secretary, Rajasthan Pollution Control Board for their leadership and support to finalise this report in a just manner. We also take the opportunity to express our heartfelt thanks to Shri. Neeraj Mathur, Chief Environmental Engineer, RSPCB for continuous inputs and support.

It is worth mentioning that to find solutions to these complex problems we on behalf of Centre for Environment Education (CEE) would like to convey our heartfelt gratitude and acknowledge the efforts of various officials who combined together their efforts and wisdom to address the path breaking vision, righteous approach of the State Government of Rajasthan and Rajasthan State Pollution Control Board (RSPCB) laying down the rather ambitious objectives of the study. The path was never easy, but the ambient environment and access provided to information through numerous discussions, workshops and one-to-one meetings, pro-active approach, clarity of thought, guidance and feedback that the State Government and the RSPCB officials (present and past) at all levels; particularly the Regional Officers and other team members not only facilitated but enabled and stimulated CEE and its partners to transparently and fearlessly bring out the results, findings, recommendations and action points which have been defined in the various chapters in the report comprehensively.



We at CEE admire and appreciate sincere efforts, encouragement and knowledge of all the team members from Dr Bhadresh Rawal, and Mr Vidhesh Pandey, PRAYAS team, the field survey partner of CEE, Shri Hem Pande, Former Secretary Govt. of India, Dr Brajesh Dubey, IIT Kharagpur, Dr Vijay Singhal, Shri Vishnudutt Purohit, Shri Sunil Kumar, Shri. Ajay Kumar and many more who were not only actively involved in this study but made the analytics possible for CEE to complete the report. I am extremely grateful to senior officers from Urban Local Bodies and Local Self Governance Department and Solid Waste Management Consultants from the state of Rajasthan for providing their feedback, continuous support, and guidance whenever required. Overall, the backing of expertise and experience from all officials always encouraged and backed CEE throughout the study. Lastly, we at CEE will fail if we do not respect the additional financial support provided by HDFC Bank to complete the extended time expenses for the report completion. I also convey my heartfelt thanks to Dr Kartikeya V Sarabhai, Director CEE, my all-team members at CEE, particularly Vidya Bhooshan Singh and Vinal Contractor.

Also, to add that the views expressed in the report are that of the CEE and it has no implications of that of the State and RSPCB officials.

Prabhjot Sodhi, MBE

Sr Program Director Circular Economy
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GOVERNMENT OF RAJASTHAN
Rajasthan State Pollution Control Board



Chairperson

Rajasthan State Pollution Control Board (RSPCB)

MESSAGE

With growing urbanization, consumption of plastic is increasing due to its durability, low cost, flexibility, moisture resistance, superior insulation, low maintenance etc. On the other hand, its resistance to decomposition is causing severe environmental pollution and health problems. Therefore, today we have to learn the use and reuse of plastics responsibly both as a packaging material and product. More circularity approaches have to be succinctly brought out to make our planet earth free of plastic pollutants.

Although, some quantity of plastic wastes is recycled and co-processed in cement kilns, it still leaves a huge quantity unattended. This waste can be gainfully utilised through various initiatives prevalent in the country and the world i.e. reduce, reuse, recover, refurbish, repair and recycle etc.

The world has also come together to address this growing problem of plastic pollution. In India Plastic Waste Management (Amendment) Rules, 2022 and new recent Extended Producer Responsibility (EPR) guidelines, will give a fillip for gainful development of plastic waste management ecosystem. In a significant first, the guidelines allow for sale and purchase of surplus extended producer responsibility certificates, thus setting up a market mechanism for plastic waste management.

Keeping this recycling gap in mind, Rajasthan State has taken various policy level decisions to encourage and guide the plastic industry, recyclers and co-processing units to maximize the plastics waste recycling within the state. The study on Inventorization of plastic waste in the State of Rajasthan is milestone in this direction. The report has highlighted that in the State, "per capita plastic waste generation in the State is well below the national average". However need of the hour is, we all must put together more efforts to have accountable collection, segregation and handling of plastics in a more circular economy approach and reduce burden, at the (growing) dumping sites/landfills. We are a state of great culture, history, tourism and inspiration and we can do it and we will do to manage plastics responsibly.

I place my sincere appreciation for Centre for Environment Education (CEE) team in bringing out various facets in the report. Lastly, I am sure this study report recommendations and action plans will help RSPCB, ULBs, policy makers and waste management practitioners in updating themselves with latest data on waste generation, recycling and management status along with challenges to deal with plastic waste and further pave the way in our collective journey towards sustainability and circular economy practices.

Naveen Mahajan, IAS
Chairperson, RSPCB





GOVERNMENT OF RAJASTHAN
Rajasthan State Pollution Control Board



Member Secretary

Rajasthan State Pollution Control Board (RSPCB)

MESSAGE

India has taken significant steps to strengthen its waste management systems after launching of the Swachh Bharat Mission (SBM) Urban and Grameen Guidelines. Governments at the Centre and State levels are focusing on the transition to a circular economy approach by placing more emphasis on waste source segregation, waste processing facilities, recycling and refurbishing and the phase-out of single-use plastics. The Central Government, State Governments, Urban Local Bodies, Safai Sathis and most importantly the country's Citizens have demonstrated remarkable coordination and commitment to Swachhta over the years.

Keeping this vision, we at Rajasthan State Pollution Control Board (RSPCB) had entrusted the job to Centre for Environment Education (CEE) and instituted a study on Plastic Waste Inventorization. I am glad that the report provides an inventory on plastic manufactures, recyclers, traders etc, and an integrated, holistic overview of the plastic waste value chain and its management in the state. It covers several aspects of plastic waste management and will help all the relevant stakeholders in developing plans and strategies in the near future. Rajasthan State Pollution Control Board and Urban Local Bodies being the key stakeholders may refer to the stakeholder recommendations and action plans in the report for taking initiatives to deal with plastic waste efficiently in the state.

The report also provides better facilitation for the implementation of the Extended Producer Responsibility (EPR) for plastics, ease for communications between recyclers, waste management agencies and the Producers, Importers, and Brand Owners (PIBOs) in the state. The recommendations do lay opportunities across the stakeholders in the plastic ecosystem and how to achieve end-to-end control over all material recovery processes. Useful Standard Operating Procedures (SOPs) can be developed for better business decisions with inventory tracking, inbound and outbound activities, planning and management and process optimisation with comprehensive planning at the material recovery facilities (MRFs).

I am sure that this report will help in achieving the laid objectives in Plastic Waste Management Rules and the Swachh Bharat Mission Guidelines. I also express my gratitude to the team of Rajasthan State Pollution Control Board and Urban Local Bodies for their efforts in finalizing this document.

B. Praveen, IFS

Member Secretary, RSPCB





GOVERNMENT OF RAJASTHAN
Rajasthan State Pollution Control Board



Chief Environmental Engineer Rajasthan State Pollution Control Board (RSPCB)

MESSAGE

Plastic as a synthetic polymer substitute of natural materials has become an essential part in our day-to-day lives. We have seen a considerable growth in the production of plastics in the last few decades and simultaneous increased consumption of plastic materials in country and world-wide.

Considering the growing plastic usage and the associated environmental challenges, plastic waste management is very critical for effective municipal solid waste management. Keeping this in preference the recent study was instituted by RSPCB in partnership with Centre for Environment Education (CEE). The study has brought out many issues, challenges, possible solutions, recommendations across the plastics ecosystem. The study aims to benefit in understanding and managing growing plastic waste in a scientific manner.

I would like to take opportunity to express my heartfelt gratitude to Our Respected Shri Naveen Mahajan, IAS, Chairperson and Revered Shri B. Praveen, IFS, Member Secretary for providing their leadership in taking forward this study on Plastic Waste Inventorization and to know the current plastic waste generation and progress at materials recovery, recycling and co-processing facilities.

I would like to convey thanks to Mr Prabhjot Sodhi, Mr Vidya Bhooshan and entire team of Centre for Environment Education (CEE) for capturing the waste value chain challenges, including that of the informal waste pickers to recyclers. I place on record the appreciation of all the Regional Officers and Sh. Vishnu Datt Purohit, Nodal Officer of Plastic Division of RSPCB and his team for their proactive role in providing direction to finalise the study in a positive manner.

I am certain that this study report will encourage the stakeholders to deal with the plastic waste using appropriate technologies and case studies, and make Plastic Waste Management a successful model in the state.

Niraj Mathur

Chief Environmental Engineer, RSPCB





CEE

Centre for Environment Education

Director

Centre for Environment Education (CEE)

MESSAGE

I would like to express my heartfelt appreciation and recognize the efforts and leadership of all officials involved from the Urban Local Bodies and Local Self Governance Department of the State Government of Rajasthan, Chairman and Member Secretary Rajasthan State Pollution Control Board (RSPCB). Also, I extend my deep gratitude to the dedicated team of senior officials from RSPCB both from headquarters at Jaipur and field offices particularly from the 15 different districts of the Rajasthan state where the study has been undertaken. Needless to say, that their prodigious expertise and experience, assistance, meetings at the ground levels in the cities have always encouraged Centre for Environment Education (CEE) throughout the study.

This determined study was made possible with all the direction, support to the CEE team led by Prabhjot Sodhi and partner institutions who put together the challenges, results, feedback, recommendations together in the form of a study report.

Must admire the vision and foresight of the RSPCB officials to conceptualised one of the first study in Inventorization of plastics, and with the intensive study of the municipal solid waste through waste characterisation process. A concept alongside sustainability and circular approaches for plastics management and operations along the plastic waste ecosystem.

Once again, I would like to acknowledge Rajasthan State Pollution Control Board for giving us this opportunity to study and analyse Plastic Waste Management in the state and come up with a comprehensive report including an action plan for better management of solid and plastic waste in the state.

Kartikeya V Sarabhai

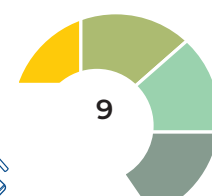
Director

Centre for Environment Education

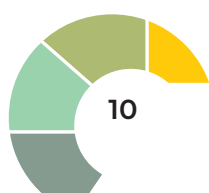


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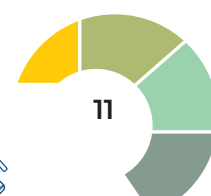
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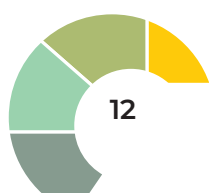
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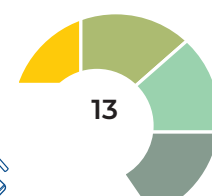
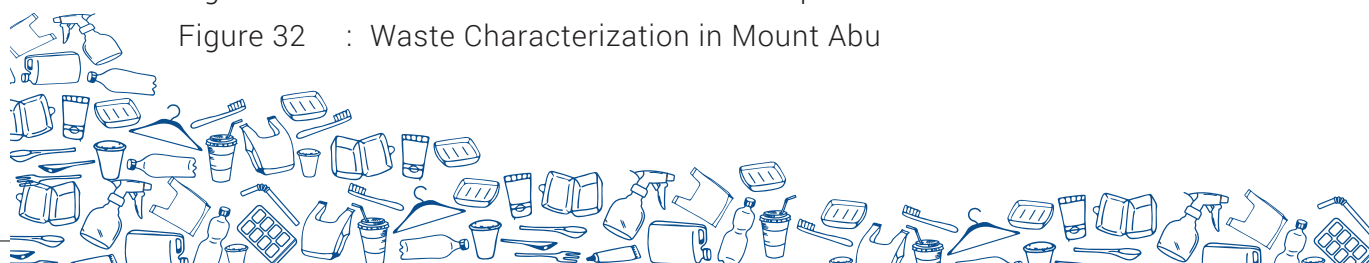


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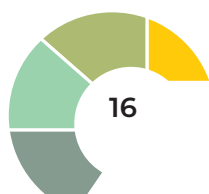
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Executive Summary

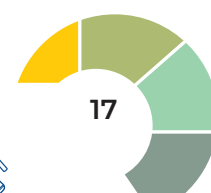
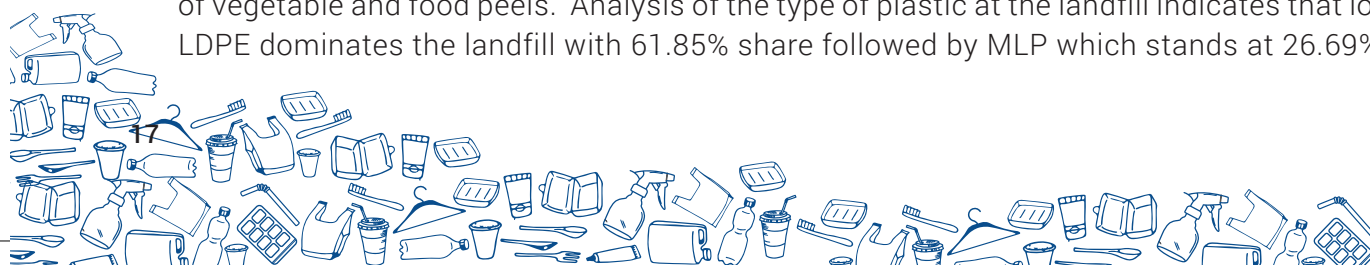
In Rajasthan, though about 97% of the total waste generated is collected, however, only 18% of the total waste collected is treated. In municipal solid waste, plastic waste (PW) is one of the most rapid-growing waste streams all over the world. Plastic waste generation is approximately 72044.77 TPA during 2021-22 in Rajasthan whereas per capita plastic waste generation in the state is around 3.56 kg/capita/year which is well below the national average.

Management of plastic waste in the country is governed by Plastic Waste Management (Amendment) Rules, 2022. The objective of this study is Inventorization of plastic waste in the state of the Rajasthan which involves identification of the current status of the waste composition, and generation, and also to understand the existing ecosystem of plastic production, plastic waste recycling, and its management. The study has been categorized into two major sections, one is the quantification and characterization of waste on a sample basis in the identified cities and the second is to assess the existing ecosystem of plastic waste recycling and the knowledge, awareness, and practices of a citizen towards the management using random sampling techniques. This was arrived by carefully developing the questionnaires and formats. The study was undertaken in 15 major towns namely, Alwar, Bhiwadi, Neemrana, Jodhpur, Barmer, Pali, Mt Abu, Udaipur, Bhilwara, Ajmer, Jaipur, Kota, Bharatpur, Bikaner and Ganganagar divided into 5 clusters in the State of Rajasthan.

During the characterization exercise, the waste was primarily categorized as dry and wet waste. The dry waste was further categorized into dry waste other than plastic (cardboard; paper and millboard; shoes-leather and rubber separately; cloth; metal; glass; domestic Hazardous waste; compostable bags) and plastic waste (PET; HDPE; LDPE; PVC; PP; PS; MLP and packaging wrappers). Under the plastic waste, LDPE, HDPE and Single Use Plastics (SUPs) were further categorized to get a clear understanding of the waste types obtained during the characterization.

A detailed assessment of all the plastic waste recyclers engaged in recycling of plastic waste was carried out to know their current status, type of waste recycled, the final product manufactured, source of raw material, environmental management of the unit, and status of statutory compliances like consent to from Rajasthan State Pollution Control Board (RSPCB). Likewise, a survey of industries engaged in the manufacturing of plastic products was also carried out and a total of 175 industrial units were surveyed. Status of Producers, Importers, Brand Owners (PIBOs), and Plastic Waste Processors (PWPs) in the state was also ascertained and as per the detailed available at CPCB portal, there are 20 Producers, 6 Importers, and 8 Brand Owners who have so far registered as on 31st October 2022.

In the waste characterization study, waste from each city under study was characterized and an overall waste composition and characterization of 15 cities was carried out. It has been observed that the percentage of wet waste is significantly high in total solid waste composition. In the wet waste, the highest fraction of 69.45% was of leftover food waste followed by 20.74% of vegetable and food peels. Analysis of the type of plastic at the landfill indicates that low-value LDPE dominates the landfill with 61.85% share followed by MLP which stands at 26.69%.



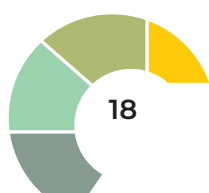
Quantification of the MSW was carried out in all the identified 15 cities. Analysis of data shows that Jaipur has the highest waste generation with 1508 TPD, and Neemrana is at the bottom with 4.16 TPD. Total MSW generation in the state was assessed as 7823.26 TPD out of which wet waste was 6025.59 TPD (77.02%), followed by plastic waste which was 496.51 TPD (6.35%). Paper waste was 369.12 TPD (4.72%) and textile waste was 412.08 TPD (5.27%). Total plastic waste generated in 15 identified cities was 276.20 TPD with the average per capita plastic waste generation being 0.03 per capita per day.

Management of plastic and municipal Solid Waste in the entire state was also assessed during the study and it was revealed that presently there are 31 municipal solid waste treatment and processing facilities in operation in the state. Further, six more municipal solid waste processing facilities and one waste-to-energy plants are under installation and two bio-methanation plants (both are in Udaipur) are operational in the state (RSPCB Annual Report 2021-22). Overall, Udaipur is the only town in the state which is having a door-to-door collection, good waste segregation, and waste processing infrastructure.

While carrying out the characterization studies for plastic and other waste streams from households, hotels, markets, institutions, Mandi, etc, the single use plastics (SUPs) were also separately characterized from the plastic waste, and the quantum of various SUPs streams was assessed. 15 manufacturing industries have also been set up in the state to manufacture alternates for SUPs. During the study, a detailed survey and assessment of hotspot where waste is disposed off indiscriminately was carried out in all the identified 15 cities, and a total of 75 such hotspots were assessed in all the cities. The kind of waste which is dumped at the hotspots was also analyzed and it came out that dry waste from market places (21%), mixed household waste (20%), waste from party functions (13%), and wet waste from sabji mandi (12%) are the major waste streams found during the survey.

Waste pickers are an integral part of the waste management system. During the survey carried out of waste pickers, 94 male waste collectors and 46 female waste collectors were interviewed. The data obtained was analyzed based on gender as well as cumulatively to draw important inferences and trends. The survey of the waste collectors brought out a wealth of information which will be very useful in designing evidence-based schemes for the upliftment of this very important stakeholder in the waste management value chain. A Survey of scrape dealers was also undertaken in all the identified 15 cities. During the survey, data were collected from 105 scrap dealers in all the identified cities. Overall, the survey has highlighted important issues faced by scrap dealers which are a vital part of the waste management hierarchy.

The study brought out major challenges faced by various stakeholders such as plastic waste recyclers, urban local bodies, plastic product manufactures, PIBOs, material recycling facilities, waste management agencies, waste pickers, scrape dealers, NGOs, citizens etc. and the report



has also suggested recommendations and action to be taken in time bound manner by each stakeholder to overcome the challenges.

The study instituted by RSPCB is very strategic and timely to uncover what and how the waste management systems can be strengthened in the state. As, in the present context of today, humans generate more than 2 billion tons of garbage per year recording to the World Bank report 2018; or approximately 4.5 trillion pounds annually and the figure is growing global impact is expected to reach 3.4 billion tons by 2050 therefore avoidable easy to handle and localized appropriate technology solutions are the need of the hour. Yes, the State and the RSPCB along with NGT directions is keen to put away with landfills as they are not a sustainable solution; leading to daily greenhouse gas emissions contributing to climate change. The different technologies and the recommendations listed in the report for different stakeholders, as and when adopted, even partially can play a very effective tool to minimize effect on the environment, including CO₂ emissions and at the same time to maximize efficiency.

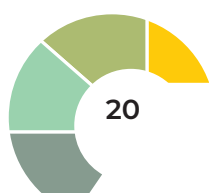


Guiding Principles for

Format development

The team followed certain principles for developing the proposed format to be used in the study:

1. The base document was the Inventorisation of plastics (IoP) in the state of Rajasthan
2. The IoP framework with defined terms of reference was examined in the context of the current Plastic waste management rules, 2016, 2018, and 2022, and Solid waste management rules 2016, and the prevalent non-financial reporting frameworks to formulate a holistic, all-encompassing format containing the essential elements of non-financial sustainability reporting.
3. The formats were developed to serve as a single comprehensive source of non-financial, sustainability information relevant to all dry & plastic waste ecosystem (D&PWE) stakeholders – citizens and the public at large; recyclers; producers, importers, and brand owners (PIBOs); waste aggregators small and large (in terms of business); waste pickers, markets, hotels, and institutions; regulators, institutions – cooperatives, Self Help Groups (SHGs), Non-Governmental Organisations (NGOs) and plastic manufacturers and informal recyclers at large.
4. The formats were developed to be simple, and mindful of the burden and cost of compliance by businesses so as not to be arduous or repetitive.
5. The information sought in the formats is a mix of quantitative and qualitative data within a timeframe (QQT approach). Quantitative data allows for easy measurement and comparability across different stakeholders (as enumerated above) companies, sectors, and in time. Qualitative data helps capture the unique ways in which organisations have implemented and embedded responsible business behaviour. These may be adopted and adapted by other stakeholders and businesses to their contexts. Both are sought after in a time frame giving it the required relevance and importance to draw from results (outputs) and impacts (outcomes).
6. The formats were developed keeping in view all stakeholders in the dry & plastic waste ecosystem – Formal-registered with the Rajasthan State Pollution Control Board (RSPCB) as well as Informal-unregistered with RSPCB. However, different reporting requirements have been considered for different classes of stakeholders especially small informal companies/NGOs.
7. The format was developed as questionnaires that allow stakeholders and businesses to share aspects material to them, are amenable to measurement, comparable, reliable, and, machine-readable.
8. The format was developed with a view to be filled electronically and integrated with the database. Keeping in view the guiding principles, the team of the report analysed the filings being made by the stakeholders in 15 different Cities of the state; studied the prevalent non-financial, sustainability frameworks already being used by stakeholders or businesses for making disclosures; and examined the need for a comprehensive non-financial and sustainability reporting requirement. These deliberations and observations of the team constitute the following chapters.



List of Abbreviation

AFR	Alternative Fuels or Raw Material
BCC	Behaviour Change Communication
BPL	Below Poverty Line
BWGs	Bulk Waste Generators
CE	Circular Economy
CEE	Centre for Environment Education
CIPET	Central Institute of Petrochemicals Engineering & Technology
CPCB	Central Pollution Control Board
CSOs	Civil Society Organizations
CSR	Corporate Social Responsibility
CTE	Consent to Establish
CTO	Consent to Operate
DIC	District Industries Centre
EPR	Extended Producer Responsibility
EWS	Economically Weaker Section
FMCG	Fast Moving Consumer Goods
GST	Goods and Services Tax
HDPE	High-Density Polyethylene
HH	Household
IEC	Information, Education and Communication
IIT	Indian Institute of Technology
KYC	Know Your Customer
LDPE	Low-Density Polyethylene
LSG	Local Self Governance



MoEFCC	Ministry of Environment, Forests and Climate Change
MoHUA	Ministry of Housing and Urban Affairs
MLP	Multi-Layer Plastic
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
MT	Million Tonnes
NGOs	Non Governmental Organizations
PET	Polyethylene Terephthalate
PIBO	Producer, Importer and Brand Owner
PP	Polypropylene
PROs	Product Responsibility Organizations
PS	Polystyrene
PVC	Poly-Vinyl Chloride
PWM	Plastic Waste Management
PWP	Plastic Waste Processors
RSPCB	Rajasthan State Pollution Control Board
RWAs	Resident Welfare Associations
RO	Regional Officer
SBM	Swachh Bharat Mission
SHGs	Self Help Groups
SOP	Standard Operating Procedure
SPCB	State Pollution Control Board
SWM	Solid Waste Management
TPD	Tonnes Per Day
ULBs	Urban Local Bodies



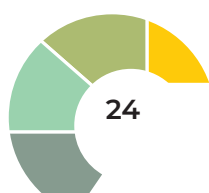
Definitions of Key Words

1. “biodegradable waste” means any organic material that can be degraded by microorganisms into simpler stable compounds;
2. “bulk waste generator” means and includes buildings occupied by the Central government departments or undertakings, State government departments or undertakings, local bodies, public sector undertakings or private companies, hospitals, nursing homes, schools, colleges, universities, other educational institutions, hostels, hotels, commercial establishments, markets, places of worship, stadia and sports complexes having an average waste generation rate exceeding 100 kg per day;
3. “carry bags” mean bags made from plastic material or compostable plastic material, used to carry or dispense commodities that have a self-carrying feature but do not include bags that constitute or form an integral part of the packaging in which goods are sealed before use;
4. “combustible waste” means non-biodegradable, non-recyclable, non-reusable, non-hazardous solid waste having a minimum calorific value exceeding 1,500 kcal/kg and excluding chlorinated materials like plastic, wood pulp, etc.;
5. “commodity” means a tangible item that may be bought or sold and includes all marketable goods or wares;
6. “compostable plastics” mean plastic that undergoes degradation by biological processes during composting to yield CO₂, water, inorganic compounds, and biomass at a rate consistent with other known compostable materials, excluding conventional petro-based plastics, and does not leave visible, distinguishable, or toxic residue;
7. “consent” means the consent to establish and operate from the concerned State Pollution Control Board or Pollution Control Committee granted under the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974), and the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981);
8. “composting” means a controlled process involving microbial decomposition of organic matter;
9. “decentralized processing” means the establishment of dispersed facilities for maximizing the processing of biodegradable waste and recovery of recyclables closest to the source of generation to minimize the transportation of waste for processing or disposal;
10. “disposal” means the final and safe disposal of post-processed residual solid waste and inert street sweepings and silt from surface drains on land as specified in Schedule I of Solid Waste Management Rules, 2016 to prevent contamination of ground water, surface water, ambient air and attraction of animals or birds;
11. “domestic hazardous waste” means discarded paint drums, pesticide cans, CFL bulbs, tube



lights, expired medicines, broken mercury thermometers, used batteries, used needles and syringes and contaminated gauges, etc., generated at the household level;

12. "door to door collection" means the collection of solid waste from the doorstep of households, shops, commercial establishments, offices, institutional or any other non-residential premises and includes the collection of such waste from the entry gate or a designated location on the ground floor in a housing society, multi-storied building or apartments, large residential, commercial or institutional complex or premises;
13. "dry waste" means waste other than biodegradable waste and inert street sweepings and includes recyclable and non-recyclable waste, combustible waste and sanitary napkins and diapers, etc.;
14. "dumpsites" means land utilised by the local body for disposal of solid waste without following the principles of sanitary landfilling;
15. "extended producer responsibility" (EPR) means the responsibility of any producer of packaging products such as plastic, tin, glass and corrugated boxes, etc., for environmentally sound management, till the end-of-life of the packaging products;
16. "facility" means any establishment wherein the solid waste management processes namely segregation, recovery, storage, collection, recycling, processing, treatment, or safe disposal are carried out;
17. "handling" includes all activities relating to sorting, segregation, material recovery, collection, secondary storage, shredding, baling, crushing, loading, unloading, transportation, processing, and disposal of solid wastes;
18. "institutional waste generator" means and includes occupier of institutional buildings such as building occupied by Central Government Departments, State Government Departments, public or private sector companies, hospitals, schools, colleges, universities or other places of education, organization, academy, hotels, restaurants, malls and shopping complexes;
19. "inert" means wastes that are not biodegradable, recyclable, or combustible street sweeping or dust and silt removed from the surface drains;
20. "incineration" means an engineered process involving the burning or combustion of solid waste to thermally degrade waste materials at high temperatures;
21. "informal waste collector" includes individuals, associations, or waste traders who are involved in the sorting, sale, and purchase of recyclable materials;
22. "non-biodegradable waste" means any waste that cannot be degraded by microorganisms into simpler stable compounds;
23. "Non-woven plastic bag" means a Non-woven plastic bag made up of plastic sheet or web-



structured fabric of entangled plastic fibers or filaments (and by perforating films) bonded together by mechanical or thermal or chemical means, and the “non-woven fabric” means a flat or tufted porous sheet that is made directly from plastic fibers, molten plastic or plastic films;

24. “materials recovery facility” (MRF) means a facility where non-compostable solid waste can be temporarily stored by the local body or any other entity mentioned in rule 2 or any person or agency authorised by any of them to facilitate segregation, sorting, and recovery of recyclables from various components of waste by authorised informal sector of waste pickers, informal recyclers or any other workforce engaged by the local body or entity mentioned in rule 2 of Solid Waste Management Rules, 2016 for the purpose before the waste is delivered or taken up for its processing or disposal;
25. “manufacturer” means and includes a person or unit or agency engaged in the production of plastic raw material to be used as raw material by the producer.
26. “multi-layered packaging” means any material used or to be used for packaging and having at least one layer of plastic as the main ingredient in combination with one or more layers of materials such as paper, paper board, polymeric materials, metalized layers or aluminum foil, either in the form of a laminate or co-extruded structure
27. “plastic” means material that contains as an essential ingredient a high polymer such as polyethylene terephthalate, high-density polyethylene, Vinyl, low-density polyethylene, polypropylene, polystyrene resins, multi-materials like acrylonitrile butadiene styrene, polyphenylene oxide, polycarbonate, Polybutylene terephthalate;
28. “plastic sheet” means a sheet made of plastic;
29. “plastic waste” means any plastic discarded after use or after its intended use is over;
30. “plastic waste processing” means any process by which plastic waste is handled for the purpose of reuse, recycling, co-processing, or transformation into new products
31. “plastic packaging” means packaging material made by using plastics for protecting, preserving, storing, and transporting of products in a variety of ways.
32. “primary collection” means collecting, lifting, and removal of segregated solid waste from the source of its generation including households, shops, offices, and any other non-residential premises or from any collection points or any other location specified by the local body;
33. “processing” means any scientific process by which segregated solid waste is handled for the purpose of reuse, recycling, or transformation into new products;
34. “recycling” means the process of transforming segregated non-biodegradable solid waste into new material or product or as raw material for producing new products which may or may not be similar to the original products;



35. "refused derived fuel" (RDF) means fuel derived from the combustible waste fraction of solid waste like plastic, wood, pulp, or organic waste, other than chlorinated materials, in the form of pellets or fluff produced by drying, shredding, dehydrating and compacting of solid waste;
36. "residual solid waste" means and includes the waste and rejects from solid waste processing facilities that are not suitable for recycling or further processing;
37. "sanitary landfilling" means the final and safe disposal of residual solid waste and inert wastes on land in a facility designed with protective measures against pollution of ground water, surface water, fugitive air dust, wind-blown litter, bad odor, fire hazard, animal menace, bird menace, pests or rodents, greenhouse gas emissions, persistent organic pollutants slope instability, and erosion;
38. "secondary storage" means the temporary containment of solid waste after collection at secondary waste storage depots or MRFs or bins for onward transportation of the waste to the processing or disposal facility;
39. "segregation" means sorting and separate storage of various components of solid waste namely biodegradable wastes including agriculture and dairy waste, non-biodegradable wastes including recyclable waste, non-recyclable combustible waste, sanitary waste, and non-recyclable inert waste, domestic hazardous wastes, and construction and demolition wastes;
40. "Single-use plastic commodity" means a plastic item intended to be used once for the same purpose before being disposed of or recycled;
41. "solid waste" means and includes solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering, and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture, and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, and radio-active waste generated in the area under the local authorities and other entities mentioned in rule 2016;
42. "sorting" means separating various components and categories of recyclables such as paper, plastic, cardboard, metal, glass, etc., from mixed waste, as may be appropriate to facilitate recycling;
43. "transfer station" means a facility created to receive solid waste from collection areas and transport it in bulk in covered vehicles or containers to waste processing and, or, disposal facilities;
44. "transportation" means a conveyance of solid waste, either treated, partly treated, or untreated from one location to another location in an environmentally sound manner



through a specially designed and covered transport system so as to prevent foul odour, littering, and unsightly conditions;

45. "treatment" means the method, technique, or process designed to modify physical, chemical, or biological characteristics or composition of any waste to reduce its volume and potential to cause harm;
46. "user fee" means a fee imposed by the local body and any entity mentioned in rule 2 on the waste generator to cover the full or partial cost of providing solid waste collection, transportation, processing, and disposal services.
47. "waste generator" means and includes every person or group of persons, every residential premise, and non-residential establishments including Indian Railways, and Defence Establishments, which generate solid waste;
48. "waste to energy" means using plastic waste for the generation of energy and includes co-processing (e.g. in cement kilns).
49. "waste hierarchy" means the priority order in which the solid waste is to be managed by giving emphasis to prevention, reduction, reuse, recycling, recovery, and disposal, with prevention being the most preferred option and disposal at the landfill being the least;
50. "Waste picker" means a person or groups of persons informally engaged in the collection and recovery of reusable and recyclable solid waste from the source of waste generation the streets, bins, material recovery facilities, processing, and waste disposal facilities for sale to recyclers directly or through intermediaries to earn their livelihood.







CHAPTER

1

Introduction





CHAPTER

1

Introduction

1.1 Current Scenario of Municipal Solid Waste & Plastic Waste Management¹

Solid waste management (SWM) is a crosscutting problem that influences different facets of growth in all three domains of sustainability: environment, economy, and society. Global waste is expected to grow to 3.4 billion tonnes by 2050 from the current 2.01 billion tonnes. As per the Annual Report published by CPCB under the Solid Waste management Rules, 2016, the total quantity of solid waste generated in the country is 160038.9 TPD of which 152749.5 TPD of waste is collected at a collection efficiency of 95.4%. 79956.3 TPD (50%) of waste is treated and 29427.2 (18.4%) TPD is landfilled. 50655.4 TPD which is 31.7 % of the total waste generated remains unaccounted for. As per the report, around 119 gm of solid waste is generated per capita per day.

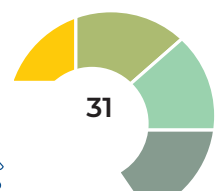
Plastic Waste represents 8% of the total waste generated in India. As per the annual report for the year 2019-2020, published by CPCB, plastic waste generation in the country is 34,69,780 Tons. Per capita plastic waste generation in the country has increased from around 0.750 kg per person per year to around 2.4 kg per person per year in the last five years.

In Rajasthan, the estimated plastic waste generation is approximately 72044 TPA during 2021-22. Per capita plastic waste generation in the state of Rajasthan based on waste generated in 2021-2022 is very low and comes out to be around 1.3 kg/capita/year which is well below the national average per capita plastic waste generation of 2.4 kg/capita/year.

Plastic waste (PW) is one of the most rapid-growing waste streams in municipal solid waste all over the world. The global plastics industry marked its beginning in the year 1907 with the production of the first synthetic plastic-bakelite. In 1950, only 2 million tonnes of plastic were produced globally which rose to 359 million in 2018. An analysis of plastic production rates shows that in a span of around 68 years from 1950 to 2018, plastic consumption increased about 180 times. Figure 1 highlights the per capita consumption of plastics in developed and developing countries. Plastic production is likely to increase two-fold globally by 2040, and by 2050, reaching an estimated 1600 million tons. It is also estimated that from 1950 to 2015, 6.3 billion tons of plastic waste was generated globally out of which only 9% was recycled and the rest was disposed of through landfill.

As per the annual report filed by Rajasthan State Pollution Control Board for the year 2021-2022 under Solid Waste Management Rules, 2016, the total quantity of municipal solid waste generated in the state of Rajasthan is 7973.156 TPD. Out of the total waste generated, about 7859.356 Tons (98.57%) is collected through the door-to-door collection mechanism. However, only 1925.97 Tons (24.50% of the total waste collected) is treated and the rest is disposed of through a landfill. Out of 207 ULBs, segregation is practiced only in 104 ULBs.

¹ Annual Report on Solid Waste Management (2020-21), CPCB, Delhi



There are 31 municipal solid waste treatment and processing facilities presently in operation in the state. Further, six more municipal solid waste processing facilities and one waste-to-energy plants are under installation and two bio-methanation plants (both are in Udaipur) are operational in the state (RSPCB Annual Report 2021-22). Overall, Udaipur is the only town in the state which is having a door-to-door collection, good waste segregation, and waste processing infrastructure.

India has become a global player in the plastic value chain despite low consumption which is 11 kg per capita/year, whereas the global average is recorded at 28 kg. Despite its low consumption of plastic, India is the second largest producer (14.17 million tonnes (MT)) of plastic polymers in the world. Plastic production and consumption in India are increasing at a very rapid pace, and the majority of production is related to HDPE, LDPE, and PP. In 2018–2019, consumption was 913 kilotons (kt), which increased to 964 kt in 2019–2020, with a year-on-year growth rate of 5.5%.

Plastic Waste represents 8% of the total waste generated in India. As per the annual report for the year 2019-2020, published by CPCB, plastic waste generation in the country is 34,69,780 Tons. Per capita plastic waste generation in the country has increased from around 0.750 kg per person per year to around 2.4 kg per person per year in the last five years. In Rajasthan, the estimated plastic waste generation is approximately 51965.5 TPA during 2019-20. Per capita plastic waste generation in the state of Rajasthan based on waste generated in 2019-2020 is very low and comes out to be around 1.3 kg/capita/year which is well below the national average per capita plastic waste generation of 2.4 kg/capita/year.

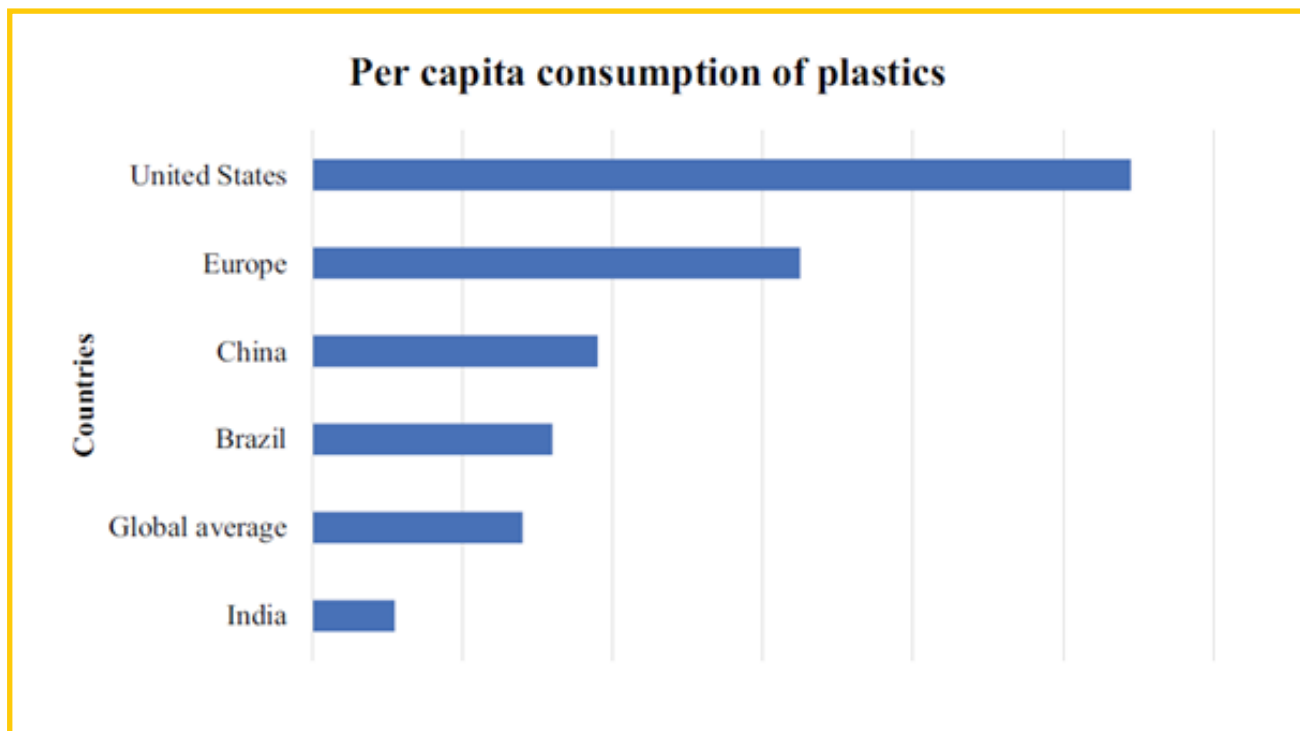


Figure 1: Consumption of plastics in developed and developing countries (FICCI 2014)

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1.2 Major Acts and Guidelines for Plastic Waste Management in India

To address the challenges of managing municipal solid waste and plastic waste in the country, India started setting up its regulatory framework on waste management almost two decades ago. In 2000, the Ministry of Environment, Forests, and Climate Change notified the first-ever law on waste management in the form of the Municipal Solid Wastes (Management and Handling) Rules. Since then, the country's waste management regulations have developed in several aspects and undergone a massive transformation.

The Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India notified the Plastic Waste Management Rules, 2016, as one comprehensive rule that encompasses all the amendments since the first rules were released for PWM in India in 1999 (Recycled Plastic Manufacturing and Usage Rules 1999).

The 2016 rules replaced the earlier Plastic Waste (Management and Handling) Rules 2011. In 2018, an amendment was brought about to this rule. Other amendments to the Plastic Waste Management Rules 2016 were brought about in August 2021, September 2021, and February 2022. Now the rule is called as Plastic Waste Management (Amendment) Rules, 2022. These define the duties of various stakeholders such as Local bodies, Gram Panchayats, Waste generators, Producers, Importers, and Brand Owners, and regulatory agencies such as State Pollution Control Boards/Committees and Central Pollution Control Boards. Fig. 2 represents the timeline evolution of plastic waste management regulations in India.

The new rules are centered on a philosophy of circular economy in which waste is treated as an important resource to replace virgin raw materials. It aims for a more efficient regulatory framework for the management of plastic waste generated in the country.

At the same time, it will give impetus to plastic waste minimization, source segregation, and recycling, involving waste pickers, recyclers, and waste processors in the collection of the plastic waste fraction either from households or any other source of its generation or intermediate material recovery facility and adopt the polluters pay principle for the sustainability of the waste management system.



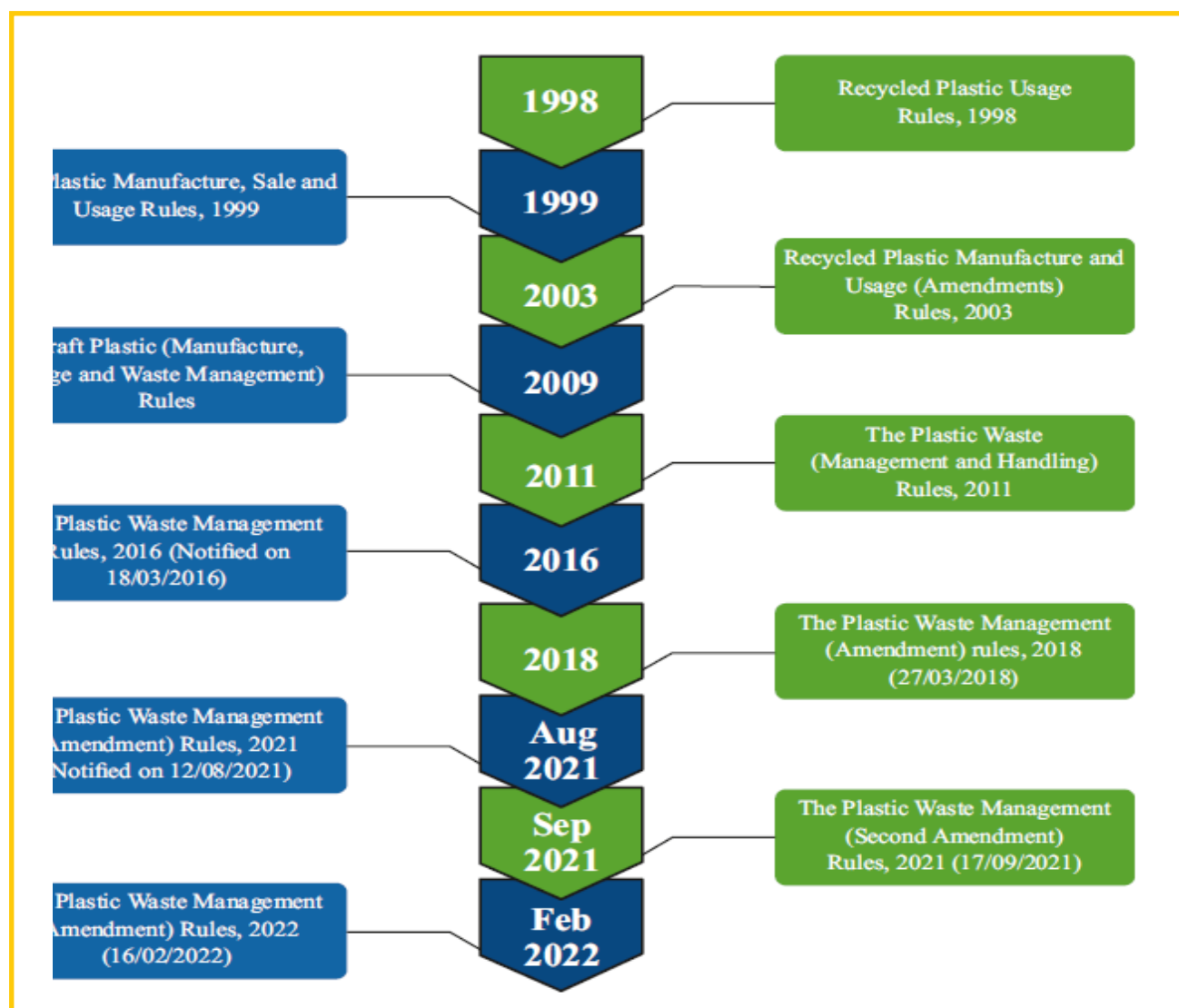


Figure 2: Timeline for Plastic Waste Management Rules in India

1.2.1 Ban on Single Use Plastics

According to PWM Rules, 2016 as amended, Single-use plastic commodity is defined as a plastic item intended to be used once for the same purpose before being disposed of or recycled. Recently, policymakers have laid significant focus on single-use plastic while working on the Plastic Waste Management Rules. As a result, the Plastic Waste Management (Amendment) Rules, 2021 prohibits identified SUP items that have low utility and high littering potential from 1.07.2022. As per the rules notified on 12.08.2021, the manufacture, import, stocking, distribution, sale, and use of the following single-use plastic, including polystyrene and expanded polystyrene, commodities shall be prohibited with effect from the 1st July 2022²:

- Ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene (Thermocol) for decoration.
- Plates, cups, glasses, cutlery such as forks, spoons, knives, straws, trays, wrapping or packaging films around sweet boxes, invitation cards, cigarette packets, plastic or PVC

2 Ministry of Environment, Forest & Climate Change has issued notification No G.S.R. 571 (E) dated 12th August, 2021.



banners less than 100 microns, and stirrers.³

In order to stop littering due to lightweight plastic carry bags, with effect from 30th September 2021, the thickness of plastic carry bags has been increased from fifty microns to seventy-five microns and to one hundred and twenty microns w.e.f. 31st December 2022. **However, in the State of Rajasthan, plastic carry bags excluding compostable plastic carry bags are completely banned vide state government notification dated 21.07.2010.**

1.2.2 Provisions related to Extended Producers Responsibility

The Government of India, vide notification dated 16.02.2022 has notified Guidelines on Extended Producer Responsibility for Plastic Packaging by bringing an amendment in the Plastic Waste Management Rules, 2016. As per the notification, Producers, Importers, and Brand Owners (PIBOs) are responsible to comply with the provisions related to Extended Producer Responsibility for environmentally sound management of the product until the end of its life. This means the PIBOs are responsible to develop and execute the collection back mechanism for the equivalent quantity of plastic waste packaging waste introduced directly or through the sale of their products into the Indian market within six months from the date of notification of these Rules. The rules classify plastic waste into four categories as shown in Table 1.

Table 1: Classification of various categories of plastic

Category	Classification
Category I	Rigid plastic packaging (e.g. packaging in the form of bottles and containers)
Category II	Flexible plastic packaging of single layer or multilayer (more than one layer with different types 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)
Category IV	Plastic sheet or like used for packaging as well as carry bags made of compostable plastic

The rules also lay down category-wise targets for the collection, reuse, recycling, and use of recycled plastic by PIBOs. Under the rules both pre-consumer and post-consumer plastic waste is covered under EPR. PIBOs are also required to get online registration from CPCB (if operating in more than two States/UT) or with respective SPCB/PCC.

Filing of annual returns by Producers, Importers & Brand- Owners, and plastic waste processors is mandatory under the rules. SPCBs/PCC is also required to fill online annual report on EPR. Figure 3 details the important steps to fulfil EPR obligations.

3 Central Pollution Control Board, Delhi



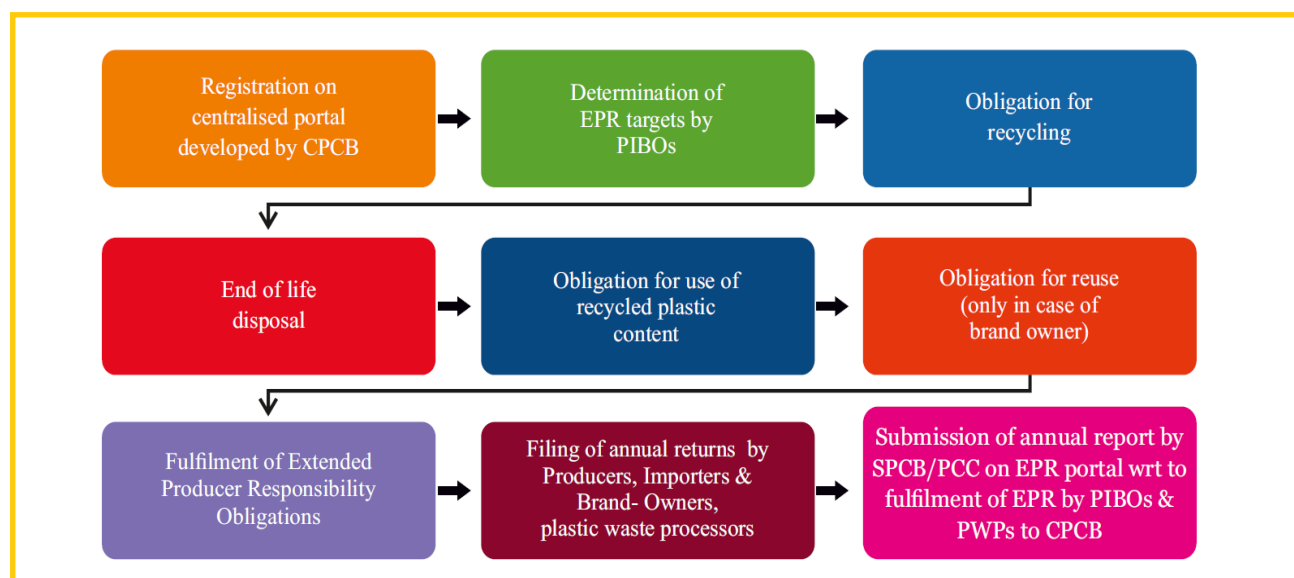


Figure 3: Standard Steps to fulfil EPR Obligations

1.3 Salient Features of the Study Area-The State of Rajasthan

1.3.1 Geographical Location and Physiography

Rajasthan is a state of north-western India, located in the north-western part of the Indian subcontinent. It is bounded to the north and northeast by the states of Punjab and Haryana, to the east and southeast by the states of Uttar Pradesh and Madhya Pradesh, to the southwest by the state of Gujarat, and the west and northwest by the provinces of Sindh and Punjab in Pakistan. The capital city is Jaipur, in the east-central part of the state.

The Aravalli (Aravalli) Range forms a line across the state running roughly from Guru Peak on Mount Abu (5,650 feet [1,722 meters]), near the town of Abu in the southwest, to the town of Khetri in the northeast. About three-fifths of the state lies northwest of that line, leaving the remaining two-fifths in the southeast. Those are the two natural divisions of Rajasthan. The north-western tract is generally arid and unproductive, although its character shifts gradually from desert in the far west and northwest to comparatively fertile and habitable land toward the east. The region includes the Thar (Great Indian) Desert.

1.3.2 Climate

Rajasthan has a wide range of climate that varies from extremely arid to humid. The humid zone spans the southeast and east. Except in the hills, the heat during the summer is intense everywhere, with temperatures in June—the warmest month—typically rising from the mid-80s F (about 30 °C) to nearly 110 °F (low 40s C) daily. Hot winds and dust storms occur in the summer, especially in the desert tract. In January—the coolest of the winter months—daily maximum temperatures range from the upper 60s to the mid-70s F (low to mid-20s C), while minimum temperatures are generally in the mid-40s F (about 7 °C). The western desert has little rain, averaging about 4 inches (100 mm) annually. In the southeast, however, some areas may receive almost 20 inches (500 mm). South-eastern Rajasthan benefits from both the Arabian Sea and Bay of Bengal branches of the southwest (summer) monsoon winds, which bring the bulk of the annual rainfall.



1.3.3 Demography

As per Census 2011, the State's population is 6.86 Crores out of which around 24.87% of people live in urban regions and 75.13% people in rural areas. There are 33 districts, 196 Urban Local Bodies (ULBs), 295 Panchayat Samitis, and 9,892 Gram Panchayats (GPs) in Rajasthan. Rajasthan covers 342,239 square km or 10.4 % of India's total geographical area. It is the largest Indian state by area and the seventh largest by population.

Jaipur is the capital and largest city in the state. Other important cities are Jodhpur, Kota, Bikaner, Ajmer, Bharatpur, and Udaipur. The entire state of Rajasthan is divided into seven divisions and each division comprises four to six districts. The constitution of each division is shown in Fig 4.

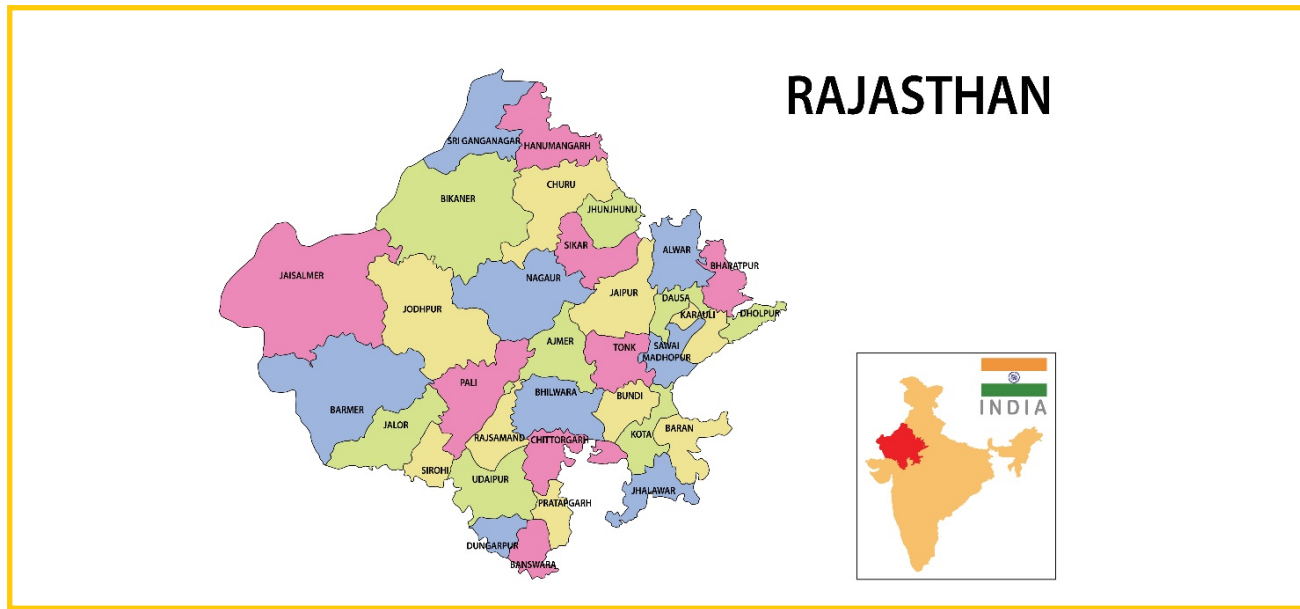


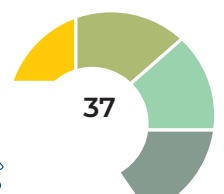
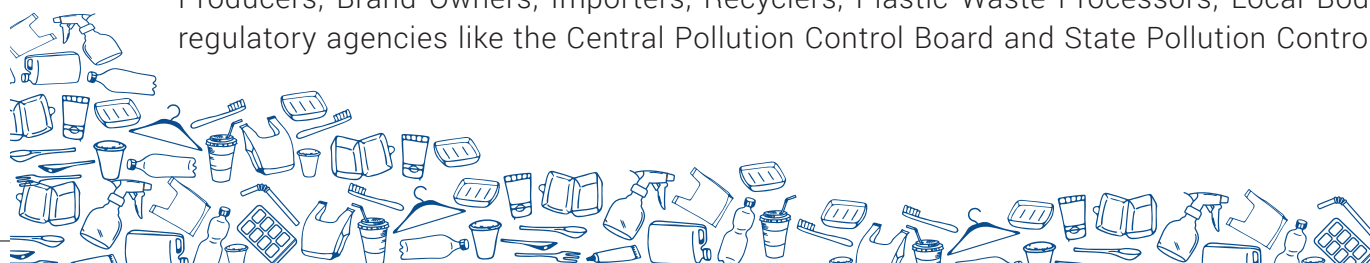
Figure 4: Administrative Map of Rajasthan

Rajasthan is a mineral-rich state and has a diversified economy having agriculture, mining, and tourism as its main engines of growth. Economically, Rajasthan is the seventh-largest state in India with Rs.10.20 lakh crore in gross domestic product and a per capita GDP of Rs. 118,000. Rajasthan ranks 29th among Indian states in the human development index. The state mines produce gold, silver, sandstone, limestone, marble, rock phosphate, copper, and lignite. It is the second-largest producer of cement and contributes one-tenth of the salt produced in India.

Tourism is an important economic activity in the state. The palaces of Jaipur, the lakes of Udaipur, and the desert forts of Jodhpur, Bikaner & Jaisalmer are among the most common destinations for tourists. Tourism accounts for 16% of the state's domestic product. Some of the towns of religious importance are Ajmer, Pushkar, Bikaner, Jaipur, Udaipur, Mount Abu, and Jodhpur where important places of worship for all the communities are located.

1.4. Stakeholders in Plastic Waste Management, their Roles and Responsibilities

Plastic waste management requires the involvement of various stakeholders which include Producers, Brand Owners, Importers, Recyclers, Plastic Waste Processors, Local Bodies, and regulatory agencies like the Central Pollution Control Board and State Pollution Control Board/



Committees. Synergy and coordination among all the stakeholders are necessary for the effective implementation of the Rules. Table 2⁴ depicts various stakeholders, their definitions, and the roles each of them is required to play.

Table 2: Various Stakeholder, their definition and Role in Plastic Waste Management

Stakeholder	Definition	Responsibility
Producer	Person engaged in manufacture or import of carry bags or multi-layered packaging or plastic sheets or like, and includes industries or individuals using plastic sheets or like or covers made of plastic sheets or multi-layered packaging for packaging or wrapping the commodity	<ul style="list-style-type: none"> • Submit an online application on the CPCB portal for registration. • Set up a mechanism for the collection of plastic waste for its recycling or end-of-life disposal. • Discontinue production of Single Use Plastic (SUP) items as notified in PWM Rules dated 12th August 2021. • Submission of the annual report against its approved EPR action plan. • Shall not carry any business without registration obtained through an online centralized portal developed by Central Pollution Control Board.
Importer	Person who imports plastic packaging or products with plastic packaging or carry bags or multi-layered packaging or plastic sheets or like	<ul style="list-style-type: none"> • Submit an online application on the CPCB portal for registration. • Set up a mechanism for the collection of plastic waste for its recycling or end-of-life disposal. • Submission of the annual report against its approved EPR action plan. • Shall not carry any business without registration obtained through an online centralized portal developed by Central Pollution Control Board.
Brand Owner	Person or company who sells any commodity under a registered brand label or trade Mark	<ul style="list-style-type: none"> • Submit an online application on the CPCB portal for registration. • Set up a mechanism for the collection of plastic waste for its recycling or end-of-life disposal. • Discontinue the use of Single Use Plastic (SUP) items as notified in the PWM Rule dated 12th August 2021. • Submission of the annual report against its approved EPR action plan. • Shall not carry any business without registration obtained through an online centralized portal developed by Central Pollution Control Board.

⁴ Plastic Waste Management Rules, dated February 16, 2022, notified 'Guidelines on Extended Producer Responsibility for Plastic Packaging' in the Schedule II of the Rules.



Stakeholder	Definition	Responsibility
Recyclers	Entities who are engaged in the process of recycling of plastic waste	<ul style="list-style-type: none"> Register with the concerned SPCB or PCC. Submit the annual returns after the end of every financial year by 30th April of the next financial year on the quantity of plastic waste recycled category-wise as per prescribed pro forma on the centralized portal developed by CPCB. The total quantity of plastic waste recycled and attributed to PIBOs, on an annual basis, will be made available on the centralized portal developed by the CPCB. Provide certificates for plastic recycled, except in case of the use of plastic waste in road construction. Shall not carry any business without registration obtained through an online centralized portal developed by the Central Pollution Control Board.
Plastic Waste Processors (PWPs)	Recyclers of plastic waste as well as entities engaged in using plastic waste for energy (waste to energy) including in coprocessing or converting plastic waste to oil (waste to oil) except in cases where feedstock chemicals are produced for further use in the production of plastic which may then be considered under recycling, industrial composting	<ul style="list-style-type: none"> Register with the concerned SPCB or PCC. Submit the annual returns after the end of every financial year by 30th April of the next financial year on the quantity of plastic waste processed category-wise as per prescribed pro forma on the centralized portal developed by the CPCB. The total quantity of plastic waste processed and attributed to PIBOs, on an annual basis, will be made available on the centralized portal developed by CPCB. Provide certificates for plastic waste processing, except in the case of the use of plastic waste in road construction. PWPs undertaking end-of-life disposal of plastic packaging waste viz. waste to energy, waste to oil, and cement kilns (co-processing) shall provide information on an annual basis as per prescribed pro forma, on the centralized portal developed by the CPCB. Shall not carry any business without registration obtained through an online centralized portal developed by the Central Pollution Control Board.
Central Pollution Control Board	Legal entity constituted under the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981. It is also responsible for implementation of various rules framed under Environment Protection Act, 1986 for management of various types of solid wastes.	<ul style="list-style-type: none"> Formulation of guidelines & SOP for the execution of EPR. Processing applications for registration if operating in more than two States/UT Development and maintenance of a centralised online portal to facilitate PIBOs and PWPs for registration and submission of their annual report. Holding stakeholder consultations. Coordination with SPCBs/PCCs. Data compilation.



Stakeholder	Definition	Responsibility
State Pollution Control Boards	Legal entities constituted under the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981. It is also responsible for implementation of various rules framed under Environment Protection Act, 1986 for management of various types of solid wastes.	<ul style="list-style-type: none"> • Shall ensure the constitute of State Level Advisory Committee headed by the Secretary, Urban Development Department (UDD). • Implementation of CPCB guidelines & SOPs related to EPR. • Processing applications for registration if operating one or two States/UT • Verifying the action plans & annual reports submitted by the PIBOs & PWP. • Establish regular dialogues with stakeholders. • Industry authorizations.
Urban Local Bodies	As defined in Solid Waste Management Rules, 2016 (Municipal corporation, Nagar Nigam, Municipal Council, Nagarpalika, Nagar Palika/Parishad, Municipal Board, Nagar Panchayat and Town Panchayat, Census Towns, notified areas and notified industrial townships with whatever name they are called in different States and union territories in India)	<ul style="list-style-type: none"> • Development and setting up of infrastructure for segregation, collection, storage, transportation, processing, and disposal of plastic waste either on its own or by engaging agencies or producers. • Setting up, operationalisation and co-ordination of the waste management system and for performing the associated functions, namely: - <ul style="list-style-type: none"> » Ensuring segregation, collection, storage, transportation, processing, and disposal of plastic waste; » ensuring that no damage is caused to the environment during this process; » ensuring channelization of recyclable plastic waste fraction to recyclers; » ensuring processing and disposal of non recyclable fractions of plastic waste in accordance with the guidelines issued by the Central Pollution Control Board; » creating awareness among all stakeholders about their responsibilities; » engaging civil societies or groups working with waste pickers; and » ensuring that open burning of plastic waste does not take place. • Shall seek the assistance of producers for setting up of a system for plastic waste management. • To frame bye-laws incorporating the provisions of these rules.





CHAPTER

2

Terms of Reference & Scope of the Project





CHAPTER

2

Terms of Reference & Scope of the Project

This study involves details of plastic waste processing, manufacturing, and recycling units in the State along with details of raw material used, sources of raw material, the capacity of recycling plastic waste, types of waste generated, and their respective quantities.

The scope of work for the proposed project was defined as below mentioned points;

Terms of Reference of the Study	Page#
List of complete plastic waste processing, manufacturing, and recycling units in the State along with details of raw material used, source of raw material, the capacity of recycling plastic waste, type of waste generated, and their respective quantities.	59-83
List of PIBOs required to take registration by CPCB & RSPCB separately along with details as per Annexure - 1.	85-104
Complete list of Single-use plastic manufacturing units & alternates of SUPs manufacturing units with item-wise capacity details.	159-169
Status of Registration with RSPCB and its validity (Manufactures/Recyclers/PIBOs).	59-83
Status of consent under the Water/Air act with RSPCB and its validity (Plastic processing units/Manufacturers/Recyclers).	59-83
Waste generation, segregation status, and disposal management of the plastic waste generated in the State.	112-115
To carry out Market Survey to check the availability of the items in the three categories (SUP/ plastics item (excluding SUP)/SUP Alternative). The sample size, location of the survey covering Municipal Corporations & village panchayats and other such details may be worked out.	159-169
Field survey may be carried out for PW characterization of plastic waste at different location covering littering hot spots, Solid Waste processing & disposal facilities as per Annexure 2.	162-163
The Institute should also suggest an action plan for different stakeholders in their report.	207-222
Population census for the generation of waste, including plastics.	139-148
Consumption patterns by the various classes of people in their respective cities.	111-136
Generation of waste as per the Urban Development Department (UDO) records from secondary sources.	144
The study follows the methodology using in-person interviews (At least 50 % of the total nos.) with different stakeholders in the waste value chain in the respective cities.	223
Others	
<ul style="list-style-type: none"> CEE will do an audit of all the authorized recyclers of the State to assess their production capacity in view of available space and other infrastructure (Plant & machinery). The geographical coordinates (latitude/longitude) of the units inventorised will be collected in a mutually agreed Performa. Study will formulate recommendations/action plan for effective Plastic Waste management in Rajasthan, in short-term and a sustainable long-term manner. CEE will collect the GPS locations of all the Plastic waste disposal sites (Hot-spots) and will be presented on a map. 	173-178







CHAPTER

3

Overview and Methodology for carrying out the Study





CHAPTER

3

Overview and Methodology for carrying out the Study

3.1 The Overall Strategy of the study

3.1.1 The Objectives of the Study

The objective of this study i.e., Inventorization of plastic waste in the state of the Rajasthan is to identify the current status of the waste composition, and generation, and also to understand the existing ecosystem of plastic production, plastic waste recycling, and its management.

This study has also envisaged to know the waste management practices in various cities and the behavioral aspects of different stakeholders towards plastic waste generation and its management.

Besides, an accurate data basis to determine the plastic waste quantities and qualities. An understanding of environmental, social, and governance (ESG) roles and responsibilities by different stakeholders in the ecosystem. Interaction of diverse stakeholders within the state and the current awareness level of citizens are imperative for supporting states in their management of plastic waste.

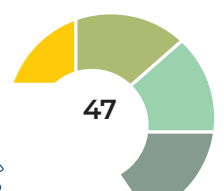
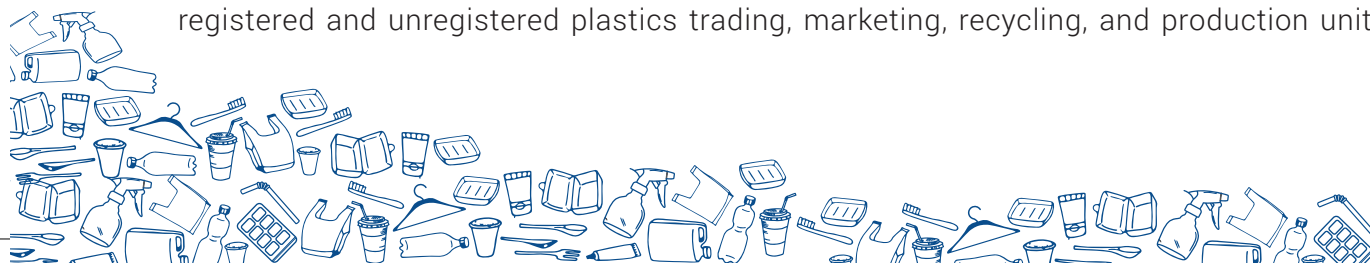
3.1.2 Study Methodology

The presented study was categorized into three major sections,

- (I) First one was to look into the primary and secondary sources and cumulate the list of complete plastic waste processing, manufacturing, and recycling units in the State along with details of raw material used, source of raw material, the capacity of recycling plastic waste, type of waste generated, and their respective quantities.
- (II) Second one was the quantification and characterization of waste on a sample basis in the identified cities and
- (III) Third was to assess using random sampling techniques the existing ecosystem of plastic waste recycling and the knowledge, awareness, and practices of a citizen towards the management. This was arrived by carefully developing the questionnaires and formats.

In the study, a total of 15 stakeholders were identified in the ecosystem and later analyzed with different sample sizes.

During the Inventorization of the plastic waste recycling, co-processing, manufacturing units, team has gone through the secondary data and primary physical visits of the industrial area to explore and identify these units. Team has rigorously visited to these scattered units of recycling plants to interview and assess their working as per the given formats. Team has screened the list of plastic manufacturing units provided by the DIC and other Plastic Manufacturing Associations to identify SUP manufacturers. The study focused to identify and assess existing registered and unregistered plastics trading, marketing, recycling, and production units in the



given 15 geographical locations of the state. This was verified by both secondary and primary sources, including the head and regional offices⁴ of the Rajasthan Pollution Control Board.

Waste quantification and characterization were conducted by an interdisciplinary team of two to three persons, with at least a woman in the team, to overcome biases and personal likes and dislikes and capture gender perspectives (as women talk and communicate better with women). The waste characterization was done into more than 20 different fractions, of dry waste⁵ was conducted in a three to four day time period in each city.

Nearly 08 different samples were collected from each of the stakeholders e.g. households, market, hotels, sabzi mandi, citizens, waste collectors/safai mitras, small informal aggregators (kabadiwalas), big aggregators, registered and unregistered recyclers, waste management agencies (WMAs) both companies, NGOs, community-based organisation (CBOs), self-help groups (SHGs) of the waste management agencies, RSPCBs and their regional officers, industrial units, plastics associations (plastic machinery manufacturing, plastics recycling, plastic manufacturing units {Virgin}) and the municipality/municipal corporations officials, etc. and landfills.

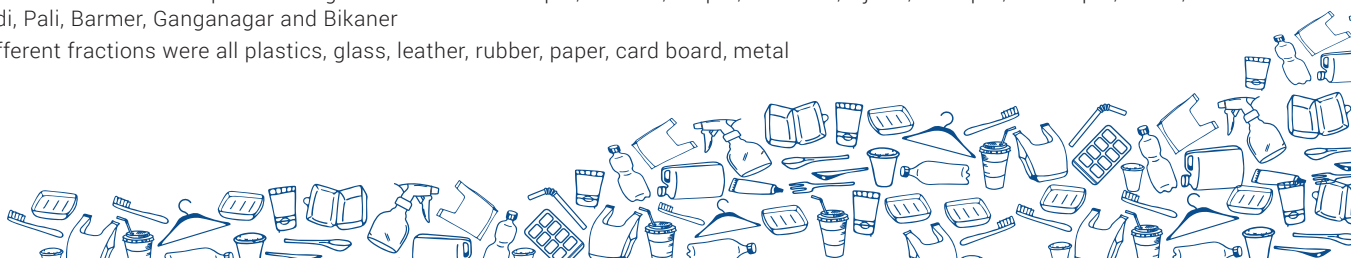
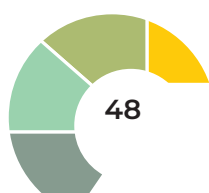
Please note that seasonal effects on public disposal behavior and waste composition are not mapped in this assessment; however, they have been evaluated through secondary literature and will be addressed and added during the proposed next phase of the study.

The study has been based on certain assumptions such as,

- Generally, the availability of accurate data on quantity of different types of wastes generated and their characteristics for Indian cities is commonly low as not many studies have made definite conclusions.
- The data on waste generation and recycling by different government agencies, waste contractors, municipalities, and literature sources vary widely in accuracy and relevance.
- During the study it was equally felt in the case of Rajasthan state, that wide variations existed on data from different sources on waste generation quantities and qualities and recyclability as most of the data presently available is based on rule of thumb and not on actual data collection and analysis.
- Following a standardized methodology reduces the uncertainty of values, however, cannot eliminate it. Especially when we all realize that the Indian waste sector is supported significantly through informal processes and actions. This poses a challenge for an appropriate and scientifically accurate methodology design. As a time-bound study, this assessment does not reflect seasonal, and wealth variabilities of waste quantities and qualities. The authors could not lay hands on secondary data sources to validate the seasonal and wealth variability.
- Quantification of the plastic waste and other waste have been done based on actual waste characterization carried out in 15 cities; and the same has been extrapolated for similar cities across the state assuming that these cities will have a similar characterization of various waste streams.
- Though, greater emphasis was laid by the study team in each city, to have a sufficient number of samples to represent various economic strata/user groups; it was collected to

4 The RSPCB head office Jaipur and Regional offices of Udaipur, Bikaner, Jaipur, Bhilwara, Ajmer, Jodhpur, Bharatpur, Alwar, Bhiwadi, Pali, Barmer, Ganganagar and Bikaner

5 The different fractions were all plastics, glass, leather, rubber, paper, card board, metal



reflect the true waste characterization. However, the authors cannot claim that all such variations were covered.

- The income groups for carrying out a sampling of the waste were defined indirectly by considering the plot size, width of streets and other observatory parameters of income/wealth classes as no direct assessment and sampling based on income was practically possible in the given time frame.
- The detailed methodology of data extrapolation is covered in the waste quantification chapter.
- Assessment of various stakeholders such as citizens, manufactures, scarp dealers, rag-pickers, Kabaddis, Waste Management Agencies, etc. is based on random interviews through a questionnaire in the identified cities and individual biases of the interviewees cannot be ruled out. Further, the authors do not claim these lists to be exhaustive and complete.
- While carrying out mapping of the littering hot-spots, efforts were made to cover all significant hot-spots in the identified cities. However, the list is not exhaustive.
- As per the details obtained from RSPCB, there was a list of 66 plastic waste recyclers in the state. However, when the teams carried out an actual survey in the field and explored all the above-mentioned sources, they could locate a total of 126 plastic waste recyclers in the entire state. However, the list is not exhaustive.

3.1.3 Study Area:

The study was proposed to be considered and undertaken in 15 major towns divided into five clusters in the State of Rajasthan. The cities were carefully chosen on three major criteria; population, ecological fragility, and consumption of plastics. The clusters were chosen keeping in view the contiguity of cities, environmental fragility and ease of travel and cost optimization. The details are defined below.

1. Alwar, Bhiwadi and Neemrana
2. Jodhpur, Barmer, Pali and Mt Abu.
3. Udaipur, Bhilwara and Ajmer
4. Jaipur, Kota and Bharatpur
5. Bikaner and Ganganagar

3.1.4 Methodology used in Study

The study aims to focus on all aspects as defined in the aims of the study in the report. The project team including officials from RSPCB and CEE Team developed questionnaire (format). The Format documented the results from interviews and meetings in person in the respective cities/towns. The report was analysed using a set of digital applications. The documents issued by the State/Central Pollution Control Boards (CPCB) in the respective states were considered in drafting the assessments.

The study through field visits documented the management & disposal of plastic waste on the ground. The Secondary sources for access to data searched and complemented the analytical data collected personally (on spot analysis) on the cities. The project took into consideration the formats provided by the RSPCB to track the information. The same is attached in the respective chapters.

Methodology for extrapolation used in the Study, the project developed a strategy and



extrapolated data across the state. Certain assumptions were made to develop more robust data systems across the details. The Methodology of extrapolation has been elaborated in the waste quantification chapter 8 of this report.

The assessments conducted in the state of Rajasthan contain the following systems

1. Waste Inventory Analysis
 - Composition
 - Quantification
 - Typology (identified SUPs)
2. Assessment of Plastic Manufacturers, PIBOs and Waste Management status
3. Assessment of the Informal Waste Sector and Plastic Waste Value chain.
 - PIBOs and Waste Processing units
 - Identification and assessment of registered and unregistered recycling unit.
 - Scrap dealers, waste pickers,
4. Stakeholder perception, awareness, and knowledge
 - Survey of HH and Commercial Entities.
 - Buyer and shopkeepers to know more about the Single Use Plastics
5. Littering Hotspots
6. Legal status of the existing manufactures, recyclers and waste co-processing units with respect to the pollution control board norms.

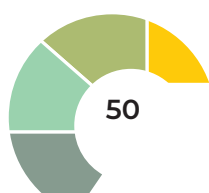
3.1.5 Process of the Waste Characterization:

A series of discussions and a joint workshop between RSPCB and the team defined a proactive, participative, and bottom-up strategy to seek support from City Nagar Nigam officials to help provide the required samples of MSW straight from the identified different sources, in different categories of sources to complete the waste characterization processes in a more transparent and the traceable manner in completing the plastic waste assessment in the respective cities.

Likewise, as in the earlier cases, a multidisciplinary team visited cities from the break of dawn with the Nagar Nigam waste pickers and staff, both active and keen to do the job. One change that was amply noticeable during the study in the city ecosystems was the constructive role the Swachh Bharat Mission (SBM) Swachh Survekshan has played in waste management operations. Clear as it was most of the Safai Mitras (waste pickers) were wearing dresses, clean, and confident realising that once the waste is segregated it has value. With deft hands, they segregated wet, dry & plastic waste, along with different plastics swiftly into the loosely hanging bags by their vehicles. It was very noticeable that in every city a collection of vans that play Swachh Songs, with lyrics that are not only catchy but also draw the attention of everyone to come and give their segregated waste.

Experiencing this the team was feeling more cheerful and aligned to address their problems effectively But many waste pickers did share experiences that manual segregation, more so in summers is leading to skin diseases, diarrhea and malarial infections, therefore health cards are a necessity for them.

It was mutually agreed that in every group identified the waste will be collected across



households or the recipients as the case be. As per the given standards (ASTM⁶ methods of waste characterization), the sample size was ensured to be in the range of a minimum of 91 kgs to 130 Kgs in every category. Coning and quartering methods were adopted at the dumping site for the best representation of the waste.

Table 3: Categories and Sub-Categories undertaken for Study

S.N.	Categories	Sub – Categories
1	Households	High Income
2		Middle Income
3		Low Income
4	Market	Sabji Mandi
5		Shops (General)
6	Landfill sites	-
7	Hotels	-
8	Institution (Schools, Colleges, Universities)	-

Household (HH) income group areas⁷ (high, middle, and low-income groups) were discussed and decided with the consultation of municipal corporation officials. The areas identified and thereafter samples were collected from all identified categories of HHs i.e., high, middle, and low-income groups.

Low-income groups were defined as the slum areas on the outskirts of the city habitations, people living with marginal incomes, poor sanitation facilities, and high-density settlements.

3.1.6 Waste Sample Collection Methods:

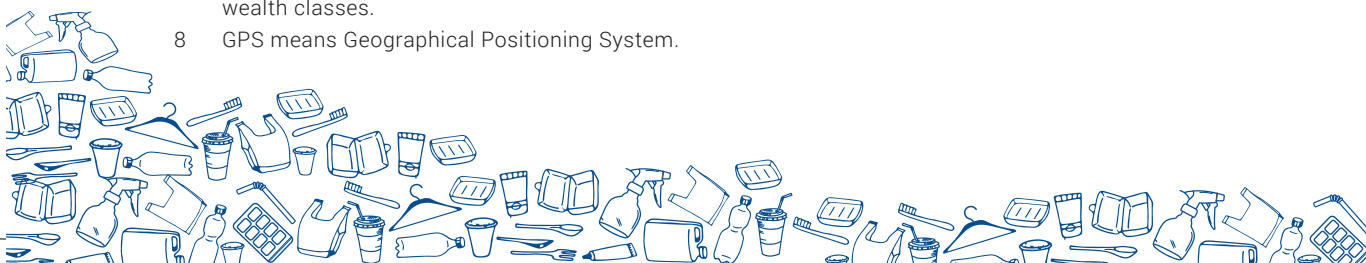
All the samples collected from the sources were analysed after segregation either at the open transfer station sites or the landfill sites. While collecting household samples, to ensure the best representation of HHs; waste quality, and quantities. One person from the survey team tagged along with the waste pickers collecting waste materials from every HHs to their vehicle. This was primarily to have a count of the samples collected from the identified HHs.

- A total of nearly 100-150 no of HHs covered to ensure a sample weight of above 100 Kgs.
- These collected samples were analysed at identified dry and covered places (either at the open spaces or landfill sites) for further assessment.
- Each member of the survey team co-piloted with collection vehicles, fastened with various formats and geotag apps to capture GPS⁸ based on real-time photos and other details like vehicle no, name of the driver, area of sampling, and also counting the number of households giving the waste.
- This process was followed to ensure better characterization results and avoid any leakages or mixing of the dry waste with other waste materials.
- The team had engaged trained and local waste pickers to do the segregation and

6 ASTM- American Society for Testing and Materials

7 The income groups were defined in consideration of the plot size, width of streets and other observatory parameters of income/ wealth classes.

8 GPS means Geographical Positioning System.



characterization process.

3.1.7 Waste Analysis Segregation Process

During the field exercises for waste characterization the *so called waste has always been seen as a resource in the study* has been seen in the following manner.

a. Dry (Non Biodegradable) Waste

b. Wet (Biodegradable) Waste

The Dry waste was further segregated in following categories.

- **Dry Waste (resource) other than Plastics:** cardboard; paper and millboard; shoes-leather and rubber separately; cloth; metal; glass; domestic Hazardous waste; compostable bags.
- **Plastic Waste:** PET; HDPE; LDPE; PVC; PP; PS; MLP and packaging wrappers.
- LDPE and PP further segregated into following categories

Table 4: Categories of LDPE and PP

LDPE	PP
LD Plain	PP White
Milk Pouch	PP Color
HM and other carry bags	PP Natural

- **Single Use Plastics (SUPs):** SUPs were further segregated separately into following categories to have a more indepth analysis.
 - Plastic Bags < 120 microns
 - Plastic Sticks
 - Thermocole
 - Plastic Cups, Glasses and Cutlery
 - PVC/Plastic < 120 microns
 - Stirrers, straws, etc.

Each sample was carefully analyzed under the supervision of the survey team; after segregation, each category was separately weighed, readings noted and completed the following questionnaires accordingly. The format representation was a result of discussion.



Plastic Waste Characterisation (Alwar)															
Name of the Surveyor		Moazul Haque		Vinal Contractor											
Place		MRF Alwar				Date				21-06-2022					
Income category of Waste Generated		High Income				Households				94					
Waste collected from		Arya Colony (SCHEME NO 1), Ward 7				Population				Generation of Waste per Household					
Geotag location		Latitude		Longitude								1.57			
Driver Name		Babli Meena		Vehicle		RJ-02-GB-5640						Dry (%)			
Name of the Waste Pickers		Hanif										20.0%			
Types of Waste						Total Sample of waste in Kgs		148.00		Wet (%)		73.0%			
Category of Waste	Dry	Wet	Coconut	Inerts (stone, etc)	Grand Total (Kgs)					Coconut (%)		4.8%			
Quantity (Kgs)	29.655	107.975	7.170	3.200	148.000					Inerts (%)		2.2%			
Dry Waste (Except Plastics)															
Types of Dry Waste	Cardboard	Paper & Millboard	Shoes	Cloths	Metal	Aluminium Foil	Glass	Leather	Domestic Hazardous			Compostables Bags	Total Dry Waste (Except Plastics)	% of Dry Waste (Except Plastics) in Total Dry Waste	% of Dry Waste (Except Plastics) in Total MSW
									Sanitary Waste	Medical Waste	Used Cotton, syringe, needles etc.				
Quantity	4.570	8.505	0.150	2.900	0.200	0.205			1.895	0.390			18.815	63.45	12.71
Types of Plastic Waste															
Types of Plastic Waste	PET	HDPE	PVC	LDPE (Type of LDPE)		PP (Types of PP)					PS	Others MLP and other plastic packages	Total Plastics	% of Plastic waste in Total Dry Waste	% of Plastic Waste in Total MSW
				LD Plain	0.050	PP White	0.230								
				Milk Pouch	0.680	PP Color	0.290				0.155	2.060	10.840	36.6%	7.3%
				HM (Black panni and carry bags)	5.11	PP Natural	0.050								
Total	1.175	1.045	0.000		5.835		0.570				0.155	2.060			
Grand Total (Plastic + Dry Waste)													29.655	20.04	
Types of SUPs															
Types of SUPs	Plastic bag less than 120 micron		Plastic sticks	Polystyrene (Thermacol)	Plastic cups, glasses and cutlery	Packing films	Plastic/PV C < 120 micron			Stirrers	Straws (units in No.)	Total SUPs (weight)			
Identified in the sample (Quantity)	2.553			0.105	0.195							2.853			

Figure 5: Format for the Survey and Representation of Results

3.1.8 Standard Checks & Balances Adopted during the Waste Characterization Exercises

1. Gloves, uniforms, and other safety kits were provided and ensured that they were used during exercises by the waste pickers and survey team.
2. Hand-handled weighs scales, and weighing machines are used to have correct measurements.
3. Separate packaging materials are provided to meet the sampling deftness of different samples.
4. Proper care on all aspects of measurements and gears was kept and regular battery availability was ensured.
5. Norms created that Segregate and weigh only one sample at a time.
6. Ensure the proper collection, segregation, and measurement of all types of samples in various categories on the same day and on the spot. At times taking 8-10 hours measuring details.
7. All sampling exercises were photo-recorded to ensure transparency and correctness.
8. Each sampling exercise largely took around 3-6 hours (depending on the sample size) to segregate, weigh and note the results effectively by the survey team. The effort during all exercises was a more participatory, process-oriented, and gender-sensitive approach.

The random sampling techniques were adopted to assess the existing ecosystem of plastic waste

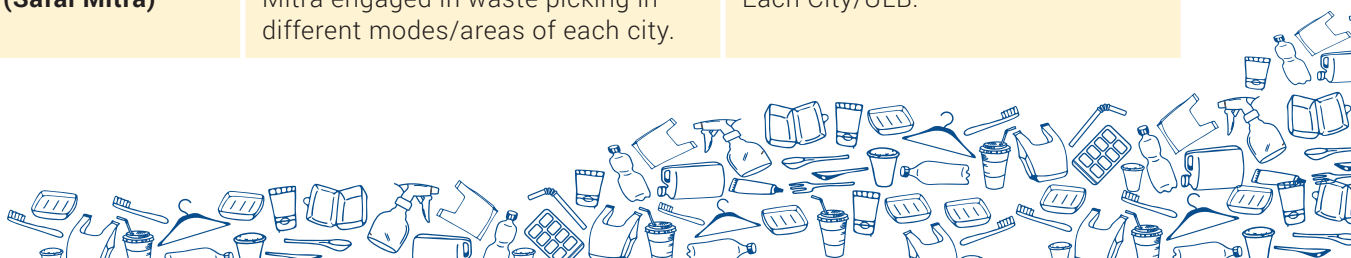


recycling and the knowledge, awareness, and practices of the citizen towards the management. This was arrived by carefully developing the questionnaires and formats. These samples were collected on the basis of the below-mentioned sample sizes of each stakeholder.

3.1.9 Sampling Strategy of various stakeholders

Table 5: Sample Sizes of Each Stakeholder

S. No	Stakeholders/ Activity	Sampling Strategy	Total Samples
1	Plastic Manufacturers	List collected from the Regional Officers (ROs) and Head office.	All Identified units of Plastic Packaging Material are targeted to cover the selected cities.
2	Manufactures of SUPs and alternatives of SUPs	Identification and listing of the Manufacturers of SUPs and alternatives of SUPs	Explored and physically visited the list provided by DIC, Plastic Manufacturing Association, and other Primary Data sources.
3	Plastic Waste Recyclers (Registered & Unregistered)	List of Reg. Recycler got from RSPCB and RO offices, explored unregistered through market assessment, and unit visits.	Explored and tried to cover all Recycling units operational in these cities through primary and secondary surveys.
4	Plastic Waste Processors	List from Secondary data sources and Regional Officers (ROs)	Explored and covered these units through primary and secondary sources.
5	PIBOs	List from Regional Officers (ROs), CPCB EPR Website.	Explored and collected the primary and secondary data with physical visits and data sources.
6	Waste Management Agency (WMA)	Name of WMAs from PIBOs and ULBs.	All Waste Management Agencies
7	Municipal Corporations (ULBs)	Meeting with the ULBs officials for data on waste generation, management, and infrastructure detail.	All Municipal Corporations (ULBs) of identified cities.
8	Citizens	Income-based Classification in 5 Categories <ul style="list-style-type: none"> • High Income • High Middle Income • Middle Income • Low Income • Low-low Income 	10 observations in each category. 10*5= 50 observations in each city.
9	Waste Collectors (Safai Mitra)	Sampling and Interview of Safai Mitra engaged in waste picking in different modes/areas of each city.	10 Unique Sample Surveys from Each City/ULB.



S. No	Stakeholders/ Activity	Sampling Strategy	Total Samples
10	Scrap Dealers (Big and Small)	A selected sample of small and big scrap dealers/Aggregator from different areas of the city	5 samples of each Small and Big Scrap dealer, a Total of 10 Sample in each city/ULB
11	SHGs	Identification of the SHGs working with waste management themes explored with ULB and NULM. Largely women SHGs.	Planned to cover at least 5 SHGs and identification of the approximate no of SHGs in the SWM area.
12	CBOs/NGOs	Identification of the NGOs working with waste management themes, need to explore with ULB and other sources.	Planned to cover at least 5 NGOs and identification of the approximate no of NGOs in the SWM area.
13	SUP (Buyers) and SUP (Sellers)	Selection of two markets in different areas to capture the availability of SUPs sellers and buyers	10 observations in each market for sellers and 10 from Buyers in the same area. 10x2x2 = 40 Observations in each city
14	Materials Recovery Facility (MRF)	Identification and assessment of the existing MRFs.	All MRFs operating in these Cities.
15	Industrial Units	Random samples of different nature of Industries to know their practices of waste management in the unit/ factory.	5 Sample of different industry/ factory for each city.
16	Mapping Littering Spots	Random Sample was selected	5-6 points of the city

3.1.10 Timeline of the Study

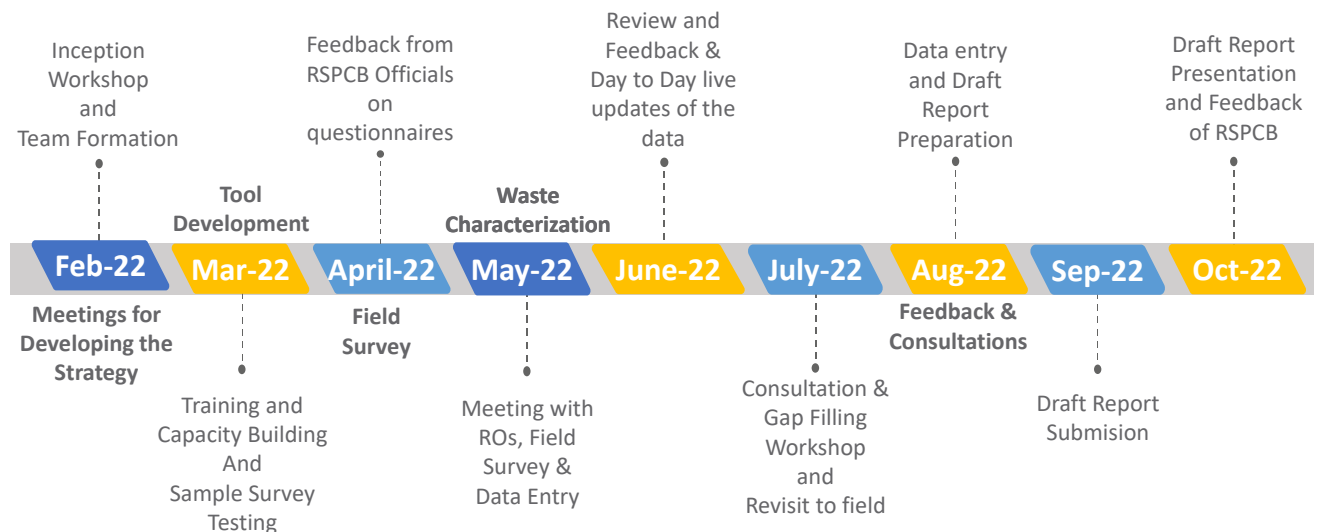
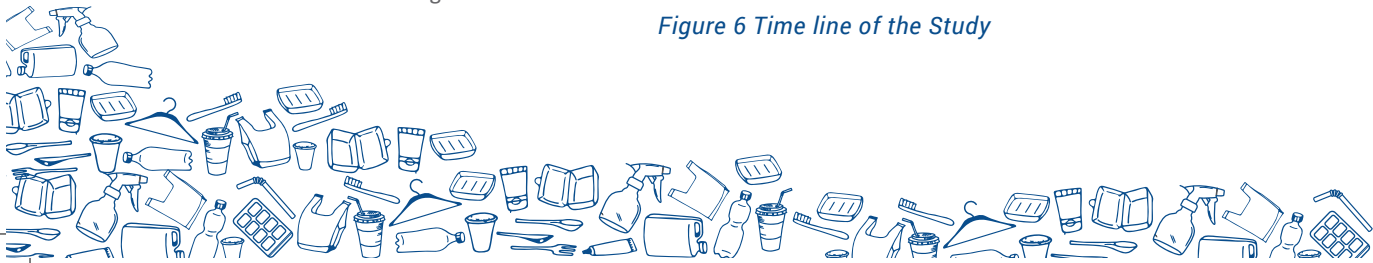


Figure 6 Time line of the Study







CHAPTER

4

Plastic Waste Recyclers and Processor





CHAPTER

4

Plastic Waste Recyclers and Processor

A detailed assessment of all the plastic waste recyclers which are engaged in recycling of plastic waste was carried out to know their current status, type of waste recycled, the final product manufactured, source of raw material, environmental management of the unit, and status of statutory compliances like consent to from Rajasthan State Pollution Control Board (RSPCB).

The study team has explored various sources to identify the recycling units operational in these cities, in which the team has visited and explored the unit details provided by DIC, regional offices of RSPCB, Plastic Manufacturing Association, and EPR portal and RSPCB data sources. The team has also randomly explored the informal units of recycling in the industrial areas of these cities.

As per the detailed obtained from RSPCB, there was a list of 66 plastic waste recyclers in the state. However, when the teams carried out an actual survey in the field and explored all the above-mentioned sources, they could locate a total of 126 plastic waste recyclers in the entire state.

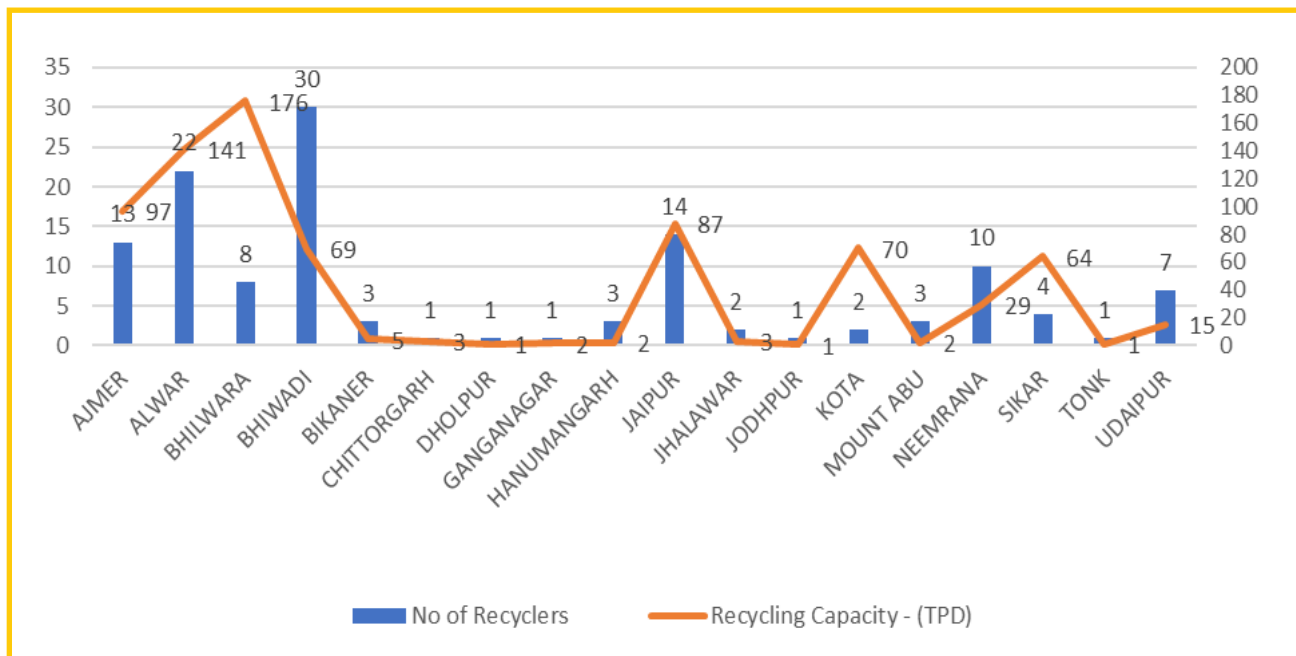
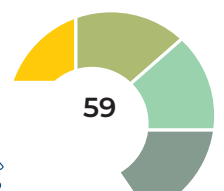


Figure 7: Number of Plastic Waste Recyclers and their recycling capacity in the State

Fig 7 shows town wise number of recyclers that are engaged in plastic waste recycling. From the graph, it is evident that Bhiwadi has a maximum number of recyclers (30) which may be due to its proximity to Delhi/Haryana in getting raw materials and to sale finished products. In fact, the entire Alwar district has 62 plastic waste recyclers which are about 49% of the total recyclers located in the state.



From the point of view of recycling capacities installed, out of a total of 126 units, 105 units are having install capacities varying from 0-10 MT/day which implies that most of the units are of small capacities only 8 units are having installed capacity more than 20 MT/day.

4.1. Type of Plastic used for recycling and its source

In terms of raw materials used by recyclers, 53% of units are using PET whereas 29% units were using HDPE. Thus, 82% recyclers were using PET and HDPE for recycling.

LDPE was the third most commonly used raw material accounting for 6% of all units. Likewise, 10% of units used PP and PVC as raw materials. This has been analyzed on the basis of surveyed recycling units of the state.

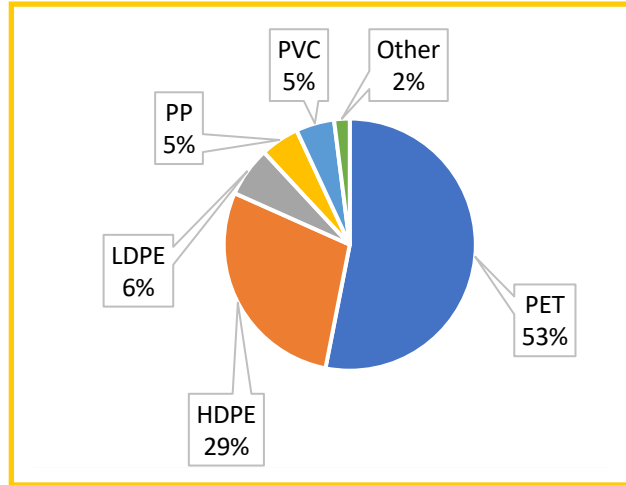


Figure 8 Type of Material Used for recycling

Source of Raw Materials

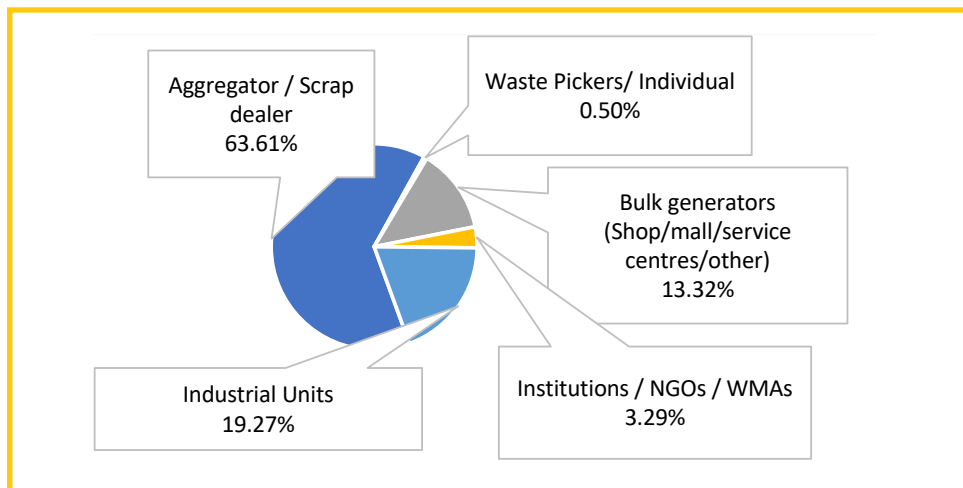


Figure 9 Source of raw material

In the survey data, it has been noticed that these recyclers are sourcing raw material majorly from informal channels as like 63.61% from scrape dealers and aggregators, and only 19.27% from Industrial units, and 3.29% from Institutions and WMAs as formal channels.

4.2. Status of Consent under the Provisions of Water (Prevention & Control of Pollution) Act, 1974, and Air (Prevention & Control of Pollution) Act, 1981

During the field visit and secondary data survey, we could identify a total 126 units of recycling. Out of total 126 plastic waste recyclers, 114 were under consent administration having obtained consent to establish and consent to operate at least once.

Further, 12 recyclers were in operation with a small capacity and they were in the process of obtaining consent to establish or consent to operate.



List of Plastic Recycling Units

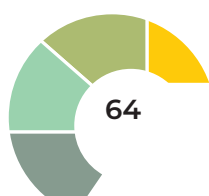
Table 6 List of Plastic Recycling Units

S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
List of Recyclers Registered as PWP on the EPR Portal of CPCB										
1	Shree Ambika Industries	H-1-160, RIICO Ind. Area Silora ,Ajmer	Ajmer	5.0	LDPE	Scrap Dealers, BWG, WMA	Granules	31-07-2032	26.533367	74.86816
2	Balaji Polymers	H-144 RIICO Ind Area	Ajmer	0.5	PET, HDPE	Other (Industries)	Chips	31-05-2026	26.534552	74.86792
3	Parswnath Industry	G-76- RIICO Ind Area Beawar	Ajmer	16.0	HDPE	WMA, Scrap Dealers, Other (Industries)	Chips	31-05-2029	26.119128	74.833380
4	Multi Scrap Corporation	H-1-29-30 RIICO Ind Beawar	Ajmer	5.0	PP	Other (Industries)	Chips	31/01/2017	26.112542	74.337324
5	Maa Bhagwati Eng& Polymers	H-232-B, RIICO Ind. Area, Silora	Ajmer	30.0	HDPE	Scrap Dealers, Other (Industries)	Granules	30-11-2031	26.533154	74.864119
6	Varun Beverage Ltd	MIA, Alwar	Alwar	10.0	PET	Scrap Dealers	Pallets	28-02-2030		
7	Kanchan India Limited	18km Milestone Nankpura	Bhilwara	130.0	PET	Scrap Dealers, BWG, Other (Industries)	Chips	31-03-2023	27.526381	76.691686
8	Eminent Dealus Pvt. Ltd	KN3359/2985,3 141/985,3355/2 874,333/2874,2 998,2997/1,2999 /1 Lambiyakalan Tehsil: Banera District: Bhilwara	Bhilwara	40.0	PET	Scrap Dealers, BWG, Other (Industries)	Chips	31-10-2025	25.515538	74.588237

S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
9	Laxmi Industries	Village Haled RIICO Area	Bhiwara	1.0	LDPE, PP, OTHERS	Scrap Dealers, BWG, Other (Industries)	Granules	30-01-2031	25.643825	74.597407
10	Aravali Polymers	G1 350 RIICO Industrial Area Kaladwas	Udaipur	3.0	HDPE	Scrap Dealers, BWG, Other (Industries)	Granules	31-12-2031	25.322786	74.683613
11	Abhinav Strips	Plot No 1,2 Dic Mujras	Bhiwara	1.0	HDPE	Scrap Dealers	Chips	31-08-2029	25.339797	74.626328
12	Yashwardhan Industries	Khasra No.-550, 528, Industrial Area Haled	Bhiwara	1.0	HDPE, LDPE	Scrap Dealers, BWG	Granules	31-07-2028	25.227145	74.62849
13	Mehta Enterprises	G-1-190, Road No.6, RIICO Ind. Area, Gudli	Udaipur	0.6	PVC	Scrap Dealers, BWG	Shredded Plastic	30-06-2027	24.643315	73.840874
14	Sandhya Industries	Araji No 1/4050/4, Danthal Road, Villagesuwana Tehsil:Bhiwara	Bhiwara	1.0	HDPE	Scrap Dealers, BWG	Granules	30-11-2026	25.346113	74.704562
15	SR Enterprises	F - 188 RIICO Industrial Area	Bhiwara	0.8	HDPE	Scrap Dealers, Other (Industries)	Chips	Active	25.219456	74.634004
16	M.R Polytech	H-1/861, Phase3 RIICO Ind Area	Bhiwadi	2.0	HDPE	Scrap Dealers, Other (Industries)	Granules	28-02-2031	28.19925	76.869797
17	Tanwar Traders	F-1294e, RIICO, Bhiwadi	Bhiwadi	2.0	PP	Scrap Dealers, WC, Other (Industries)	Chips	31-01-2031	28.214561	76.863022
18	Nikki Traders	H1-320, Ria, Khushkhara, Bhiwadi	Bhiwadi	1.0	PET	Scrap Dealers, Other (Industries)	Granules	30-04-2028	28.116192	76.786428



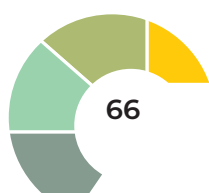
S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
19	Shukla E-Waste Processor	H-309(B)RIICO Industrial Area, Bhiwadi	Bhiwadi	3.0	HDPE	Scrap Dealers, Other (Industries)	Granules	28-02-2023	28.206717	76.857899
20	Chahat Plastic	J-1352, RIICO Industrial Area, Bhiwadi Tehsil: Tijara	Bhiwadi	0.5	LDPE	Scrap Dealers, Other (Industries)	Granules	30-04-2028	28.192732	76.871712
21	M/S Shakti Plastics	H1-324, Ria, Khushkhhera, Bhiwadi	Bhiwadi	7.0	LDPE	Scrap Dealers, Other (Industries)	Granules	31-03-2032	28.21986	76.85056
22	Suvalal And Sons	G-76A Old Industrial Area Bagru Distt. Jaipur	Jaipur	5.0	HDPE	Scrap Dealers, Other (Industries)	Granules	31-07-2030	26.819057	75.541515
23	M/S Ecosheets India Private Ltd	Trimurthy Dave Apartments, Bani Park, Jaipur	Jaipur	10.0	OTHERS	WMA	Granules	31-12-2029	26.927818	75.790354
24	SD Industry	D-74(A) RIICO Ghiloth, Neemrana	Neemrana	0.8	HDPE, PP	WMA, Other (Industries)	Granules	31-01-2031	28.122207	76.788422
25	Shri Nangla Pti Plastics	G1/575, RIA , Bhiwadi	Neemrana	10.0	LDPE	Scrap Dealers, Other (Industries)	Shredded Plastic	30-11-2031	28.194747	76.851721
26	Shri Adhweshwal Industries Pvt	G-1, 200, RIICO Industrial Area, Gudli, Udaipur	Udaipur	5.5	PP	Scrap Dealers, Other (Industries)	Granules	30-09-2028	24.64575	73.838226
27	Harit Plastic & Pipes	H-1-307, RIICO Industrial Area Khushkhhera, Bhiwadi	Bhiwadi	1.5	PVC	WMA, Other (Industries)	Plastic Granules	30-06-2027	28.118721	76.782602



S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
28	Yadav Traders	H1-13J RIICO Industrial Area Kehrani RIICO Industrial Area Kehrani	Alwar	1.5	PP and PVC	Scrap Dealers, BWG, Other (Industries)	Plastic Dana	30-11-2031	28.171883	76.860347
29	Pearl Polypacks	B-111,A-1, Road No- 09 VKIA	Jaipur	8.0	OTHERS	Scrap Dealers, Other (Industries)	Granules	30-11-2029	26.988468	75.784552
30	M/S BLS Ecotech Ltd.	Sp-12, RIICO, Keshwana, Kotputli	Jaipur	30.00	PET	WMs, Scrap Dealers, BWG, Other (Industries)	Flakes / Granules	30-06-2026	27.819665	76.231696
31	Janhavi Polymers	H-91 RIICO Ind. Area Ajeetgarh Srimadhapur Sikar	Sikar	0.50	HDPE	WMA, Other (Industries)	Granules	31-01-2030	27.417049	75.841295
32	RSWM Limited	Sp-1, RIICO, Ringus Sikar	Sikar	50.00	PET	WMs, Scrap Dealers, BWG, Other (Industries)	Recycle Polyester Staple Fiber	31-12-2026	27.377853	75.556549
33	Shri Shyam Steel	Plot No. G106, RIA, Shahjahanpur, Neemrana, Alwar	Alwar	8.00	PET	WMs, Scrap Dealers, BWG, Other (Industries)	Chips	31-05-2031	27.970005	76.371926
34	Chittor Packtech Private Limited	Araji 1611, 1612, 1615, 1615/2154,1613, Gram Baldarkha, N.H. 27, Kota Road, Chittorgarh, Rajasthan, 312022	Chittorgarh	3.00	PVC, HDPE	WMA, Other (Industries)	Reprocessed Plastic Granules	30-06-2027	24.980277	74.724035



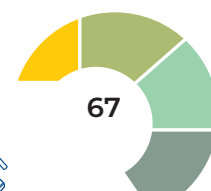
S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
35	Gayatri Enterprises	Plot No. G-1-113, Phase Ist, RIICO Industrial Area, Beawar	Ajmer	5.00	PP	WMs, Scrap Dealers, BWG, Other (Industries)	Plastic Lumps	30-06-2027	26.125762	74.337918
36	Gemcorp Recycling And Technologies Private Limited	B-35 A-5, RIICO Industrial Area Khushkhhera Teh. Tijara	Alwar	1.00	PET	WMs, Scrap Dealers, BWG	Flex And Granules	30-04-2032	28.12539	76.793431
37	Gravita India Ltd- Unit-I	Chittora Road, Harsulia Mod, Diggi-Malpura Road, Tehsil-Phagi	Jaipur	6.00	PP, LDPE	Scrap Dealers, WMA, Other (Industries)	Plastic Granules	31-01-2027	26.889924	75.823339
38	Kansal Polymers	Khasra No., 5083/1272, Deoli Gaon, Tehsil Deoli, District Tonk	Tonk	1.00	PVC	Other (Industries)	Plastic Dana	31-12-2029		
39	Khushi Polymers	Khasra No.- 300,301,308, Village Kuradi, Tehsil Digod	Kota	30.00	PP, HDPE	Scrap Dealers, WMA, Other (Industries)	Plastic Granules & Lumps	30-06-2032		
40	Krishna Polymers (Krishna Polyplast)	G-1-72,73, H-1-103, RIICO Ind. Area, Makhapura, Ajmer	Ajmer	16.50	PET, HDPE	WMs, Scrap Dealers, BWG, Other (Industries)	Plastic Granules	31-07-2032	26.40672	74.667092
41	Kumar Enterprises	H1-886, RIICO Industrial Area Bhiwadi	Bhiwadi	5.50	PP, HDPE	Scrap Dealers, WMA, Other (Industries)	Plastic Granules	30-06-2032	28.206765	76.865564



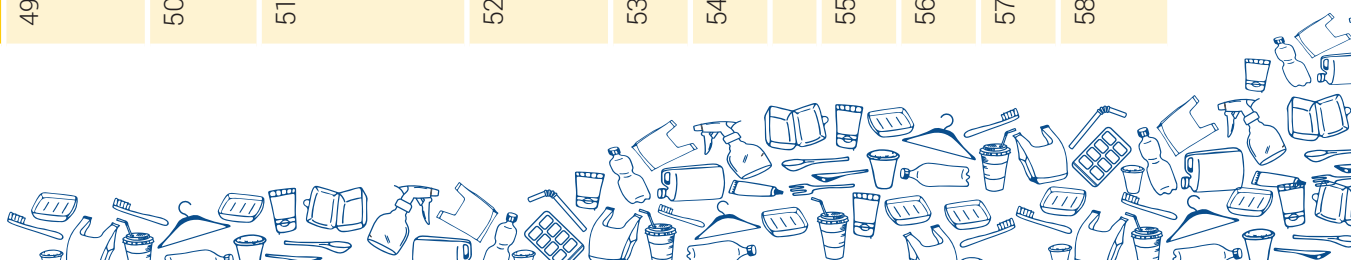
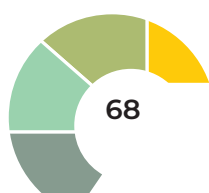
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S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
42	M/S Om Traders Scrap Management services Pvt. Ltd.	Plot No-J-994, RIICO Industrial Area, Khushkhhera, Tehsil :- Tijara, District :-Alwar , Rajasthan	Alwar	9.50	PET	Scrap Dealers, WMA, Other (Industries)	Plastic Flakes (Dana)	28-02-2030	28.123427	76.801526
43	M/S Parvesh & Company	G -106,107,108, (Area-400 Sqft.) RIICO Industrial Area, Shahanjapur, Tehsil:Behror, Dis	Neemrana	2.00	HDPE	Scrap Dealers, BWG	Chips	31-01-2032	28.009284	76.460898
44	N Chandra Polypipe Industries	G-A-22, RIICO Ind. Area, Bijaynagar Tehsil-Masuda, Dist-Ajmer	Ajmer	10.50	PVC	Scrap Dealers, BWG, WMA, Other (Industries)	Granules	31-05-2032	28.122555	76.800606
45	Rahul Industries	Village-Paldi, Panchayat Samiti -Suwana, Tehsil-Bhilwara	Bhilwara	1.00	PP, LDPE	Scrap Dealers, BWG	Plastic Granules	31-12-2031		
46	Saurabh Clean Tech Pvt. Ltd.	G1-933-934, RIICO Industrial Area, Khushkhhera	Alwar	27.00	PET/PP/ LDPE/PVC	Scrap Dealers, BWG, WMA, Other (Industries)	Washed Plastic Flakes & Granules	29-02-2032	28.112868	76.784054
47	Sharda Enterprises	G1-1323, RIICO Industrial Area, Rampur Mundana, Bhiwadi	Bhiwadi	2.00	HDPE	BWG, WMA, Other (Industries)	Plastic Granules	29-02-2032	28.20753	76.856257
48	Shree Krishna Polymers	Khasra No 281, Village-Kuradi, Tehsil-Digod	Kota	40.00	PP, LDPE	Scrap Dealers, BWG, WMA, Other (Industries)	Plastic Granules & Lumps	30-06-2032		



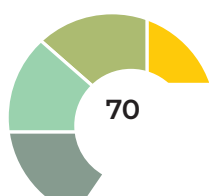
S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
49	Vanshika Plastic Industry	G1-228, RIICO Industrial Area Kahrani	Jaipur	6.50	PVC, HDPE	Scrap Dealers, WMA, Other (Industries)	Pre Compound Plastic Dana	30-04-2032	28.190749	76.873939
50	Vijay Laxmi Traders Unit li	G-1/1323, RIICO Industrial Area Bhiwadi	Bhiwadi	0.10	LDPE	Scrap Dealers, BWG	Plastic Granules	30-11-2027	28.206296	76.85781
51	Ecoeasy Recycling LLP	G1-171 (B), M.I.A., Alwar, Rajasthan - 301030	Alwar	14.00	PET	Scrap Dealers, BWG, WMA, Other (Industries)	Plastic Dana & Shredded Multi-Layer Plastic	30-06-2024	27.516887	76.686841
52	M/S Alok Industries	Plot No. 6khasara No. 291 Village-Lamana, Beawar, Ajmer	Ajmer	2.00	HDPE	Scrap Dealers, WMA, Other (Industries)	Plastic Granules	30-11-2026	26.221648	74.480008
53	Shree Krishna Industries	H-1/350, MIA, Alwar	Alwar	0.50	LDPE	Scrap Dealers	Granules	31-10-2029	27.515436	76.686433
54	M/S SRR Industries	H-166 A MIA Alwar	Alwar	2.50	PP, LDPE	Scrap Dealers, BWG	Granules	30-06-2030	27.495138	76.70323
List of Recyclers Required to Take Registration as PWP on the EPR Portal of CPCB										
55	Alok Industry	Plot-06 Kh-291 Village Amargarh	Ajmer	2.0	LDPE, PP	WMA, Other (Industries)	Chips	30-11-2026	26.221648	74.480008
56	Shree Shyam Plastic	Plot No.-F-155a, MIA, Alwar	Alwar	1.5	HDPE	Scrap Dealers, BWG, WMA	Granules	31-08-2031	27.529654	76.66819
57	Dev Plastics	G-331c, MIA, Alwar	Alwar	10.0	PP	Scrap Dealers, Other (Industries)	Granules	31-08-2030	27.512801	76.702296
58	Chawla Industries	H-1, 346, MIA	Alwar	1.5	HDPE, LDPE, OTHERS	Scrap Dealers, Other (Industries)	Granules	30-09-2029	27.513736	76.700633



S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
59	Vinod Plastic	F-173 Matasya Industrial Area	Alwar	11.0	HDPE	Scrap Dealers	Granules	31-01-2032	27.508997	76.672896
60	Tanmey Plastics	G-981 Phase 3 Bhiwadi	Bhiwadi	3.0	PVC	Scrap Dealers, Other (Industries)	Granules	30-06-2027	28.197408	76.858347
61	Magna Cables Manufacturing Pvt Ltd	F-1087, RIICO Industrial Area, Bhiwadi	Bhiwadi	3.0	PVC	Scrap Dealers, BWG, WMA, Other (Industries)	Granules/ Cable	30-09-2030	28.205351	76.865559
62	Navodaya Industries	H1-1390, RIICO Industrial Area, Bhiwadi Alwar	Bhiwadi	2.0	PVC	Scrap Dealers, BWG	Granules	31-08-2027	28.209628	76.860425
63	Pooja Industries	H1- 1376, RIICO Industrial Area,, Bhiwadi Tehsil:Tijara	Bhiwadi	2.0	PVC	Scrap Dealers, Other (Industries)	Granules	31-08-2027	28.193987	76.871678
64	Simran Plastic	G1-1312 Ind. Area Rampur Mundana Bhiwadi	Bhiwadi	2.0	PP	Scrap Dealers, Other (Industries)	Granules	31-05-2022	28.198212	76.871888
65	Gargh Plastic	G1-1290 , Phase-5 Ria Bhiwadi, Rampurmundana	Bhiwadi	2.0	LDPE	Scrap Dealers, WC	Granules	31-01-2028	28.207323	76.858686
66	Rama Packaging	G-1/1281, Phase-V, Ria, Bhiwadi Bhiwadi	Bhiwadi	1.0	LDPE	Scrap Dealers, WC, WMA	Granules	31-08-2031	28.197672	76.872071
67	N.K. Plastic Industries	G-1280, Rampur Mundana, Bhiwadi	Bhiwadi	1.0	PVC	Other (Industries)	Granules	30-11-2027	28.197423	76.870996
68	Shri Bala Ji Trading Company	F-613 RIICO Area, Bhiwadi	Bhiwadi	3.0	PVC, OTHERS	Scrap Dealers, Other (Industries)	Chips	30-06-2029	28.115845	76.775093



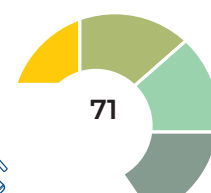
S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
69	Santosh Plastic	180 G1, RIA, Ph-2, Behror, Bhiwadi	Bhiwadi	1.0	LDPE	Scrap Dealers, WMA	Granules	28-02-2030	27.90474	76.300815
70	R.S Plastic	G-1/1322/ RILCO Ind. Area	Bhiwadi	1.0	LDPE	Scrap Dealers, BWG	Granules	30-11-2026	28.195805	76.87065
71	Goyal Internantional	G1/1292a Phase5 RILCO, Rampur Mundana	Bhiwadi	0.7	LDPE	Scrap Dealers, BWG, WMA	Granules	30-11-2027	28.195743	76.854895
72	Rudransh Polymers	G1/106(B), RIA, Behror, Alwar, Bhiwadi	Bhiwadi	1.0	HDPE	Scrap Dealers	Granules	30-06-2029	27.866966	76.304044
73	Bestech Polymers	Phase V, H1 1373, RILCO Rampura Bhiwadi	Bhiwadi	0.5	LDPE	Scrap Dealers	Granules	30-11-2027	28.207065	76.857793
74	Shree Balaji Plastics	G-1021, Ria, Bhiwadi	Bhiwadi	0.5	PP	Scrap Dealers	Granules	31-01-2028	28.215712	76.861911
75	Sourabh Plastic Industry	H1, 1380 Rampur Bhiwadi	Bhiwadi	0.8	HDPE	Scrap Dealers, WMA	Granules	30-11-2027	28.113022	76.784015
76	Jai Durga Plastic Industries	C-31-33, Phase I, RILCO Industrial Area,	Hanumangarh	2.5	PVC	Scrap Dealers, Other (Industries)	Granules	31-05-2028	29.624121	74.269159
77	Tirupati Plastics	C-23, Industrial Area	Hanumangarh	1.8	HDPE	Scrap Dealers	Granules	31-05-2028	29.624008	74.272873
78	Jaipur Plasto Processors	H-1-1049, Sitapura Industrial Area Phase 3,	Jaipur	2.0	PP	Scrap Dealers, BWG	Granules	30-09-2024	26.780317	75.857412



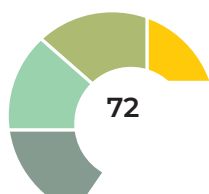
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S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
79	Agarwal Electro Plast	H-2157, Ground Floor, RIICO Industrial Area, Sitapura Extn, Ramchandpura	Jaipur	0.5	PVC	Scrap Dealers	Granules	30-11-2030	26.780346	75.885843
80	D.K. Traders	G/217/E, Ambajji Ind. Area, Abu Road	Mount Abu	0.7	OTHERS	Scrap Dealers, BWG	Others	30-09-2027	24.453112	72.757845
81	Sidhballi Industry Private Limited	G1-74, RIA, Soltana, Neemrana	Neemrana	5.0	LDPE	Other (Industries)	Granules	31-03-2031	27.979765	76.395769
82	Vishal Industries	H-1, 24, RIICO Industrial Area, Neemrana	Neemrana	2.0	HDPE	Scrap Dealers, Other (Industries)	Granules	31-01-2031	28.058498	76.420555
83	Vikas Multicorp Ltd.	G-83, Vigyan Nagar RIICO Ind. Sjr, Neemrana	Neemrana	5.0	HDPE, PVC	Scrap Dealers, Other (Industries)	Granules	31-12-2029	27.973148	76.389398
84	Kusu Stone Tech.	F-25(E) Phase-1, RIICO Ind. Area, Neemrana	Neemrana	1.5	HDPE, PP	Scrap Dealers, WMA	Granules	28-02-2027	27.987841	76.384226
85	Yes Enterprises	G1-120, RIICO Industrial Area, Phase-2, Neemrana Alwar	Neemrana	1.5	PET, PP	Scrap Dealers, WMA	Chips	31-12-2031	27.970197	76.375583
86	Shiv Shakti Enterprise	Plot No. G.117 RIICO Ind. Area, Neemrana	Neemrana	0.5	HDPE	Scrap Dealers	Others	31-10-2031	27.976237	76.395942
87	N.T.F. India Pvt Ltd	Plot-F-6,7,38,39, EPIP, RIICO Neemrana	Neemrana	0.6	OTHERS	Scrap Dealers	Granules/ Auto-mobile Parts	30-09-2027	27.960178	76.364162



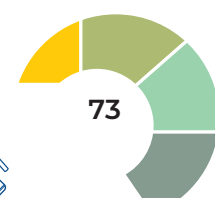
S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
88	National Plastic	E-1 59 Industrial Area Madari	Udaipur	1.5	HDPE, PVC	Scrap Dealers, ULBs	Chips	30-04-2036	24.573818	73.751896
89	Pusp Polyplast	G-1-242, IID Centre, kaladwas , Tehsil: Girwa	Udaipur	0.3	PP	Scrap Dealers, WMA	Shredded Plastic	30-09-2028	24.523996	73.75383
90	M/S B.B Enterprises	GA 332B, MIA, Alwar	Alwar	13.0	Flexible Plastic	Scrap Dealers, Other (Industries)	Plastic Dana, Shredded Multi-Layer Plastic	31-01-2030	27.515432	76.694428
91	Shree Shyam Industries	Plot No.-F-155A, MIA, Alwar	Alwar	1.6	Rigid Plastic	Scrap Dealers, ULBs	Plastic Granules	31-08-2031	27.898269	76.304596
92	Swastic Plastics	H-1-119, RIICO Industrial Area, Bagru (Extn.), Tehsil Sanganer, District Jaipur	Jaipur	0.5	PVC	Scrap Dealers	Granules	30-09-2028	26.954852	75.752756
93	M/S Airavat Green Energy Pvt. Ltd	Plot G-1/315,RIICO Kaladwas	Udaipur	4	PET	Scrap Dealer, WMAs, Other (Industries)	Flakes / Granules	30-06-2031	24.61689	73.706873
94	Aditya Industries	F-551A, Road No6 Vishwakarma Industrial Area, Jaipur	Jaipur	1	HDPE	Scrap Dealers, WC	Plastic Compounds (By Plastic Scrap)	30-06-2028	26.994773	75.792893
95	Excellent Waste Management Private Limited	G1-360 B, RIICO Industrial Area, Chopanki, Tehsil:- Tijara, District:- Alwar	Bhiwadi	8.0	OTHERS	Scrap Dealers, Other (Industries)	Granules	31-10-2031	28.156975	76.872691



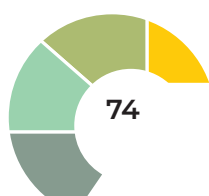
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S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
96	M/S Venkatesh Irrigation Pvt Ltd	G-1-28 RIICO Hmt Industrial Area, Beawar Road, Ajmer Rajasthan	Ajmer	4.00	H.D.P.E. PIPE	Scrap Dealers, Other (Industries)	Plastic Dana	30-11-2026	26.405079	74.624147
97	M/S Mono Batteries & Chemicals	G-1/16 RIICO Growth Centre Dholpur	Dholpur	0.80	Rigid Plastic	Scrap Dealers	Plastic Chips & Dana	31-01-2027		
98	M/S Shree Trading Company	J-774 Phase II, Ria, Bhiwadi	Bhiwadi	3.00	Flexible Plastic	Scrap Dealer, WMAs, Other (Industries)	Plastic Granules	31-10-2030		
99	M/S Vicky Trading Company	H1- 618, RIA, Chopankitehsil Tijara Distt. Alwar Rajasthan.	Alwar	1.00	Waste Plastic	Scrap Dealers, WC	Plastic Granules	31-12-2030		
100	M/S Khalil Ahmed Choudhary	H1- 13(C), RIA, Kehranitehsil Tijara Distt. Alwar Rajasthan.	Alwar	2.50	Waste Plastic	Scrap Dealers, Other (Industries)	Plastic Granules	31-12-2028		
101	M/S Indian Plastic Waste Management Industries	37, Silver Soil Industrial Park, Anantpura, Govindgarh, Tehsil-Chomu, Jaipur	Jaipur	10.00	Plastic Scrap	Scrap Dealer, BWG, WMAs, Other (Industries)	Plastic Lump	30-06-2030		
102	Jagrati Industries	F-121 RIICO Ind. Area Ajeetgarh Srimadhapur Sikar	Sikar	0.50	Plastic Scrap	Scrap Dealers	Plastic Granules	31-07-2030		
103	M/S Eco Metro Green LLP	Plot No. H-1-137(A), RIICO Industries Area, Shahjahanpur, Teshil- Neemrana, District Alwar.	Alwar	14.00	Rigid Plastic & Flexible Plastic	Scrap Dealer, BWG, WMAs, Other (Industries)	Plastic Granules/ Dana	31-05-2031	27.510496	76.671804



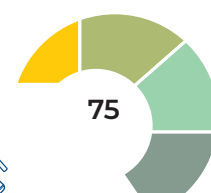
S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
104	M/S Ram Dass Trading Company	F-189, MIA, Alwar	Alwar	8.00	Rigid Plastic	Scrap Dealers, Other (Industries)	Pellets	30-06-2030	27.509235	76.674004
105	Parth Plastic Industries	Plot C-13, RIICO, Phase 1 Hanumangarh Jn.	Hanumangarh	0.40	Rigid Plastic	Scrap Dealers	Cutting Of Plastic	30-06-2030	29.621609	74.275227
106	M/S Sharma Industries	H-303, Chandrawati Growth Centre, Jhalrapatan, Jhalawar	Jhalawar	3.00	Flexible Plastic	Scrap Dealers, BWGs	Plastic Sheet	28-02-2029		
107	Shri Sawaliya Industries	H-52(A), RIICO Ind. Area, Bhawanimandi, Jhalawar	Jhalawar	0.25	Flexible Plastic	Scrap Dealers, WC	Pellets	30-06-2028		
108	Multi Polymers	H-1-30, Ria-li Ajmer Road Beawar ,Ajmer	Ajmer	0.3	PP	Scrap Dealers	-	In Process 31/01/2015	26.18356	74.33519
109	Agarwal Plastic	G-116, Ambajji Ind. Area Abu Road	Mount Abu	0.5	LDPE, PP	Scrap Dealers	Chips	CTE 31/05/2018	24.451435	72.756138
110	Royal Flour Mill	H-1-126-127, RIICO Industrial Area, Bagru Old, Tehsil Sanganeer, District Jaipur	Jaipur	1.2	Flexible Plastic	Scrap Dealers, BWGs	Granules	CTE 30/09/2016	26.819754	75.541319
111	M/S Kamal Plastic	G-1-32,RIICO Ind. Area Beawar, Ajmer	Ajmer	0.25	HDPE	Scrap Dealers, WC	Plastic Granules	CTE 31-03-2027	26.530505	74.314762
112	Meet Industries	G1-106, Phase-2 RIICO, Hanumangarh Jn.	Hanumangarh	0.10	Rigid Plastic	Scrap Dealers, WC	Plastic Granules	Refuse	29.638955	74.280747



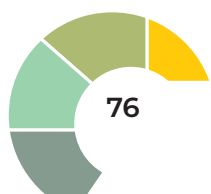
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S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
113	Durga Plastic	H1-772 (A), MIA, Tehsil Ramgarh	Sikar	13.00	HDPE	Scrap Dealers, BWG, WMAs	Granules	31-08-2030	27.524022	76.689614
114	Dev Enterprises	Plot No. G-1-547, MIA, Alwar	Alwar	1.5	HDPE	Scrap Dealers, WC	Granules	30-11-2029	27.513902	76.684354
115	Udairam Badrinarayan	Krishana Nagar, Pal road Jodhpur	Jodhpur	0.5	LDPE, PP	Scrap Dealers, WC	Others	In Process	26.231945	72.990152
116	Real Polymers	G-173,174 Ambaji Ind. Area	Mount Abu	0.5	LDPE, PP	Scrap Dealers, BWG	Others	In Process	24.456147	72.762691
117	Adiva Polymers	E-138, RIICO Ind. Area Bhiwadi	Bhiwadi	8.0	HDPE	Scrap Dealers, BWG	Granules	In Process	28.219515	76.854059
118	Dangi Plastic/ Leo Plast	G-1-460-469a, Road No 12, MIA	Udaipur	0.2	HDPE, LDPE	Scrap Dealers, Other (Industries)	Granules	In process	24.57653	73.74333
119	Sachdeva Plastics	A-6, Industrial Estate, Opp Police Line, Industrial Area, Sri Ganganagar,	Ganganagar	1.5	PP	Scrap Dealers	Granules	In Process	29.934891	73.879939
120	Kamala Foolipat	H11-393 Karnal Ind. Area	Bhiwadi	1.0	PP	Scrap Dealers, Other (Industries)	Granules	In Process	28.829639	77.102785
121	Shreeshyam Pipe And Granuate	G-1/128, RIICO, Industrial Area, Behror,	Alwar	0.5	HDPE	Scrap Dealers	Granules	In Process	27.548821	76.656764
122	Jai Maa Durga Enterprise	F-115, MIA	Alwar	1.0	PVC	Scrap Dealers, Other (Industries)	Chips	In Process	27.51462	76.681896
123	Jai Kishan Recycling Units	Road No 9, Industrial Area, Rani Bazar Bikaner, Rajasthan, 334001 India	Bikaner	1.5	OTHERS	Scrap Dealers	Granules	In Process	27.990148	73.329155



S. N.	Name of Recycling Unit	Address	City Name	Recycling Capacity (TPD)	Type of Plastic Recycling	Source of Plastic Waste Procurement	Final Product	CTE/CTO Status	Latitude	Longitude
124	Royal Plastic	H-2169, Sitapura Industrial Area, Jaipur	Jaipur	5.0	HDPE	Scrap Dealers, BWG, Other (Industries)	Granules	In Process	26.956686	75.893891
125	Mayank Industries, Sitapura	Vedani Ramchandrapura, Sitapura Industrial Area	Jaipur	1.5	OTHERS	Scrap Dealers, WC, BWG, WMA, Other (Industries)	Granules	In Process	27.620126	75.672834
126	Aman Industries	Plot No.13,RIICO Industrial Area	Bikaner	0.5	OTHERS	Scrap Dealers, Other (Industries)	Granules	In Process		

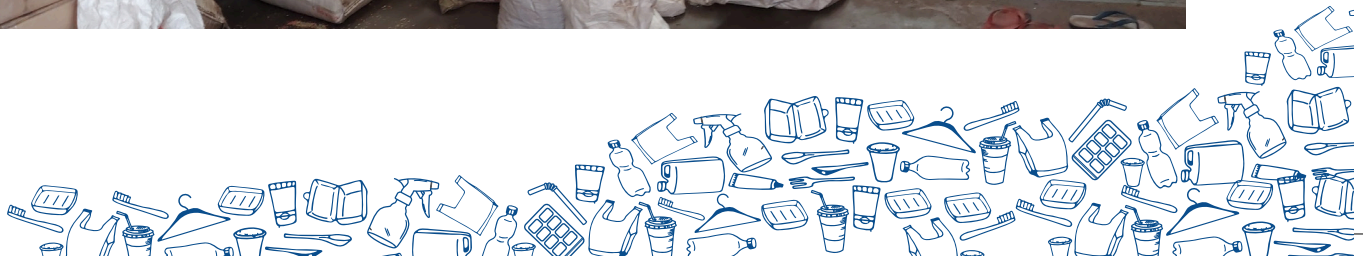




CHAPTER

5

Survey of Plastic Product Manufactures in the State of Rajasthan





Survey of Plastic Product Manufactures in the State of Rajasthan

Survey of industries engaged in the manufacturing of plastic products was also carried out in the identified 15 towns of the state and a total of 175 industrial units were surveyed. Town-wise units surveyed are shown in Fig 11. As per the details, maximum of 44 such industrial units were surveyed in Bhiwadi followed by 36 in Jaipur and 24 in Ajmer. In towns like Barmer, Mount Abu, and Ganganagar small number of units were surveyed as the total number of plastic product manufacturers in these towns is small.

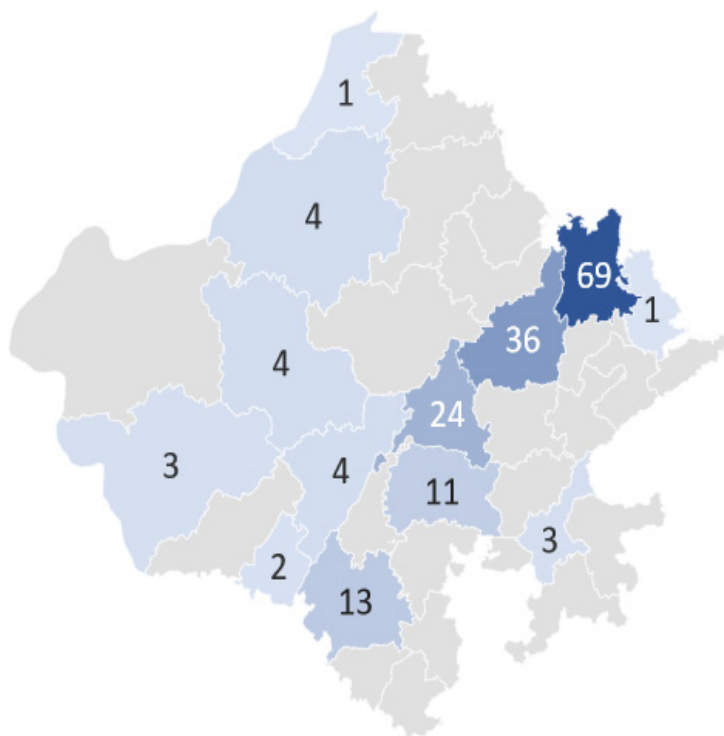


Figure 11 City-wise Plastic Manufacturer Units

City	No Plastic Manufacturer
Ajmer	24
Alwar	9
Barmer	3
Bharatpur	1
Bhilwara	11
Bhiwadi	44
Bikaner	4
Ganganagar	1
Jaipur	36
Jodhpur	4
Kota	3
Neemrana	16
Sirohi	2
Pali	4
Udaipur	13
TOTAL	175

5.1 Type of Polymer used for Manufacturing and Production Capacity

The type of polymer used by these units as raw material was also surveyed and it was found that about 33.51% use PP as raw material whereas 28.80% use PE as raw material. PETE or PET is used by around 8% and PVC by around 18% as raw material.

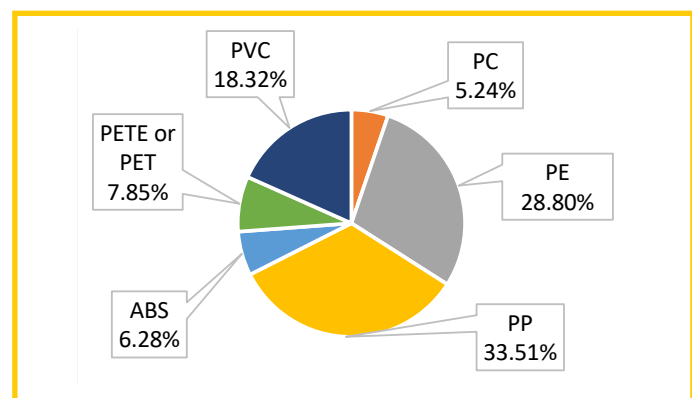
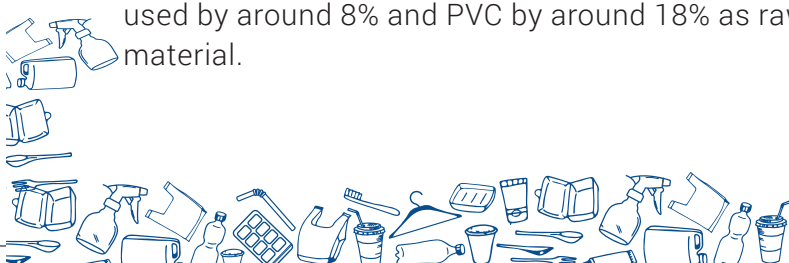


Figure 12 Type of Plastic Polymer Used in the Industry



From the point of view of the polymer produced by these units, PP was the major type of polymer produced followed by HDPE, PET, LDPE, PS, PVC, MDPE, and MLP.

5.2 Final Product and Supply of the Products

The type of products manufactured by these units was also ascertained and it was observed that 31% of units are engaged in the manufacturing of plastic packaging items whereas 8% manufacture bottles/cups and 2% produce industrial containers. 19% of the units are engaged in manufacturing various plastic articles at the time of the survey. However, 24% of the unit manufactures other items including fabric, yarn, plastic net, AC parts & washing machine parts, etc.

How the product manufactured are sold/supplied was also enquired and it was revealed that 34% of the units are supplying their goods within the state whereas 39% supply the goods within and outside the state. Around 4% of the units supply only outside the

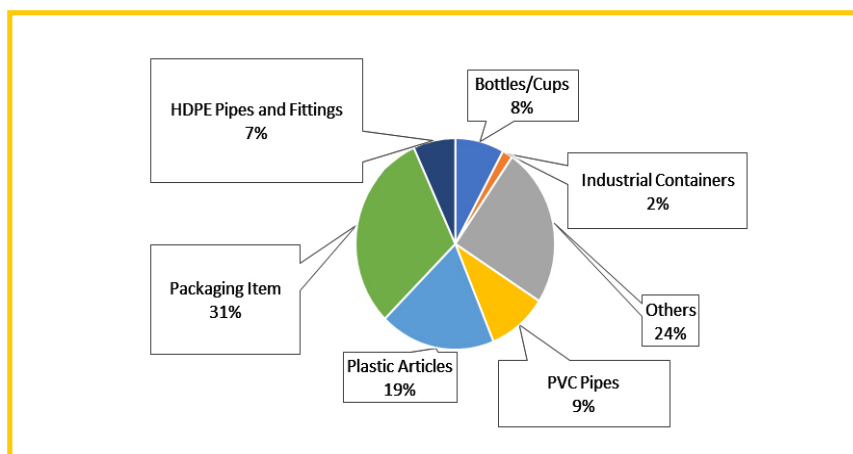


Figure 13 Type of Product Manufacturing by Industry

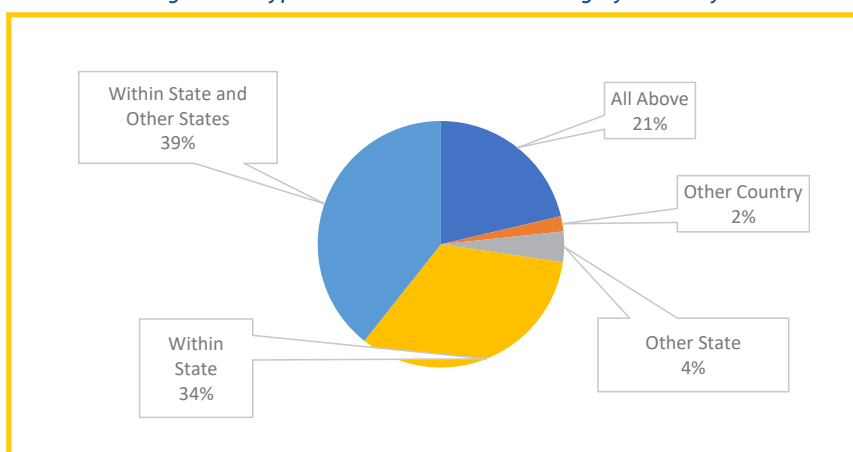


Figure 14 Supply of Products

state and even 2% sell their product outside the country. Around 21% keep all the options and supply as per the customer demand.

5.3 Waste Management during Operation

Industries were also asked about the disposal mechanism of the waste generated by them and it came out that a good 51% are disposing of the waste through third-party whereas 28% have their waste management facility and 4% units send their waste to landfill. There are some units (2%) that are dumping waste illegally in the neighborhood.

When the industries were asked whether they are satisfied with their existing waste management system, 47% said they are satisfied and 5% said they were highly satisfied whereas 34% were not satisfied and 3% were not satisfied at all.



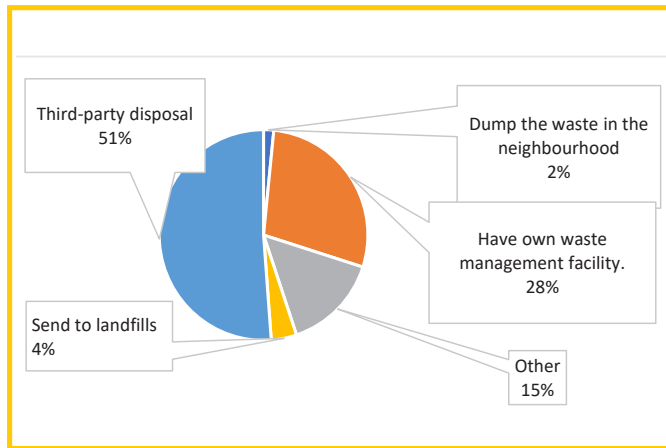


Figure 15 Waste Management by Industry

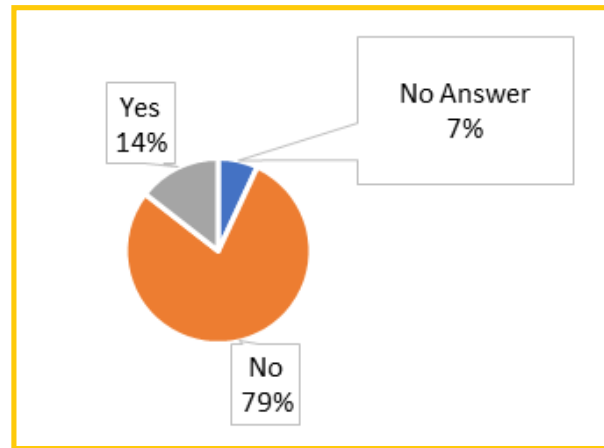


Figure 16 Awareness on EPR

When the industries were asked about the new EPR policy, 79% said that they are not aware of the same and only 14% showed some awareness about the same.

5.4 Status of Consent under the Provisions of Water (Prevention & Control of Pollution) Act, 1974, and Air (Prevention & Control of Pollution) Act, 1981

The status of Consent under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, and Air (Prevention & Control of Pollution) Act, 1981 was also analyzed and it was found that 139 units have obtained CTE and CTO, whereas 128 units have valid/Active CTE and CTO the provisions of Water and Air Acts. Further, 46 units were in the process of obtaining consent to establish or consent to operate.







CHAPTER

6

Status of Producers, Importers, Brand Owners (PIBOs), and Plastic Waste Processors (PWPs) in the state of Rajasthan





Status of Producers, Importers, Brand Owners (PIBOs), and Plastic Waste Processors (PWPs) in the state of Rajasthan

Plastic Waste Processors (PWPs) in the state of Rajasthan

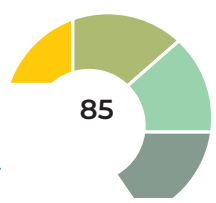
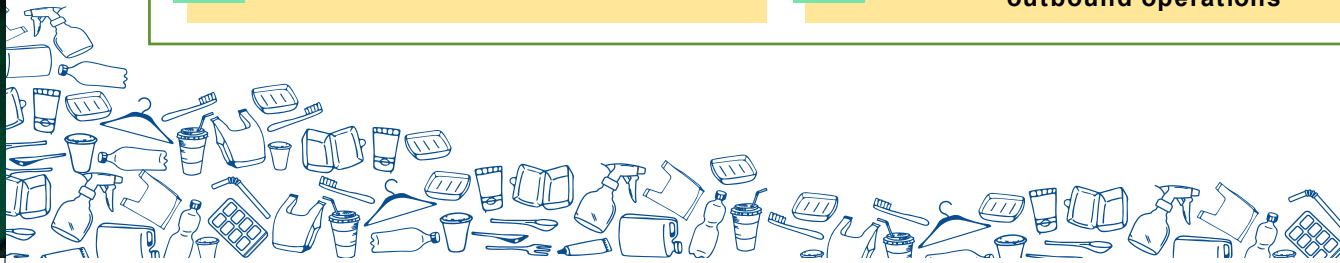
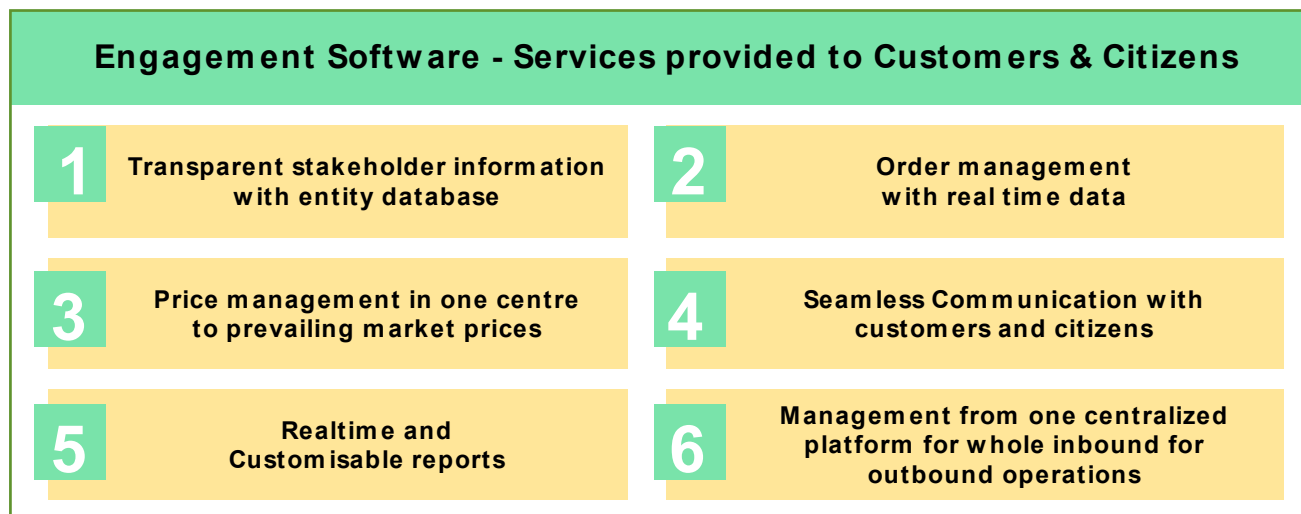
PIBOs and Plastic Waste Processors (PWP) under CPCB new guidelines on Extended Producers Responsibility on plastic packaging under Plastic Waste Management (Amendment) Rules, 2022

The EPR guidelines will give a boost for formalization and further development of plastic waste management sector. In a significant first, the guidelines allow for sale and purchase of surplus extended producer responsibility certificates, thus setting up a market mechanism for plastic waste management.

The implementation of EPR is being done through a customized online platform which will act as a digital backbone of the system. The online platform will allow tracking and monitoring of EPR obligations and will reduce the compliance burden for companies through online registration and filing of annual returns. In order to ensure monitoring on fulfilment of EPR obligations, the guidelines have prescribed a system of verification and audit of enterprises.

The present EPR (plastics) guidelines propose a framework for levy of environmental compensation on PIBOs based upon polluter pays principle, with respect to non-fulfilment of extended producer responsibility targets by producers, importers & brand owners, for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environment pollution. The funds collected shall be utilized for collection, recycling and end of life disposal of uncollected plastic waste in an environmentally sound manner.

Under these producers, importers & brand owners (PIBOs), may operate schemes such as deposit refund system or buy back or any other model, in order to prevent mixing of plastic packaging



waste with solid waste. The present EPR policy guidelines give greater ease to operations, greater traceability and transparency in the country for better recovery and recycling of resources giving it a more circular economy approach.

Earlier in the EPR guideline, PIBOs were engaged as Waste Management Agencies (WMAs) to complete the loop of EPR targets in partnership with recycling of waste by the third-party recyclers. WMAs used to meet the compliances by providing supporting and valid proof of the procurement and sale of the recyclable plastic waste to the recyclers. During the study in the month of April-May 2022, CEE team found very low awareness about the EPR among the small-scale manufactures, recyclers in the state. Before the new amendments in third quarter of 2022 in the guidelines, PIBOs operational in multi-state have engaged various waste management agencies to have collection of plastic waste for meeting their compliances of Plastics-EPR. WMAs used to collect the waste in various cities and states to cater the need of multiple PIBOs as per their requirements and targets. The below mentioned are some of waste management agencies engaged with these PIBOs in the state of Rajasthan;

- | | |
|--------------------------|---------------------|
| 1. NEPRA | 8. Recykal |
| 2. Shakti Plastics | 9. Eco-wrap |
| 3. Trashonomy | 10. Cut Paste |
| 4. Rekart Innovations | 11. Finish Society |
| 5. 21st Century Polymers | 12. Mobitrash |
| 6. SAAHAS Zero Waste | 13. Sarthak Sanstha |
| 7. Rollz India | |

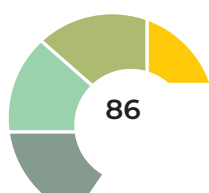
With the effect of new EPR guidelines, the registration of PIBOs have been boosted as of 30th October 2022, total 83 units have been registered as PIBOs in the state of Rajasthan. At the same time, increased recycling units are also getting registered with the EPR portal of CPCB to avail the benefits of EPR through PIBOs. Total 72 plastics recyclers and 11 plastic waste co-processing units have been registered with portal as Plastic Waste Processors (PWPs).

The role of waste management agencies presently, although not very clear are still very much in the loop of collecting more plastics, (involving small aggregators, waste pickers) to sell it to the recyclers and claim a better price (value) for the collected plastics. All in all, the new guidelines are a boon to the plastic ecosystem as it encourages all to adopt collection, segregation of plastics, including informal recyclers to register with SPCBs/CPCB.

Of course time will tell whether the small aggregators and the waste pickers will benefit in this plastic EPR ecosystem and they will not remain an exploited lot; and whether the recyclers and the PIBOs will invest in laying partnerships with ULBs in developing and investing in the infrastructure required for plastics waste management.

6.1 Status of Producers, Importers, and Brand Owners (PIBOs)

The status of PIBOs in the state was ascertained through the CPCB portal and as per the details available, there are 20 Producers, six Importers, and eight Brand Owners who have so far registered at the CPCB portal. Besides the above, in the case of Producers, 30 applications are received and 11 are in the process of registration and three applications have not been approved



as on 31st October 2022 . Likewise, in the case of Brand Owners, four applications have been received. A list of these PIBOs along with required details are mentioned below in this chapter as per the given format.

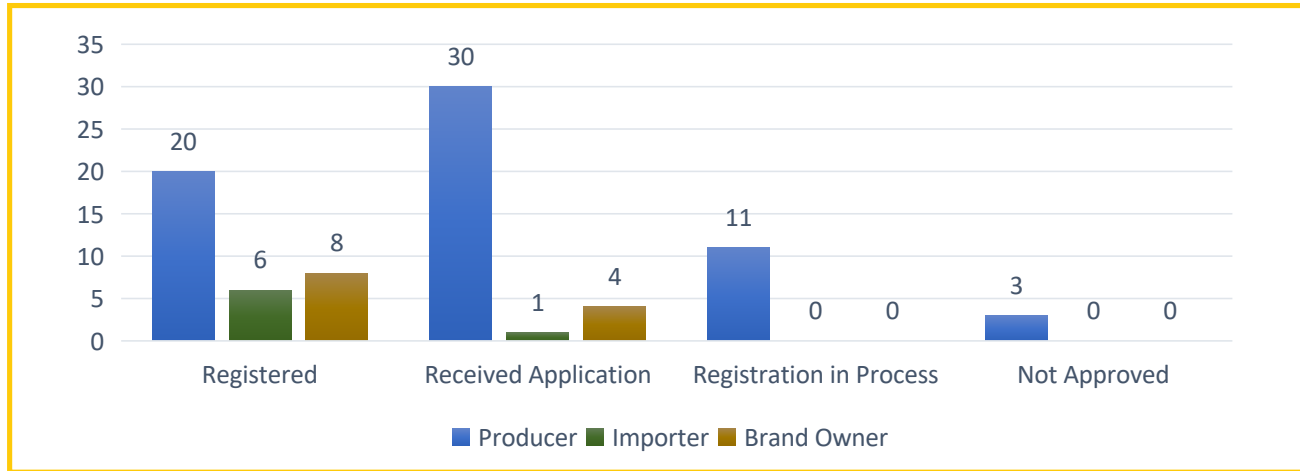


Figure 17: Status of PIBO in Rajasthan

Table 7 PIBO Target

Category	EPR Target (TPA)				Total
	Cat-I (Rigid Plastic)	Cat-II (Flexible Plastic)	Cat-III (MLP)	Cat-IV (Compostable Plastic)	
Brand Owners	78.41	1004.69	19.27	0.00	1102.38
Producers	777.04	10837.83	3549.74	1.05	15165.66
Importers	1.49	185.65	0.00	0.00	187.14
Total	856.95	12028.17	3569.01	1.05	16455.18

Cumulative EPR targets of all the PIBOs were analyzed and it was revealed that Cat-II (Flexible Plastic) makes the highest proportion (12028.17 TPA) followed by Cat-III(MLP), which is 3569.01 TPA. Rigid plastic (Cat-I) and Compostable plastic (Cat-IV) are in smaller quantities which are 856.95 TPA and 1.05 TPA respectively.

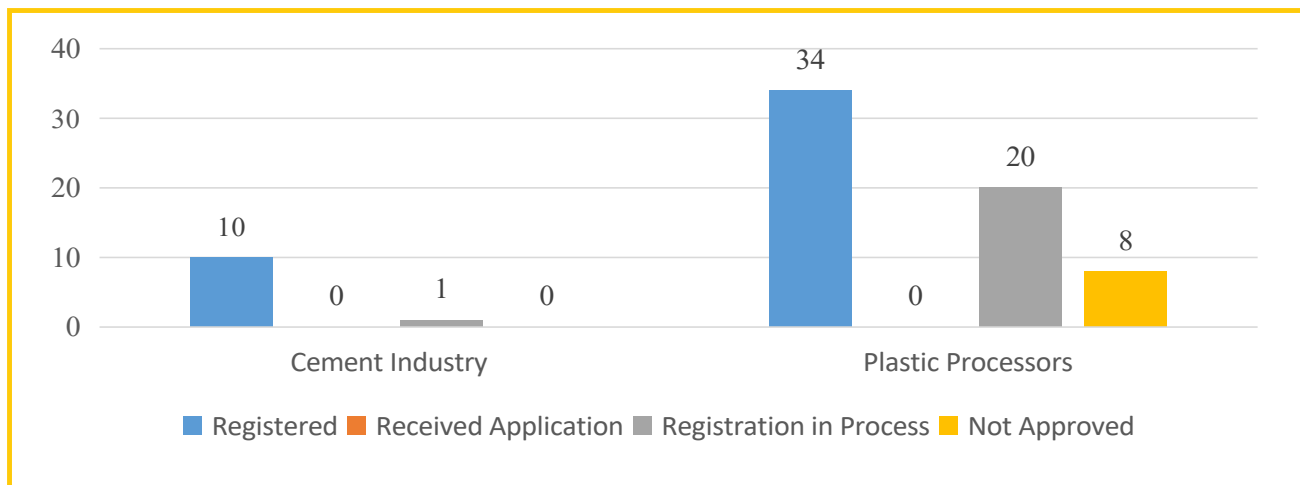
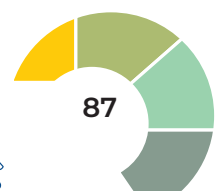
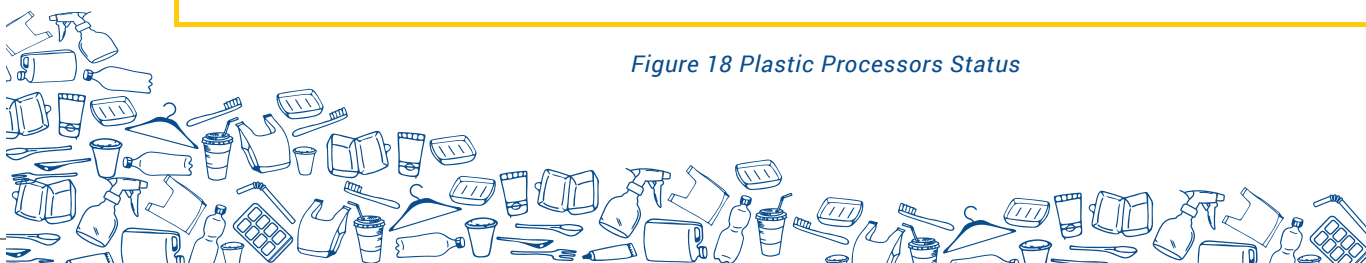


Figure 18 Plastic Processors Status



6.2 Status of Plastic Waste Processors

The status of Registration for Plastic Waste Processors was also obtained from the CPCB portal and as per the details available on the portal, registration has been issued to 44 plastic waste processors and 21 applications are under process. At the national level, 1287 plastic waste processors have been registered. Out of a total of 73 Plastic Waste Processors so far brought into the registration mechanism launched by CPCB on its portal, 11 are cement units that use plastic waste for co-processing and the remaining 62 are other Plastic Waste Processors. Out of 10 cement units, 10 are already registered and in the case of one, the registration is in the process whereas one application is received. The list of cement processing units has been attached in the annexures.

For the Waste Processing units, 34 are already registered and applications for 20 units are under process. In the case of 8 units, the application has not been approved.

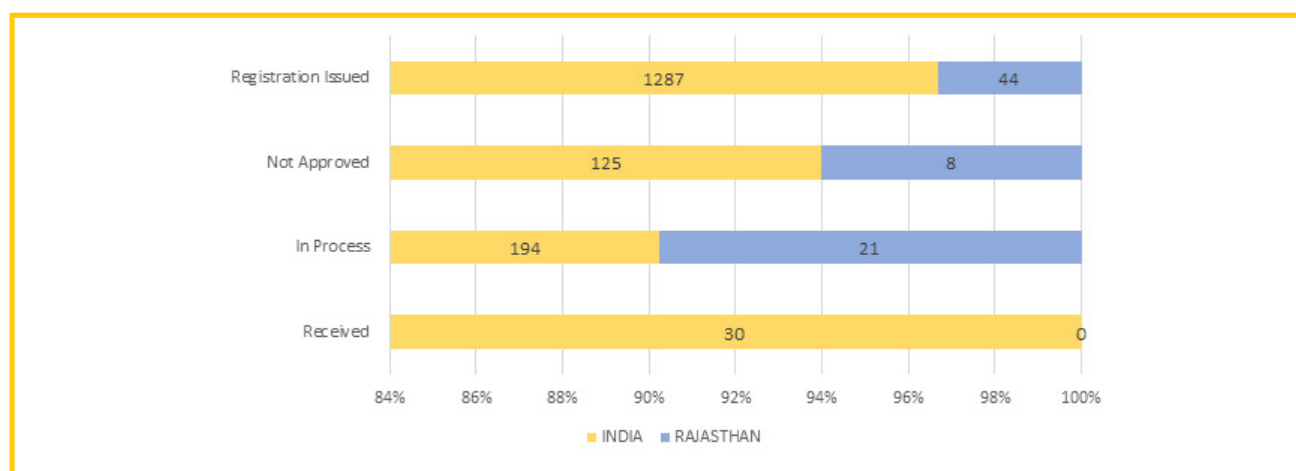


Figure 19 Plastic Processors Status Across India



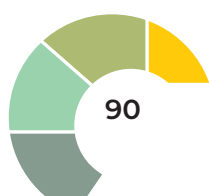
6.3 List of Registered PIBOs as per the given format (Annexure-1)

Table 8 List of Registered PIBOs as per the given format

S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
Producers									
1	Bansal Industries	Plot No. G-30,31,40,41 RIICO Inds. Area, Phase-II, Bagru Extension, Jaipur	Jaipur	Polyethylene	730	Active	Registration Issued		
2	Uma Polymers Limited	Uma Nagar, National Highway No. 62, Pali Road, Mogra	Jodhpur	Flexible Packaging Material	1080	30-11-2027	Registration Issued	24.455226	72.760873
3	Umax Packaging A Unit Of Uma Polymers Limited	Kharsa No. 20 & 20/2, National Highway No. 62, Pali Road, Mogra, Jodhpur	Jodhpur	Flexible Packaging Material	400	Active	Registration Issued		
4	Vardhman Polymers Pvt Ltd	Village-Dadar, Rajgarh Road, Alwar, Tehsil & District-Alwar	Alwar	Printed/Non-Printed Plastic, Laminated Flexible Film & Pouches	1800	30-11-2031	Registration Issued		
5	Daga Poly Laminators Private Limited	G-643-646 & E-277-277(A/1) And E-277-277a, Marudhar Industrial Area, 2nd Phase Basni	Jodhpur	LD/Plastic Film	1200	01-01-2030	Registration Issued		
6	Eco Techfab Private Limited	A-07 & SP-7, Kishangarh Hi-Tech Textile Park Ltd., RIICO Industrial Area, Silora, Kishangarh	Ajmer	Non-Woven Fabrics	1800	30-09-2031	Registration Issued	26.5377727	74.875634



S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
7	Gopal Flexo Packers	F-91-92-93, Industrial Area Ajaymeru, Palra, Ajmer	Ajmer	Laminated & Poly Laminated Pouches	3600	30-11-2030	Registration Issued	26.437215	74.699116
8	Jagannath Industries Pvt Ltd	P. No. 222, JDA Industrial Area, Jaipur	Jaipur	PE Coated Paper	1320	Ackn.	Registration Issued		
9	JBMD Polymers	H-1-786 ,Khushkhhera Ind. Area	Neemrana	LDPE Woven Bags	70	Ackn.	Registration Issued		
10	Kailash Chand Ranka (Mahveer Plastic Industries)	H-35 A RIICO Industrial Area Ajmer Road Beawar	Ajmer	Plastic Packaging Material	80	31-03-2028	Registration Issued		
11	Kamla Polythene Printers	G-226, Hirawala RIICO Industrial Area, Ext. Kanota	Jaipur	Flexo Multi Colour Printing PP, HM, LD Poly Bags		Active	Registration Issued		
12	Laxmi Plastics	P-5, Industrial Estate, New Power House Road, Jodhpur	Jodhpur	Printed Plastic Packaging Material	336	Ackn.	Registration Issued		
13	Manju Devi Agarwal (Shree Krishna Plastics)	G1 185 B, RIICO Industrial Area Chopanki	Bhiwadi	Plastic Containers	60	Ackn.	Registration Issued		
14	Miracle Well Pack (India) Private Limited	398, Rani Sati Nagar Nirman Nagar, Ajmer Road Jaipur, Jaipur, Rajasthan, 302019	Jaipur	Flexible Packing Material, Multi-Layered Plastic Packaging Material	650	IN PROCESS	Registration Issued		



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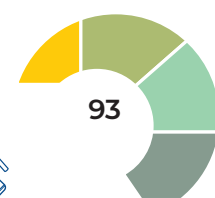
S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
15	Parle Biscuits Pvt Ltd	Sp 2-4, RIICO Industrial Area Neemrana	Neemrana	Multi-layered Wrapper For Biscuits & Candy	19.25	31-03-2027	Registration Issued		
16	Parnami Plastics	F-48(A), Kartarpura Industrial Area, Bais Goddam	Jaipur	Plastic Flexible Containers, (Plastic Packaging Material)	250	31-08-2032	Registration Issued		
17	Santosh Jain (Mahaveer Polypack)	G-150, Ajaymeru RIICO Industrial Area, 8, Palra, Ajmer, Rajasthan, 305001	Ajmer	Rigid Plastic Containers Trays & Plates	480	30-04-2032	Registration Issued	22.4118757	76.6290157
18	Shakun Plastics Private Limited	B-11A2, Road No 9, VKI Area	Jaipur	Compostable Carry Bags	365	31-07-2031	Registration Issued		
19	Uma Polymers Limited	G-154-155-156, Ambaji Industrial Area, Santpur ,Abu Road,	Sirohi	Flexible Film (Packaging Material)	1080	31-01-2027	Registration Issued		
20	Aditya Polysack Private Limited	Khasra No 1853,1857,1860,1875,1841, Aditya Polysack Pvt. Ltd., Amargarh Road, Lamana, Ajmer, Rajasthan 305202	Ajmer	PP/HDPE Poly Sack	5400	30-11-2030	Received	26.2305365	74.4765042
21	Agroha Colourtec Pvt Ltd	F-83 AB RIICO Industrial Area Bhiwadi	Bhiwadi	Master Batch	1200	31-01-2019	Received		
22	Betala Polymers	F-268, Road No.13, VKI Area, Jaipur	Jaipur	Plastic Packaging Bags (Virgin Plastic Only)	90	Ackn.	Received		



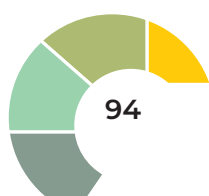
S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
23	Chittor Packtech Private Limited	Araji 1611, 1612, 1615, 1615/2154,1613, Chittor Packtech Private Limited, Gram Baldarkha, N.H. 27, Kota Road ,Chittorgarh, Rajasthan, 312022	Chittaurgarh	Reprocessed Plastic Granules	1080	30-06-2032	Received		
24	Chittor Polyfab Private Limited	Village Semalpura, Bundi Road, Chittaurgarh, Chittorgarh, Rajasthan, 312001	Chittaurgarh	HDPE/PP Woven Sacks/ Bags/Fabrics/ Tape	2620	31-03-2032	Received		
25	Duratuff Yarns Private Limited	Khasra No. 289, Lamana, Amargarh Road, Tehsil - Pisangan, Ajmer, Rajasthan, 305202	Ajmer	Polypropylene Multifilament Yarn	2400	28-02-2029	Received	26.2343585	74.4802188
26	Marudhara Polypack Private Limited	F 661-662, G681-682, Iv Phase, RIICO Industrial Area, RIICO Road, Jodhpur, Rajasthan	Jodhpur	HDPE Fabrick, Woven Sack	6000	30-09-2032	Received	26.5294766	74.7898317
27	National Polytex	Khasra No. 576, 1831/577, Near Rajfed Oil Mill, Ladana Road, Basni Kala, Tehsil Mavli, Udaipur, Rajasthan 313205	Udaipur	PP Fabrics Rolls	3600	31-07-2036	Received		
28	Nutech Polymers Private Limited	B-3 RIICO Industrial Area, Gudli, Tehsil Mavli,	Udaipur	HDPE/PP Woven Sacks	4275	31-01-2027	Received	24.643371	73.832895



S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
29	Santosh Devi Bansal	64, Hanuman Nagar, Jaysaliya, Vki Area	Jaipur	Packaging Materials		Active	Received		
30	SCCI India Private Limited	Plot No 287-88, RIICO Industrial Area, Chopanki (Bhiwadi), Distt Alwar	Bhiwadi	Hand Sanitizer/ Hand Purifies/Hand Rub Floor Cleaners Surface Cleaners and cleaners	600	30-06-2025	Received		
31	Shivangi Polysack Private Limited	Khasra No 293, Shivangi Polysack Pvt. Ltd., Amargarh Road, Amargarh, Ajmer, Rajasthan, 305202	Ajmer	Woven Bags/ Sacks	7200	31-07-2026	Received		
32	Shree Shyam Packaging	G-90, Udyog Vihar,Jaipur	Jaipur	Multilayer Flexible Laminates	775	Ackn.	Received		
33	St Wooven Bags Pvt. Ltd.	Sp-3, RIICO Ind. Area, Phase-II, , Silora, Tehsil-Kishangarh	Ajmer	PP/HDPE Woven Bags	5256	31-08-2030	Received	26.8491206	75.8185692
34	Sumati Plastic Private Limited	G-1/1019, RIICO Industrial Area, Phase 3, Bhiwadi	Bhiwadi	Co-Extruded Multilayer Flexible Packing Films	3250	31-05-2022	Received		
35	Supreme Polymers	H-341, Near Fire Station Office, Sitapura Industrial Area	Jaipur	Packaging Materials	4600	Ackn.	Received		
36	Suras Engineers	C-15, Bais Godam		Plastic Modulated Items		Ackn.	Received		



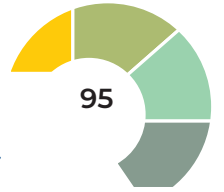
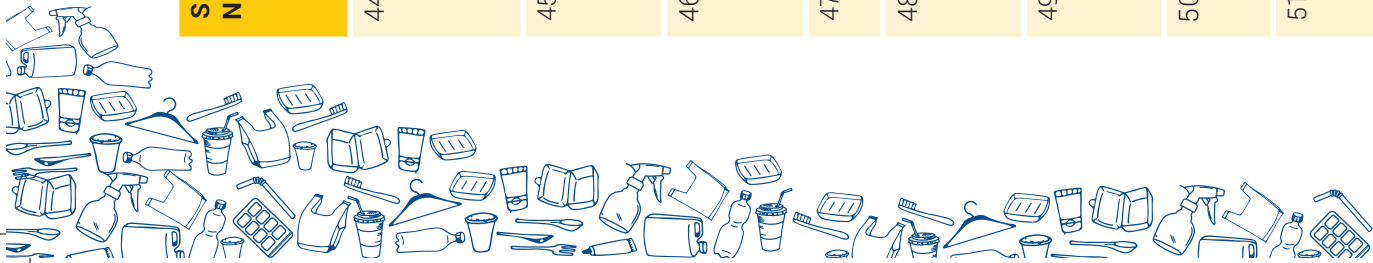
S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
37	Uma Devi Garg	G1-136, RIICO Growth Center, Swaroopganj.	Sirohi	Packaging Material		Active	Received		
38	Sony sales Packaging India Private Limited	Plot No G1-893-894-895, RIICO Industrial Area, Chopanki	Bhiwadi	Air Bubble Pouch, Bopp Tapes, Capcel Foam, Pp/Pat Strap, Stretch Film	3600	30-06-2030	Received		
39	Universal Polysack (India) Pvt. Ltd.	Khasra No. 1522/1/2, 1521/3, 1492/1, Nh-8, Ajmer Road,	Jaipur	HDPE Woven Sacks	5000	31-07-2028	Received		
40	M/S Eastern Poly Craft Industries Ltd.	Plot No. A-49, RIICO Industrial Area, Kehrani Tehsil - Tijjar	Alwar	Plastic Products, Plastic Containers & Plastic Moulded Components	8000	31-03-2026	Received		
41	M/S Eastern Poly Craft Industries Ltd	A 48, RIICO Industrial Area Kaharani, Bhiwadi	Bhiwadi	Plastic Barrels And Plastic Moulded Items	1800	30-06-2025	Received		
42	Girdhar Plastics Private Limited	Plot No. 163, Industrial Area, Jhotwara, Jaipur	Jaipur	HDPE Bottles Jars And Container	1700	31-08-2018	Received		
43	Mahesh Kumar Khinchi	H-49, RIICO Industrial Area - Prahladpura, San	Jaipur	PVC Container By PVC Virgin Granules		Ackn.	Received		



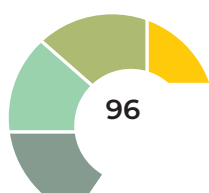
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S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
44	Suraksha Flexo Pack Pvt. Ltd.	F-25, Makhapura Ind. Estate, Ajmer	Ajmer	Multilayered Plastic Film & Pouches And Plastic Packing Material	6000	30-06-2027	Received		
45	ISBIR Mewar Bulk Bag Private Limited	A -210, Road No. 11, Mewar Industrial Area, Madr	Udaipur	PP Woven Sacks /HDPE Woven Sacks	5700	31-01-2028	Received	24.5846696	73.7520505
46	NNB Paper Products Private Limited	Khasra No. 458,460,461/2	Mt Abu	PP Woven Bags	3600	31-03-2032	Received		
47	Subhas Bagla	A-187 A Road No.6 Vki Area Jaipur	Jaipur	Packaging Material		Active	Received		
48	Patni Polymers Private Limited	Khasra No. 641/08 Nh-8 Near Hotel Amar Village	Ajmer	HDPE Bags	3500	30-06-2032	Received		
49	Pegma Resources Private Limited	Khasra No. 10 41, Vill-Rudlai, Teh- Pisangan, Ajmer	Ajmer	Woven Bags/ Sacks	7643	31-08-2029	Received		
50	Doulat Ram Yadav (Girraj Polytech)	J-454, Industrial Area, Sitapura	Jaipur	Packaging Items		Ackn.	In Process		
51	Easy Flux Polymers Private Limited	704, Manglam Fun Square, Durga Nursery Road	Udaipur	Bio-Degradable/ Compostable Disposable Products	1000	Ackn.	In Process	24.5828863	73.7094979



S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
52	Jyoti Polymers	H1-48(B), 49 & 49(A), RIICO Industrial Area, Gegal, Ajmer	Ajmer	Multilayer Co-Extruded, Film	3650	31-12-2031	In Process		
53	Khandelia Oil & General Mills Pvt Ltd.	KHANDELIA OIL & GENERAL MILLS PVT LTD, Plot No. 23, Industrial Area Phase-II,	Ganganagar	Refined Oil (Mustard), Mustard Solvent Oil, Mustard Cake, Deoiled Cake	129	31-10-2026	In Process		
54	Krishna Kacholiya	158, Industrial Area, Jhotwara	Jaipur	Packaging Items		Active	In Process		
55	M/S Shree Dayal Kripa Laminators	H-2094, H-2095, Ramchandpura, Sitapura Industrial Area, Tonk Road	Jaipur	Packing Material	619	31-03-2027	In Process		
56	Miracle Container	Plot No.398, Rani Sati Nagar, Nirman Nagar, Ajm	Jaipur	Hard Plastic		28-02- 2027	In Process		
57	S. K. Thermoformers	Khasra No- 1075, Harsoli Road, Khairthal	Alwar	Biodegradable Disposable Products	850	Ackn.	In Process		
58	Shubham Polymers	Plot No. G1-31D(B), RIICO Ind. Area, Gegal, Ajmer, Rajas	Ajmer	Rigid Plastic Containers Trays & Plates	456	30-04-2032	In Process		
59	Sita Devi Mandot	Nh 8 , Balato Ki Guhar , Bhim	Bhilwara	Woven Bags/ Sacks		Active	In Process		
60	Gayatri Devi Agarwal	186 Chauri Vaali Kothi, Khasra No 2272, Near OI	Jaipur	Rigid Plastic		Active	In Process		



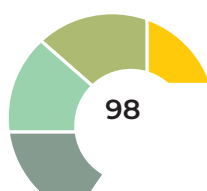
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S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
61	Mahalaxmi Polymer Industries	51, Laxmi Industrial Estate Jawadiya Ghumtti, Jodhpur Road	Jodhpur	Box Strapping, PP/LD/HM/Linear	365	31-10-2022	Not Approved		
62	Balaji Polymers	H-1/144 RIICO Industrial Area, Silora, Tehsil Kishangarh	Ajmer	Woven Bags/ Sacks		Active	Not Approved		
63	Sahjanand Plastic Industries	Plot No. 44 & 31/A, Bahubhai Estat	Ahmedabad	Packaging Material		Active	Not Approved		
Importers									
64	Vedicare Ayurveda Private Limited	No 2, Forest Lane, Near Ghitorni Metro Station, Sulttanpur, M.G. Marg, New Delhi	New Delhi	Ayurvedic cosmetics Massage Oils	1000	31-05-2026	Registration Issued		
65	Jain Traders	A-8, Dharam Narayan Ji Ka Hatha, Lohar Colony, Paota, Jodhpur	Jodhpur	Tents, Umbrellas, and Tipis		In the Process of Renewal	Registration Issued		
66	Mohan Enterprises	F-143, First Floor, Industrial Area, Vikram Chowk, Alwar, Rajasthan, 301019	Alwar	Plates, Sheets, Film, Foil, And Strips, Of Plastics		Active	Registration Issued		
67	Oasis Impex	7, New Bhupalpura	Udaipur	PVC Items		Active	Registration Issued		
68	Pankaj Traders	KH. NO.-862, Dhan Mandi, Mahamandir, Jodhpur,	Jodhpur	Cumin Processing (Cleaning & Packaging)	10000	Ackn.	Registration Issued		
69	Sonia Bhatia	838, W/O Manish Bhatia,, Frontier Colony, Jaipur	Jaipur	Rigid Plastic		Ackn.	Registration Issued		



S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
70	Cultivator Natural Products Pvt Ltd	Plot No. - 24 To 31, Khasra No.- 135/1, Sonamukhi Nagar	Jodhpur	Green Category - Ayurvedic and Homeopathic medicine	32000	Ackn.	Received		
Brand Owners									
71	Alwar Zila Dugdh Utpadak Sahkari Sangh Ltd	Jaipur Road, Near Bhawani Top, Alwar	Alwar	Milk Packaging Materials	6000	31-12-2031	Registration Issued		
72	Bhilwara Zila Dugdh Utpadak Sahakari Sangh Limited	Post Box No. 46, 5 Km, Ajmer Road	Ajmer	Milk & Milk Products (ghee chhach, dahi lassi srikhand & paneer)	150	28-02-2027	Registration Issued		
73	Eight Brothers Sales Pvt.Ltd	20-21,Ratan Ind. Area,Village Harsuliya,Phagi	Jaipur	Washing Soap	18000	30-06-2028	Registration Issued		
74	Surendra Industries	H-174, Malviya Ind Area , Malviya Nagar , Jaipur-302017	Jaipur	Detergent, Dishwasher, Floor Cleaner, Hair Oil, Hand wash, Toilet Cleaner, Toilet Soap, Washing Soap	3500	31-03-2028	Registration Issued		
75	Lotus Dairy Products Pvt. Ltd.	5th, 6th, And 7th Floor, City Plaza, Jhotwara Road, Bani Park	Jaipur	Chhach, Dahi, Flavored Milk, Ghee, Lassi, Namkeen Chhach, Packed Milk, Paneer	1700	30-09-2023	Registration Issued		



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S. N.	PIBO Name	Address	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	PIBO Status Till October-22	Latitude	Longitude
76	Paayas Milk Producer Company Ltd	D-232-233, 4th Floor, Atlantis Tower, Vaishali Nagar	Jaipur	Milk Products		Active	Registration Issued		
77	Paramount Surgimed Limited	A-106, RIICO Ind. Area, Bhiwadi	Bhiwadi	Diaper For Adult & Baby Sanitary Pad Product / Napkin Under Pad, Stainless / Carbon Steel	3600	31-12-2024	Registration Issued		
78	Radha Soami Food Products Pvt Ltd	H-273, Sitapura Ind. Area, Tonk Road, Jaipur	Jaipur	Food Product Packaging	2200	31-03-2031	Registration Issued		
79	Goyal Proteins Limited	Village-Kasar Nh-52 Kota	Kota	Soya Hipro Meal/Soya	3650	31-07-2023	Received		
80	K P Textiles Private Limited	H-373, RIICO Industrial Area Sitapura, Jaipur	Jaipur	Edible Flour/ Soya Grits		Active	Received		
81	Shubham Textiles	Plot No. 40, 41, 42, Near Jaipur Gate, Khadi Gram Udyog Road, Sanganer, Jaipur	Jaipur	Packaging Material		Ackn.	Received		
82	Udaipur Dugdh Utpadak Sahakari Sangh Ltd	Goverdhan Vilas Sec. 14, Ahmedabad Road Udaipur	Udaipur	Milk Pouches And Packaging Material	5000	28-02-2027	Received		

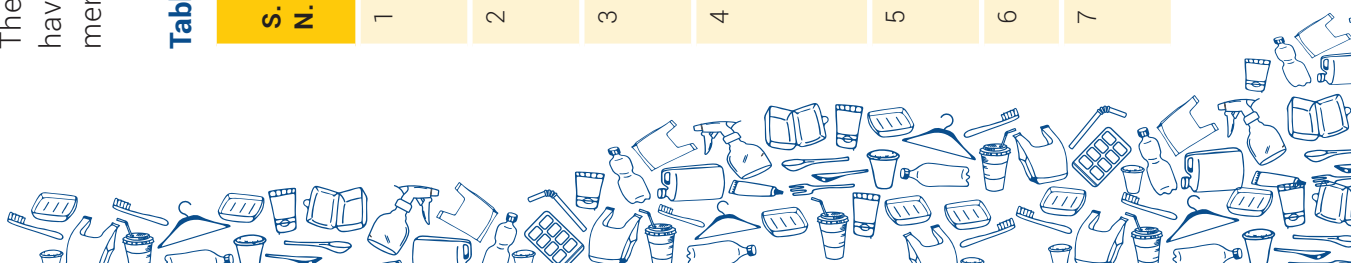
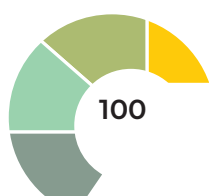


6.4 List of PIBOs required to take registration on EPR Portal as per the given format (Annexure-1);

The below mentioned are the manufacturers of the plastic packaging items which have been surveyed during the study. Total 82 units have applied on the EPR portal for registration and there are many small manufacturers are in line to apply for the same. The below-mentioned list of plastic manufacturers has been segregated from the list of 175 surveyed plastic manufacturing units.

Table 9. List of PIBOs required to take registration on EPR Portal

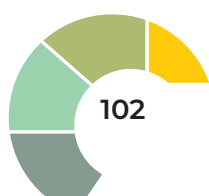
S. N.	PIBO Name	Address	PIBO Type	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	Latitude	Longitude
1	Palra Production Pvt. Ltd.	Kharsa No 282 To 284, 299 To 30, Vill. Palra	Producers	Ajmer	HDPE, PP Woven Fabrics, Woven Sacks & bags	3024	31-10-2026	26.43185	74.69941
2	Premier Poly Products	Kharsa No 2115, Village- Saradhana Tehsil:Ajmer	Producers	Ajmer	Metallised Lacquered Polyester Film	1200	30-06-2031		
3	S.R. Converters	Nh-8, Beawar Road, Kesarpura , Ajmer Tehsil:Ajmer	Producers	Ajmer	Polythene Film (Packaging Material)	1200	31-05-2030		
4	Vishwakarma Health Care (P) Ltd.	Kharsa No. 1784, 1785, Mangaliyawas Nasirabad Road Brikchiyawas Tehsil:Ajmer	Producers	Ajmer	Printed Laminated Flexible Packaging Material	2400	30-06-2029		
5	Ganpati Poly Pack	H-1-22, RIICO Ind Area, Ajmer Road Beawar	Producers	Ajmer	Liner LLDPE/HDPE Packing Material	120	31-05-2030	26.9611638	75.6414381
6	Griraj Plastics	7-RIICO Industry Area	Producers	Ajmer	Industrial Packaging Material	219	31-10-2026	26.3309607	74.3774414
7	Marudar Polyfab P.V.T Ltd.	SP-2, Kishangarh Hi-Tech Textile Park Silora	Producers	Ajmer	PP/HDPE/Woven Sacks/Fabric	3285	CTO - 31/03/2017	26.5294766	74.7898317



S. N.	PIBO Name	Address	PIBO Type	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/ CTO)	Latitude	Longitude
8	Mehata Selse Corporation	H-1-29, RIICO Ind. Area Phase-2 Ajmer Road	Producers	Ajmer	Industrial Packaging Material, Woven Bags/Sacks, Zip Lock Bags	1440	30-11-2028	26.11174	74.3367378
9	Shree Nakoda Polypack	7, Phase-I, RIICO Ind. Area, , Beawar	Producers	Ajmer	Industrial Packaging Material	190	31-10-2026	25.3817669	74.5640319
10	Amrit Industries	G-177B MIA, Alwar	Producers	Alwar	Plastic Products	1000	Ackn.		
11	Aravali Despotech Pvt. Ltd.	E-614, Matsya Industrial Area (Extension) , Alwar	Producers	Alwar	Bio-Degradable/ Compostable Disposable Products	1200	Ackn.	27.52215	76.688249
12	M/S JBMD Polymers	H-1-786 , Khushkhera Tehsil:Tijara	Producers	Alwar	LDPE woven Bags	80	Ackn.	27.522529	76.689197
13	Ashok Plastic Industri	Mandir Ohalla,Vill. Khed Barmer	Producers	Barmer	PP Bags & Rolls	300	05-04-2022	25.8646448	72.1721047
14	M.M. Corporation	G-156,2nd Phase Ind. Area Balotra	Producers	Barmer	PP, HM, LD & BOPP Bags & rolls		Ackn.	25.845796	72.229988
15	Bahiti Polyfab Pvt. Ltd	RIICO Area, Lambiyakhurd	Producers	Bhilwara	PP Woven Fabric	9792	CTE 31/12/2025	25.6148	74.63571942
16	Vijay Industries	RIICO Ind Area, Ajmer Road, Bhilwara	Producers	Bhilwara	Polythene Roll Sheet (Printed & Plain) Packing Material, PVC Agri Pipe	6500	Ackn.	25.3852	74.63068539
17	H K Polymers	H1/1386,Riico Industrial Area, Phase-V	Producers	Bhiwadi	Garbage Bags for Segregation & Storage of Biomedical Waste	360	Ackn.	28.193384	76.870968
18	JMT PISO Pvt. Ltd.	E-1159, Phase 3 RIICO Industrial Area Bhiwadi	Producers	Bhiwadi	Corrugated & Sheets (PVC/PP/HDPE Rigid Plastic)	1200	CTO - 31/05/2014	28.6507225	77.217744



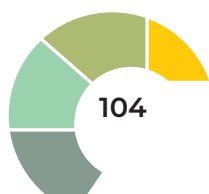
S. N.	PIBO Name	Address	PIBO Type	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	Latitude	Longitude
19	Neha Packaging	F-1206/2 Rampura Mudana Ind. Area Bhiwadi	Producers	Bhiwadi	Industrial Packaging Material	420	Ackn.		
20	Patel Industries	812H/55A Samtal Zone Ra Bhiwadi	Producers	Bhiwadi	Industrial packaging material	144	30-06-2022	28.207003	76.846967
21	Shavitri Enterprises	C2 531 RIICO Ind. Area Bhiwadi	Producers	Bhiwadi	PP Packaging Item	100	In Process		
22	Surmount Industries	E-94 Phase 1	Producers	Bhiwadi	Air Bubble Sheet roll	756	Ackn.	28.209943	76.859347
23	Vaibhav Polymers	E-94, Phase I, RIICO Industrial Area Phase I	Producers	Bhiwadi	Plastic Packing & Roll	730	Ackn.		
24	Ashv Packaging Industries LLP	F-1095, RIICO Ind. Area ,Bhiwadi	Producers	Bhiwadi	LD, PP, HD packaging materials, AND PVC Flexible pipes	1200	Ackn.	28.194845 28.197243	76.861027 76.861881
25	Goyal International	G1/12929(A) Phase-V Bhiwadi	Producers	Bhiwadi	Packaging Bags	100	30-11-2027		
26	Bikaner Polypack	Road No.2, Rani Bazar Industrial Area	Producers	Bikaner	Liner & Bags (Packaging Material)	200	In Process		
27	P.P. Industries	45 B, Road No. 5, Rani Bazar Industrial Area	Producers	Bikaner	LDP Polyester Film Laminated Plastic Pouch/Bags with Printing	100	CTO - 31/08/2013	27.99345	73.322368
28	Ganpati Plastfab Ltd.	C-58(B) Road No 2D, Bindayaka	Producers	Jaipur	HDPE PP woven fabric woven sacks AND bags	5040	29-02-2028	26.92303	75.653408
29	M/S Marisboro Industries Llp	A-333C, Yadav Market Road VKIA Jaipur	Producers	Jaipur	PP Woven Bags	2250	31-01-2032	26.99999	75.796291



S. N.	PIBO Name	Address	PIBO Type	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	Latitude	Longitude
30	Om Shiv Industries	H-395, RIICO Ind. Area, Sarna Dungar, Jhotwara	Producers	Jaipur	Printed Plastic Packaging Material	600	CTO - 30-09-2014		
31	Pratibha Polymers	G-1-380, Sarna Dungar Ind. Area	Producers	Jaipur	Printed Plastic Packaging Material	365	31-12-2015		
32	Ridhi Entreprises	Pitaliyon Ki Bagichi, Amar Path, Janta Colony, Jaipur	Producers	Jaipur	Packaging Bags	500	In Process		
33	Shri Gopal Flexo	4/168,Rawalji Ka Bandha,Khatipura Road	Producers	Jaipur	Plastic Packaging Material	110	Ackn.		
34	Shree Shyam Polymers	G1-5 Udyog Vihar, Jaitpura Chomu	Producers	Jaipur	Lamination Pouch	600	Ackn.		
35	Pack Point	F-401, 402,404, Basni 2nd Phase, Jodhpur	Producers	Jodhpur	F.L.Roll F.L. Pouch And Paper Roll	600	31-05-2029		
36	Frystul Pet Pvt Ltd	G-171,172 RIICO Phase 2 , Neemrana	Producers	Neemrana	Bottles/Cups & Packaging	7200	30-09-2032	27.972918	76.370917
37	Grabeco Packaging Llp	Epip-2, RIICO Industrial Area, Neemrana	Producers	Neemrana	Biodegradable Tableware And Industrial Packaging	4000	30-11-2029		
38	Meenakshi Polymer Pvt. Ltd.	G-135-136,Ind. Area Neemrana	Producers	Neemrana	Plastic items and moulding items, PU Foam Articles	1500	31-07-2022	27.971912	76.376006
39	MG Polyplast Industries Pvt. Ltd.	F-191,192 And G-183,184 EPIP RIICO Industrial Area Neemrana	Producers	Neemrana	Plastic & Poly carbonate Moulded Sheets	100	30-04-2026		
40	Murliwala Enterprises	G-1/128a, RIICO Area	Producers	Neemrana	Poly Roll/Poly Sheet & Shrink film	150	Ackn.	27.971576	76.376975



S. N.	PIBO Name	Address	PIBO Type	ULB / Designated State Authority)	Plastic Type	Qty of plastic to be channelized (MTPA)	Validity of PIBO (CTE/CTO)	Latitude	Longitude
41	Kunstocom India Ltd	E-134&135 EPIP RIICO Industrial Area	Producers	Neemrana	Plastic Moulded Components	647	CTE - 31/10/2013		
42	Aran Polymers	E-188 , 4 RIICO Phase 2nd Area, Pali	Producers	Pali	Plastic Packaging Materials (Plain and Print)	1305	31-12-2027	25.8108553	73.3255401
43	Dhariwal Suppliers	F-201C, Hiandia Road	Producers	Pali	Plastic Articles Packing Material For Industrial Use	180	Ackn.		
44	Dhulewa Industries	B-501 Bhamashah Industrial Area	Producers	Udaipur	HDPE/PP Tape & Fabric	3000	31-05-2031	24.513315	73.756936
45	Pushp Enterprises	G1-243 RIICO Center Kaladwas	Producers	Udaipur	Plastic Reprocess Granules & Plastic Ropes	100	30-09-2028		
46	Trutuf Pipes And Fitting Pvt. Ltd	Village Lakadwas Near P.H.C Govt. Hospital, Tehsil-Girwa	Producers	Udaipur	HDPE/PP/PVC/CPVC Pipes	1100	30-04-2036		
47	Ucron Pvt Ltd	G-4 6,RIICO, MIA	Producers	Udaipur	LD Films	900	Ackn.	24.572193	73.75249



6.5 Co-processing of Plastic Waste

6.5.1 Description for co-processing of Plastic Waste in Cement Kilns¹⁰

Co-processing is a more environmentally friendly and sustainable method of waste disposal as compared to landfilling and incineration because of reduced emissions and no residue after the treatment. Co-processing refers to the use of waste materials in industrial processes as alternative fuels or raw material (AFR) to recover energy and material from them. Due to the high temperature in cement kiln, different types of wastes can be effectively disposed without harmful emissions. As per the Basal Convention, variety of wastes including hazardous wastes, get disposed in an environmentally safe and sound manner through the technology of co-processing in cement kiln. Disposal of different categories of plastic wastes through co-processing is practiced in many countries as a regular method for their environmentally sound disposal.

6.5.2 Infrastructural Requirement for Plastics Co-processing

Every cement plant will have to have a separate feeding arrangement for undertaking co-processing of AFRs. In case it already has one on the calciner or kiln inlet, then the same can be utilised for plastics as well. However, if it does not have any on the calciner or kin inlet, then the same needs to be set up. This feeding facility will consists of proper covered storage along with conveying mechanism to move plastic waste from storage area to kiln. This can be manual or can be automatic. The manual one consists of winch and hopper arrangement and conveyor belts arrangements. At the feed point, it is desired that equipment such as double flap valves, shut off gates etc. are installed to ensure uniform feed and safety in operation. The feeding facility shall also be equipped with a lab to carry out the calorific value, ash content, moisture content and chloride content.

In the guideline of co-processing of plastic waste in the cement kiln, it has been recommended to all municipal corporations to have MRF facility to achieve segregation and recovery of maximum possible recyclables from the mixed waste so that they can be directly reused or recycled for beneficial purposes. The segregated combustible fraction (SCF) such as plastic, paper, leather etc. The SCF can be compacted and handover to the cement kilns which can be used as Refused Derived Fuel (RDF) and residue material which cannot be converted into RDF will be taken to the sanitary landfill cells.

Roles and responsibilities of different stakeholders for use of plastic waste in co-processing in cement kilns (as per the guideline of co-processing of Plastics by CPCB)

Table 10 Roles and responsibilities of stakeholders in co-processing

S. No.	Activity	Responsible Stakeholder
1.	Door to door collection and segregation of all category of used plastic waste by Municipal Staff or Authorised NGO or person.	Safai Karamchari (Municipal Staff) or Authorized Private Person

¹⁰ Guidelines for co-processing of plastic waste in cement kilns (as per rule '5(b)' of plastic waste management rules, 2016)



S. No.	Activity	Responsible Stakeholder
2.	Collection of littered/dumped plastic waste in public places like market areas, bus stands, railway stations, cinema halls, parks, community centres, road side etc. by Municipal Staff or Authorised NGO.	Safai Karamchari (Municipal Staff) or Authorized Private Person
3.	Storage of collected plastic waste from households and other places in a covered yard authorised by Municipal Authority.	Municipal Staff or Authorized Private Agency
4.	Shredding of plastic waste to desired size, if required, using shredder and storing in bags.	Municipal Staff or Authorized Private Agency
5.	Signing the MoU with cement kilns for management of plastic waste by co-processing.	Municipal Authority or Urban Development Department
6.	Transporting plastic waste to cement kilns and maintaining the record of the same.	Municipal Authority or Authorized Private Agency
7.	Receiving the shredded plastic waste from Municipal Authority and maintaining the record of its receipt, storage and co-processing.	Staff of Cement Plant
8.	Collection of the plastic waste under EPR and transporting it to the cement plant for co-processing	Producer, Brand Owner or Importer
9.	Monitoring of the efficient implementation of plastic waste management Rules 2016 by assigning the responsibility to a nodal officer.	Concerned SPCB / PCC
10.	Co-processing of Plastic Waste as Alternative Fuel & Raw Material (AFR) in cement kilns and monitoring/controlling emissions as per set standards.	Cement Plant
11.	Monitoring of emissions and sharing the data with concerned SPCB/PCC and CPCB.	Cement Plant

In the state of Rajasthan, there is good presence of the cement manufacturers due to availability of good quality raw material and other operational ease. As per the current status, total 11 cement plants have been registered as plastic co-processing unit under EPR portal of CPCB. During the study team has interacted and interviewed multiple unit managers and also visited to two cement plants to assess and understand the real picture of the co-processing in these units. Team has gone through the whole process during the visit and also analysed the sources of waste coming from various cities. During the meeting and discussion, it has been observed that there is huge gap in the supply side of the waste (RDF). Recommendations and action plan for the co-processing units prepared separately and attached in the recommendations chapter.

- Mixed waste is coming as RDF with high moisture content (25-40%) and low calorific value (1500-2000 CV).
- High maintenance cost is required by Cement Co processors during processing to segregate stones, silt and sand.



- Co-processors increasing expenditures in processing of low-quality RDF is limiting them not to use more RDF materials as alternative fuel. Restrict only for mandatory CPCB guidelines; lest remain on coal. (which is not an environment friendly due to its high cost of mining and ash content).
- Poor calorific value in RDF is leading for additional combustible (agro base) materials.
- Unable to track the quantity of plastic waste received in RDF for EPR certification.
- Plants are running below capacity;
 - **JK Cement:** Total Processed RDF: 16765.35 MTPA Capacity: 110,000 MTPA. (Total Processed from Rajasthan: 662 MTPA (3.94%)
 - **Ultratech:** Total Processed RDF: 18522.38 MTPA capacity: 219,000 MTPA. (Total Processed from Rajasthan: 16123MTPA (7.36 %)

The below mentioned are the conclusion and rational points of the co-processing defined under the guideline of CPCB;

- The economic viability of the pre and co-processing of RDF in cement kilns depends substantially on the quality of the same on as received basis at the cement plant gate.
- Co-processing provides the waste management solution without any waste to worry about in future.
- It has been demonstrated globally and also in India through large number of successful co-processing trials that co-processing provides environmentally sound and ecologically sustaining disposal of a variety of wastes starting from simple ETP sludge to most complex POPs including the hazardous ones.
- If the cement plants have to undertake large scale co-processing activity to solve the MSW problem faced in the country, then they have to make investments of more than Rs. 25 Cr to 30 Cr per million TPA clinker manufacturing capacity while operating at a TSR level of about 15%.
- To encourage this kind of investment, cement kilns be provided the same grants and subsidies that are extended to the waste management project operators.
- Use of RDF by cement plants will not only help reduce the waste management problem but also it will help reduce GHG emissions, reduce foreign exchange outgo on account of reduced coal imports and conserve the coal reserves of the country.
- Capacity building of the MSW project operators on proper segregation of the combustible fraction and also on producing right quality RDF is essential.



Table 11. List of Cement Industries registered as co-processing units on EPR Portal:

S. N.	Company	Address	Registration Status
1	J K Cement Works Nimbahera, Tehsil Nimbahera	J K Cement Ltd, Kamla Tower Kanpur (UP) 208001	Registration Issued
2	J K Cement Works Mangrol, Tehsil Nimbahera, Dist Chittorgarh, Rajasthan	J K Cement Ltd, Kamla Tower Kanpur (UP) 208001	Registration Issued
3	Birla Corporation Limited (Units: Birla Cement Works & Chanderia Cement Works)	Sector - III, Madhav Nagar, Chanderia, Chittorgarh	Registration Issued
4	Shree Cement Limited	Bangur Nagar, Post Box No. 33, Beawar 305901, Rajasthan, India	Registration Issued
5	Shree Cement Limited	Shree Cement Limited, Bangur Nagar, Post Box No.-33, Beawar 305901, Rajasthan	Registration Issued
6	Mangalam Cement Ltd.	P. O. Aditya Nagar Morak, Distt Kota (Rajasthan) Pin - 326520	Registration Issued
7	UltraTech Cement Limited (Unit: Aditya Cement Works)	PO Adityapuram, Chittorgarh-312622	Registration Issued
8	Wonder Cement Limited	Wonder Cement Limited, Corporate Office, 17 Old Fatehpura, Udaipur Rajasthan	Registration Issued
9	Udaipur Cement Works Limited	Shripati Nagar, CFA, P.O. Dabok,	Registration Issued
10	Jk Lakshmi Cement Limited	Village- Jaykaypuram Tehsil:Pindwara District:Sirohi	Registration Issued
11	Ambuja Cements Limited Bhatapara	Ambuja Cements Limited Bhatapara Cement Works Rawan Baloda Bazar, Bhatapara	In-Processs





CHAPTER

7

Municipal Waste and Plastic Waste Characterisation





CHAPTER

7

Municipal Waste and Plastic Waste Characterisation

7.1 City wise Characterization of Municipal and Plastic Waste

Cities today face problems due to fragmented and inadequate waste management systems. This is further multiplied, as over the past few years has led to the shifting of India's predominantly agriculture-based economy in an industrialized economy. More waste is being generated now than ever before. This is further augmented due to increased income, increasing populations, and changing high-consumption lifestyles and discard systems in semi-urban and urban cities. Under the present study, municipal waste sampling was done in 15 cities namely, Ajmer, Alwar, Barmer, Bharatpur, Bhilwara, Bhiwadi, Ganganagar, Bikaner, Jaipur, Jodhpur, Mount Abu, Neemrana, Pali, Udaipur, and Kota.

In all these cities, sampling and characterization studies were undertaken in households, hotels, markets, institutions, and landfill. Sampling from households were carried out in three income categories, namely low-income, medium-income, and high-income to capture all economic groups sampling and analysis were done as detailed in Chapter 2. A brief outcome of the characterization study of each city is discussed below.

7.1.1 Ajmer

In Ajmer, sampling points were selected for waste characterization and quantification study. In households, three income groups were defined and separate analysis of waste characterization was undertaken in all three categories.

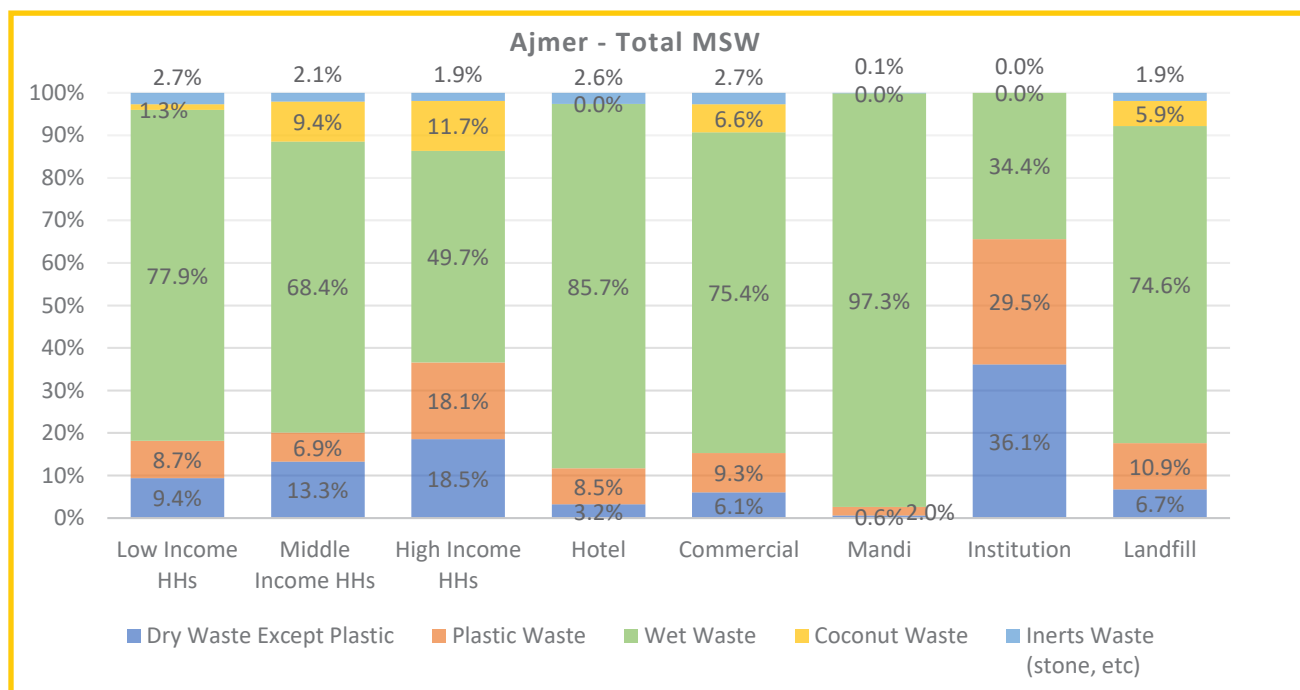
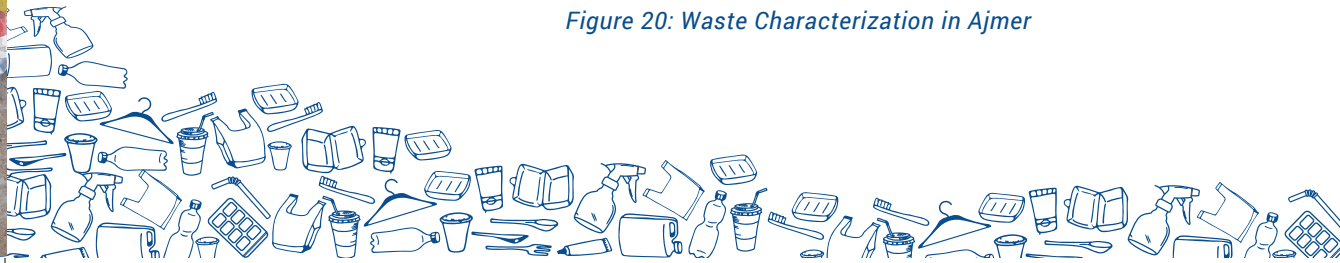


Figure 20: Waste Characterization in Ajmer



In the low-income areas, 9.4% was dry waste except for plastic waste whereas plastic waste was 8.7%. The highest percentage of the waste fraction was 77.9% which was for the wet waste. Coconut waste was separately quantified and it stood at 1.3% of the overall municipal solid waste in the low-income category. Inert waste was only 2.7% of the total waste.

In the middle-income group, the percentage of dry waste (except plastic) was slightly higher at 13.3% with plastic waste reducing to 6.9% as compared to the low-income group. Wet waste fraction was also reduced to 68.4% whereas coconut waste fraction was high at 9.4% and inert waste fraction as 2.1%.

In the high-income group, the fraction of dry waste (except plastic) was highest among all the three income groups at 18.5% whereas the percentage of wet waste was lowest at 49.7%. The fraction of plastic waste and dry waste (except plastic) was almost equal with the plastic waste fraction at 18.1% as compared to the dry waste (except plastic) fraction at 18.5%. Data also shows that wet waste fraction is highest in the low-income group followed by the middle-income group and high-income group.

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was 97.3% and 85.7% which is expected. Plastic waste was 2% in Mandi and 8.5% in hotels which indicates significant use of plastic disposable and packaging waste in hotels. The inert fraction of the waste was 2.6 % in hotels which is quite significant.

In institutions, the fraction of plastic waste and dry waste was quite high at 29.5% and 36.1% whereas the percentage of wet waste is only 34.4%. It indicates that institutes generate a very high fraction of dry waste which provides a good opportunity for recycling. Waste from markets has a high wet waste fraction of 75.4% and good plastic waste content of 9.3%.

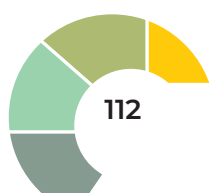
Waste reaching to the dumpsites (landfill) also contains a good fraction of plastic waste which was 10.9%. However, the fraction of dry waste other than plastics is only 6.7% indicating sorting during transportation and at dumpsites. A good fraction of coconut waste (5.9%) at the dumpsite is an indicator that the waste needs environmentally sound options for recycling. Plastic waste was dominated by low-value LDPE which forms 52.1% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 70.4% followed by dry waste (other than plastic) and plastic waste which comprise of 11.7% each. Coconut waste is 4.4% of the overall and inert formed just 1.7% of the overall waste composition of the city.

7.1.2 Alwar

In Alwar town, sampling points were identified for carrying out the waste characterization study.

In the low-income areas, 19.8 % was dry waste (other than plastic waste) whereas plastic waste was 9.8%. The highest waste fraction was 65.0 % which was for wet waste. Coconut waste was separately quantified and it stood at 2.4 % of the overall municipal solid waste in the low-income category. Inert waste was 3.1% of the total waste.



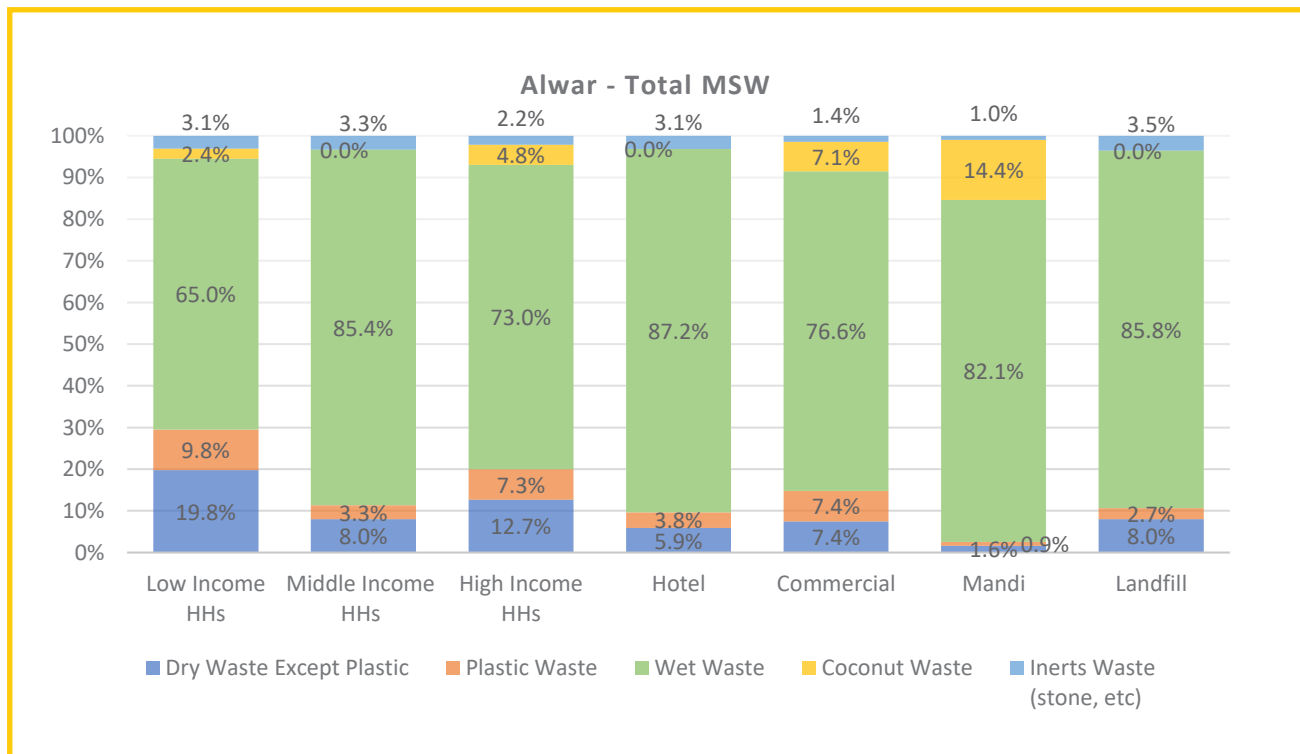


Figure 21: Waste Characterization in Alwar

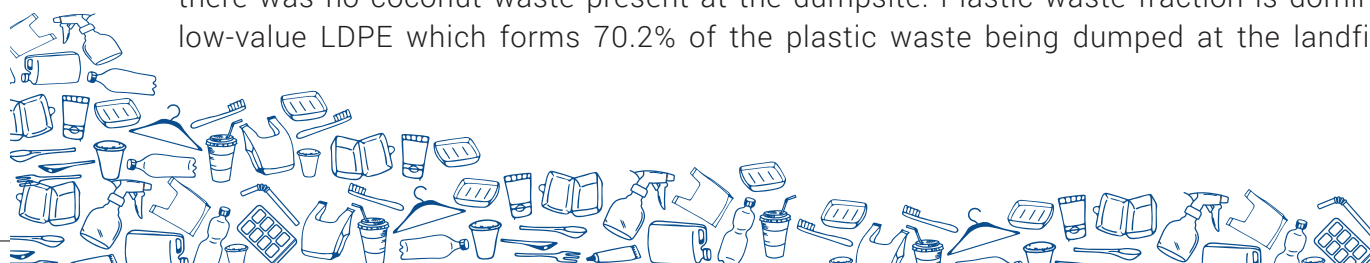
In the middle-income group, the percentage of dry waste (except plastic) was only 8.0% with plastic waste amounting to only 3.3% which is quite less as compared to the low-income group. Wet waste fraction is slightly higher at 85.4% whereas no coconut waste fraction was observed in the middle-income group. The inert waste fraction was 3.3%.

In the high-income group, the fraction of dry waste (except plastic) was 12.7% and plastic waste stood at 7.3%. The percentage of wet waste was highest at 73% among all income groups. Further, coconut waste was also highest at 4.85% in the high-income group. The plastic waste fraction was highest in the low-income group which indicates high use of low-cost consumer items in small packaging.

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 82.1% and 87.2% respectively which is expected. Plastic waste was 0.9% in Mandi and 3.8% in hotels. The coconut waste fraction at Mandi is 14.4% which is very high and provides a good opportunity for recycling. The inert fraction of the waste was 3.1% in hotels which is quite significant.

In the market, the fraction of plastic waste and dry waste was 7.4% each. The wet waste fraction was at 76.6%, which is quite high. Whereas, the coconut waste at the market was at 7.1% which is similar to the coconut waste in Mandis and provides a good opportunity for recycling.

Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which was only 2.7%. The fraction of dry waste other than plastics was also only 8.0% which indicates that the dry waste/plastic usually gets sorted either during transportation or at dumpsites. The wet waste fraction was 85.8% which is very significant. Moreover, it has been observed that there was no coconut waste present at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which forms 70.2% of the plastic waste being dumped at the landfill which



indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 79.3% followed by dry waste (other than plastic) and plastic waste which comprises of 19.1% and 5.0% respectively. Coconut waste is 4.1% of the overall and inert formed just 2.5% of the overall waste composition of the city.

7.1.3 Barmer

In Barmer, sampling points were identified for carrying out the waste characterization study.

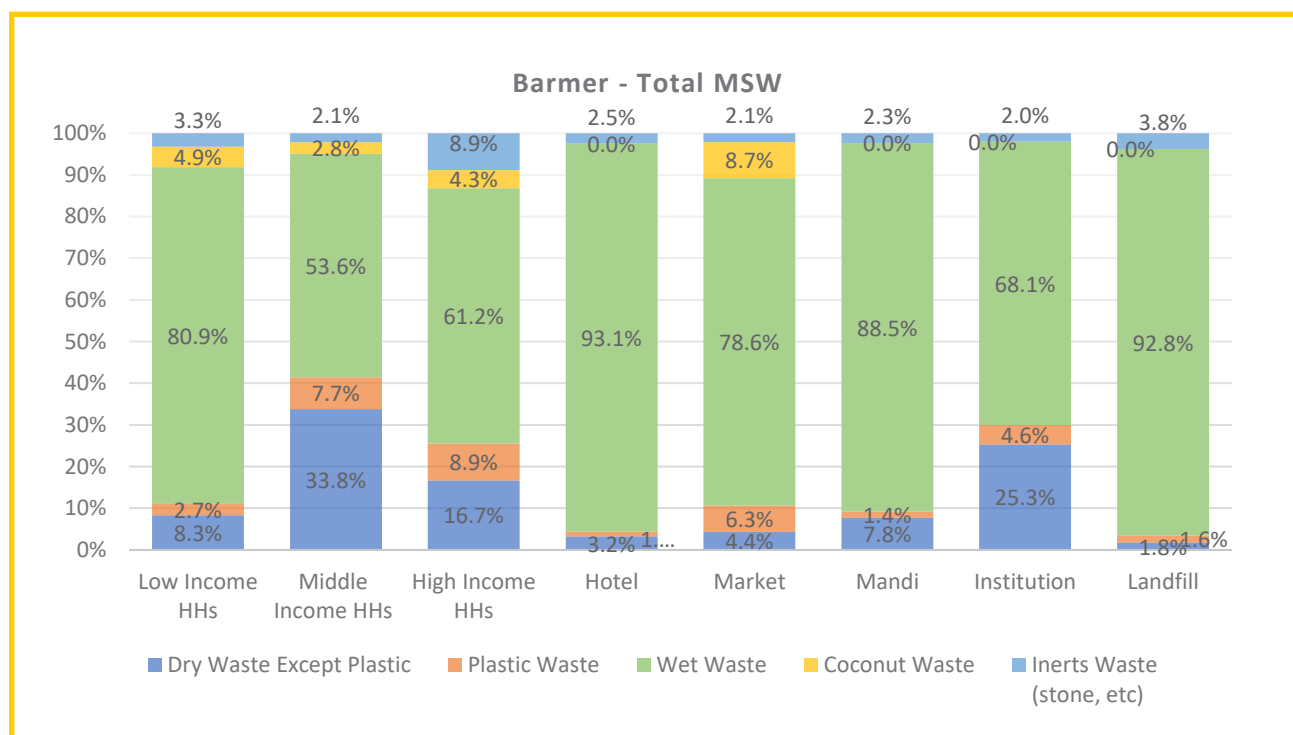


Figure 22: Waste Characterization in Barmer

In the low-income areas, 8.3% was a dry waste (other than plastic waste) whereas plastic waste was only 2.7%. The highest percentage of the waste fraction was 80.9% which was for wet waste. Coconut waste was separately quantified and it stood at 4.9 % of the overall municipal solid waste in the low-income category. Inert waste was 3.3% of the total waste.

In the middle-income group, the percentage of dry waste (except plastic) was very high at 33.8% while plastic waste amounted to 7.7%. The wet waste fraction is 53.6% which is quite low as compared to the low-income group category. Coconut waste fraction was 2.8% and the inert waste fraction was only 2.1%.

In the high-income group, the fraction of dry waste (except plastic) was 16.7% and plastic waste stood at 8.9%. The percentage of wet waste was at 61.2%. Further, coconut waste was at 4.3%. The inert waste fraction of 8.9% was the highest across all the income groups. Wet waste fraction was highest in the low-income group followed by the high-income group and middle-income group.



In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 88.5% and 93.1% respectively. Plastic waste was 1.4% in Mandi and 1.2% in hotels. No coconut waste fraction was found at Mandi. The inert fraction of the waste was 2.5 % in hotels and 2.3% in Mandi.

In institutions, the fraction of plastic waste was 4.6% whereas the dry waste fraction was 25.3%. The wet waste fraction was quite high at 68.1%. The inert waste fraction was 2.0% only.

Waste reaching the dumpsites (landfill) contains a very low fraction of plastic waste which was 1.6%. The fraction of dry waste other than plastics was also only 1.8% indicating sorting of dry waste/plastic waste during transportation and at dumpsite. The wet waste fraction was 92.8% which is very significant. No coconut waste was observed at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which forms 88.6% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city’s municipal solid waste is dominated by a wet waste fraction which stood at 77.1% followed by dry waste (other than plastic) and plastic waste which comprises, and removes of 12.7% and 4.3% respectively.

7.1.4 Bharatpur

In Bharatpur, sampling points were identified for carrying out the waste characterization study.

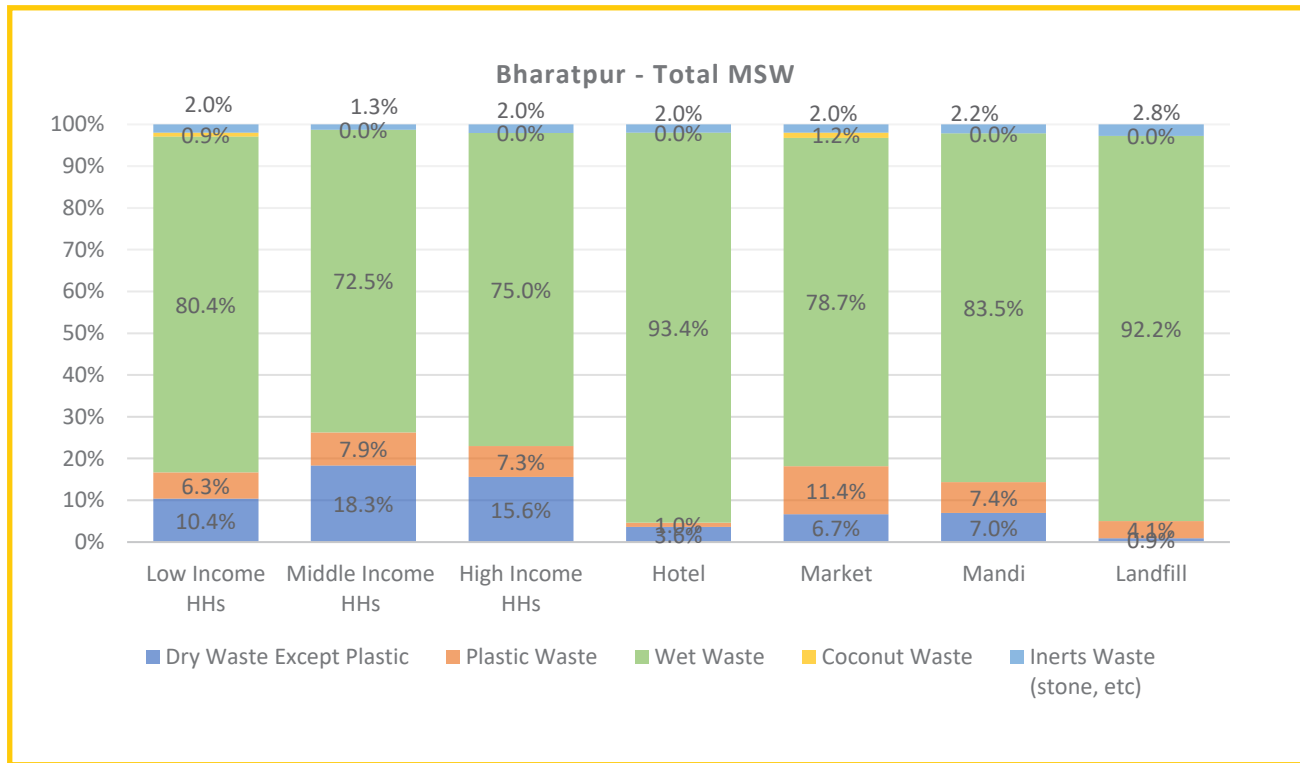
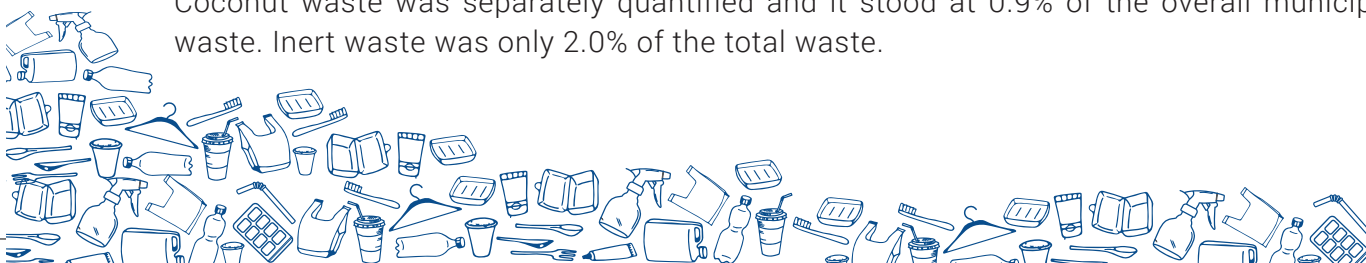


Figure 23: Waste Characterization in Bharatpur

In the low-income areas, 10.4 % was dry waste (other than plastic waste) whereas plastic waste was 6.3%. The wet waste at 80.4% was the highest waste fraction across all income categories. Coconut waste was separately quantified and it stood at 0.9% of the overall municipal solid waste. Inert waste was only 2.0% of the total waste.



In the middle-income group, the percentage of dry waste (except plastic) was only 18.3% with plastic waste amounting to 7.9% which is higher as compared to the low-income group. The wet waste fraction is slightly lower at 72.5% whereas no coconut waste fraction was observed in the middle-income group. Inert waste fraction as 1.3% only.

In the high-income group, the fraction of dry waste (except plastic) was 15.6% and plastic waste stood at 7.3%. The percentage of wet waste was 75% in this income group. Further, no coconut waste was observed in the high-income group also. The plastic waste fraction was similar in all income categories varying from 6.3%-7.9%.

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 83.5% and 93.4%. Plastic waste was 7.4% in Mandi which is quite significant and shows a lot of use of plastic for packaging and other purposes. Coconut waste fraction was not observed in both the categories. The inert fraction of the waste was 2.2 % at Mandi and 2.0% in hotels. In the market, the fraction of plastic waste and dry waste was 11.4% and 6.7% respectively. The wet waste fraction was quite high at 78.7%. Coconut waste fraction at the market was only 1.2% and inert waste fraction was also low at 2.0%.

Waste reaching to the dumpsites (landfill) contains a very low fraction of dry waste (other than plastic) which was 0.9%. The fraction of plastic waste was also only 4.1% indicating the sorting of dry waste/plastic waste during transportation and at dumpsite. The wet waste fraction was 92.2% which is very significant. No coconut waste was observed at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which forms 91.2% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 82.2% followed by dry waste (other than plastic) and plastic waste which comprises of 9.0% and 6.5% respectively. Coconut waste is very low at 0.3% of the overall and inert formed just 2.0% of the overall waste composition of the city.

7.1.5 Bhilwara

In Bhilwara, sampling points were identified for carrying out the waste characterization study.

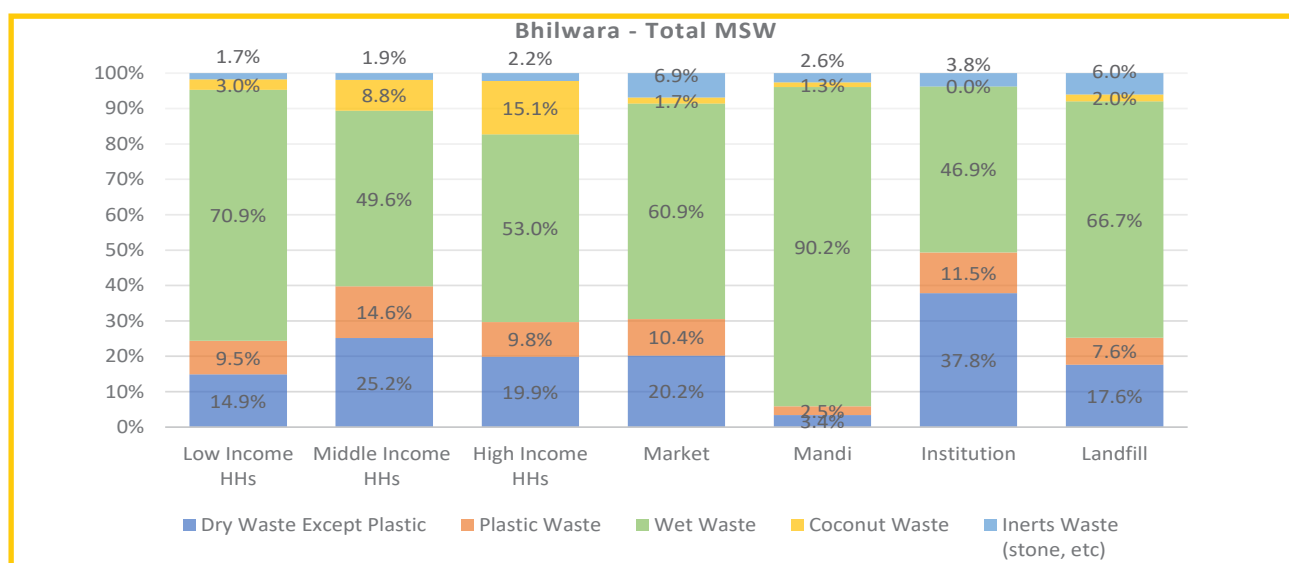
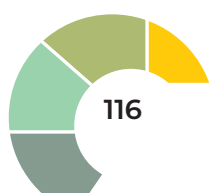


Figure 24: Waste Characterization in Bhilwara



In the low-income areas, 14.9% was dry waste other than plastic waste whereas plastic waste was 9.5%. Highest percentage of waste fraction was 70.9% which was for wet waste. Wet waste in low-income group was also highest across all income groups. Coconut waste was separately quantified and it stood at 3.0% of the overall municipal solid waste. Inert waste was 1.7% of the total waste.

In the middle-income group, percentage of dry waste (except plastic) was 25.2% with plastic waste amounting to 14.6% which is on higher side as compared to low-income group. Wet waste fraction is lower at 49.6% whereas coconut waste fraction was 8.8% which is significant from the point of view of recycling potential. Inert waste fraction as only 1.9%. Dry waste and plastic waste were highest in middle income group across all income groups.

In high income group, fraction of dry waste (except plastic) was 19.9% and plastic waste stood at 9.8%. Percentage of wet waste was 53.0%. Further, coconut waste was also highest at 15.1% across all income groups.

In case of Mandi (vegetable market), fraction of wet waste was quite high at 90.2% which is expected. Plastic waste was only 2.5% and dry waste (except plastic waste) was 3.4%. Coconut waste fraction at Mandi was only 1.3% whereas inert fraction of the waste was 2.6%.

In institution, fraction of plastic waste and dry waste (other than plastic waste) was 37.8% and 11.5% respectively. Wet waste fraction was quite low at 46.9%. Inert waste fraction was 3.8%. High fraction of dry and plastic waste at institution offers good recycling opportunities.

Waste reaching to the dumpsites(landfill) contain 7.6% plastic waste whereas fraction of dry waste other than plastics was 17.6%. Wet waste fraction was low at 66.7%. Coconut fraction of the waste was only 2%. The landfill also has high percentage of inert at 6%.

Overall, the city municipal solid waste is dominated by wet waste fraction which stood at 62.6% followed by dry waste (other than plastic) and plastic waste which comprises of 19.8% and 9.4% respectively. Coconut waste is 4.5% of the overall and inert formed 3.6% of the overall waste composition of the city.

7.1.6 Bhiwadi

In Bhiwadi, sampling points were identified for carrying out the waste characterization study.

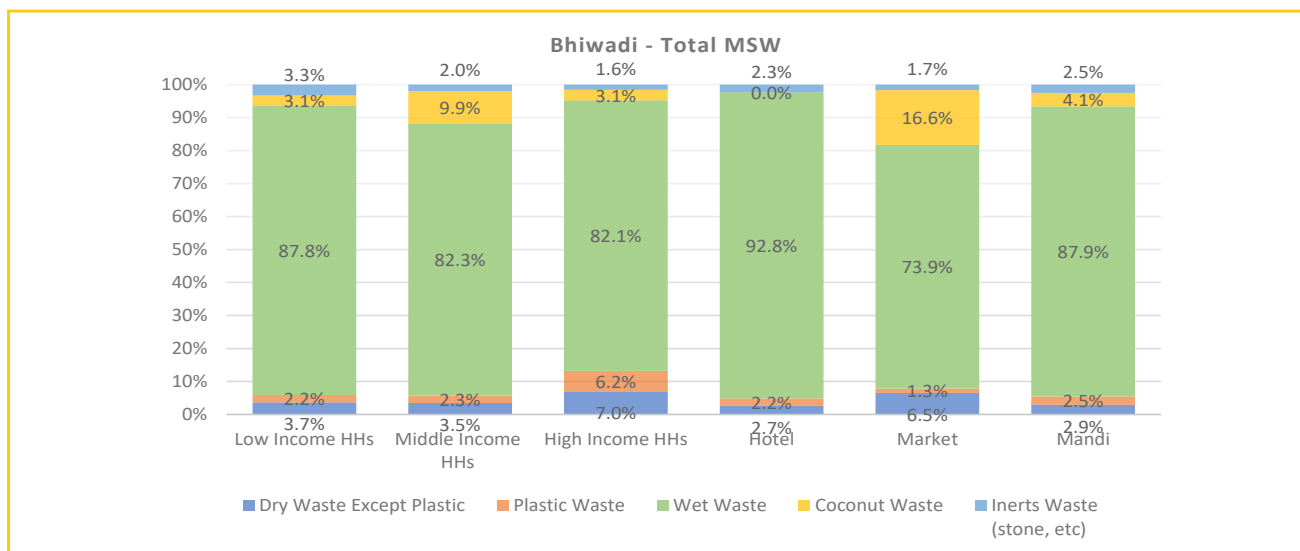
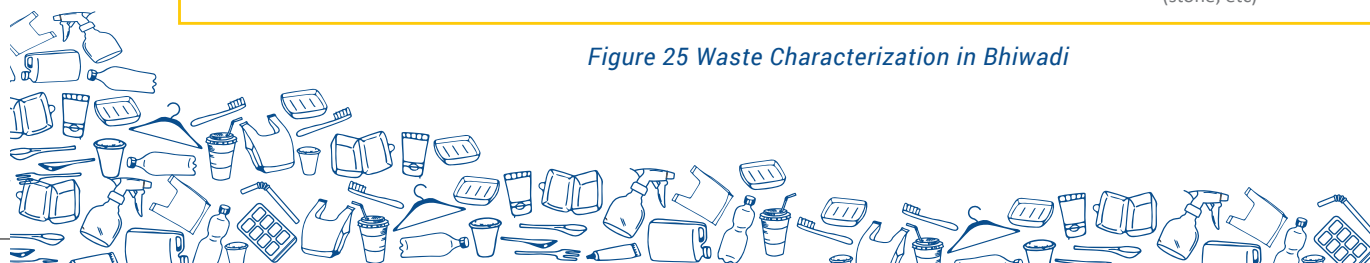


Figure 25 Waste Characterization in Bhiwadi



In the low-income areas, 3.7% was dry waste other than plastic waste whereas plastic waste was also very less at 2.2%. The wet waste fraction was very high at 87.8%. Coconut waste was separately quantified and it stood at 3.1% of the overall Municipal Solid Waste. The inert waste was 3.3% of the total waste.

In the middle-income group, the percentage of dry waste (except plastic) was only 3.5% with plastic waste amounting to only 2.3% which is similar to the low-income group. The wet waste fraction is high at 82.3%. The fraction of coconut waste was very high at 9.9%. Inert waste fraction was only 2.0%.

In the high-income group, the fraction of dry waste (except plastic) and plastic waste was 7.0% and 6.2 % respectively which is the highest in all three income groups. The percentage of wet waste was at 82.1%. Further, coconut waste was 3.1% and inert waste was 1.6% in this income group.

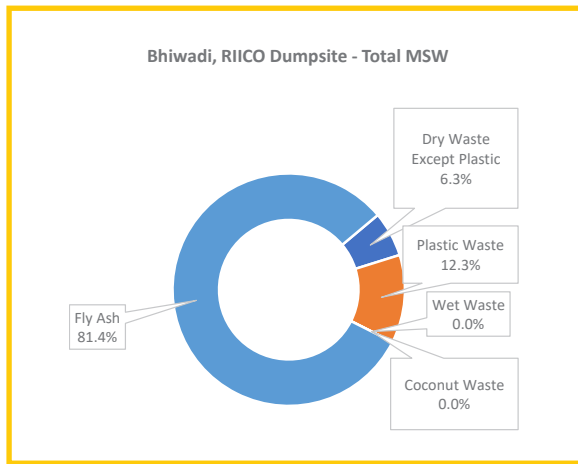


Figure 26 Total MSW, RIICO Dumpsite, Bhiwadi

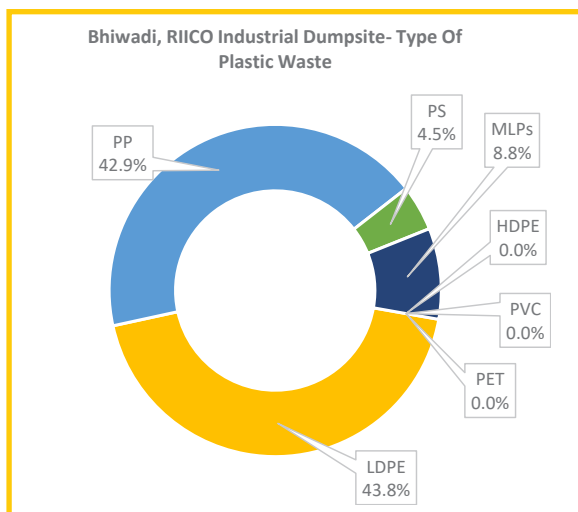


Figure 27 Type of Plastic Waste, RIICO Dumpsite, Bhiwadi

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 87.9% and 92.8% respectively which is expected. Plastic waste was 2.5% in Mandi and 2.2% in hotels. Coconut waste fraction at Mandi was 4.1%. Inert fraction of the waste was 2.5% in Mandi and 2.3% in hotels.

In the market, the fraction of plastic waste and dry waste was 1.3% and 6.5% respectively. The wet waste fraction was quite high at 73.9%. Coconut waste fraction at the market is also quite good at 16.6% and provides a good opportunity for recycling. Inert fraction of the waste was just 1.7%. This is a waste dumpsite located in RIICO industrial area, Bhiwadi, and mainly caters to the waste generated from the industries located at Bhiwadi Industrial Area. Waste reaching to the dumpsites (landfill) contains a high fraction of plastic waste which was 12.3%. It may be due to the pre-consumer plastic waste generated by the industries located in the industrial town. The fraction of dry waste other than plastics was also high at 6.3%. No wet waste fraction was observed at the dumpsite as the site is primarily used by industries for the disposal of their waste. However, the fraction of inert waste was very high at 81.4% which indicates a significant presence of Construction and Demolition Waste (C & D Waste). Plastic waste fraction is dominated by low-value LDPE stood at 43.8%.

Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 72.4% followed by an inert waste fraction which was 13.6%. Dry waste (other than plastic) and



plastic waste comprises of 4.6% and 4.1% respectively. Coconut waste was 5.3% of the overall waste composition of the town city.

7.1.7 Ganganagar

In Ganganagar, sampling points were identified for carrying out the waste characterization study.

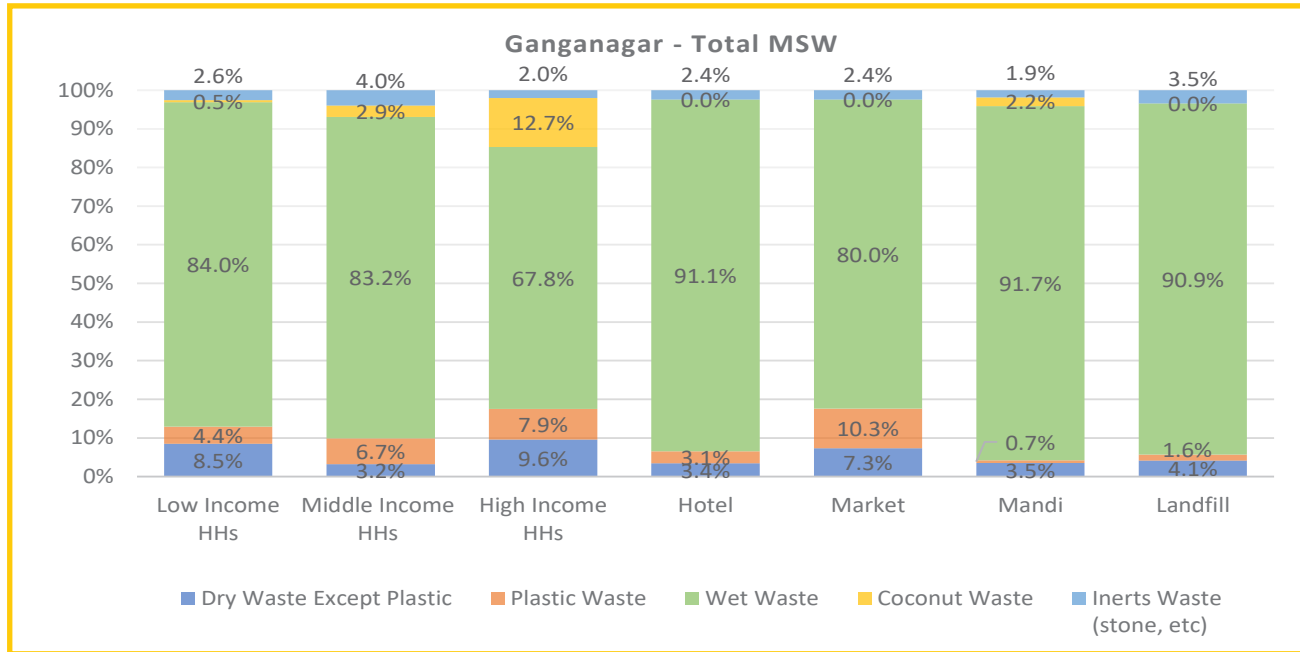


Figure 28 Waste Characterization in Ganganagar

In the low-income areas, 8.5% was dry waste other than plastic waste whereas plastic waste was only 4.4%. The highest percentage of the waste fraction was 84.0 % which was for wet waste. Coconut waste was separately quantified and it stood at 0.5% only of the overall municipal solid waste. Inert waste was 2.6% of the total waste.

In the middle-income group, the percentage of dry waste (except plastic) was very low at 3.2% only with plastic waste amounting to only 6.7%. Wet waste fraction is higher at 83.2% whereas coconut waste fraction was only 2.9% in the middle-income group. Inert waste fraction was 4.0%.

In the high-income group, the fraction of dry waste (except plastic) was 9.6% and plastic waste stood at 7.9%. The percentage of wet waste was the lowest at 67.8% among all three income groups. Further, coconut waste was also highest at 12.7% in the high-income group. The fraction of dry waste and plastic waste was also highest in the high-income group.

In the case of the Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 91.7% and 91.1%. Plastic waste was only 0.7% in Mandi and 3.1% in hotels. Coconut waste fraction at Mandi was low at 2.2% only. The inert fraction of the waste was 2.4% in hotels and 1.9% at Mandi.

In the market, the fraction of plastic waste and dry waste was 10.3% and 7.3% respectively. Wet waste fraction was quite high at 80%. No coconut waste fraction was observed at the market. Inert waste fraction was 2.4%.

Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which



was only 1.6%. The fraction of dry waste other than plastics was also only 4.1% indicating sorting of dry waste/plastic waste during transportation and at dumpsites. Wet waste fraction was 90.9% which is very significant. No coconut waste was observed at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which forms 61.2% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 84.1% followed by dry waste (other than plastic) and plastic waste which comprises of 5.7% and 5.0% respectively. Coconut waste is 2.6% of the overall waste and inert formed just 2.7% of the overall waste composition of the city waste.

7.1.8 Bikaner

In Bikaner, sampling points were identified for carrying out the waste characterization study.

In the low-income areas, 20.6% was dry waste other than plastic waste whereas the plastic waste fraction was 5.8%. Wet waste at 68.7% was the highest waste fraction in the low-income group. Coconut waste was separately quantified and it stood at 3.2% of the overall municipal solid waste. Inert waste was 1.8% of the total waste.

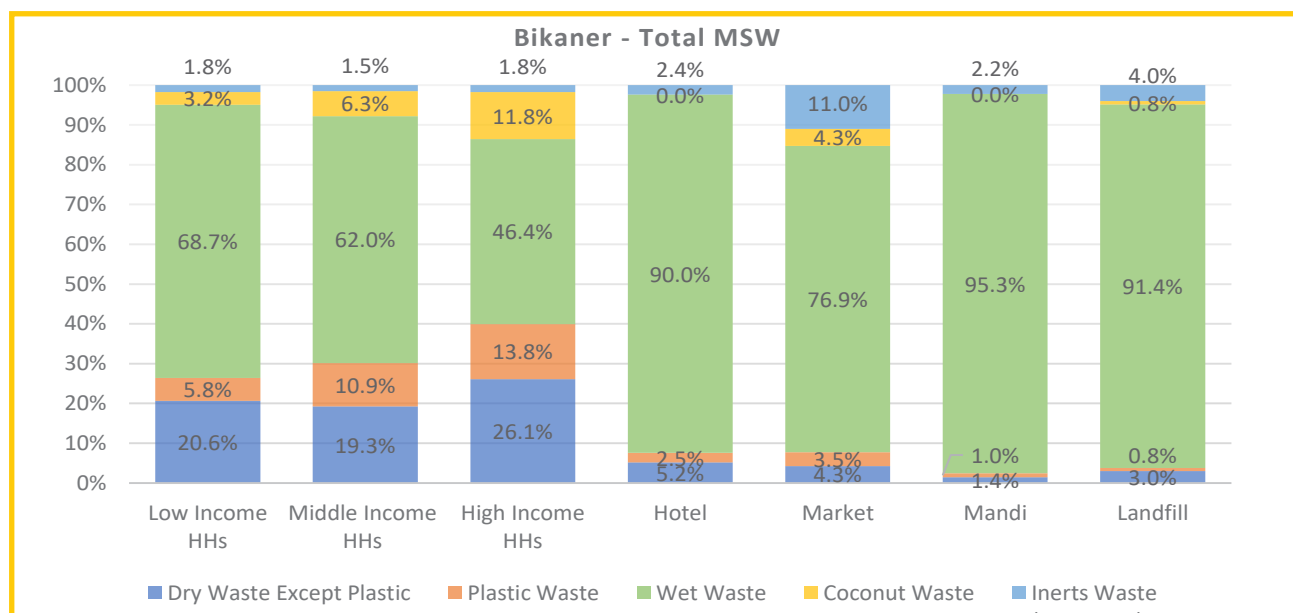
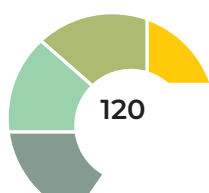


Figure 29: Waste Characterization in Bikaner

In the middle-income group, the percentage of dry waste (except plastic) was high at 19.3% with plastic waste amounting to 10.9%. Wet waste fraction was 62% whereas coconut waste fraction was quite significant at 6.3% in the middle-income group. Inert waste fraction is 1.5%.

In the high-income group, the fraction of dry waste (except plastic) was 26.1% which is very high and plastic waste also stood at 13.8%. The percentage of wet waste was 46.4% which was the lowest among all income groups. Further, coconut waste was also highest at 11.8% across all income groups. Likewise, dry waste and plastic waste fractions were also highest across all income groups.



In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 95.3% and 90.0% respectively which is expected. Plastic waste was 1.0% in Mandi and 2.5% in hotels. No coconut waste fraction was observed in Mandi or hotel. Inert fraction of the waste was 2.2% in Mandi and 2.4% in hotels which is quite significant.

In the market, fraction of plastic waste and dry waste was 3.5% and 4.3% respectively. Wet waste fraction was quite high at 76.9%. Coconut waste fraction at market was at 4.3%. Further, inert waste fraction was 11% which was quite high.

Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which was only 0.8%. The fraction of dry waste other than plastics was also only 3.0% indicating sorting of dry waste/plastic waste during transportation and at dumpsite. Wet waste fraction was 91.4% which is very significant. Coconut waste was very low at 0.8% at the dumpsite. Inert waste fraction was 4% of the total waste composition.

Overall, the city municipal solid waste is dominated by wet waste fraction which stood at 75.8% followed by dry waste (other than plastic) and plastic waste which comprises of 11.4% and 5.5% respectively. Coconut waste is 3.8% of the overall and inert formed 3.5% of the overall waste composition.

7.1.9 Jaipur

In Jaipur, sampling points were identified for carrying out the waste characterization study.

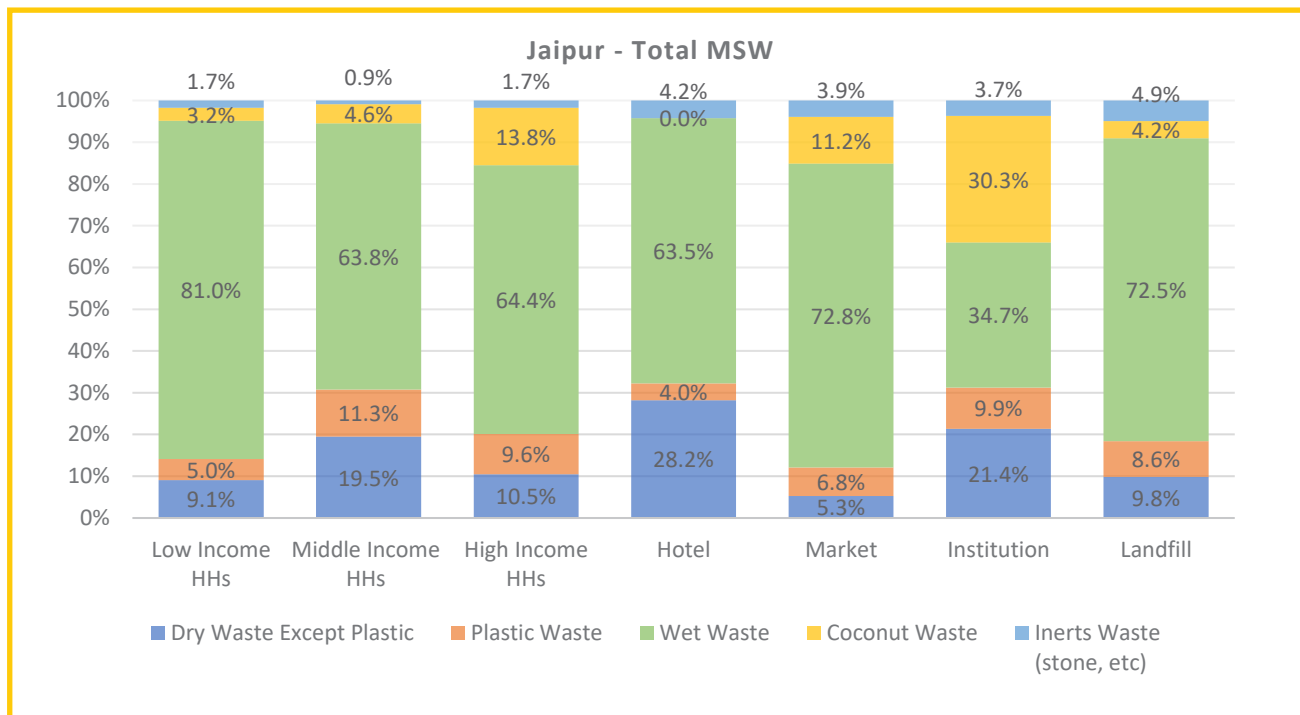


Figure 30: Waste Characterization in Jaipur

In the low-income areas, 9.1% was dry waste other than plastic waste whereas plastic waste was 5%. The highest percentage of the waste fraction was 81 % which was for wet waste. Coconut waste was separately quantified and it stood at 3.2 % of the overall municipal solid waste in low-income areas. Inert waste was 1.7% of the total waste fraction.



In the middle-income group, the percentage of dry waste (except plastic) was 19.5% with plastic waste amounting to a good 11.3% which is the highest across all the income categories. The wet waste fraction was at 63.8% which was the lowest across all income groups. Coconut waste fraction was 4.6% whereas inert waste fraction was only 0.9%.

In the high-income group, fraction of dry waste (except plastic) was 10.5% and plastic waste stood at 9.6%. The percentage of wet waste was 64.4%. Further, coconut waste was also highest at 13.8% across all income groups.

In the case of the hotel (luxury category), the fraction of wet waste was at 63.5% which is low considering the data from other cities. Plastic waste was 4.0% whereas dry waste (except plastic waste) fraction was very high at 28.2%. Inert fraction of the waste was 4.2 % in hotels which is quite significant.

In the institution, the fraction of plastic waste and dry waste was very significant at 9.9% and 21.4% respectively which is on expected lines. Wet waste fraction was low at 34.7%. Coconut waste fraction is high at 30.3% which provides a good opportunity for recycling. Inert waste is 3.7%.

Waste reaching to the dumpsites (landfill) contains 8.6% plastic waste and 9.8% dry waste (except plastic waste) which may be due to the sorting of waste by the service providers. The wet waste fraction was 72.5% which is very significant. Coconut waste was 4.2% at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which 41.5% which is low as compared to other cities where a fraction of LDPE is observed much higher. Inert fraction of the waste at the dump site was 4.9%.

Overall, the city's municipal solid waste is dominated by the wet waste fraction which stood at 64.9% followed by dry waste (other than plastic) and plastic waste which comprises of 14.8% and 7.9% respectively. Coconut waste is 9.6% and inert formed 3% of the overall waste composition of the city.

7.1.10 Jodhpur

In Jodhpur, sampling points were identified for carrying out the waste characterization study.

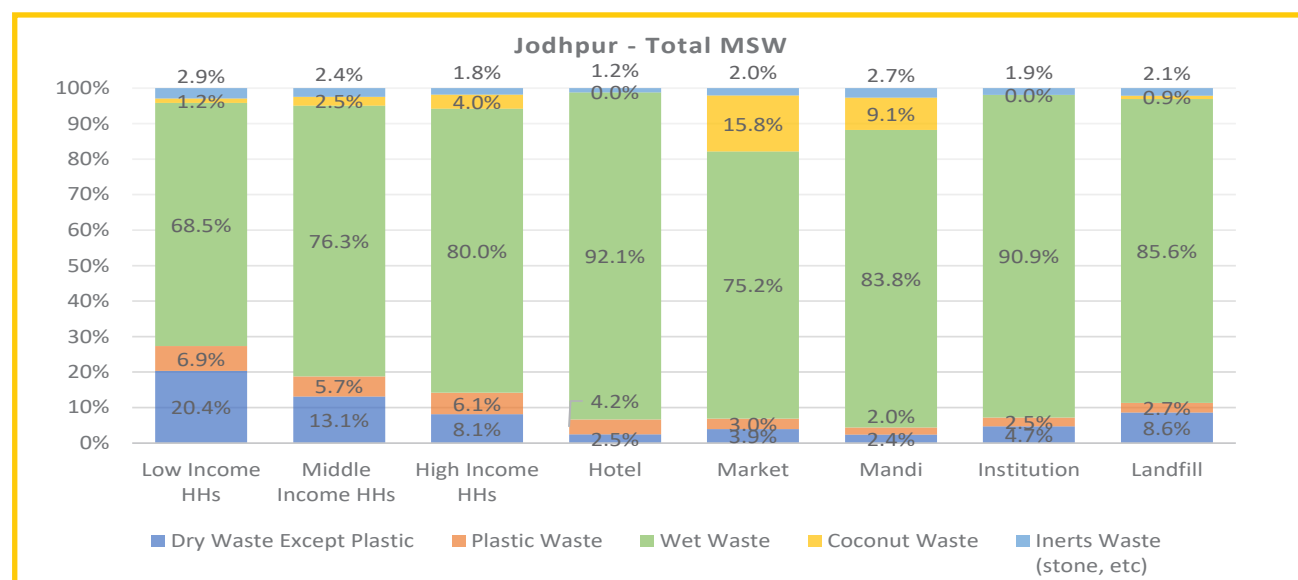


Figure 31: Waste Characterization in Jodhpur

In the low-income areas, 20.4% was dry waste other than plastic waste whereas plastic waste was 6.9%. The highest percentage of the waste fraction was 68.5% which was for wet waste. Coconut waste was separately quantified and it stood at 1.2 % of the overall municipal solid waste in the low-income group category. Inert waste was only 2.9%.

In the middle-income group, the percentage of dry waste (except plastic) was 13.1% whereas plastic waste amounted to only 5.7%. The wet waste fraction is 76.3% whereas coconut waste fraction was only 2.5% in the middle-income group. Inert waste fraction is 2.4%.

In the high-income group, the fraction of dry waste (except plastic) was low at 8.1% whereas plastic waste stood at 6.1%. The percentage of wet waste was highest at 80.0% among all income groups. Further, coconut waste was also highest at 4.0% across all income groups.

In the case of the Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 83.8% and 92.1%. Plastic waste was only 2.0% in Mandi and 4.2% in hotels. Coconut waste fraction at Mandi was 9.1% which is quite high and provides a good opportunity for recycling. Inert fraction of the waste was 1.2% in hotels.

In institution, the fraction of plastic waste and dry waste was 2.5% and 4.7% respectively. Wet waste fraction was quite high at 90.9%. The fraction of inert waste at the institution was low at 1.9%.

Waste reaching to the dumpsite (landfill) contains a very low fraction of plastic waste which was 2.7%. The fraction of dry waste other than plastics was also only 8.6% indicating sorting of dry waste/plastic waste during transportation and at dumpsite. Wet waste fraction was 85.6% which is very significant. Only 0.9% coconut waste was observed at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which forms 71.4% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city's municipal solid waste is dominated by wet waste fraction which stood at 81.5% followed by dry waste (other than plastic) and plastic waste which comprises of 8.0% and 4.1% respectively. Coconut waste is 4.2% of the overall and inert formed just 2.2% of the overall waste composition of the city.

7.1.11 Mount Abu

In Mount Abu, sampling points were identified for carrying out the waste characterization study.

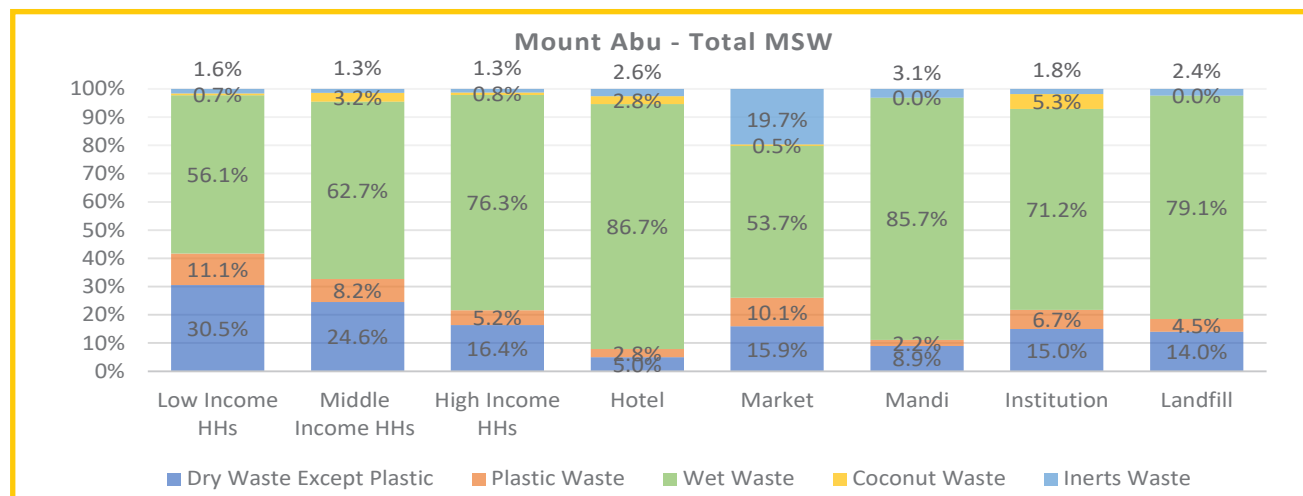
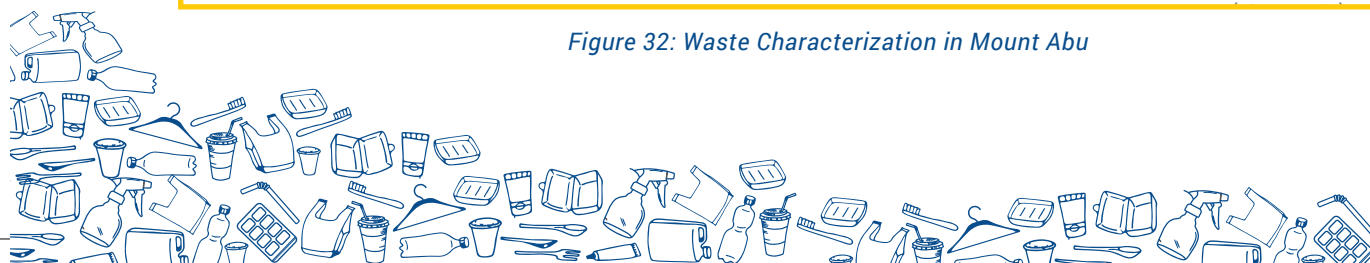


Figure 32: Waste Characterization in Mount Abu



In the low-income areas, 30.5% was dry waste other than plastic waste whereas plastic waste was 11.1% which were highest among all the income categories. The highest percentage of the waste fraction was 56.1 % which was for wet waste in the low-income category. Coconut waste was separately quantified and it stood at 0.7%. Inert waste was only 1.6%.

In the middle-income group, the percentage of dry waste (except plastic) was very significant at 24.6% with plastic waste amounting to 8.2% which is slightly less as compared to the low-income group. The wet waste fraction is slightly higher at 62.7% as compared to the low-income group category whereas the coconut waste fraction was 3.2% middle income group. Inert waste fraction was 1.3%.

In the high-income group, the fraction of dry waste (except plastic) was 16.4% and plastic waste stood at 5.2%. The percentage of wet waste was highest at 76.3% among all income groups. Further, coconut waste was only 0.8% and inert waste fraction stood at 1.3%.

In the case of the Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 85.7% and 86.7% respectively which is expected. The plastic waste was 2.2% in Mandi and 2.8% in hotels. No coconut waste fraction was observed at Mandi though in hotel fraction of coconut waste was 2.8%.

In the institution, the fraction of plastic waste and dry waste was 6.7% and 15% respectively. The wet waste fraction was quite high at 71.2%. Coconut waste fraction was also quite good at 5.3% which provides a good opportunity for recycling.

Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which was 4.5%. The fraction of dry waste other than plastics was also 14.0% indicating sorting of dry waste/plastic waste during transportation and at dumpsite. The wet waste fraction was 79.1% which is very significant. No coconut waste was observed at the dumpsite. Plastic waste fraction is dominated by low-value LDPE which forms 87% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

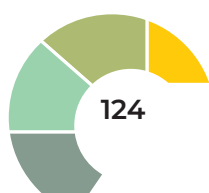
Overall, the city's municipal solid waste is dominated by the wet waste fraction which stood at 71.4% followed by dry waste (other than plastic) and plastic waste which comprises of 16.3% and 6.4% respectively. Coconut waste is only 1.7% of the overall and inert formed 4.2% of the overall waste composition of the city.

7.1.12 Neemrana

In Neemrana, sampling points were identified for carrying out the waste characterization study.

In the low-income areas, 8.2 % was dry waste other than plastic waste whereas plastic waste was only 2.1%. The highest percentage of the waste fraction was 86.8 % which was for wet waste. No Coconut waste was observed in the low-income areas. Inert waste was 2.9% of the total waste in the area.

In the middle-income group, the percentage of dry waste (except plastic) was only 13.0% with plastic waste amounting to only 3.6% which is higher as compared to the low-income group. Wet waste fraction is higher at 80.2% whereas coconut waste fraction was negligible at 0.5%. The inert waste fraction was 2.8%. Dry waste and plastic waste fractions were highest in the middle-income group category.



In the high-income group, fraction of dry waste (except plastic) was only 7.1% and plastic waste stood at 2.4%. The percentage of wet waste was highest at 86.2% in the high-income group. Further, coconut waste was 1.6% and inert waste stood at 2.7% only.

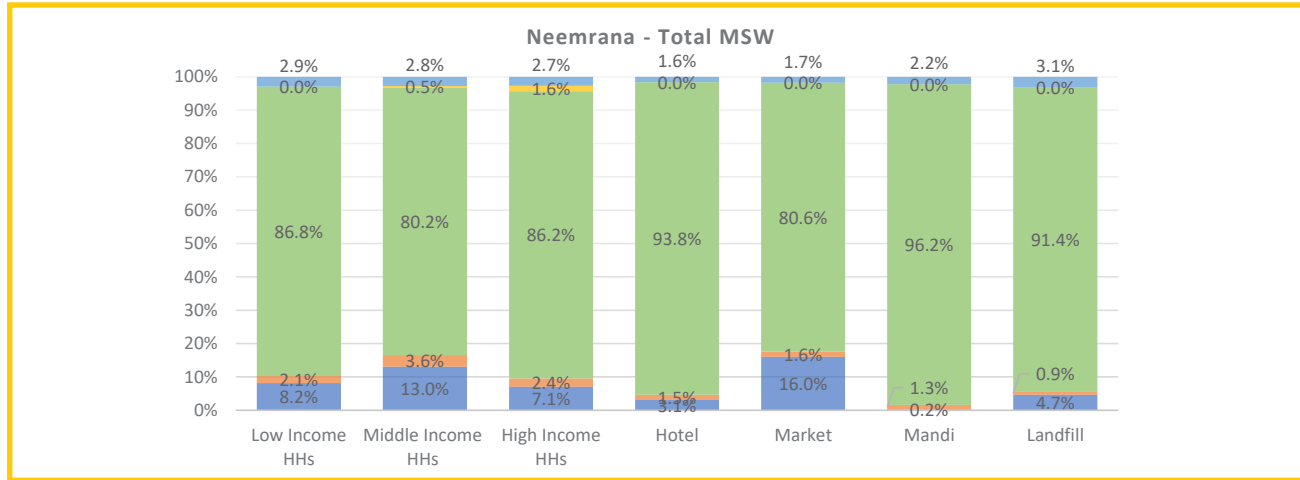


Figure 33: Waste Characterization in Neemrana

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 96.2% and 93.8% respectively. Plastic waste was only 1.3% in Mandi and 1.5% in hotels. There was no coconut waste fraction at Mandi or the hotel. The inert fraction of the waste was only 1.6% in the hotel.

In the market, the fraction of plastic waste and dry waste was only 1.6% and 16% respectively. Wet waste fraction was quite high at 80.6%. There was no coconut waste fraction at the market. Inert fraction was only 1.7%.

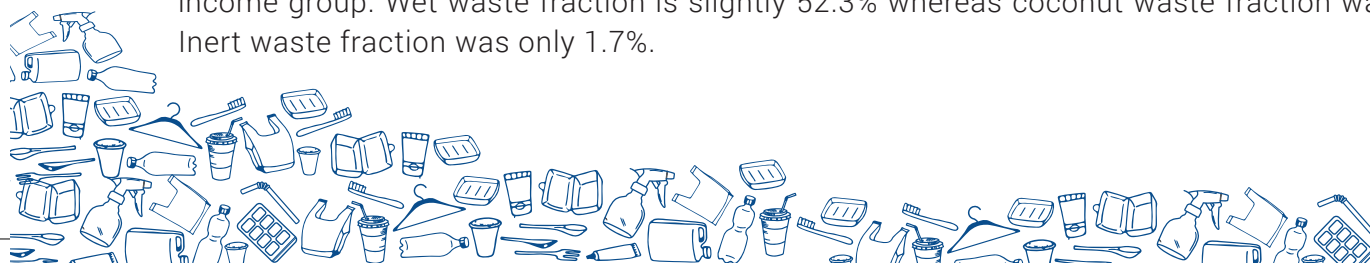
Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which was only 0.9%. The fraction of dry waste other than plastics was also low at 4.7% indicating sorting of dry waste/plastic waste during transportation and at the dump site. Wet waste fraction was 91.4% which is very significant. No coconut waste was observed at the dump site.

Overall, the city’s municipal solid waste is dominated by a wet waste fraction which stood at 87.9% followed by dry waste (other than plastic) and plastic waste which comprises of 7.5% and 1.9% respectively. Coconut waste was negligible at 0.3% of the overall and inert formed just 2.4% of the overall waste composition of the city.

7.1.13. Pali

In Pali town, sampling points were identified for carrying out the waste characterization study. In the low-income areas, 14.1% was dry waste other than plastic waste whereas plastic waste was 8.9%. The highest percentage of the waste fraction was 70.4 % which was for wet waste. Coconut waste was separately quantified and it stood at 4.7 % of the overall municipal solid waste. Inert waste was 1.8% of the total waste.

In the middle-income group, the percentage of dry waste (except plastic) was high at 28.5% with plastic waste amounting to 9.0% which is a similar plastic waste fraction observed in the low-income group. Wet waste fraction is slightly 52.3% whereas coconut waste fraction was 8.6%. Inert waste fraction was only 1.7%.



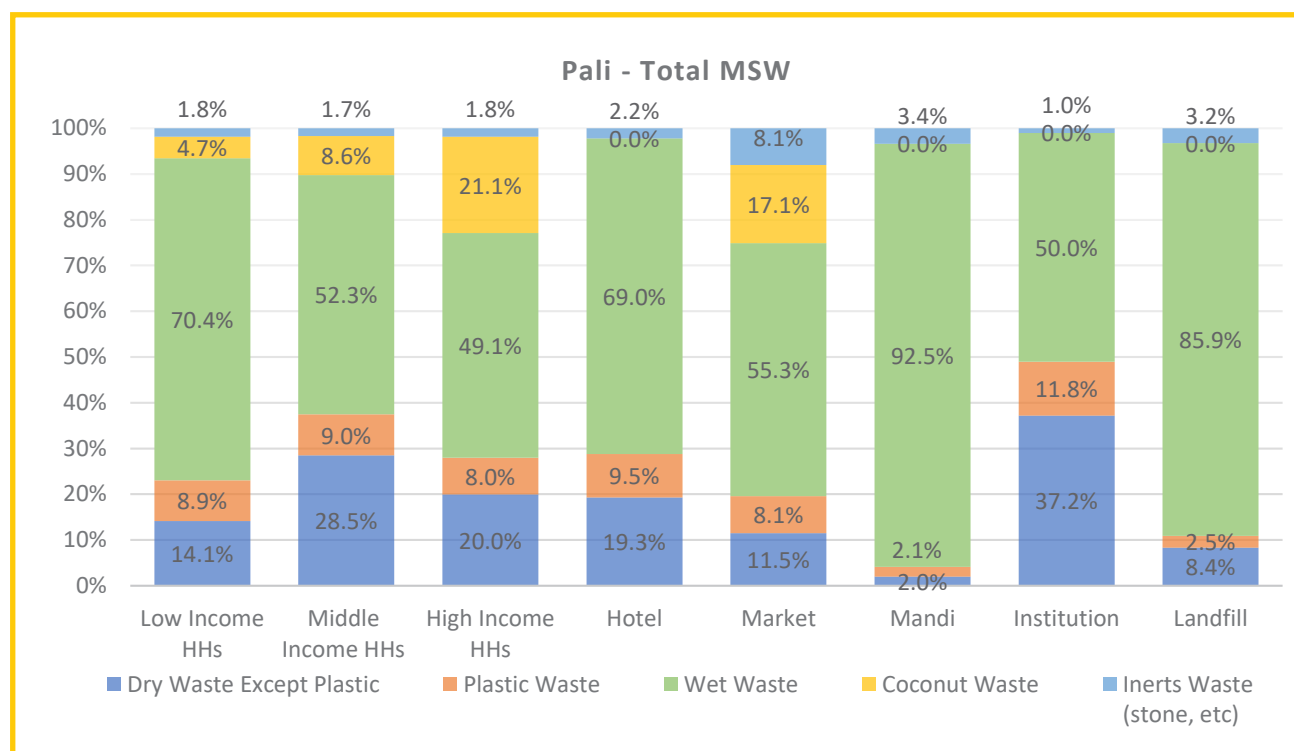


Figure 34: Waste Characterization in Pali

In the high-income group, fraction of dry waste (except plastic) was 20.0% and plastic waste stood at 8.0%. The percentage of wet waste was only 49.1% which was the lowest across all income categories. Further, coconut waste was also very unusually high at 21.1% in the high-income group.

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 92.5% and 69.0% respectively which is expected. Plastic waste was only 2.1% in Mandi though it was 9.5% in hotels. No coconut waste fraction was observed or in the hotel. Inert fraction of the waste was 3.4 % in Mandi and 2.2% in the hotel.

In the market, the fraction of plastic waste and dry waste was only 8.1% and 11.5% respectively. Wet waste fraction was quite high at 55.3%. Coconut waste fraction was 17.1% at the market. Inert fraction was 8.1%.

In the institution, fraction of plastic waste and dry waste was 11.8% and 37.2% which is very significant. Wet waste fraction was only 50.0%. No coconut waste fraction was observed at the institution.

Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which was 2.5%. Fraction of dry waste other than plastics was also only 8.4% indicating sorting of dry waste/plastic waste during transportation and at dumpsites. Wet waste fraction was 85.9% which is very significant. No coconut waste was observed at the dump site. Plastic waste fraction is dominated by low-value LDPE which forms 70.7% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.



Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 65.6% followed by dry waste (other than plastic) and plastic waste which comprises of 17.6% and 7.5% respectively. Coconut waste was 6.4% of the overall and inert formed just 2.9% of the overall waste composition of the city.

7.1.14. Udaipur

In Udaipur, sampling points were identified for carrying out the waste characterization study.

In the low-income areas, 16.5% was a dry waste (other than plastic waste) whereas plastic waste was 5.5%. The highest percentage of the waste fraction was 74.7 % which was for wet waste. Coconut waste was separately quantified and it stood at 1.2% of the overall municipal solid waste in the low-income category. Inert waste was 2.1% of the waste.

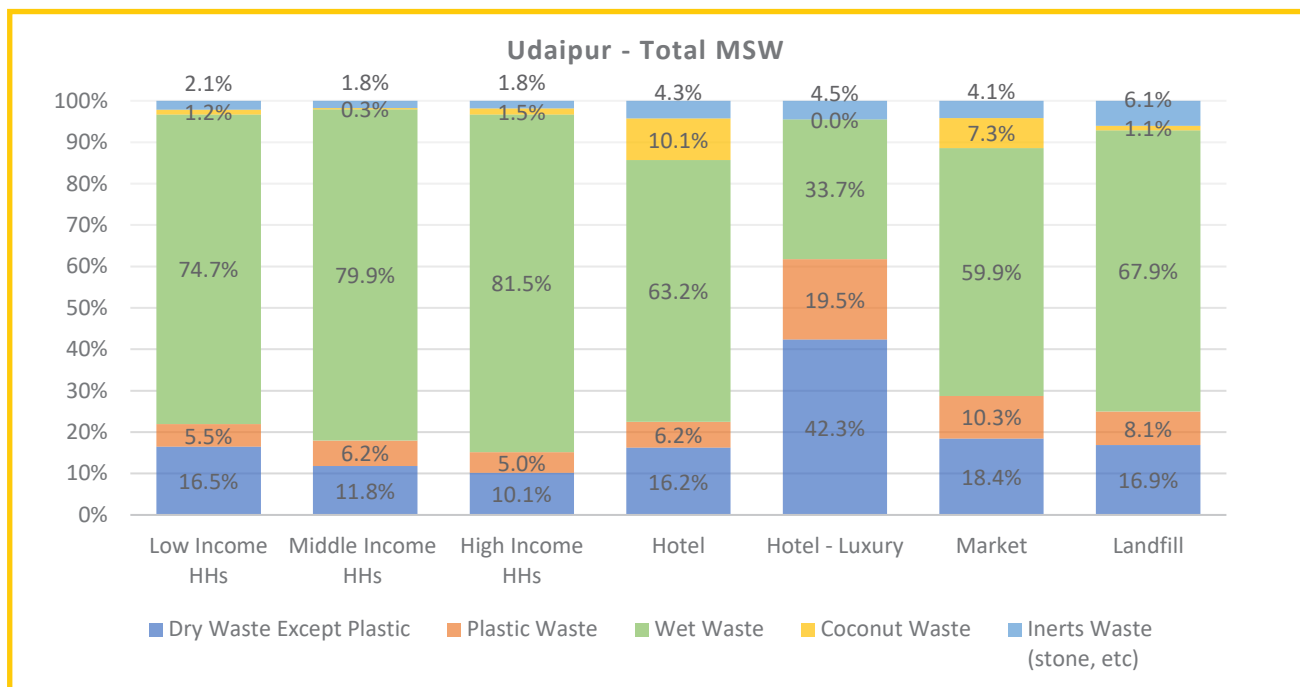
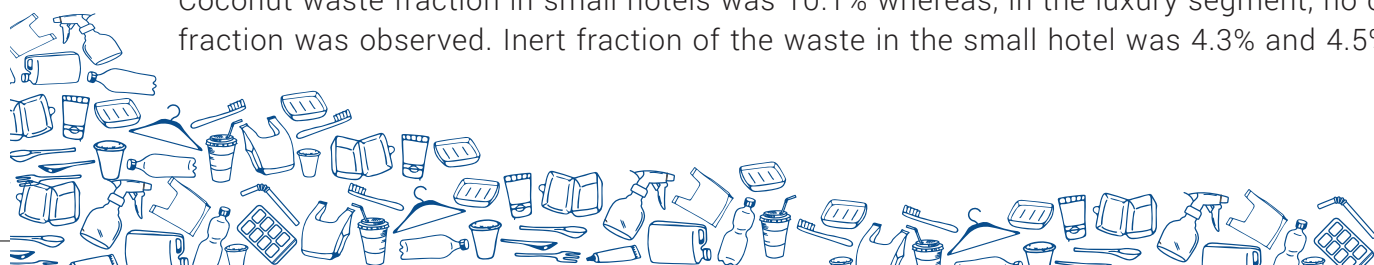


Figure 35: Waste Characterization in Udaipur

In the middle-income group, the percentage of dry waste (except plastic) was 11.8% with plastic waste amounting to 6.2%. Wet waste fraction is slightly higher at 79.9% as compared to low-income areas whereas coconut waste fraction was only 0.3%. Inert waste fraction was 1.8%.

In the high-income group, fraction of dry waste (except plastic) was 10.1% and plastic waste stood at 5.0%. Percentage of wet waste was highest at 81.5% among all income groups. However, coconut waste fraction was only 1.5% only. Inert waste fraction was only 1.8%.

In the case of hotels, characterization was done for small and luxury hotel separately and the fraction of wet waste in small hotels was at 63.2% whereas, in the luxury segment, it was 33.7%. Plastic waste was 6.2% in a small hotels and 19.5% in luxury hotels. The dry waste fraction (other than plastic waste) in the small hotel was 16.2% whereas it was 42.3% in the luxury hotel. Coconut waste fraction in small hotels was 10.1% whereas, in the luxury segment, no coconut fraction was observed. Inert fraction of the waste in the small hotel was 4.3% and 4.5% in the



luxury hotel segment. It is evident that in luxury hotels, fraction of plastic and dry waste is much higher than in small hotels whereas fraction of wet waste and coconut waste was higher in small hotels.

In the market, the fraction of plastic waste and dry waste was 10.3% and 18.4% respectively. Wet waste fraction was 59.9%. Coconut waste fraction at the market is also quite good at 7.3% which provides a good opportunity for recycling. Inert waste fraction was 4.1%.

Waste reaching to dumpsites (landfill) contains 8.1% fraction of plastic waste. Fraction of dry waste other than plastics was 16.9%. The wet waste fraction was 67.9% is moderate. Coconut waste was only 1.1% observed at the dump site. Plastic waste fraction is dominated by low-value LDPE which forms 60.5% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies. Inert waste fraction was 6.1% which is quite high.

Overall, the city’s municipal solid waste is dominated by a wet waste fraction which stood at 65.8% followed by dry waste (other than plastic) and plastic waste which comprises of 18.9% and 8.7% respectively. Coconut waste was 3.1% of the overall and inert formed 3.5% of the overall waste composition of the city.

7.1.15. Kota

In Kota, sampling points were identified for carrying out the waste characterization study.

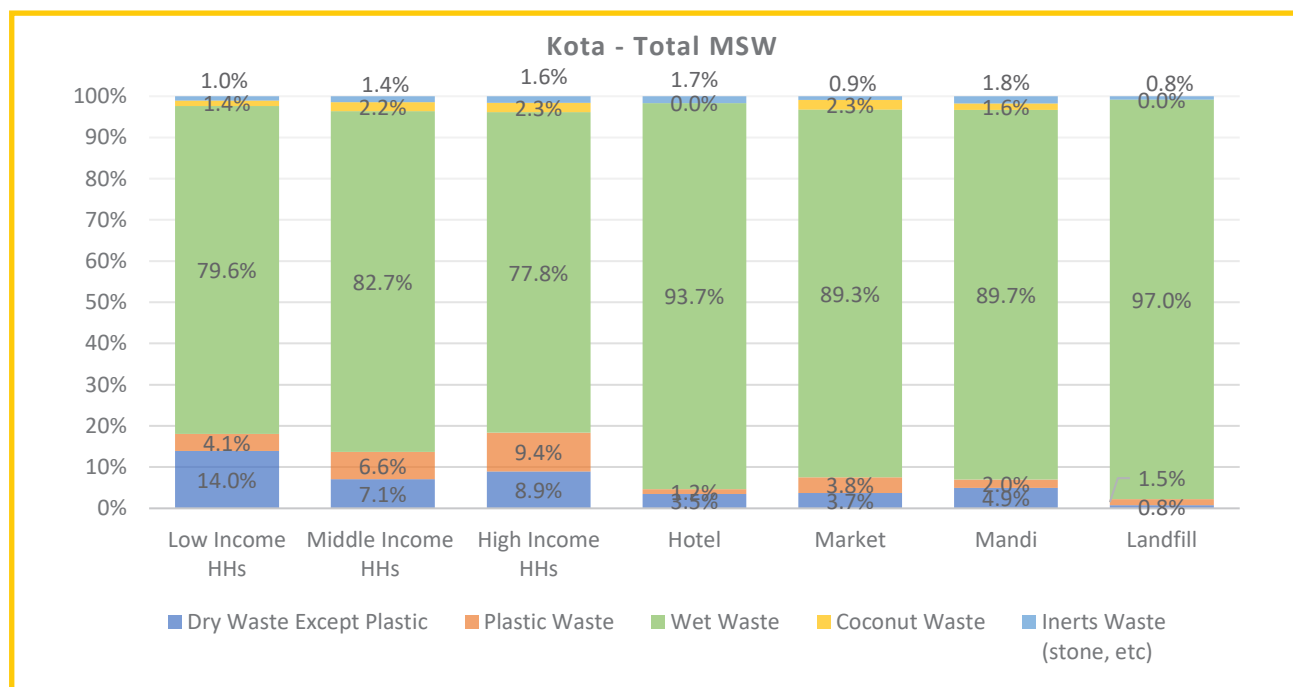


Figure 36: Waste Characterization in Kota

In the low-income areas, 14.0% was dry waste other than plastic waste whereas plastic waste was 4.1%. The highest percentage of the waste fraction was 79.6% which was for wet waste. Coconut waste was separately quantified and it stood at 1.4 % of the overall municipal solid waste. Inert waste was only 1.0% of the waste.



In the middle-income group, the percentage of dry waste (except plastic) was only 7.1% with plastic waste amounting to 6.6%. The wet waste fraction was highest at 82.7% in all income categories whereas coconut waste fraction was observed at 2.2% in the middle-income group. Inert waste fraction was only 1.4%.

In the high-income group, fraction of dry waste (except plastic) was 8.9% and plastic waste stood at 9.4%. The percentage of the wet waste fraction was 77.8%. Further, coconut waste was only 2.3% in the high-income group. Inert waste fraction was only 1.6%.

In the case of Mandi (vegetable market) and hotels, the fraction of wet waste was quite high at 89.7% and 93.7% respectively which is expected. Plastic waste was 2.0% in Mandi and 1.2% in hotels. Coconut waste fraction at Mandi was 1.6% whereas no coconut waste was observed at the hotel. Inert fraction of the waste was 1.7% in hotels.

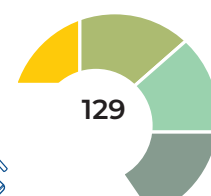
In the market, the fraction of plastic waste and dry waste was 3.8% and 3.7% respectively. Wet waste fraction was quite high at 89.3%. Coconut waste fraction at the market was 2.3% and inert waste fraction was only 0.9%.

Waste reaching to the dumpsites (landfill) contains a very low fraction of plastic waste which was 1.5%. Fraction of dry waste other than plastics was also only 0.8% indicating sorting of dry waste/plastic waste during transportation and at dumpsites. Wet waste fraction was 97.0% which is very significant. No coconut waste was observed at the dump site. Plastic waste fraction is dominated by low-value LDPE which forms 65% of the plastic waste being dumped at the landfill which indicates that all the high-value plastic waste fractions are collected by rag pickers or waste collection agencies.

Overall, the city's municipal solid waste is dominated by a wet waste fraction which stood at 87.1% followed by dry waste (other than plastic) and plastic waste which comprises of 6.1% and 4.1% respectively. Coconut waste was 1.4% of the overall and inert formed just 1.3% of the overall waste composition of the city.

7.2. Overall Waste Composition and Characterization of 15 cities

In the low-income group, the highest waste fraction was 78.09% which was for wet waste. Dry waste other than plastic was 15.99% followed by plastic waste which was 5.92. Inert waste was only 2.29%. In the middle-income group, wet waste was again the highest fraction with 75.35% followed by dry waste which was 17.58%. Plastic waste is higher as compared to the low-income group and stood at 7.07%. Inert waste was only 2.01%. In the high-income group, the wet fraction was 76.91% followed by the dry waste fraction at 15.37%. Plastic waste fraction was 7.72% and inert was 2.3%.



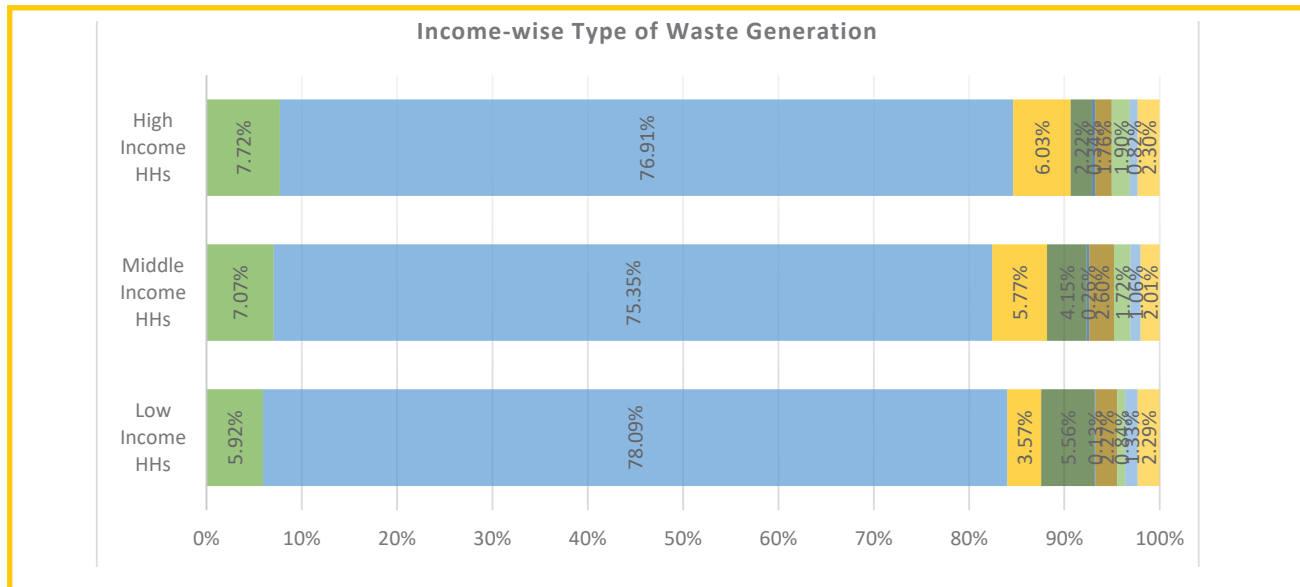


Figure 37: Income-wise Types of Waste Generation

Further analysis of dry waste fraction reveals that paper, plastic and textiles are the major components of dry waste fraction across all the income groups and form about 65% of the dry waste. Other waste streams constituting remaining dry waste are glass, metal, domestic hazardous waste, and leather & rubber.

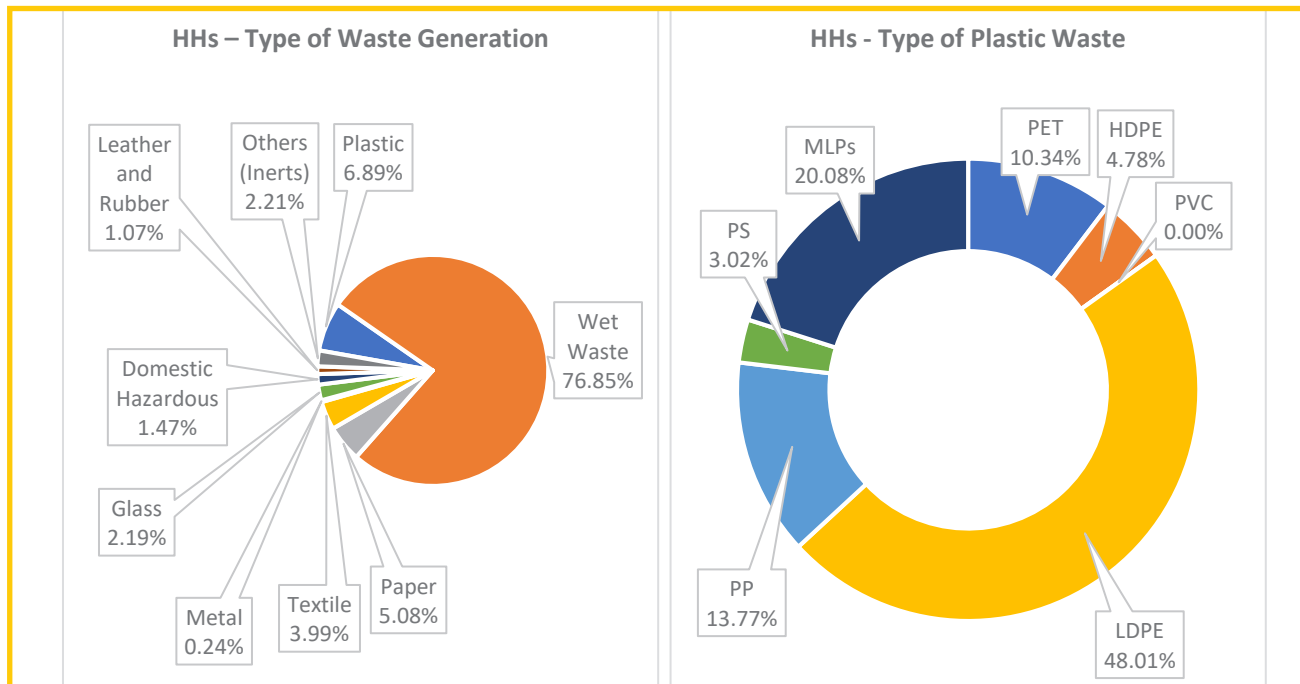


Figure 38: Types of Waste Generation and Plastic Waste in Households



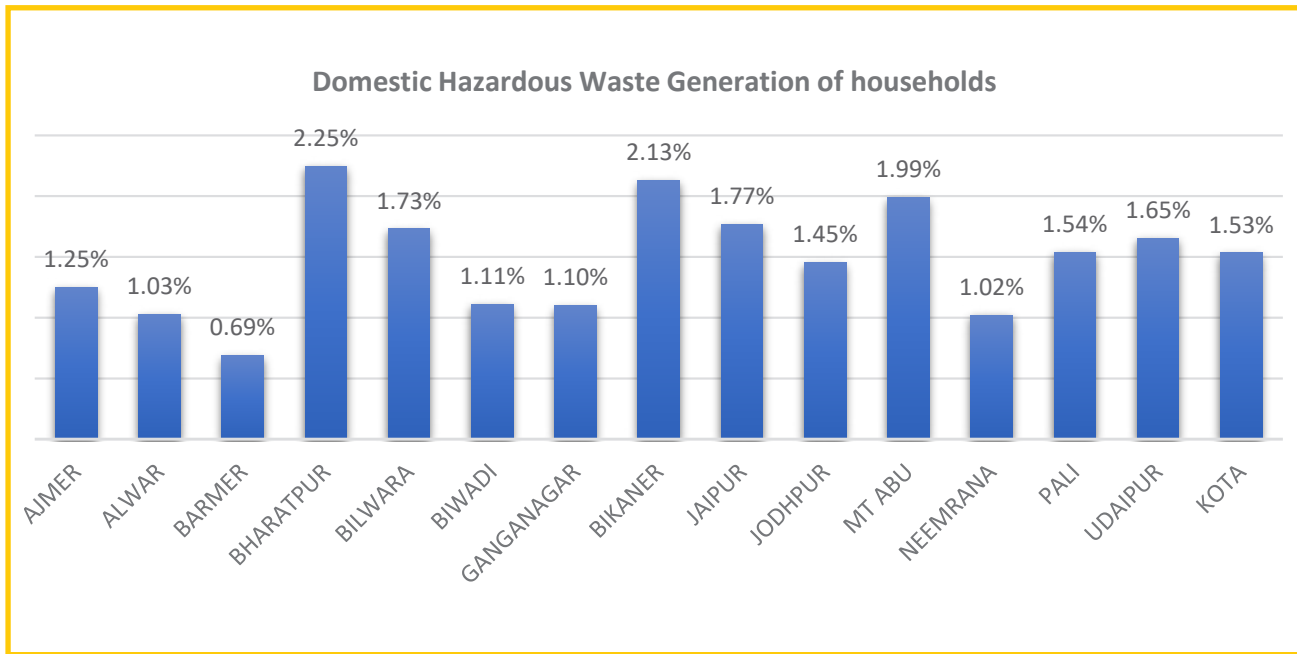


Figure 39: Domestic Hazardous Waste Generation of Households

Analysis of domestic hazardous waste shows that the fraction of domestic hazardous waste in the low-income group was 0.8% followed by 1.7% and the middle-income group and 1.9% in the high-income group. City-wise analysis shows that the highest fraction of domestic hazardous waste fraction of 2.2% was in Bharatpur with the lowest fraction of 0.7% at Barmer.

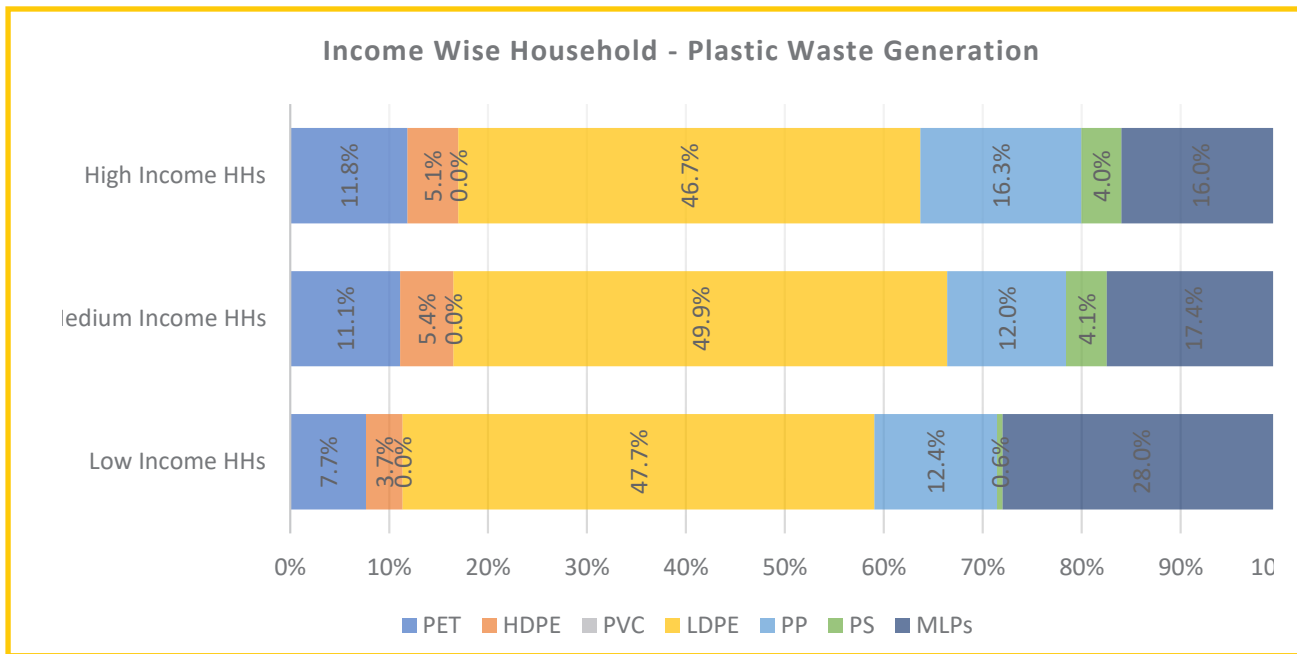


Figure 40: Income-wise Household Plastic Waste Generation

Various plastic waste fractions in different income groups in households were also analyzed and the data shows that plastic waste fraction is highest in the high-income group followed by the middle-income group and low-income group. Further analysis of plastic waste constituents reveals that LDPE forms the major fraction which is 47.7% in the low-income group, 49.9% in middle-income group, and 46.7% in high-income group. MLPs and PP are also dominant across



all income groups and forms a major chunk varying from 30% to 40% of the total plastic waste. PET was another important recyclable stream which is present in good fractions varying from 7.7 to 11.8% with high-income group having the highest fraction. Interestingly, PS and HDPE are available in lower fractions across all the income groups with PS forming the lowest fraction.

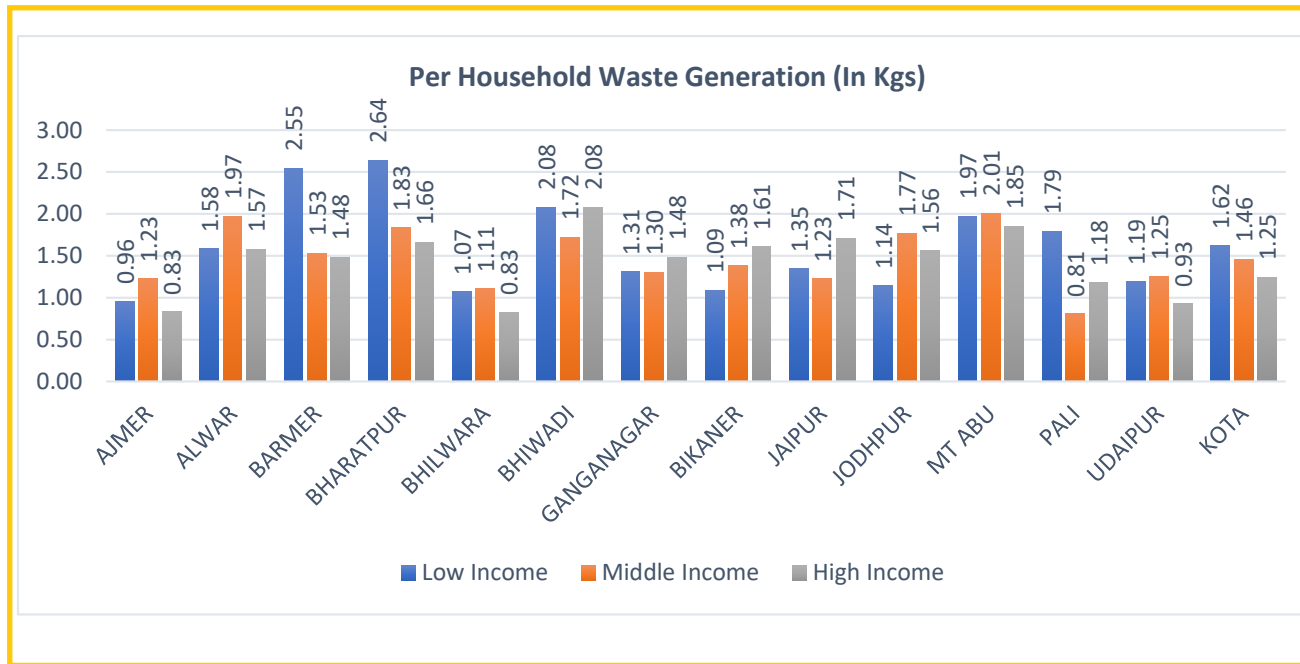


Figure 41: Per Household Waste Generation

If we look at total municipal solid waste generation per household (HH) in each income group, analysis of data brings out that Bharatpur has the highest waste generation of 2.6 Kg per/HH in the low-income category with Ajmer at the bottom with 0.96 Kg/HH. In the middle-income group, Mount Abu was the highest with 2.01 Kg/HH and Pali with 0.81 Kg/HH was the lowest.

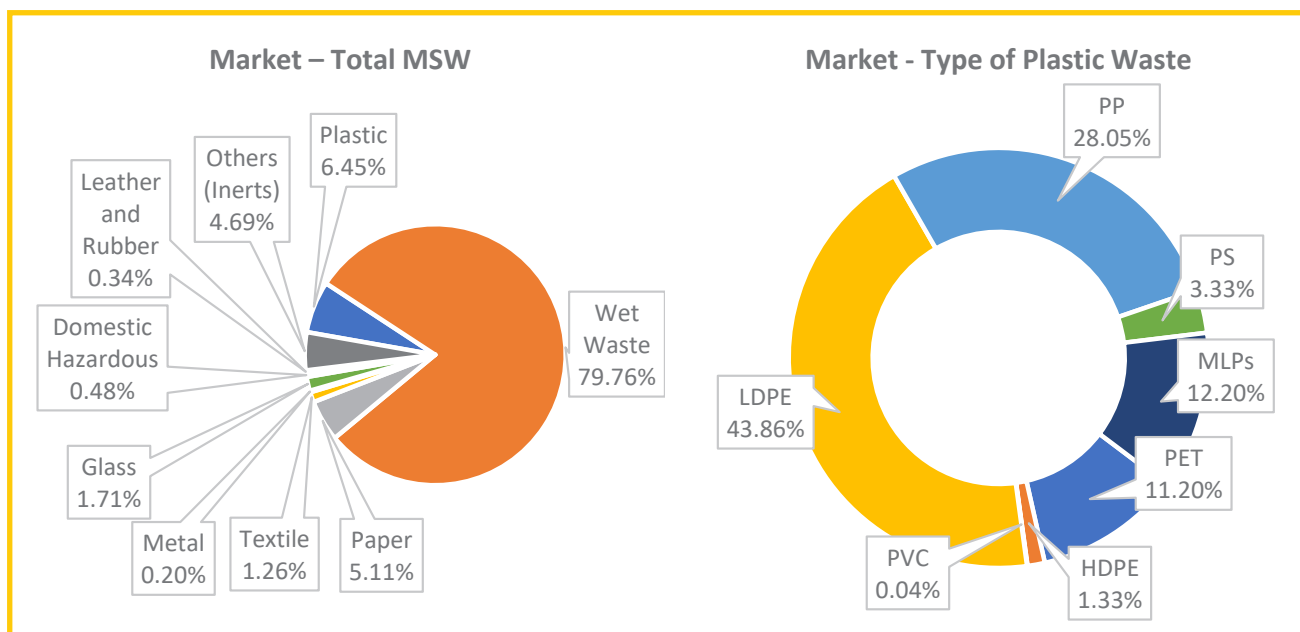


Figure 42: Total MSW and type of plastic waste across the Market

In the high-income group, Bhiwadi was highest with 2.08 Kg/HH, and Ajmer and Bhilwara were lowest with 0.83 Kg/HH.

Analysis of cumulative data for all the cities for markets shows that wet waste fraction is highest with 79.76% followed by plastic and papers which are 6.45% and 5.11% respectively. Inert which stood at 4.69% is also a significant presence in the market which may be due to road sweepings and other inert waste generated in market places.

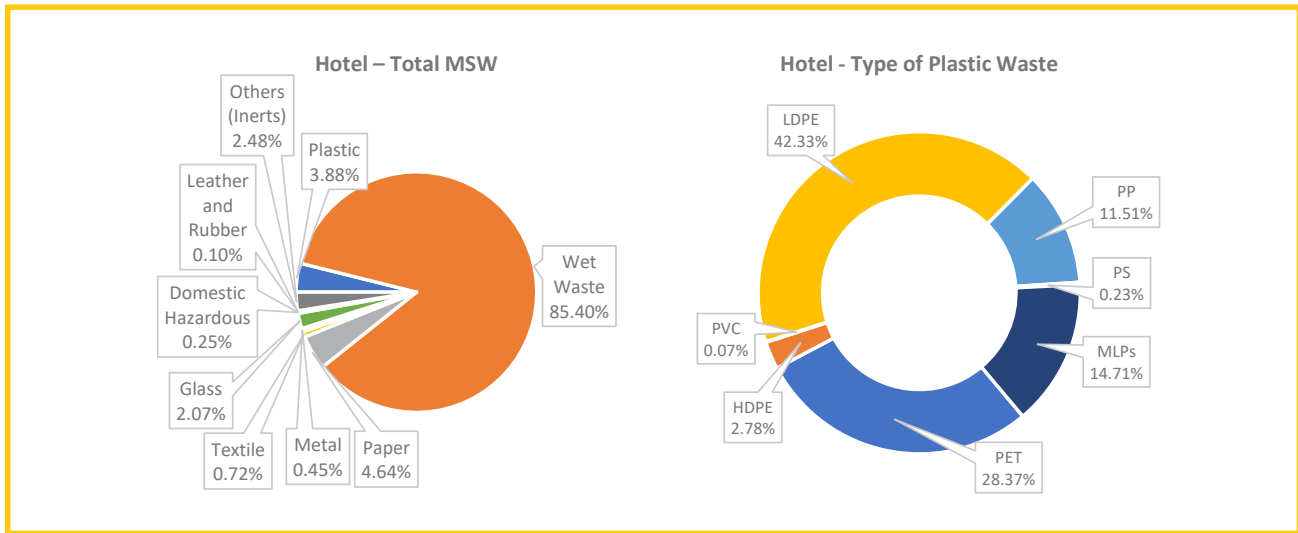


Figure 43: Total MSW and type of Plastic Waste in Hotels

In Hotels, again wet waste fraction stood at 85.40% which was the highest followed by paper (4.64%) and plastic (3.88%). Glass waste was 2.07% which is another significant stream for recycling.

The Mandi waste is a predominately wet waste with 92.51% falling in this category. Only 3.00% was paper followed by 2.04% plastic. Inert waste is 2.04%.

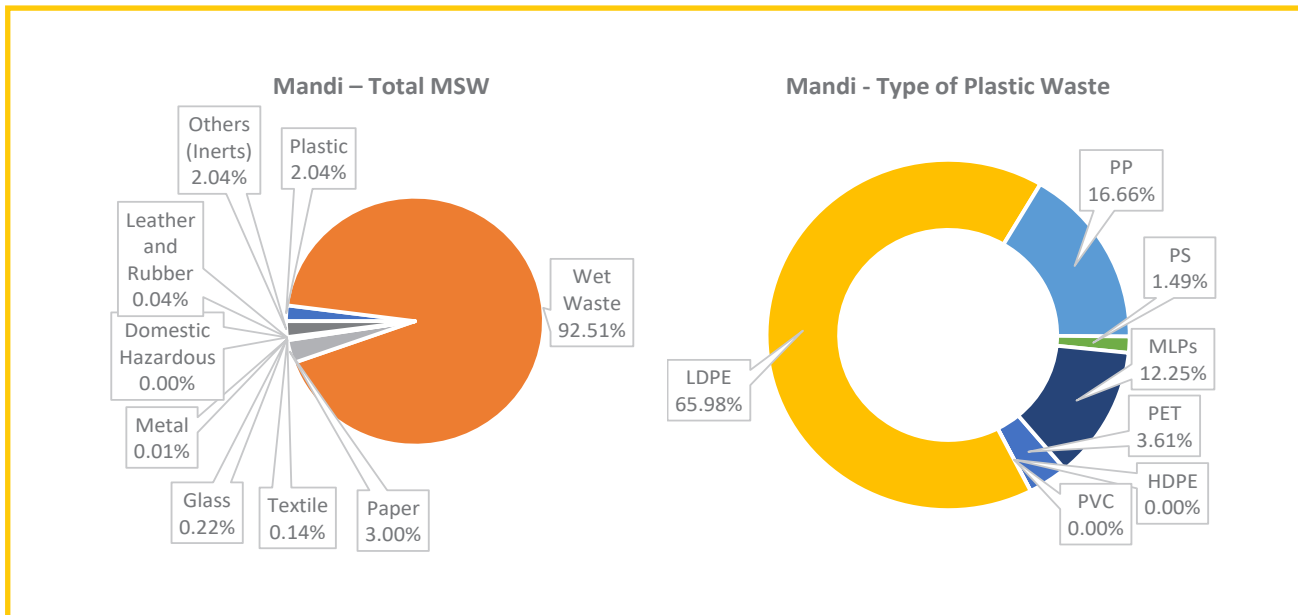


Figure 44: Total MSW and type of Plastic Waste in Mandis



In institutions, wet waste was highest with 71.81% followed by the paper which stood at 9.07%. Plastic and glass were other major fractions present with 6.25% and 5.47% respectively.

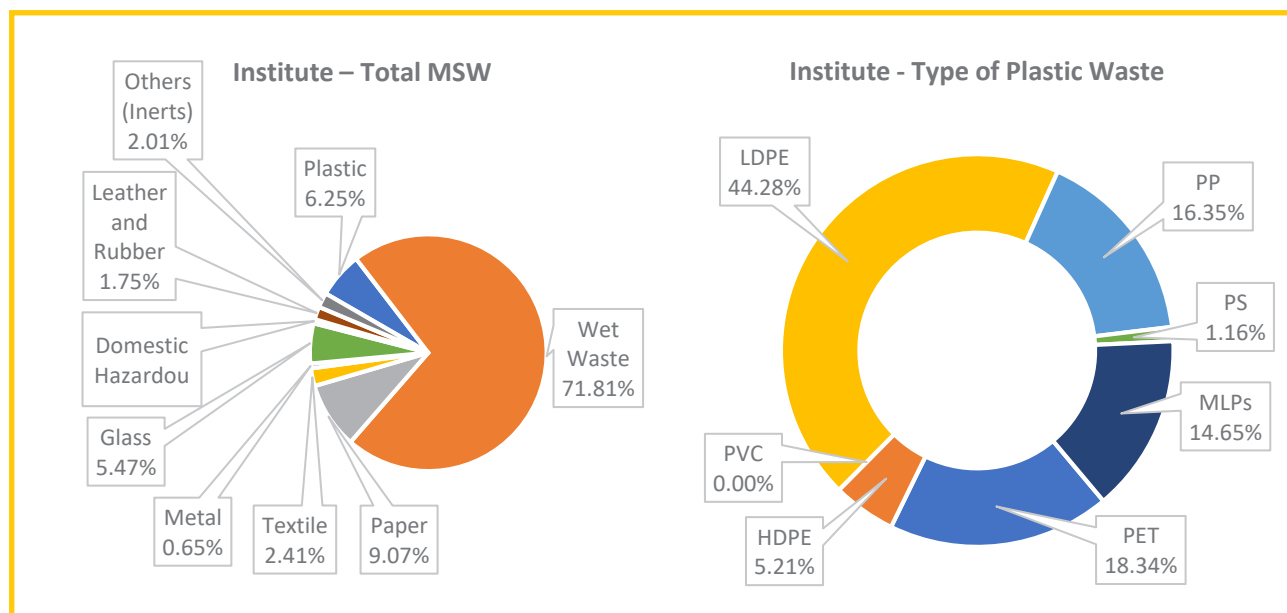


Figure 45: Total MSW and type of Plastic Waste in Institutes

In landfill also wet waste fraction was 81.17% followed by inert waste which was 7.68%. Textile waste was also had a significant fraction with 5.26%. The plastic fraction was only 4.36%.

Further analysis of the type of plastic at the landfill indicates that low-value LDPE dominates the landfill with 61.85% share followed by MLP which stands at 26.69%. PP is also present in a significant fraction with 9.91%. However, most of the high-value easily recyclable fractions are present only in insignificant quantities.

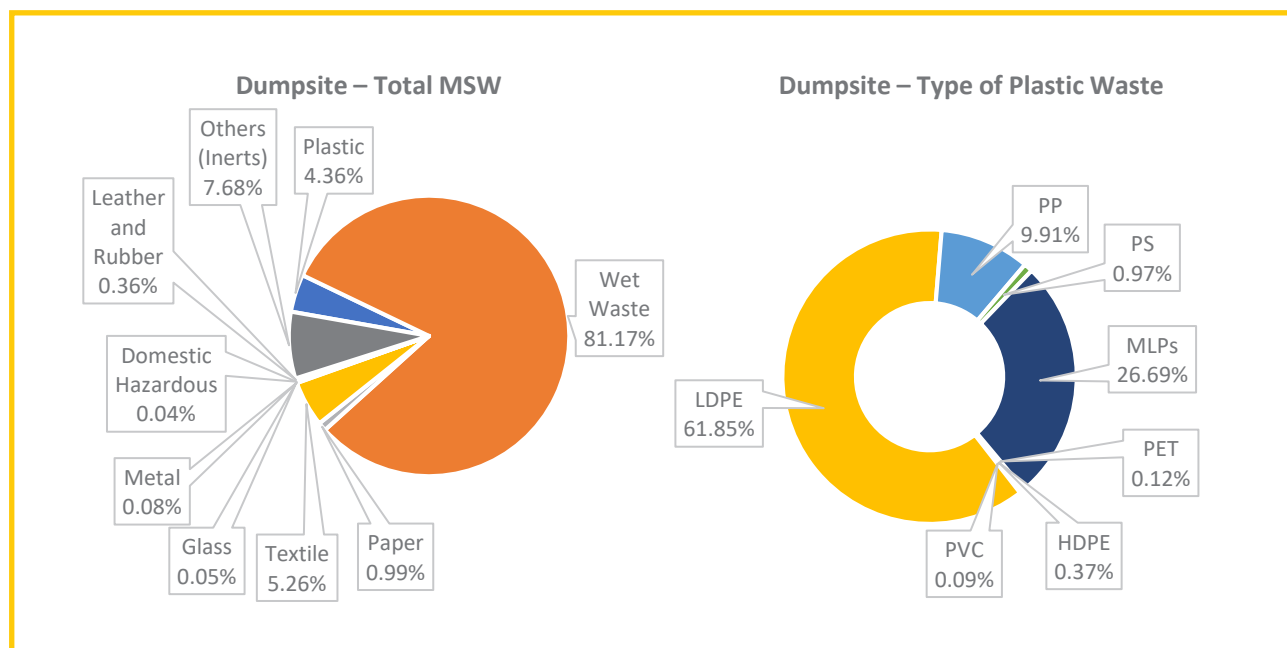


Figure 46: Total MSW and type of Plastic Waste at Dumpsite

7.3 Composition and Characterization of Wet Waste (Organic/Bio-Degradable)

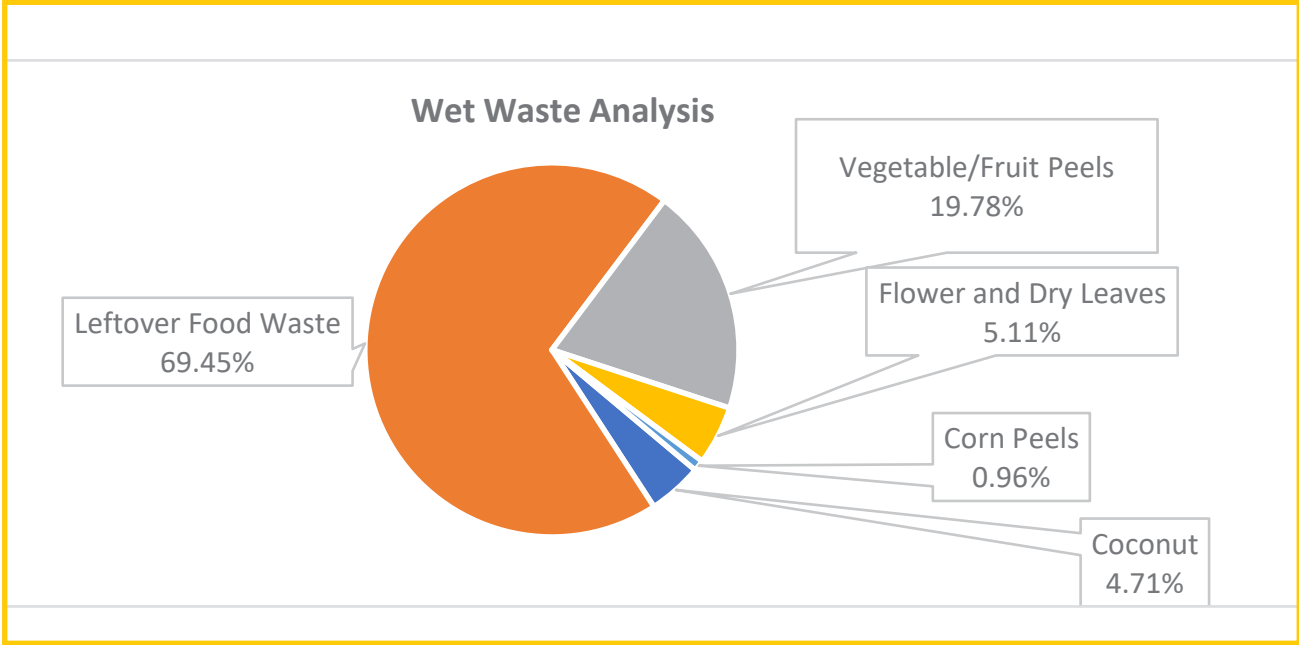


Figure 47 Composition of Wet Waste



In the analysis of the solid waste characterization, it has been observed that the percentage of wet waste is significantly high. In different research data, wet waste is around 55-70% along with a high percentage of 10-25% of inert material but here the findings are slightly different in household samples, the wet waste composition is ranging from 65-77% along with the lower percentage of 2-3% of inert materials. During the waste characterization study, waste samples of different income groups of households have been minutely segregated into around 25 different fractions, and it has been examined by the assessors to identify and weight each items.

Due to the high percentage of wet waste, assessors have taken a few samples of waste from Jaipur and Ajmer to understand the further composition of wet waste or organic waste.

In the wet waste sample, the highest fraction was 69.44% which was leftover food waste followed by 20.74% of vegetable and food peels. Flower and dry leaves were 5.11% along with 4.71% of green coconut which was significantly high in all samples as biodegradable items.

Changing patterns of lifestyle have been evident in these waste samples as earlier leftover food waste was not a core part of the MSW. People used to segregate leftover food and feed it separately to the animals, but now all waste is being collected through the municipal waste collection channels which have impacted the percentage of wet waste.

Waste Characterisation Process



Meeting With Officials



Waste Collection (as per the samples)



Dumping the collected waste at MRF/Landfill



Waste segregation (as per SWM 2016 guidelines)



Weighing of segregated waste

Ajmer

Plastic Waste Characterisation

Item	Quantity (kg)	Remarks
Cardboard	1.450	
Paper and cardboard	9.02	
Shoes	1.93	
Clasils	5.450	
Wool	0.540	
Aluminium foil	0.85	
Glass	1.830	
Rubber		
Domestic Hazardous	1.62	
Sanitary		
Medical waste		
Liquid wastes, syringes, needles etc.		
Compostable Bags (Alternative Slips)	1.060	
Plastic	11.940	
PVC	1.230	
LD PE	1.230	
HD PE	1.230	
HD (Black Plastic and Ca)		
PP (White)	0.350	
PP (Color)	0.350	
PP (Recycle)	0.350	

Date: 10-05-2022
Place of the Survey: MRF
Geotag location: Kenji House Ajmer
Total Sample Size (kg): 144
Dry: 93.598 **Wet:** 100.59 **Coconut:** 13.8m **Isert:** 3.02

Name of the Surveyor: Manoj Khatke
Sample Category: Middle Income

Data Entry





CHAPTER

8

Quantification of Municipal Solid waste and Plastic waste in the Identified cities and in the State of Rajasthan





CHAPTER

8

Quantification of Municipal Solid waste and Plastic waste in the Identified cities and in the State of Rajasthan

Quantification of municipal solid waste and plastic waste are necessary to plan scientific management of these waste. Based on the actual characterization of the waste carried out in the field, population data, and assessment of waste generated in different areas such as households, institutions, markets, etc., the quantification of the waste has been carried out under this study. The detailed methodology adopted for waste quantification is discussed below.

8.1. Methodology Adopted for Quantification of Municipal and Plastic Solid Wastes

8.1.1. Extrapolation of the data

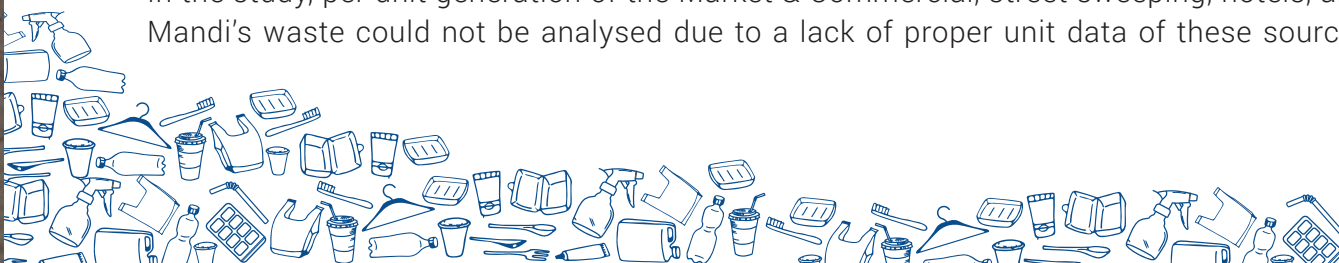
In the proposed study, it was envisaged to have a comprehensive representation of all cities in the state. Therefore, 15 potential cities with defined criteria of population density, environment fragility, and rural-urban divide were selected in the state to capture the diversity, and differences in waste characterization, and composition of the waste. While selecting the Cities the criteria of culture, religious faith, tourism, and historical importance were also considered. Therefore, the palaces of Jaipur, lakes of Udaipur, and desert forts of Jodhpur, Bikaner & Jaisalmer are among the most common destinations for tourists. Some of the towns of religious importance are Ajmer, Bikaner, Jaipur, Udaipur, Mount Abu, and Jodhpur where important places of worship for all the communities are located. This enabled to address of all geographies in the state during the study.

Waste sample data has been collected and analysed for each identified sample i.e. Households (HHs) (Low, Middle, and High Income), Market, Hotels, Sabji (vegetable) Mandi, Landfill or Dumpsite, Institutions (schools, colleges, and office campuses) in each of the cities.

Total population of the selected cities was categorised into three main income groups (Low, Middle, and High) on the basis of household category data from the census 2011. The Population of all ULBs were taken from the state urban department of Rajasthan (2011). Waste characterisation and per-household waste generation data have been extrapolated with the population of the respective income groups. Waste generation of all three income groups were added to get the cumulative figure of the HH waste generation in the total MSW of the city.

Municipal Solid Waste is being collected through numerous sources like Door to Door collection waste of HHs, Market & Commercial, street sweeping, hotels and Sabji (vegetable) Mandis, etc.

In the study, per unit generation of the Market & Commercial, street sweeping, hotels, and Sabji Mandi's waste could not be analysed due to a lack of proper unit data of these sources, high



variability, and complex and mixed waste collection systems from all given sources. Sample of Market, Hotels, Sabji Mandi, Landfill/Dumpsite, and Institutions were analysed to assess the waste composition and typology. These percentage data of the representative samples were extrapolated with the total quantum of waste generated in respective ULBs for all waste generation sources.

Secondary data of Udaipur has been referred for the calculation of total waste composition for other equalling cities. The given composition is as follows;

Table 12: Source of MSW and Percentage of Waste Generation ¹¹

Source Municipal Solid Waste	Percentage of the Waste Generation
Household	72.65
Commercial	11.28
Hotels	11
Institutional	1
Markets (Vegetable /Fruits Mandi)	4.06
Total	100.00%

On the basis of the given percentage, the total municipal waste has been extrapolated and total plastic and other waste categories along with typologies have also been calculated for selected cities to arrive at more verifiable, robust, and practical figures/ quantum of the waste generated by the respective cities.

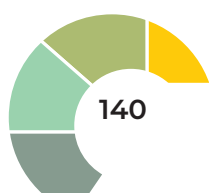
In the state of Rajasthan, there is a huge diversity in terms of geography, livelihood, religion, income, and culture so it was rather tough to analyse samples of all ULBs of the state in a given short span of time. Extrapolation methodology has been adopted for the remaining cities.

In the study, secondary data has been referred for all 213 ULBs of the state where data has been extrapolated with the sample of representative cities in the same population and cultural groups. In 44 equalling cities, gross per capita generation were considered to calculate the total generation of the waste of these cities through multiplying the current population of each city with the gross per capita generation of representative samples of the city.

In the remaining 152 cities (population<50k), secondary data of waste generation provided by the state Local Self Governance (LSG) Department has been considered for the total estimated quantum of MSW of these small ULBs. A representative city sample has been considered for characterisation and typology analysis of these cities, data has been extrapolated directly with the same representative sample cities to extract the quantum of the plastics and other waste being generated. In these cities, there is no data of per capita waste generation so the gross composition of waste has been considered from representative cities for the extraction of the city data.

Total data has been extrapolated and compiled in the required category as explained to arrive at the most appropriate answers.

¹¹ Pre feasibility report of Udaipur, 2020

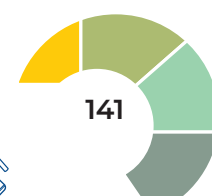


8.2 Quantification of Municipal Solid Waste for the Cities identified under the Study

Based on the above methodology, quantification of the MSW was carried out in all the identified 15 cities and the details are as per the below-mentioned table.

Table 13: Quantification of MSW across 15 Cities

S.N.	District Name	ULB name	Population Category	Projected 2021 Population (@ 23% decadal growth)	Household on 2021	Per Capita Waste Generation (Kg/Day)	Waste Generation (TPD)
1	JAIPUR	JAIPUR	18 - 40 lakh	3746779	749356	0.40	1508.44
2	KOTA	KOTA	10 - 18 lakh	1408958	281792	0.40	569.11
3	JODHPUR	JODHPUR	10 - 18 lakh	1271519	254304	0.44	556.22
4	BIKANER	BIKANER	3-10 Lakh	792619	158524	0.39	311.55
5	AJMER	AJMER	3-10 Lakh	667055	133411	0.29	194.00
6	ALWAR	ALWAR (M CL)	3-10 Lakh	387916	77583	0.49	188.54
7	UDAIPUR	UDAIPUR (M CL)	3-10 Lakh	554853	110971	0.32	174.83
8	BHARATPUR	BHARATPUR (M CL)	1-3 Lakh	310381	62076	0.54	168.91
9	BHILWARA	BHILWARA (M CL)	3-10 Lakh	442164	88433	0.29	126.63
10	GANGANAGAR	GANGANAGAR (M CL)	1-3 Lakh	276174	55235	0.46	126.18
11	PALI	PALI (M CL)	1-3 Lakh	282992	56598	0.32	89.62
12	ALWAR	BHIWADI (M)	1-3 Lakh	129053	25811	0.47	61.13
13	BARMER	BARMER (M)	50k-1 Lakh	118357	23671	0.46	54.09
14	SIROHI	MOUNT ABU (M)	Less than 25k	28220	5644	0.54	15.31
15	ALWAR	NEEMRANA	Less than 25k	8786	1757	0.47	4.16
	Total			-	-	-	4148.74

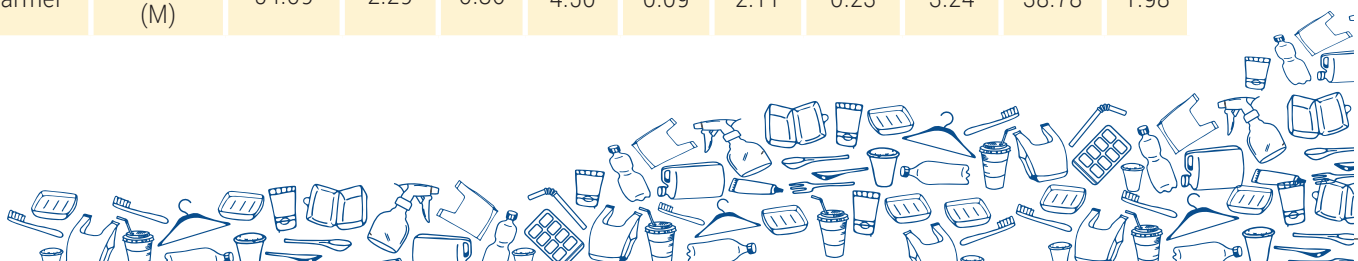
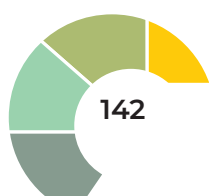


As can be seen from the table, Jaipur has the highest waste generation with 1508 TPD, and Neemrana is at the bottom with 4.16 TPD. As far as the rate of per capita waste generation is concerned, Bharatpur and Sirohi have the highest rate of 0.54 Kg/capita/day whereas Ajmer and Bhilwara have the lowest rate with 0.29 Kg/capita/day. The average rate of municipal solid waste generation in these 15 cities is 0.42 Kg/capita/day.

Detailed analysis of the waste generated by each city was also carried out and the same is tabulated in table 13.

Table 14: Amount and Type of Waste Generated by each City

S.N.	District Name	ULB name	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inert Waste (stone, etc)
1	Jaipur	JAIPUR Greater and Jaipur Heritage	1508.44	87.32	20.2	30.4	4.9	29.34	24.23	110.84	1170.37	30.85
2	Kota	Kota	569.11	19.81	4.39	12.13	0.85	4.85	6.09	29.49	484.01	7.50
3	Jodhpur	Jodhpur	556.22	18.27	3.15	17.17	1.62	9.40	7.33	29.08	457.96	12.24
4	Udaipur	Udaipur (M CL)	174.83	13.35	1.18	4.99	0.70	4.29	3.56	13.34	129.21	4.23
5	Ajmer	Ajmer	194.00	12.07	1.34	3.36	0.97	2.35	1.69	18.19	149.91	4.12
6	Bhilwara	Bhilwara (M CL)	126.63	10.68	1.57	7.90	0.33	1.91	1.00	13.29	86.71	3.24
7	Bharatpur	Bharatpur (MCL)	168.91	10.65	1.29	3.50	0.22	2.27	3.43	11.87	132.68	3.01
8	Alwar	Alwar (MCL)	188.54	8.84	0.97	6.52	0.61	0.63	1.77	10.30	153.82	5.08
9	Pali	Pali (MCL)	89.62	7.04	1.12	6.36	0.24	1.36	0.80	7.64	62.74	2.32
10	Bikaner	Bikaner	311.55	5.90	0.19	1.25	0.73	6.46	2.61	18.18	263.95	12.30
11	Ganganagar	Ganganagar (MCL)	126.18	2.36	0.28	1.32	0.30	2.57	0.95	7.84	106.94	3.62
12	Barmer	Barmer (M)	54.09	2.29	0.86	4.50	0.09	2.11	0.23	3.24	38.78	1.98



13	Alwar	Bhiwadi (M)	61.13	1.19	0.13	0.44	0.03	0.36	0.47	1.59	55.46	1.45
14	Sirohi	Mount Abu (M)	15.31	0.97	0.20	0.75	0.08	1.03	0.25	1.23	10.24	0.57
15	Alwar	Neemrana village	4.16	0.10	0.04	0.05	0.00	0.10	0.04	0.08	3.65	0.10
Total			4148.72	4148.72	200.74	36.91	11.67	69.03	54.41	276.2	3306.43	92.61

In the 15 cities under study, the component of wet waste was highest at about 80% of the total waste generated. The plastic waste component was around 6.65% of the total waste. Paper which stood at 4.8% of the total waste was also a very important contributor to the total waste and impact waste recycling in a big way. Textile waste was 2.42% and glass form was about 1.66% of the total waste.

8.3 Quantification of Municipal Solid Waste Generated in the State of Rajasthan

The assessment and quantification of MSW generated in the entire state were carried out as per the methodology discussed above and the total waste generation in the state was assessed as 7823.26 TPD out of which wet waste was 6025.59 TPD (77.02%), followed by plastic waste which was 496.51 TPD (6.35%). Paper waste was 369.12 TPD (4.72%) and textile waste was 412.08 TPD (5.27%). Other fractions such as inert waste were 181.16 TPD (2.32%) followed by glass waste 137.11 TPD (1.75%) and leather & shoes, 86.89 TPD. Per capita, the average waste generated as per the assessment carried out stood at 0.37 kg.

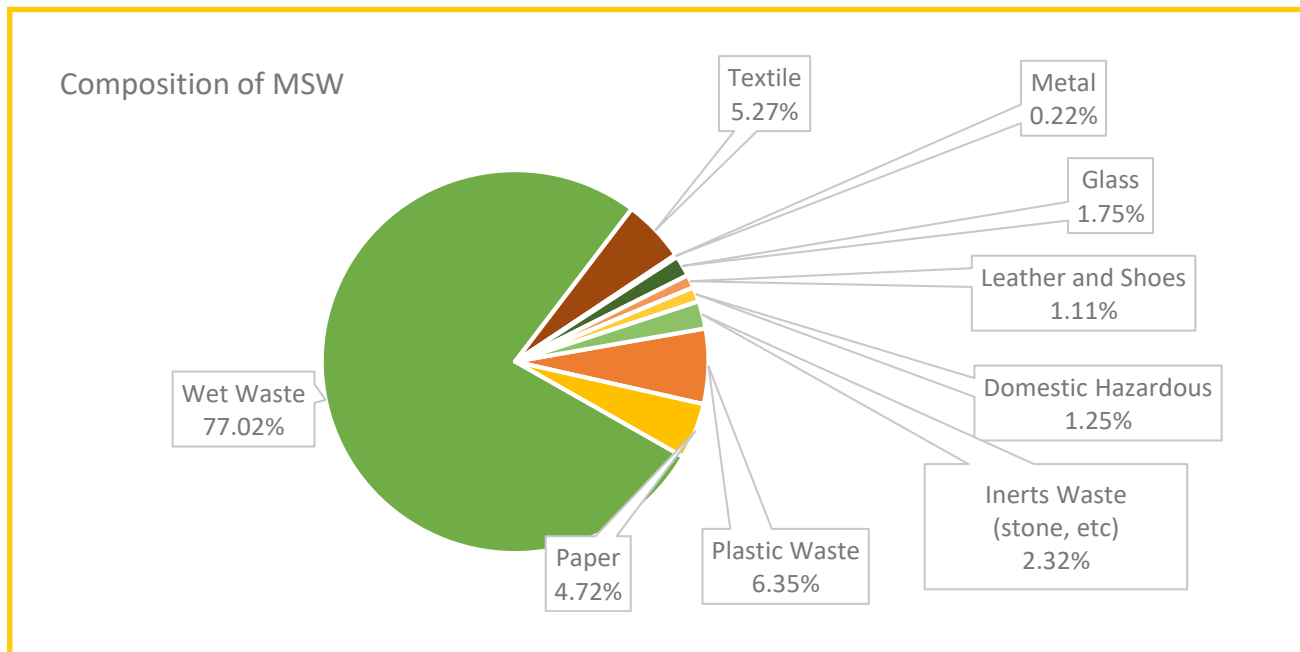


Figure 48: Composition of MSW



Table 15: Waste Generated across Categories in Rajasthan

Category	Waste Generation - TPD
Plastic Waste	496.51
Paper	369.12
Wet Waste	6025.59
Textile	412.08
Metal	17.31
Glass	137.11
Leather and Shoes	86.89
Domestic Hazardous	97.49
Inert Waste(stone, etc)	181.16
Grand Total (TPD)	7823.26

The assessment carried out during the study is in line with the estimation of waste carried out by the Local Self Government Department which has estimated the total quantity of waste as 8808 TPD in the state. Per capita waste generation as per LSG data is 0.44 Kg/capita/day (mention in table 16) which is also quite close to the per capita waste generation obtained through the assessment carried out through the aforesaid study.

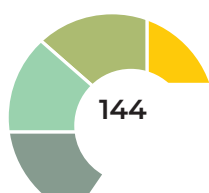
8.4. Comparison of Solid Waste Generated in the State of Rajasthan

Table 16: Comparison of Solid Waste Generated in the State of Rajasthan

Category	Annual Report RSPCB 2021-22	LSG Data (State Urban Dept.)	Research Data (Study)
Projected 2021 Population ¹² (ULBs)	20182295	20182295	20182295
Household on 2021	4036459	4036459	4036459
Waste Generation - TPD	6897.15	8808	7823.25
Total Plastic Waste Generation – TPD	197.38	353.32	496.51
Total Plastic Waste Generation in Total MSW	2.86%	4.00 ^{13%}	6.35%
Waste Generation (KGs Per Households)	1.70	2.18	1.94
Waste Generation (KGs Per Capita)	0.34	0.44	0.37

¹² Population of all ULBs of Rajasthan as per LSG data

¹³ LSG Plastic Waste Management Action Plan 2019

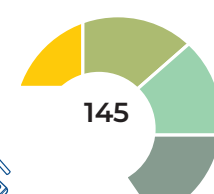


8.5 Quantification of Plastic Waste Generated for the Cities identified under the Study

As per the assessment of the plastic waste carried out during the study, the total plastic waste generated in 15 identified cities was 276.20 TPD with the average per capita plastic waste generation being 0.03 kg per capita per day. The maximum quantity of plastic waste is generated at Jaipur which is 110.84 TPD and the lowest quantity is generated at Neemrana which is 0.08 TPD. However, from the point of view of per capita plastic waste generation, Bharatpur and Sirohi have the highest per capita generation of 0.04 Kg per capita per day. The lowest per capita generation is at Neemrana which is 0.01 Kg per capita per day.

Table 17: Per Capita and Total Waste Generation in the 15 Cities of Rajasthan

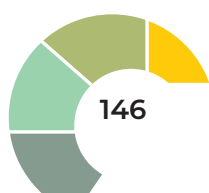
S.N.	District Name	ULB name	Projected 2021 Population (@ 23% decadal growth)	Household on 2021	Per Capita Plastic Waste Generation (Kg/Day)	Total Plastic Waste (TPD)
1	JAIPUR	JAIPUR	3746779	749356	0.03	110.84
2	KOTA	KOTA	1408958	281792	0.02	29.49
3	JODHPUR	JODHPUR	1271519	254304	0.02	29.08
4	BIKANER	BIKANER	792619	158524	0.02	18.18
5	AJMER	AJMER	667055	133411	0.03	18.19
6	ALWAR	ALWAR (M CL)	387916	77583	0.03	10.30
7	UDAIPUR	UDAIPUR (M CL)	554853	110971	0.02	13.34
8	BHARATPUR	BHARATPUR (M CL)	310381	62076	0.04	11.87
9	BHILWARA	BHILWARA (M CL)	442164	88433	0.03	13.29
10	GANGANAGAR	GANGANAGAR (M CL)	276174	55235	0.03	7.84
11	PALI	PALI (M CL)	282992	56598	0.03	7.64
12	ALWAR	BHIWADI (M)	129053	25811	0.01	1.59
13	BARMER	BARMER (M)	118357	23671	0.03	3.24
14	SIROHI	MOUNT ABU (M)	28220	5644	0.04	1.23
15	ALWAR	NEEMRANA VILLAGE	8786	1757	0.01	0.08
Total			-	-	0.03	276.20



The plastic waste generated in each city was further analyzed based on the type of plastic generated by each city and the details are in table 18. As the details, LDPE constitutes the highest fraction with 143.67 TPD followed by MLP which is 44.76 TPD. There is very meager PVC waste in identified 15 cities with the total quantity being only 0.03 TPD. PS is also very less with only 5.29 TPD in these cities.

Table 18: Type and Amount of Plastic Waste Generated in the 15 Cities of Rajasthan

S.N.	District Name	ULB name	PET	HDPE	PVC	LDPE	PP	PS	MLPs	Total Plastics
1	Jaipur	Jaipur Greater (Mc) & Jaipur Heritage (Mc)	10.17	6.95	0	60.35	12.49	3.08	17.79	110.84
2	Kota	Kota	2.97	0.66	0.00	13.53	8.11	0.31	3.90	29.49
3	Jodhpur	Jodhpur	4.13	2.01	0.00	15.66	2.52	0.16	4.60	29.08
4	Udaipur	Udaipur (M CI)	2.47	0.89	0.03	5.88	1.83	0.37	1.87	13.34
5	Ajmer	Ajmer	1.89	0.50	0.00	10.51	2.08	0.01	3.20	18.19
6	Bhilwara	Bhilwara (M CI)	0.98	0.39	0.01	6.85	1.70	0.02	3.34	13.29
7	Bharatpur	Bharatpur (M CI)	0.70	0.42	0.00	5.98	2.94	0.70	1.13	11.87
8	Alwar	Alwar (M CI)	1.06	0.32	0.00	4.98	1.53	0.26	2.15	10.30
9	Pali	Pali (M CI)	0.84	0.16	0.00	3.65	1.21	0.21	1.56	7.64
10	Bikaner	Bikaner	3.39	0.20	0.00	9.53	2.50	0.05	2.52	18.18
11	Ganganagar	Ganganagar (M CI)	1.45	0.26	0.00	3.66	1.19	0.02	1.25	7.84
12	Barmer	Barmer (M)	0.40	0.14	0.00	1.49	0.39	0.07	0.75	3.24
13	Alwar	Bhiwadi (M)	0.31	0.04	0.00	0.71	0.33	0.01	0.19	1.59
14	Sirohi	Mount Abu (M)	0.26	0.03	0.00	0.52	0.13	0.00	0.28	1.23
15	Alwar	Neemrana Village	0.02	0.00	0.00	0.04	0.01	0.00	0.01	0.08
	Total		31.05	12.97	0.03	143.67	39.11	5.29	44.76	276.2



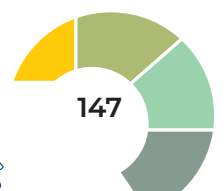
8.6 Quantification and Typology of Plastic Waste Generation in the State of Rajasthan

Based on the methodology as outlined in this chapter, assessment, and quantification of the plastic waste generated in the state were carried out and details are provided in table 19. As per the details, the total plastic waste generated in the state is 496.51 TPD out of the major share is of LDPE which is 244.92 TPD (49.33%). In LDPE also, HM is 174.54 TPD which forms 71.26% of all the LDPE waste generated in the state. Milk pouches which are high-value LDPE are also assessed as 34.56 TPD which is 14.11% of the total LDPE waste. Another major plastic waste category is PP which is 77.73 TPD (15.66%). In PP waste, PP colour is the major stream which is 42.79 TPD and forms 55% of all the PP waste generated in the state. Other categories in PP waste are PP white and PP Natural which are 24.4 TPD (31.56% of PP waste) and 10.55 TPD (13.57% of total PP waste) respectively.

The quantity of MLP in the state was estimated as 97.46 TPD (19.63% of total plastic waste generated) and presents a good opportunity for MLP recycling in the state. PET waste generation was 48.54 TPD (9.78% of the total plastic waste) and is already being recycled in the state in a big way. There is a negligible generation of PVC waste which is only 0.03 TPD followed by PS which is 9.28 TPD. HDPE waste is also 18.54 TPD which is 3.73% of the total plastic waste.

Table 19: Types of Plastic Waste Generated in Rajasthan

Category	Waste Generation - TPD
PET	48.54
HDPE	18.54
PVC	0.03
LDPE	244.92
- LD Plain	35.82
- Milk Pouch	34.56
- HM	174.54
PP	77.73
- PP White	24.40
- PP Colour	42.79
- PP Natural	10.55
PS	9.28
MLPs	97.46
Total Plastics	496.51



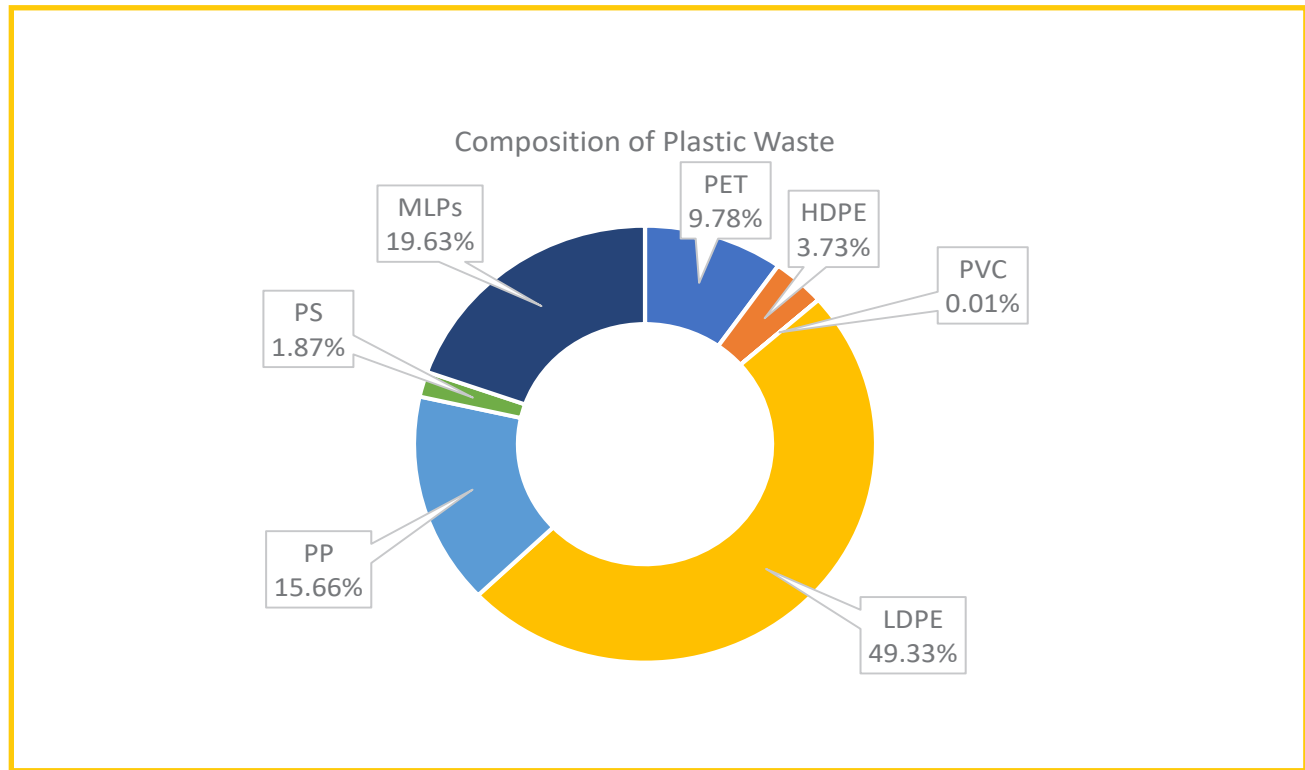


Figure 49: Percentage of Plastic Waste Generated in Rajasthan





CHAPTER

9

Management of Plastic and Municipal Solid Waste in the State of Rajasthan





Management of Plastic and Municipal Solid Waste in the State of Rajasthan

As per the annual report filed by Rajasthan State Pollution Control Board for the year 2021-2022 under Solid Waste Management Rules, 2016, there are a total of 207 Urban Local Bodies (ULBs) in the state which generates about 7973.156 Tons of municipal solid waste per day. Out of the total waste generated, about 7859.356 Tons (98.57%) is collected through the door-to-door collection mechanism. However, only 1925.97 Tons (24.50% of the total waste collected) is treated and the rest is disposed of through a landfill. Out of 207 ULBs, segregation is practiced only in 104 ULBs.

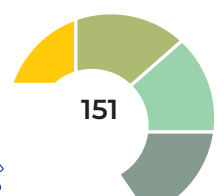
There are 31 municipal solid waste treatment and processing facilities presently in operation in the state. Further, 06 more municipal solid waste processing facilities and one waste-to-energy plants are under installation and two bio-methanation plants(both are in Udaipur) are operational in the state (RSPCB Annual Report 2021-22).

During the survey of 15 selected cities, the survey teams also evaluated the system established for the management of the MSW and the observations by the survey team have been compiled. As per the observations, all 15 cities covered under the study have arrangements for door-to-door collection of waste. However, except for Udaipur, other cities are not carrying out any source segregation. Even in Udaipur, segregation is limited to only 70% of the total waste generated in the city.

In the cities of Ajmer, Alwar, Barmer, Bhilwara, Bhiwadi, Ganganagar, Jaipur, Jodhpur, Mt Abu, Pali, and Udaipur, MRF facilities have been installed, however, except Barmer, Bhilwara, Jaipur, Pali, and Udaipur, all the MRFs were not properly operational. Further, except Bhilwara, Udaipur, and Jaipur, none of the above cities have installed any other waste processing facilities such as systematic RDF/composting plant or bio-methanation. In Udaipur, the city has installed not only MRF but has also installed a composting plant and bio-methanation for the processing of MSW. In Jaipur, the city has a composting facility and a Refused Derived Fuel (RDF) plant. In Jodhpur, work construction of waste to energy plant was in progress.

Overall, Udaipur is the only town in the state which is having a door-to-door collection, good waste segregation, and waste processing infrastructure. Details of the waste processing facilities installed at Udaipur are given in box-1.

During the survey, it was also observed that out of 15 towns selected for the study, none of the cities have a well-designed engineering landfill for disposal of the residual waste. However, all the cities have unregulated dump sites where the mixed waste is dumped without any treatment or environmental safeguards. As per the annual report filed by Rajasthan State Pollution Control Board for the year 2021-2022 under Solid Waste Management Rules, 2016, there are 208 total dumpsites in the state and one dumpsite converted into sanitary landfill in the Udaipur.



BOX1: ECOWRAP IMPACT PRIVATE LIMITED

The lack of waste segregation at the source is the main reason for the absence of technically feasible process for the sustainable treatment of solid waste. Low margins due to high logistic cost and contamination in recyclables even make it more complex. Contamination reduces the recycling property of waste material and becomes a challenge for financial viability as well. Modern available technology like waste to energy, Pyrolysis etc are not feasible for unsegregated waste. Mechanical separation is inefficient process. Second problem of this sector is an absence of reverse supply chain. Logistics is an important aspect in the waste sector and its biggest cost factor. It is very important to bring and efficient reverse supply chain for effective and decentralized collection of segregated waste.

'Ecowrap' is a one stop solution for waste segregation, tracking, collection, recycling, and up-cycling. This model is entirely based on waste segregation at source and to make this sector financially viable. To promote waste segregation at source Ecowrap provide all required Infrastructure like Smart Dustbins, Training, Doorstep Pickup and Tech enabling the process for 4-degree primary segregation of the waste. To ensure long term participation in source segregation ECOWRAP incentivize waste generator based on the segregation rating. Route tracking APIs help the waste generators to ensure that requested pickups should transferred to nearest collection truck in that area. The company is building an efficient reverse supply chain through their APP and real-time data of waste from our dustbins.



Vehicle for Collection and Segregation of the Waste



Company's segregation incentives are redeemable tokens and can be used on Govt utility platforms and various another marketplace. It has also added extra buffer of revenue in their model through these incentives. 'Zero Dumping' is the core of ECOWRAP's business model. All the collected waste including food waste is sold to recyclers and up-cyclers. The uncontaminated recyclable material fetches us good margins when sold recyclers.

BUSINESS MODEL: Ecowrap has place 4 different dustbins at the user's business for 4-degree primary segregation. The company also train the housekeeping staff on source segregation and raising pickup requests through their APP. On the basis of this data the APIs design a shortest route which appears on the collection team's app. During pickup, the company them incentives in the form of digital tokens and collect all their segregated waste. After collection most of the waste is sold to the recyclers and in return generate revenue. In growth aspect, ECOWRAP is aiming to provide sustainability rating to every commercial establishment of India to measure their waste management practices.

Currently Ecowrap is operating in 2 cities and working with more than 1000+ bulk waste generators and have brought 3500 metric ton of solid waste into source segregation process. Social Alpha and Villgro Foundation are investors of ECOWRAP and providing proper hand holding. 40% of Ecowrap waste generator partners are Dumping free entity. Aim of the company is to build India's first dumping free city by 2030.

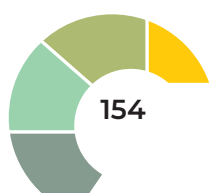


Vehicle for Collection and Segregation of the Waste



Table 20: City-wise Waste Management Infrastructure Status

City Name	Waste Generation (TPD)	Waste Source Segregation Status	Door To Door Waste Collection	MRF Facility	MRF Operations	Composting + RDF Plant	Bio-Methanation Plant	Bio-Mining Facility	Waste To Energy Plant	Ungulated Dump Site
Ajmer	194	Low	✓	✓	In Process	x	x	✓	x	✓
Alwar	188.54	Low	✓	✓	In Process	✓	x	✓	x	✓
Barmer	54.09	Low	✓	✓	✓	x	x	✓	x	✓
Bharatpur	168.91	Low	✓	x	x	x	x	✓	x	✓
Bhilwara	126.63	Low	✓	✓	✓	✓	x	✓	x	✓
Bhiwadi	61.13	Low	✓	✓	In Process	x	x	x	x	✓
Bikaner	311.55	Low	✓	x	x	✓	x	x	x	✓
Ganga Nagar	126.18	Low	✓	✓	In Process	x	x	x	x	✓
Jaipur	1508.44	Low	✓	✓	✓	✓	x	✓	x	✓
Jodhpur	556.22	Low	✓	✓	In Process	✓	x	✓	x	✓
Kota	569.11	Low	✓	x	x	x	x	x	x	✓
Mt Abu	15.31	Low	✓	✓	In Process	x	x	x	x	✓
Neemrana	4.16	Low	✓	x	x	x	x	x	x	✓
Pali	89.62	Low	✓	✓	✓	✓	x	✓	x	✓
Udaipur	174.83	High	✓	✓	✓	✓	✓	✓	x	✓

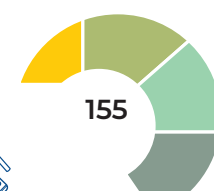


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Table 21: Waste Processing Agencies in different Cities

City	Activity	Type of Waste	Waste Processing/ Recovery/ Disposal (TPD)	Status	Name of Agency
Jaipur	Composting/Bio methanation process	Wet Waste to Compost	250		M/s IL&FS
Jaipur	Legacy Waste Management	RDF	350		M/s Ultra Tech Ltd
Jaipur	Waste Processing (Waste to Energy Plant)	Mixed Waste	600	In Process	M/s JITF Urban Infrastructure Ltd, New Delhi
Pali	Legacy Waste Management	RDF + Compost	100		M/s Rollz Material Handling System Pvt. Ltd., New Delhi
Pali	Composting	Compost	38		ULB
Bhilwara	Legacy Waste Management	RDF + Compost	144		M/s Rollz Material Handling System Pvt. Ltd., New Delhi
Bhilwara	RDF/Palletisation	RDF+ Compost	120		ULB
Udaipur	Material Recovery Facility	Dry Waste	60		ULB
Udaipur	Composting/Bio methanation process	Wet Waste to Compost	60		M/s Sandal Buildcon Pvt Ltd
Udaipur	Composting/Bio methanation process	Wet Waste to Bio methanation	20		M/s Mahindra
Udaipur	Legacy Waste Management	RDF	30		ULB
Alwar	Legacy Waste Management	RDF	129		M/s Rollz Material Handling System Pvt. Ltd., New Delhi
Barmer	Composting/Bio methanation process	Wet Waste to Compost	5		ULB
Jodhpur	Waste Processing (Waste to Energy Plant)	Mixed Waste	400	In Process	M/s JITF Urban Infrastructure Ltd., New Delhi
Jodhpur	Composting	Compost	200		ULB
Bharatpur	Legacy Waste Management	RDF	100		M/s Rollz Material Handling System Pvt. Ltd., New Delhi
Ajmer	Legacy Waste Management	RDF	300		M/s NACOF







CHAPTER

10

Single Use Plastics (SUPs)





CHAPTER

10

Single Use Plastics (SUPs)

S Single Use Plastics (SUPs) Commodity as defined vide notification dated 21.08.2021 under the Plastic Waste Management Rules, 2016 means a plastic item intended to be used once for the same purpose before being disposed of or recycled.

As per the aforesaid notification, the manufacture, import, stocking, distribution, sale, and use of the following single-use plastic, including polystyrene and expanded polystyrene, commodities are prohibited with effect from the 1st July 2022:

- a. *Earbuds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, and polystyrene (Thermocol) for decoration.*
- b. *Plates, cups, glasses, cutlery such as forks, spoons, knives, straws, trays, wrapping or packaging films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 microns, stirrers.*

Also, in order to stop littering due to lightweight plastic carry bags, with effect from 30th September 2021, the thickness of plastic carry bags has been increased from fifty microns to seventy-five microns and to one hundred and twenty microns w.e.f. 31st December 2022. However, in the State of Rajasthan, plastic carry bags excluding compostable plastic carry bags are completely banned vide state government notification dated 21.07.2010. Therefore, all carry bags irrespective of thickness are banned in the state.

To study the extend of use, manufacture, and sale of the SUP commodities in the state of Rajasthan, a detailed study was conducted in various towns of the SUP buyers, sellers, and manufacturers in the state.

10.1.Characterisation and Quantification of SUPs

While carrying out the characterisation studies for plastic and other waste streams from households, hotels, markets, institutions, Mandi, etc., the SUPs were also separately characterized from the plastic waste, and the quantum of various SUPs streams was assessed.

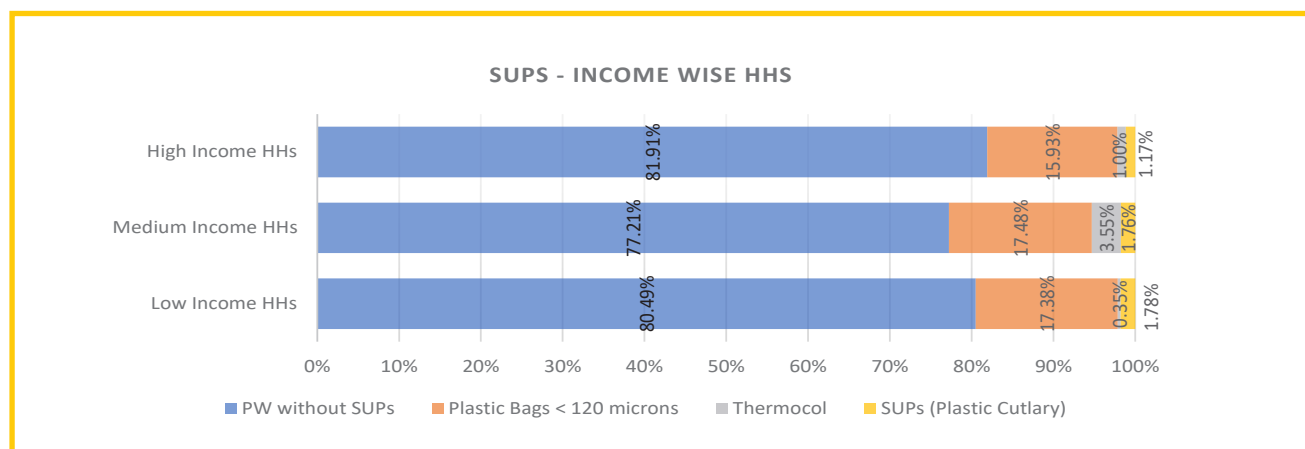


Figure 50: Single Use Plastics in Income-wise Households



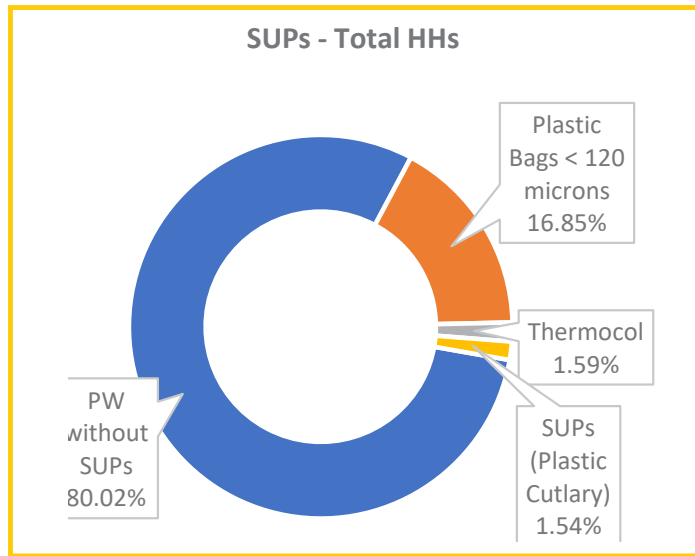


Figure 51: Percentage of various SUPs in Households

In the household, plastic was 5.92% in the low-income group out of which 80.49% were without SUPs and 17.38% were plastic carry bags that were less than 120 microns. Plastic cutlery was only 1.78% and thermocol was very low at 0.35%. In the middle-income group, the plastic waste fraction in total waste was 7.07% out of which 77.21% was without SUP and 17.48% was plastic carry bags that were less than 120 microns. Plastic cutlery was also low at 1.76%, however, thermocol was quite significant at 3.55%. In the case of the high-income group, a similar trend was observed with plastic waste fraction in total waste was 7.72% out of which plastic waste without SUP was very high

at 81.91% and plastic carry bags of less than 120 microns stood at 15.93%. Plastic cutlery and thermocol were in similar fractions with 1.17% and 1.00% respectively.

Analysis of the overall trend in the household provides similar insight with the presence of SUP in overall plastic waste fraction restricted to only about 20% and the rest being non-SUP plastic. In SUPs, plastic carry bags dominate with a fraction of 16.85%, and the rest thermocol and plastic cutlery were in an almost equal fraction of 1.59% and 1.54% respectively. Thus, in the household, plastic carry bags were the only major fraction of SUP present in the plastics.

In the market, plastic other than SUP was slightly less than household and stood at 69.52% which was followed by plastic carry bags fraction which was 17.30%. However, plastic cutlery waste was dominant with 9.48%. Thermocol fraction was also 3.7% which was higher than observed in household plastic waste. .

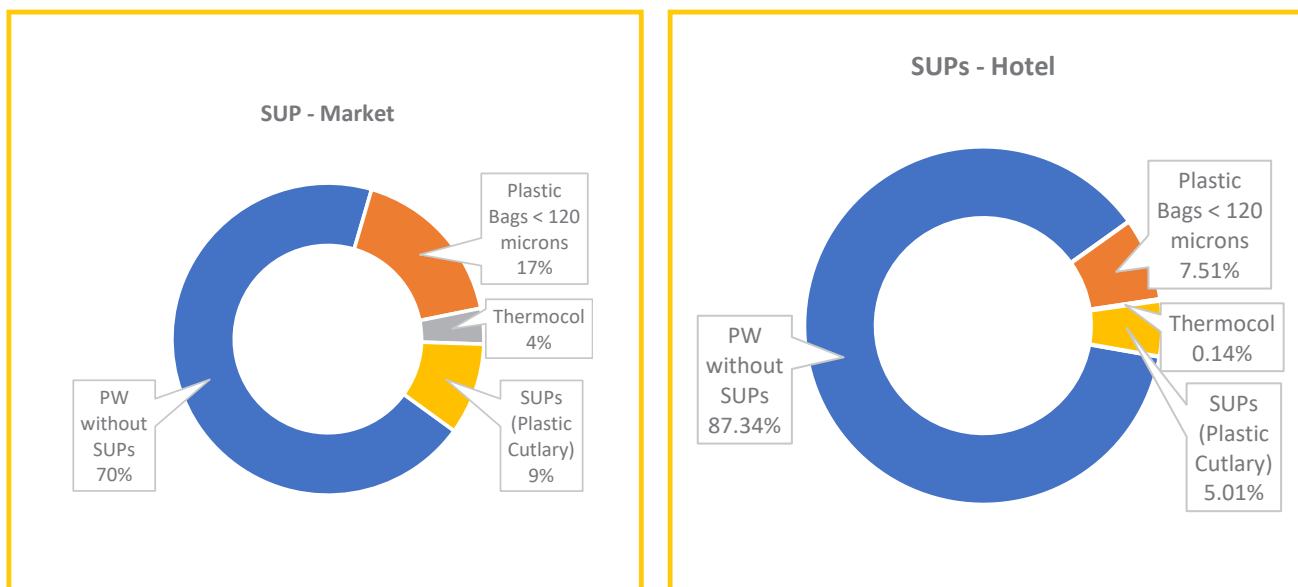
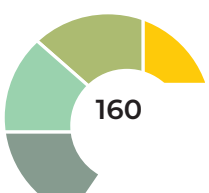


Figure 52: SUPs in Market and Hotels



In hotels, non-SUP plastic waste was highest at 87.34% followed by plastic carry bags of less than 120 microns which stood at 7.51%. The plastic carry bag fraction was less as compared to households or markets. Plastic cutlery was 5.01% with thermocol present only in a minuscule fraction of 0.14%. Thus, the presence of SUPs in the hotel is only 12-13%, and rest being none-SUP plastics.

In the landfill, plastic cutlery and thermocol were negligible with fractions of both stood at 0.22% and 0.73% respectively. Thin Plastic carry bags with a fraction of 28.23% dominates the SUPs at the landfill. It appears that due to the low cost of these thin plastic carry bags, collection of such waste is very less by waste pickers and waste collection agencies. However, the presence of SUPs at the landfill is about 30% with the rest being plastic waste other than SUPs.

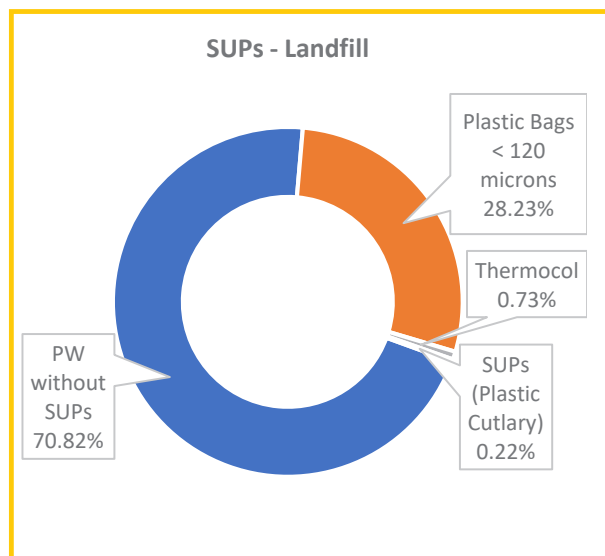


Figure 53: SUPs in Landfill

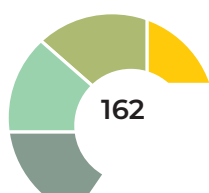
From the above analysis, it is evident that the fraction of SUPs in plastic waste is only about 20-30% of the total plastic waste fraction and it is largely consisting of thin plastic carry bags of thickness less than 120 microns which are probably not getting collected due to low value to the plastic waste collection agencies and rag pickers. Plastic cutlery is the second most dominant item though its fraction is quite less as compared to thin plastic carry bags. Thermocol waste is also present in small quantities except in the market where its fraction was highest at 3.7%.



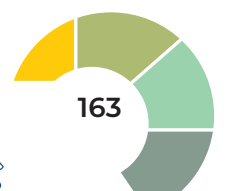
10.2 Quantification of SUPs (Prohibited and Permitted SUPs) across 15 cities of the state as per the given format (Annexure-2)

Table 22: Quantification of SUPs (Prohibited and Permitted SUPs)

Sample/Location	Ajmer	Alwar	Barmer	Bharatpur	Bhilwara	Bhiwadi	Ganganagar	Bikaner
	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW
SUP - Prohibited								
Households (Low Income)	0.31	0.19	0.18	0.24	0.16	0.33	0.07	0.16
Households (Middle Income)	0.23	0.19	0.16	0.29	0.15	0.30	0.29	0.41
Households (High Income)	0.27	0.26	0.23	0.22	0.17	0.09	0.12	0.23
Hotel	0.18	0.17	0.00	0.00	NA	0.22	0.02	0.24
Market	0.11	0.41	0.48	0.48	0.24	0.36	0.44	0.22
Landfill	0.22	0.43	0.58	0.65	0.17	0.34	0.44	0.27
SUP - Permitted								
Households (Low Income)	0.69	0.81	0.82	0.76	0.84	0.67	0.93	0.84
Households (Middle Income)	0.77	0.81	0.84	0.71	0.85	0.70	0.71	0.59
Households (High Income)	0.73	0.74	0.77	0.80	0.83	0.91	0.88	0.77
Hotel	0.82	0.83	1.00	1.00	NA	0.78	0.98	0.76
Market	0.89	0.59	0.52	0.52	0.76	0.64	0.56	0.78
Landfill	0.78	0.57	0.43	0.35	0.83	0.66	0.56	0.73
Total % of Plastic Waste in Solid Waste	9.38%	5.46%	5.99%	7.03%	10.49%	2.61%	6.21%	5.83%



Sample/Location	Jaipur	Jodhpur	Mt Abu	Neemrana	Pali	Udaipur	Kota	Total
	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW	Kg/Kg of PW
SUP - Prohibited								
Households (Low Income)	0.06	0.24	0.20	0.25	0.17	0.08	0.22	0.19
Households (Middle Income)	0.05	0.22	0.15	0.17	0.21	0.15	0.29	0.23
Households (High Income)	0.16	0.15	0.19	0.29	0.16	0.07	0.11	0.18
Hotel	0.01	0.24	0.08	0.09	0.13	0.05	0.21	0.12
Market	0.16	0.38	0.09	0.78	0.32	0.22	0.24	0.30
Landfill	0.31	0.38	0.63	0.19	0.23	0.32	0.42	0.28
SUP - Permitted								
Households (Low Income)	0.94	0.76	0.80	0.75	0.83	0.92	0.78	0.81
Households (Middle Income)	0.95	0.78	0.85	0.83	0.79	0.85	0.71	0.77
Households (High Income)	0.84	0.85	0.81	0.71	0.84	0.93	0.89	0.82
Hotel	0.99	0.76	0.93	0.91	0.87	0.95	0.79	0.88
Market	0.84	0.62	0.91	0.22	0.68	0.78	0.76	0.70
Landfill	0.69	0.63	0.37	0.81	0.77	0.68	0.58	0.72
Total % of Plastic Waste in Solid Waste	7.35%	5.23%	8.03%	1.93%	8.53%	7.63%	5.18%	6.65%



10.3 Impact of SUP Ban Policy

In the samples of households, waste has been analysed to assess the presence of SUPs after the ban enforcement. Three different samples of households were collected in the month of August from the same area from where these samples were collected earlier in May 2022. In the low-income group, the percentage of SUPs in total plastic was lower at 20.20% in August in compare to 31.4% in May 2022.

In the middle-income group, the percentage of SUPs in total plastic was slightly lower at 20.50% in August in compare to 22.6% in May 2022, and in the high-income group, it was 23.70% in August in compare to 27.0% in May 2022.

The below-mentioned images are examples of the alternative being used in the market and other usage points. It was a reflection of the ban on SUPs in the market and it is being encountered in the waste samples through the assessments. The quantity of SUPs was getting lower in the total plastics.

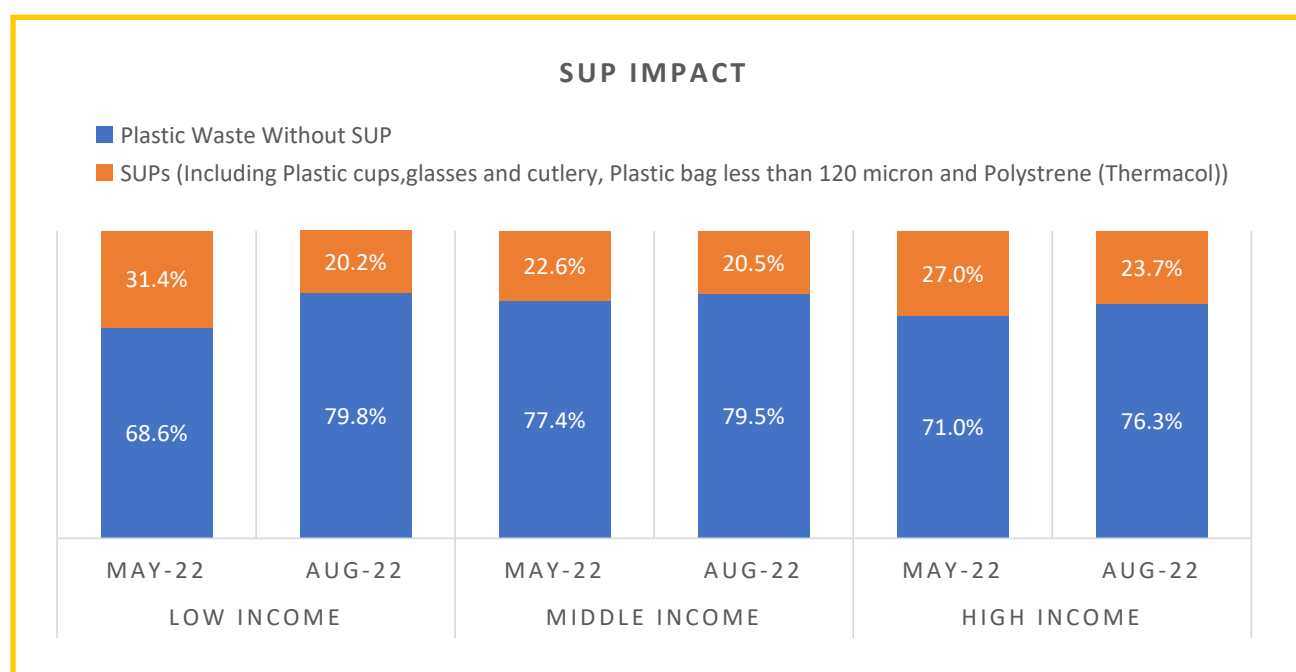


Figure 54 Impact of SUP Ban Policy



10.4 Survey of buyers to assess the use of SUPs

A Survey of 294 buyers was conducted in all 15 towns to know the behaviour of the buyers regarding buying habits with respect to SUPs and most respondents were informed that the maximum use of plastic carry bags is for dispensing vegetables/fruits/meats and groceries. Also, almost half of the respondents said that they get more than 4 plastic carry bags daily whereas only 59 respondents informed that they get 2-3 plastic carry bags. Surprisingly, only 4 respondents stated that they use only paper, cloth, or gunny bags. Surveys also revealed that dairy products and vegetables produce most of the plastic waste attributed to plastic carry bags.

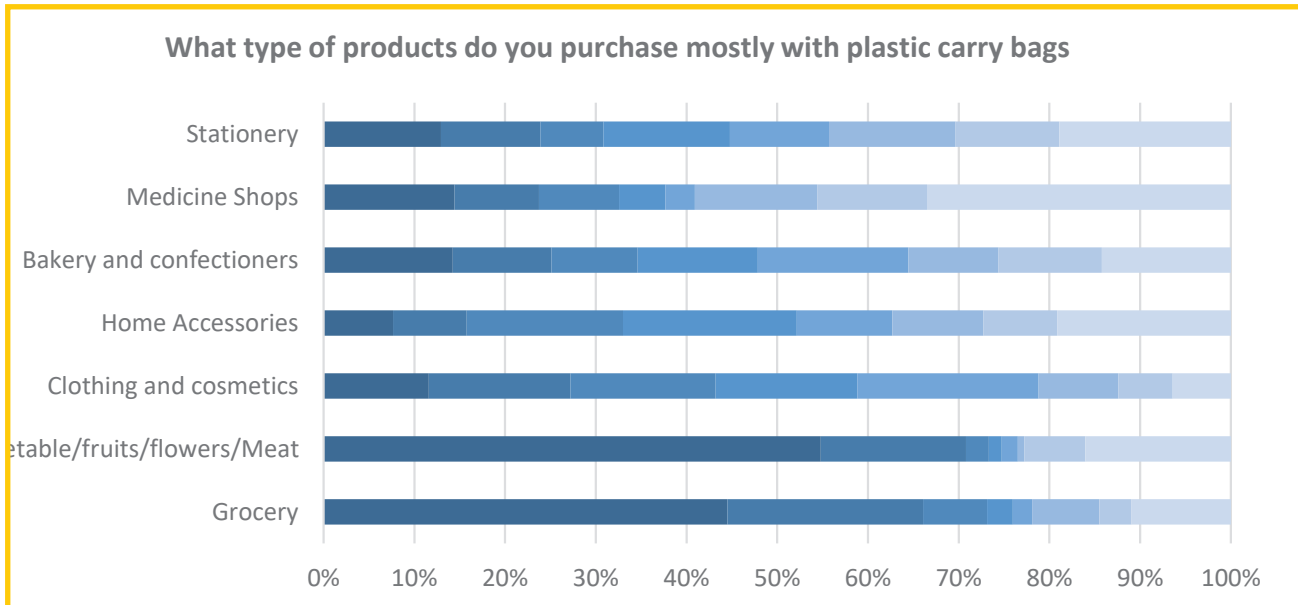


Figure 55: Products Purchased in the Plastic Carry Bag

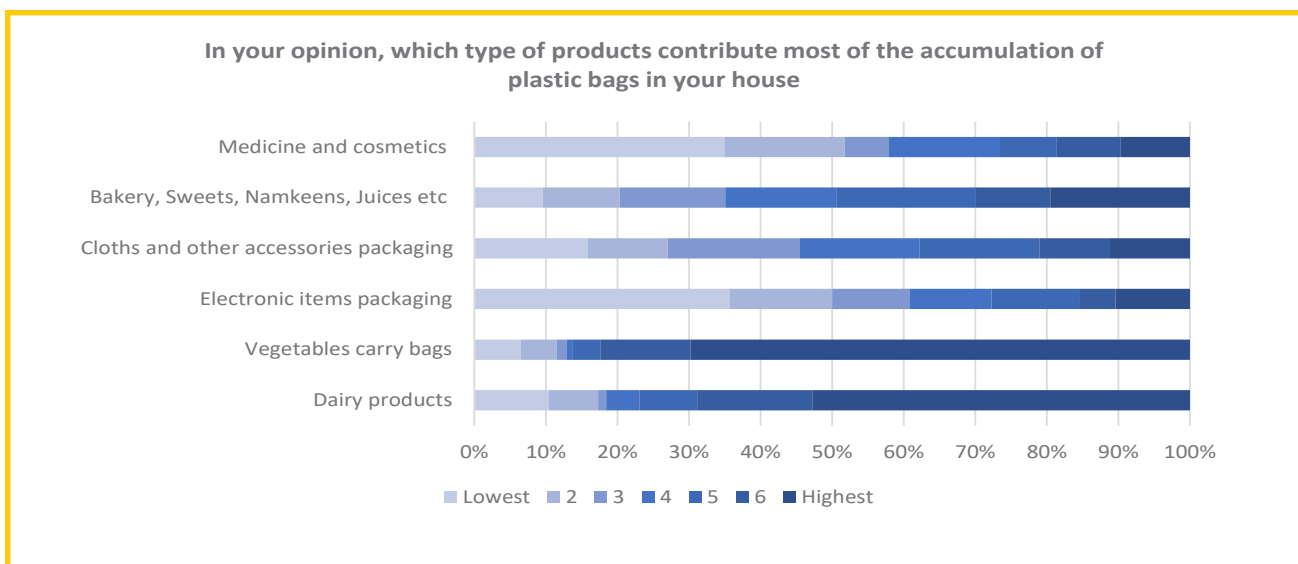
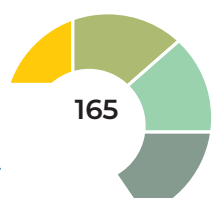


Figure 56: Products contribute most to the Accumulation of Plastic Bags at Home

During the survey, the respondents were also asked whether they were aware of the recently notified ban on single use plastic items and it was found that only 39% were aware about the ban and the rest has no idea about the same. Respondents were also asked about the environmentally



friendly alternatives to the SUP items and most of the people showed their awareness about the use of paper/cloth/compostable carry bags, however, only 16% of respondents stated that they use compostable/reusable fork/spoon. However, the use of wooden sticks for ice creams, flags, and earbuds was more common with 32% reporting using the same frequency.

When asked about the challenges they are facing due to the ban on plastic carry bags, 55% responded that they face no challenge. However, others enumerated various challenges like the need to pay for a carry bag (22.5%), carrying goods becomes difficult (18.5%), and the need to remember to take carry the bags (17.5%).

10.5 Survey of Sellers/Shopkeepers to assess the use of SUPs

Likewise, the survey of SUP sellers was also conducted across all 15 towns and total 314 sellers were surveyed. As per the findings of the survey, 23% of sellers responded that grocery was the highest-selling product for which a carry bag is used followed by clothing (16%), bakery and confectionary (13%), home accessories (10%), vegetable, fruits and flowers (8%) and stationery (7%). Regarding the behaviour of the buyers, 66% sellers informed that only less than 10 buyers refuse to accept plastic carry bags offered by them.

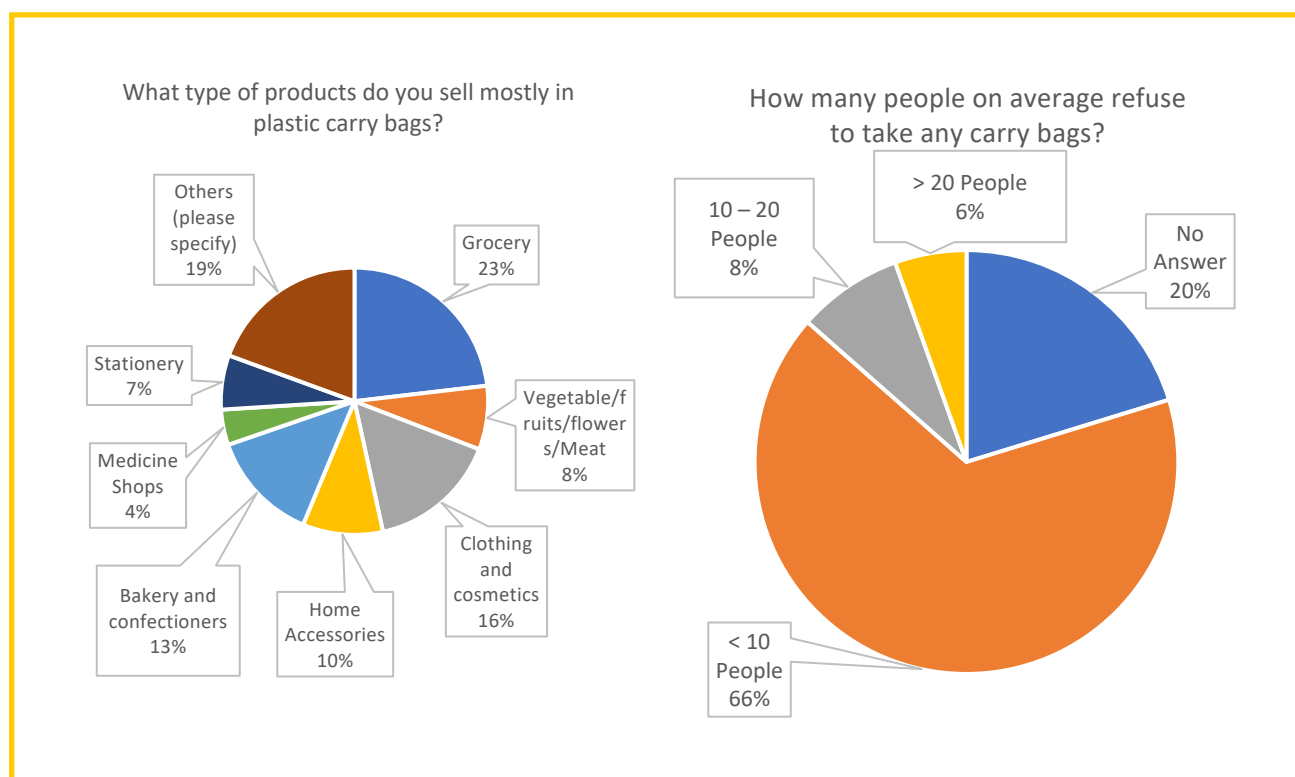


Figure 57: Product Sold in Plastic Carry Bags and Average Refusal to take Carry Bag

From the survey, it also appears that the use of paper bags is on increased as 52.5% of the sellers said that they either always use paper bags or use them frequently.



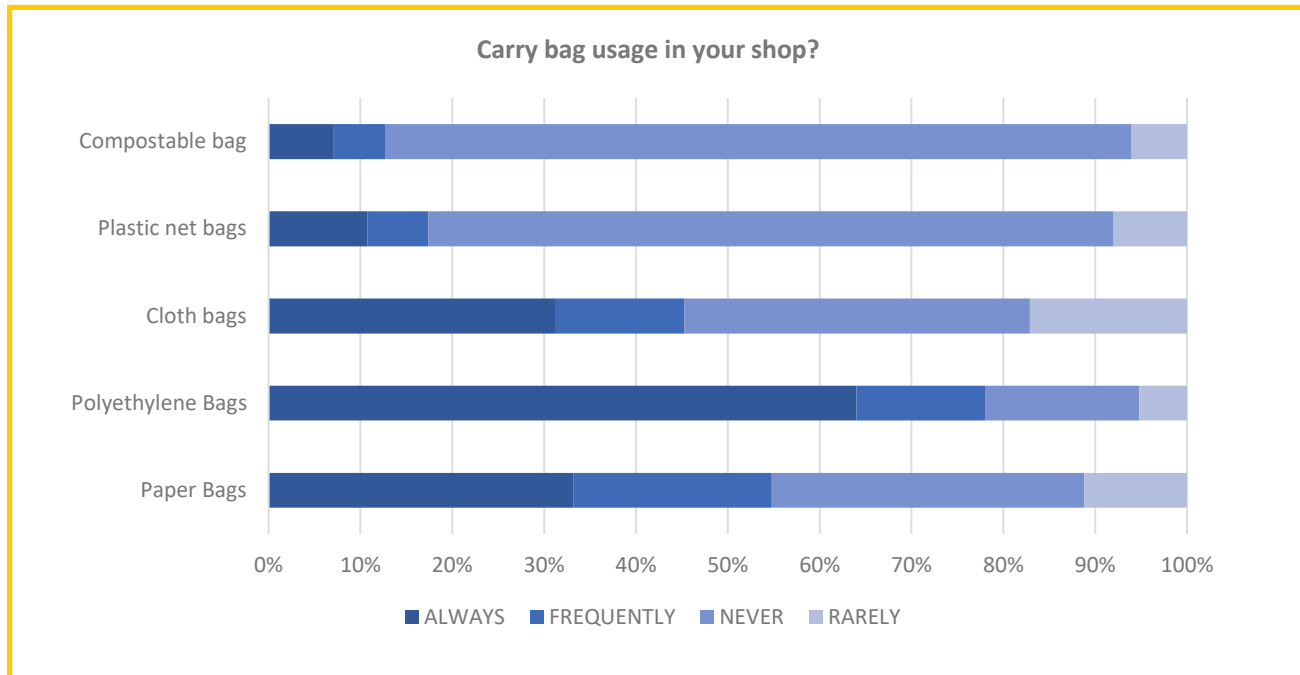


Figure 58: Usage of Carry Bags in Shop

As regarding sourcing of SUPs products at their establishments, 40% of sellers said that they get it through wholesalers and 36% said that they get it from the local market.

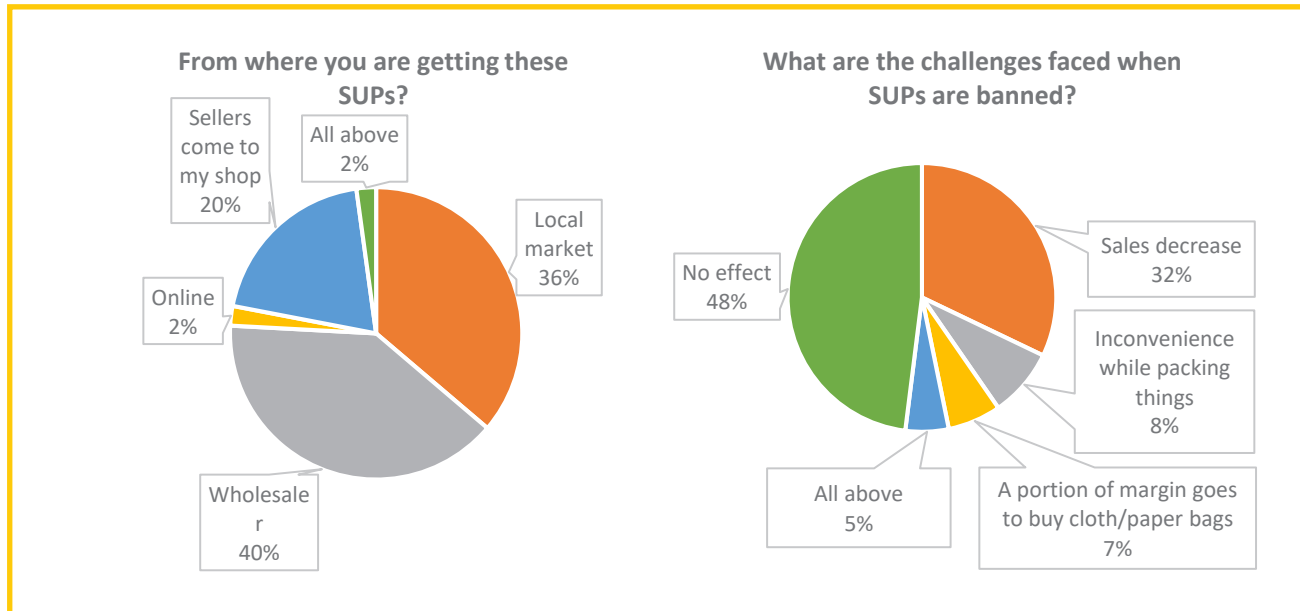


Figure 59: Sources of SUPs and Challenges faced SUPs are Banned

When the sellers were asked about the impact of the SUP ban on them, 48% responded that there is no impact while 32% were of the view that the sales have decreased and 8% responded that it is now inconvenient while packing the goods. About 7% also said that their margins have decreased as they now need to buy paper/cloth bags.

10.6. Survey of Manufacturing Units of Single Use Plastic Items

During the survey of the manufacturing units, the team has explored various sources like DICs,



Plastic Manufacturing Associations, and regional offices of the RSPCB to identify the manufacturer of Single Use Plastic items. A list of more than 400 units of manufacturer addresses provided by the DICs was verified by the ROs and team, where the survey team has also physically visited to more than 100 units in the industrial areas of different cities to verify these addresses and also explored the status of the remaining list with ROs in respective cities.

In addition to this, the team has randomly surveyed more than 200 units of plastic manufacturers but could not find any SUP manufacturing units. As per discussion with some manufacturers, they have quoted that these units are being closed due to the ban of SUPs as ROs and the department has issued notification for the same.

10.7. Alternatives Single Use Plastic Item

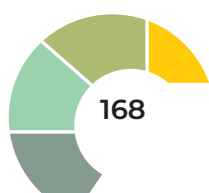
After the ban on Single Use Plastic items, manufacturing units to produce alternate items such as compostable carry bags, compostable packaging films, biodegradable tableware, and cutlery, etc. have been set up in the state of Rajasthan to provide alternatives to the banned SUP items. As per the information available from the Rajasthan State Pollution Control Board and other secondary sources, 15 units have been set up to manufacture such alternates out of which five are located in district Jaipur, six in district Alwar, three in district Ajmer and one in District Udaipur. A complete list of all the units engaged in manufacturing alternatives to SUPs is at Annexures.

It may be pointed out that out of 15 units that are engaged in manufacturing of SUP alternates, two are manufacturing tableware and cutlery from bagasse pulp, bamboo pulp, and softwood pulp obtained from renewable resources and the rest are manufacturing compostable/biodegradable plastic carry bags, packaging materials, paper-based products, films additives, etc. The raw material used for manufacturing of compostable/biodegradable plastic are Polylactic Acid (PLA) and Polybutylene Adipate, Terephthalate (PBAT), solid food starch, corn starch, etc. Combined capacity of all these units is about 15000 TPA. All these units are under the consent administration of the State Board and are operating with valid consent/acknowledgment with the RSPCB.

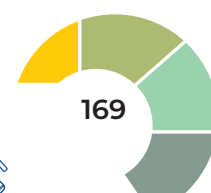
10.8 List of Manufacturers of Alternatives of Single Use Plastic Items

Table 23: List of Alternatives of SUP Manufacturers

S. No.	Name of unit	Address	City	Manufacturing Items	Production capacity	Consent status CTE & CTO
1	Grabeco Packaging LLP	E-203, RIICO Industrial Area, Neemrana, Alwar	Alwar	Biodegradable Tableware and Industrial Packaging	4000	30.11.2029
2	Eco Healthware LLP	Khasra No. 12/1/1, Village Dhani Purohitan, Tehsil- Kishangarh, Distt.-Ajmer	Ajmer	Bio degradable Disposables items	912.5	31.12.2023



3	M/S Green Maneuver Industries LLP.	Plot No F-972 A, Road No 14P, Near Bharat Gas Godam, VKIA Jaipur Tehsil:Jaipur (VKIA)	Jaipur	Compostable Carry Bags, Compostable Cutlery and tableware, Compostable Garbage Bags, Medical Waste Bags, Compostable Nursery Bags And Compostable Packaging Material	1140	31.12.2031
4	Sava Eco Packaging LLP	F-24, EPIP RIICO Industrial Area, Neemrana, Alwar	Alwar	Biodegradable Tableware	1400	31.07.2030
5	Easy Flux Polymers Pvt. Ltd.	22, Main Road, Village Ashwara, Near Mittha Neem, Bambora Kurabad Highway, Tehsil Vallabh Nagar, Distt. Udaipur- 313003	Udaipur	Bio compostable Packaging Films, Biodegradable Garbage B Flexible Container, Nursery Flexible Containers, Packaging Material, Biodegradable garbage Bags, Bio Medical Waste Collection Bags, & Bio Degradable Carry Bags	730	Ackn
6	M/S Mahaveer Green World	G-125, 125A, RIICO Industrial Area, Kekri Tehsil Kekri Distt.- Ajmer (Rajasthan)	Ajmer	Bio degradable packing material	73	Ackn
7	M/S Shakun Plastic Pvt. Ltd.	B-111 A-2 Road No. 9, VKIA, Jaipur	Jaipur	Compostable Carry Bags	365	31 07.2031
8	M/S Green Field Agro Tech	H-1036,3rd Phase, Sitapura Industrial Area Jaipur , Jaipur Tehsil:Sanganer District:Jaipur	Jaipur	Compostable Bags/Rolls/ Films	432	31.12.2031
9	M/S Aggarwal Biotech Pvt. Ltd.	F-266 A, Chopanki Industrial Area, Bhiwadi, Alwar (Raj.)	Alwar	Biodegradable compounds, Compostable films & Rolls	3600	31.10.2030
10	M/S SKY Green Biotech Pvt. Ltd.	G-576, RIICO ind. Area, Sitapura, Jaipur	Jaipur	Biodegradable and Compostable Bags & Packaging Material unit including Industrial Liner	720	Ackn
11	S. K. Thermo-formers	KHASRA NO- 1075, HARSOLI ROAD, KHAIIRTHAL	Alwar	Biodegradable Disposable products (Glass bowls & plates)	850	Ackn
12	Pioneer Industries	Mungaska, Alwar	Alwar	PAPER CUP	350	Ackn
13	Suyog Nature Care	J-508-C, SARNA DOONGER IND. AREA, JAIPUR JAIPUR	Jaipur	PRINTED PAPER BAGS	150	Ackn







CHAPTER

11

Survey and Assessment of Littering Hot-Spots in the Identified Towns





CHAPTER
11

Survey and Assessment of Littering Hot Spots in the Identified Towns

During the study, a detailed survey and assessment of hot spots where waste is disposed of indiscriminately was carried out in all the identified 15 cities, and a total of 75 such hotspots were assessed in all the cities.

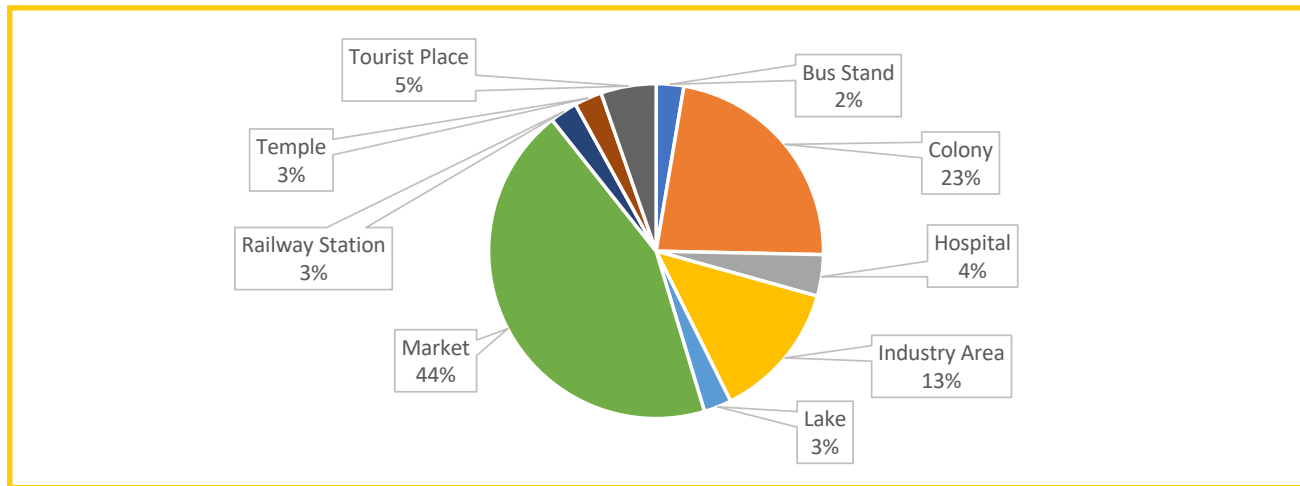


Figure 60 Percentage of Hotspot Areas

As far as different areas in which the hotspots were located, markets had a contribution of 44% whereas colonies contributed to 23% followed by industrial areas which contributed to 13%. Tourist areas were also had a good number of hot spots with 5%. Other areas in which hotspots were located are temples (3%), hospitals (4%), Railway Stations (3%), and lakes (3%).

The kind of waste which is dumped at the hotspots was also analyzed and it came out that dry waste from market places (21%), mixed household waste (20%), waste from party functions (13%), and wet waste from sabji mandi (12%) are the major waste streams found during the survey.

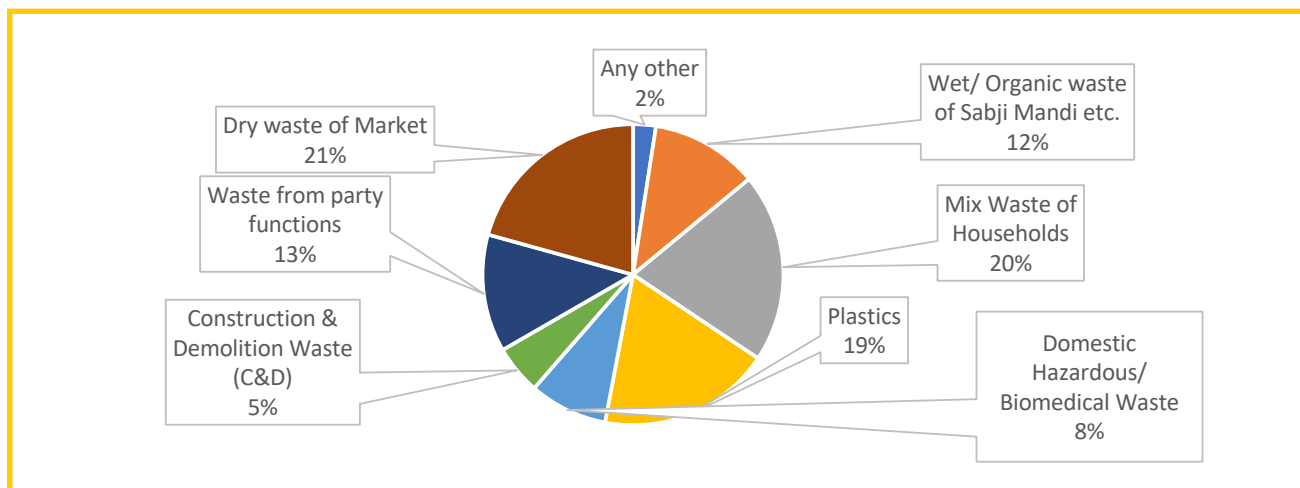
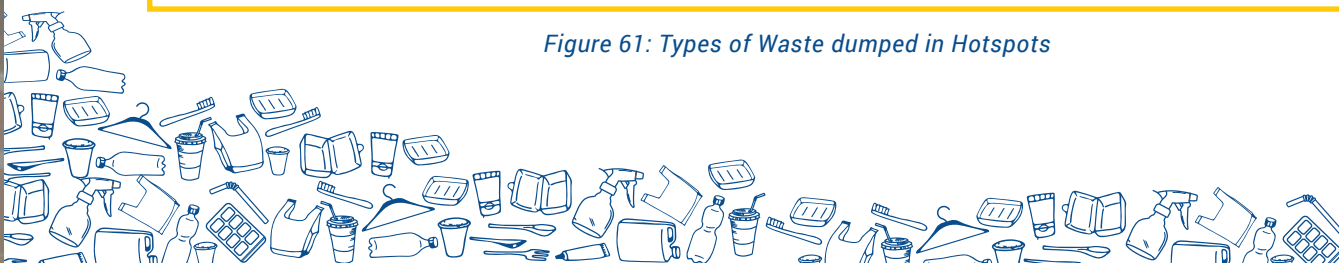


Figure 61: Types of Waste dumped in Hotspots



Institutes that are dumping waste at these hotspots were also identified and it was noticed that citizens from households (23%), shops (20%), hotels/restaurants (15%), and slums/Jhopadi (12%) are the major contributors to the waste littered at the hotspots.

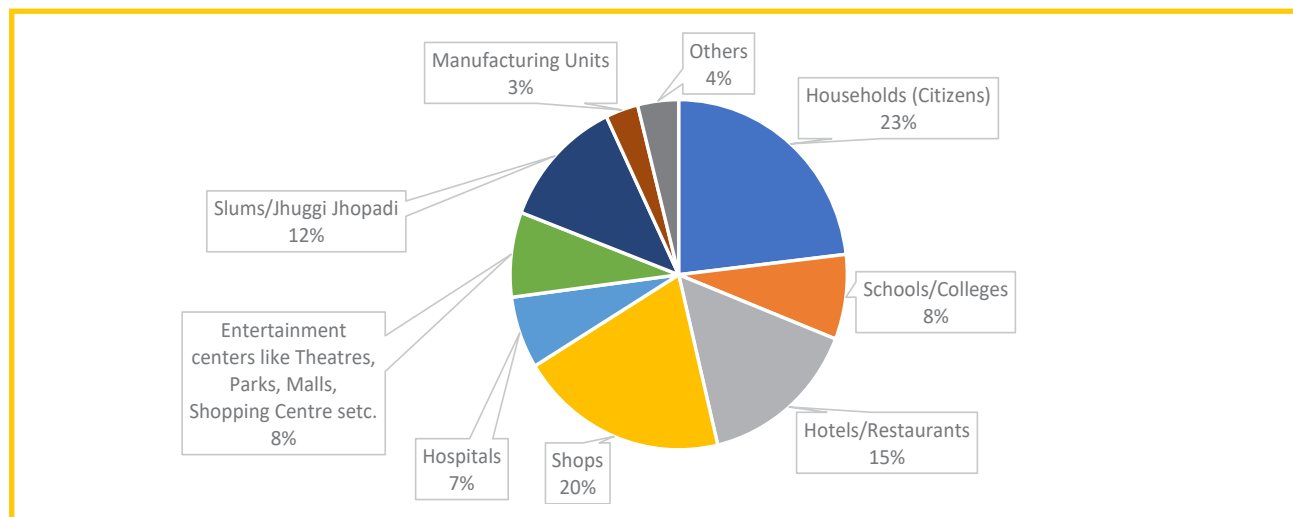


Figure 62: Institutions dumping Wastes in Hotspots

Quantities of the waste littered at these places were assessed and it was found that at most of the places (77%), the waste quantity varied from 0.5 MT to 1 MT whereas in 14% of places it varies from 1 MT to 2 MT and at 9% places it was more than 5 MT. Thus, in the majority of the hot spots, the quantity of waste littered was low.

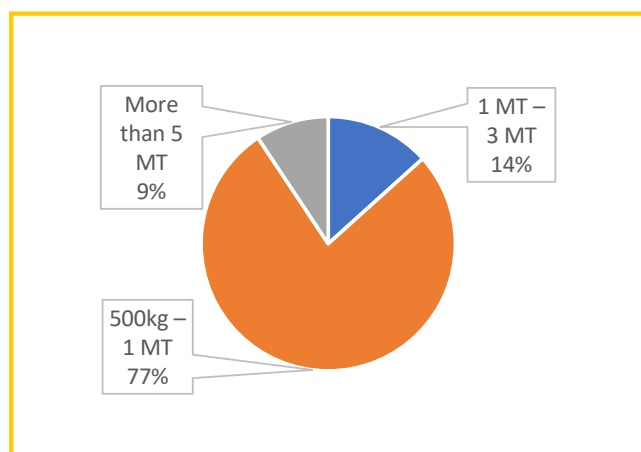


Figure 63: Quantity of Waste dumped in Hotspots

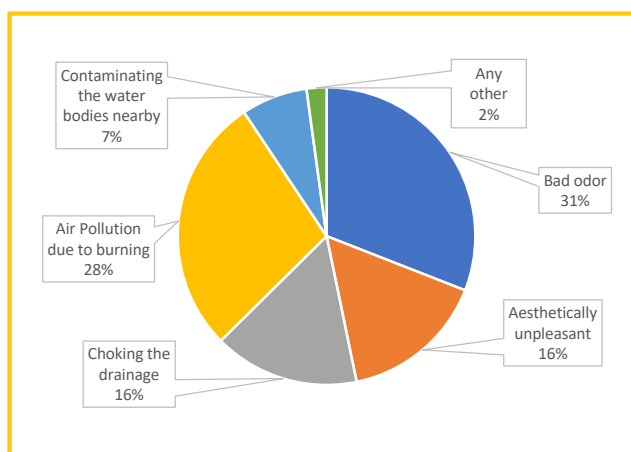


Figure 64 Effect of Littering Hotspots in nearby community

The impact on the nearby human and physical environment was also assessed during the survey and it was observed that bad odor (31%) followed by air pollution due to open burning of waste (28%) were the major impact on the nearby population. Choking of drainages (16%) and aesthetical unpleasantness (16%) are other important adverse impacts on society.

As regarding the action taken by the local authorities to clean the hotspots and frequency of clean, it was reported that only 16% of spots are cleaned daily whereas 23% are cleaned on weekly basis and 8% are cleaned on monthly basis. However, 39% hotspots are never cleaned due to which adverse impacts on the health and well-being of the people living in the nearby area cannot be ruled out.

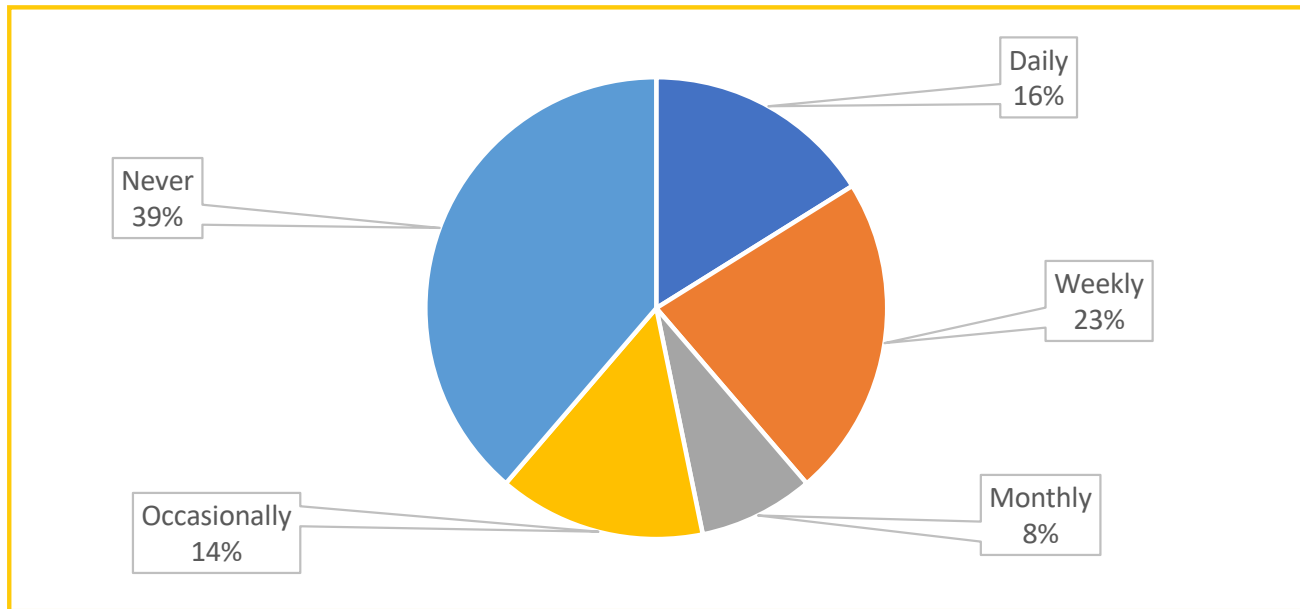
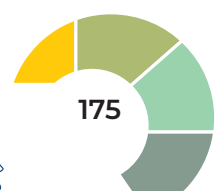


Figure 65: Frequency of Cleaning of Hotspots

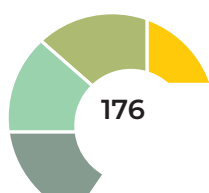
11.1 List of Littering Hotspots with Geotag location

Table 24: List of Littering Hotspots with geotag location

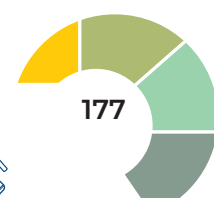
S. No.	City Name	Address	Area	Latitude	Longitude	Quantity of Waste at Littering Hotspots
1	Ajmer	Mahendra Provijan	Market	26.441770	74.668748	500kg – 1 MT
2	Ajmer	Bihari Ganj	Market	26.448455	74.659532	500kg – 1 MT
3	Ajmer	Nath Mohala	Colony	26.457074	74.635305	More than 5 MT
4	Ajmer	Dhanmal Koloni	Market	26.468527	74.642275	500kg – 1 MT
5	Ajmer	Srinagar Road	Market	26.448455	74.659532	500kg – 1 MT
6	Alwar	Matsya Industrial Area	Industry Area	27.514744	76.667549	500kg – 1 MT
7	Alwar	Rundh Dhooninath	Industry Area	27.515218	76.698842	1 MT – 3 MT
8	Alwar	Manu Marg	Market	27.561098	76.604190	500kg – 1 MT
9	Alwar	Kabir Colony	Colony	27.561230	76.601432	More than 5 MT
10	Alwar	Rathkhana Alwar	Bus Stand	27.561835	76.601370	1 MT – 3 MT
11	Alwar	Khandelwal Namkeen	Market	27.563488	76.601258	500kg – 1 MT
12	Alwar	Gurjar Wali Gali	Colony	27.563800	76.604551	500kg – 1 MT
13	Alwar	Kabir Colony	Market	27.564205	76.598925	500kg – 1 MT
14	Barmer	Kalyanpura	Market	25.740562	71.392953	500kg – 1 MT
15	Barmer	Sadar Bazar	Market	25.743822	71.389229	500kg – 1 MT
16	Barmer	Mahaveer Nagar Phase 2,	Market	25.752533	71.413868	500kg – 1 MT



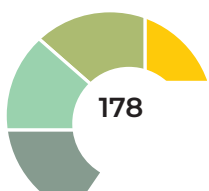
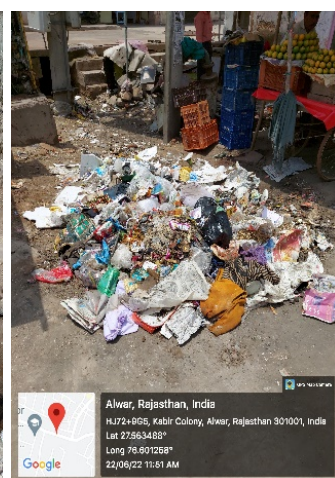
S. No.	City Name	Address	Area	Latitude	Longitude	Quantity of Waste at Littering Hotspots
17	Bharatpur	Ganga Mandir Marg	Temple	27.216332	77.495791	500kg – 1 MT
18	Bharatpur	Chauburja Road	Colony	27.216820	77.498716	500kg – 1 MT
19	Bharatpur	Gopalgarh	Lake	27.216888	77.497359	500kg – 1 MT
20	Bharatpur	Choudariya Bajar, Near Fort	Market	27.216891	77.497524	500kg – 1 MT
21	Bharatpur	Near To Fort	Tourist Place	27.217141	77.498022	1 MT – 3 MT
22	Bharatpur	Spm Nagar	Market	27.231249	77.480673	500kg – 1 MT
23	Bhilwara	Tilak Nagar	Hospital	25.342310	74.658132	500kg – 1 MT
24	Bhilwara	Gadri Kheda	Temple	25.344718	74.626767	500kg – 1 MT
25	Bhilwara	Gandhi Nagar	Market	25.345018	74.625213	500kg – 1 MT
26	Bhilwara	Basant Vihar Colony	Colony	25.348324	74.629347	More than 5 MT
27	Bhilwara	Vidhut Nagar/ Sanjay Colony	Colony	25.352073	74.643237	1 MT – 3 MT
28	Bhilwara	Puliya Mandi	Market	25.353617	74.629247	500kg – 1 MT
29	Bhilwara	Rk Conoly	Market	25.360115	74.638905	500kg – 1 MT
30	Bhiwadi	Santhlka	Market	28.194591	76.855067	500kg – 1 MT
31	Bhiwadi	Rajak Kirana Store	Industry Area	28.194885	76.872676	1 MT – 3 MT
32	Bhiwadi	Riico Industrial Area	Industry Area	28.195297	76.871590	More than 5 MT
33	Bhiwadi	Sardar Patel Marg	Market	28.195485	76.854619	500kg – 1 MT
34	Bhiwadi	Shri Mahindra Foods	Industry Area	28.196562	76.868772	500kg – 1 MT
35	Bhiwadi	Riico Industrial Area, Harchandpur	Industry Area	28.200536	76.863630	500kg – 1 MT
36	Bikaner	Rani Bazar Rd	Market	28.007141	73.314794	500kg – 1 MT
37	Bikaner	Sawai Complex	Market	28.009222	73.319323	500kg – 1 MT
38	Bikaner	Transport St, Bays Colony	Colony	28.011336	73.315856	500kg – 1 MT
39	Bikaner	Junagarh Fort Rd	Tourist Place	28.020234	73.316650	500kg – 1 MT
40	Ganganagar	Jain Store , Rani Bazar	Market	28.009236	73.319336	More than 5 MT
41	Ganganagar	Purani Aabadi Rd	Colony	29.919696	73.855550	500kg – 1 MT
42	Ganganagar	Kauda Chowk	Market	29.924885	73.864261	500kg – 1 MT
43	Ganganagar	Roadways Bus Stand	Bus Stand	29.924900	73.864148	500kg – 1 MT
44	Ganganagar	Karanpur Market	Market	29.933120	73.858280	1 MT – 3 MT
45	Jaipur	Kachhi Basti , Jagatpura	Colony	26.832157	75.821836	500kg – 1 MT
46	Jaipur	Jagatpura	Colony	26.832648	75.821739	1 MT – 3 MT
47	Jaipur	Nandpuri Colony	Colony	26.834408	75.824396	500kg – 1 MT



S. No.	City Name	Address	Area	Latitude	Longitude	Quantity of Waste at Littering Hotspots
48	Jaipur	C2 Plaza	Market	26.857329	75.824086	500kg – 1 MT
49	Jaipur	Ghat Ki Guni	Colony	26.867367	75.823675	500kg – 1 MT
50	Jaipur	Vidhayak Nagar	Market	26.889134	75.799808	500kg – 1 MT
51	Jaipur	Mayur Tower, Nehru Bazar Rd	Hospital	26.917172	75.819622	500kg – 1 MT
52	Jaipur	Shop No 3 East, Kamla Nehru Market	Tourist Place	26.917322	75.816933	500kg – 1 MT
53	Jaipur	Nehru Bazar	Market	26.917202	75.819510	500kg – 1 MT
54	Jodhpur	Pratap Nagar Jhodpur	Industry Area	26.232717	73.005628	500kg – 1 MT
55	Jodhpur	Ratanara, Jodhpur	Colony	26.265344	73.022843	500kg – 1 MT
56	Jodhpur	Shastri Circle Jhodpur	Market	26.294632	73.010331	500kg – 1 MT
57	Jodhpur	Miyo Ki Manjil	Colony	26.298306	73.028553	More than 5 MT
58	Kota	New Railway Colony	Railway Station	25.212421	75.880147	500kg – 1 MT
59	Kota	Hajira Dargah Rd	Market	25.181007	75.841016	500kg – 1 MT
60	Kota	Mala Rd	Market	25.212387	75.880352	500kg – 1 MT
61	Mount Abu	Ashok Vatika, Machgoan	Market	24.586796	72.706011	500kg – 1 MT
62	Mount Abu	Pilgrim Rd	Tourist Place	24.598667	72.724627	1 MT – 3 MT
63	Mount Abu	Gora Chapara	Market	24.600300	72.726056	500kg – 1 MT
64	Neemrana	5-8 Near Neemrana	Industry Area	27.974185	76.383581	1 MT – 3 MT
65	Neemrana	Madhosinghpura	Industry Area	27.975893	76.383082	500kg – 1 MT
66	Neemrana	Neemrana Riico Export Promotion Industrial	Industry Area	27.979358	76.399921	500kg – 1 MT
67	Neemrana	Delhi - Jaipur Expy	Market	27.976936	76.397924	500kg – 1 MT
68	Neemrana	Banzara Basti	Colony	27.991245	76.393467	500kg – 1 MT
69	Neemrana	Banzara Basti	Colony	27.992590	76.392754	500kg – 1 MT
70	Neemrana	Plot No. 27 Neemrana	Hospital	27.979951	76.400841	500kg – 1 MT
71	Pali	Naya Gaon, Pali	Lake	25.788026	73.329518	500kg – 1 MT
72	Pali	Bhatwara	Railway Station	25.790804	73.329189	500kg – 1 MT
73	Udaipur	Balicha Dumping Road	Market	24.520637	73.724717	More than 5 MT
74	Udaipur	Ambamata Temple Rd	Colony	24.585140	73.677880	1 MT – 3 MT
75	Udaipur	Sundarwas	Market	24.585143	73.724432	500kg – 1 MT



Some images of the littering hotspots are shown below





CHAPTER

12

Survey of Manufacturing Factories/Industries to know the waste generation and management





Survey of Manufacturing Factories/Industries to know the waste generation and management

A survey of manufacturing industries that generate plastic waste was also carried out to know the type of waste generated, its quantity, and how the same is being disposed of. A total of 42 industries were surveyed in the 15 identified cities.

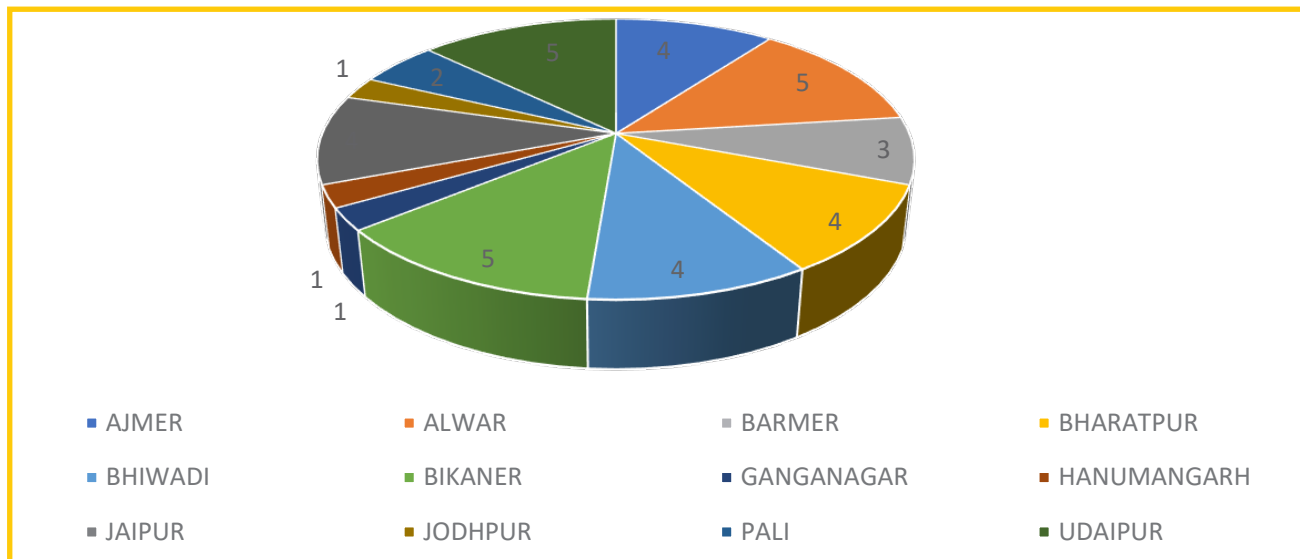


Figure 66: Number of Manufacturing Units under Survey

The number of manufacturing units surveyed in each city is shown in Fig 74. In Udaipur, Bhiwadi and Alwar 5 industries were surveyed in each city whereas, in Hanumangarh and Ganganagar, one unit each was surveyed.

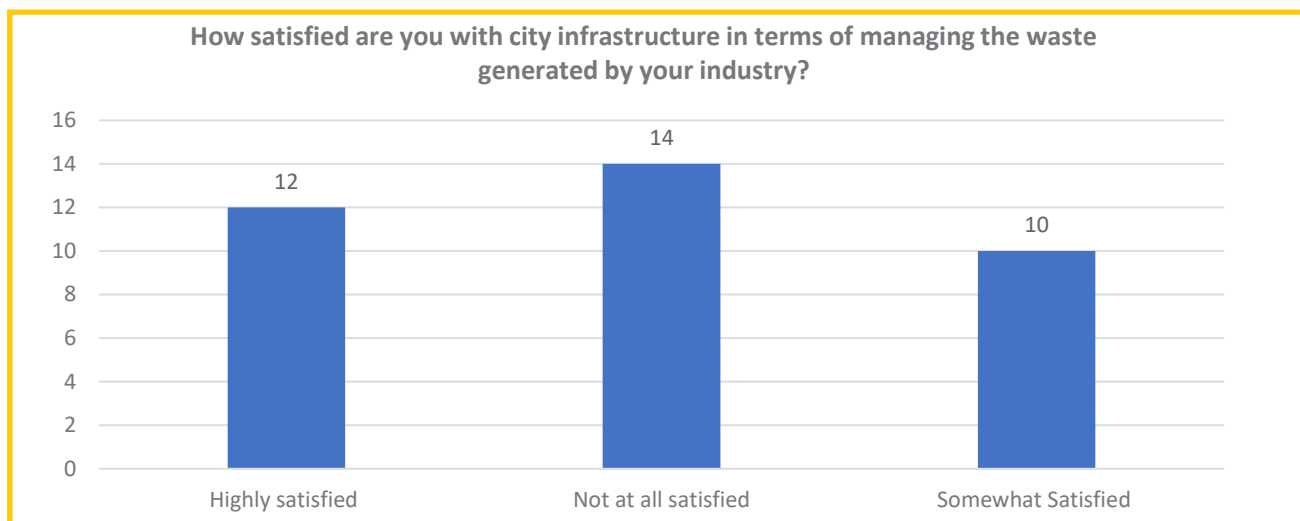


Figure 67: Satisfaction level with City Infrastructure on Waste Management



The units were asked how satisfied they were with the city infrastructure in terms of managing the waste generated by their industry. Fourteen industries responded that they are not at all satisfied whereas 12 units said that they are highly satisfied. Ten units said that they were somewhat satisfied with the waste management infrastructure in their respective cities.

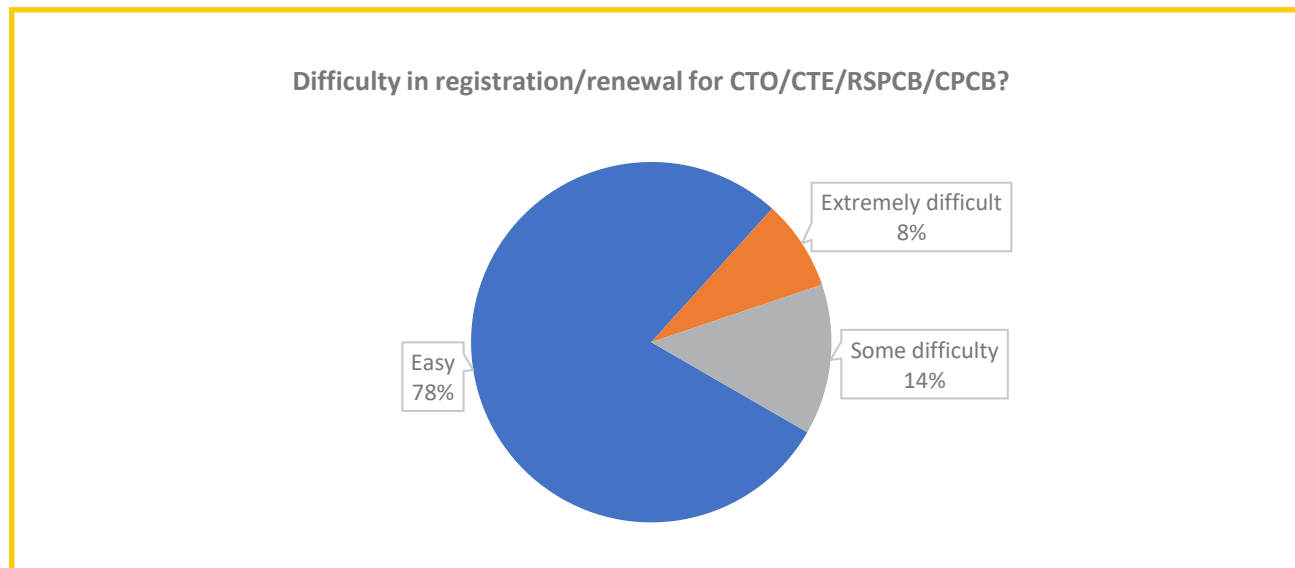


Figure 68 Difficulty in Registration of CTE/ CTO/ RSPCB/ CPCB

The industries were also asked about the ease of carrying out registrations/obtaining consent from the State Board/CPCB and 78% overwhelmingly stated they found it easy whereas 14% said that it is somewhat difficult and 8% felt that it is extremely difficult.

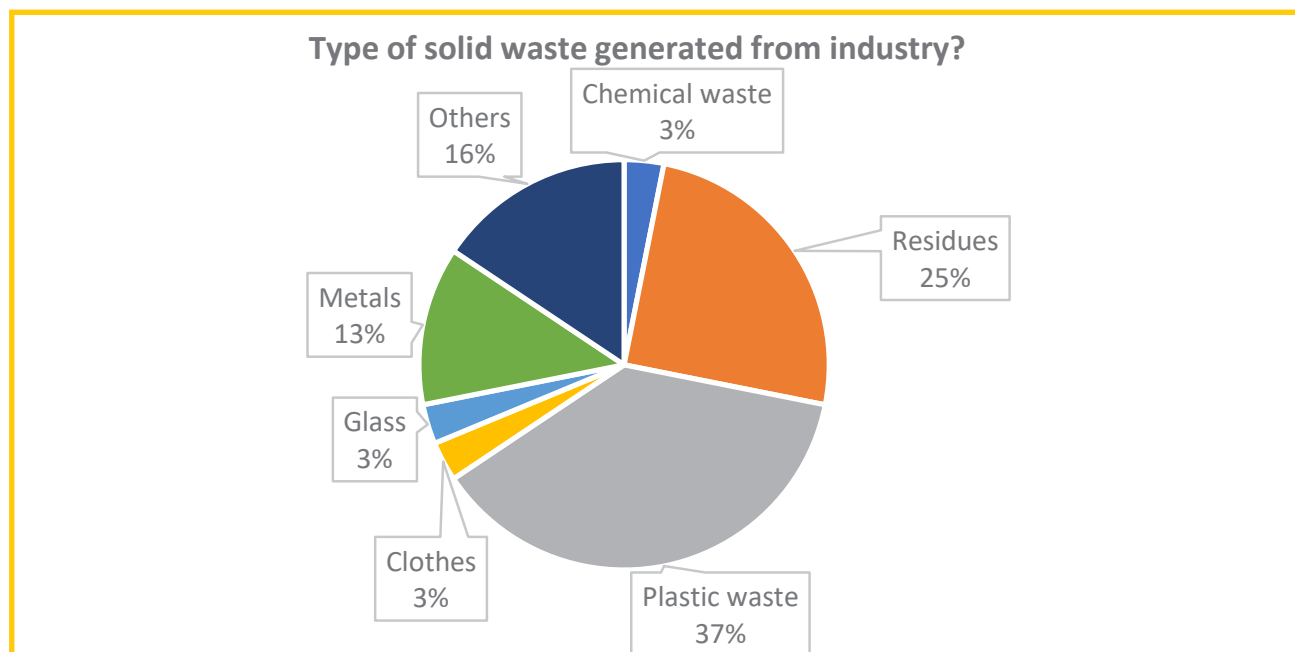
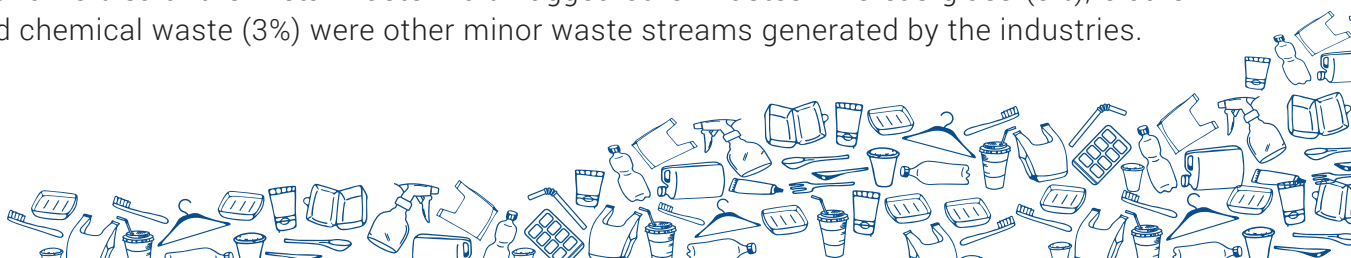


Figure 69: Type of Solid Wastes Generated by Industries

As regarding the type of waste generated by their units, 37% responded that plastic waste is the mainstream of waste generation whereas 25% indicated waste residues as the main waste stream and 13% said it is metal waste. 16% flagged other wastes whereas glass (3%), cloths (3%), and chemical waste (3%) were other minor waste streams generated by the industries.



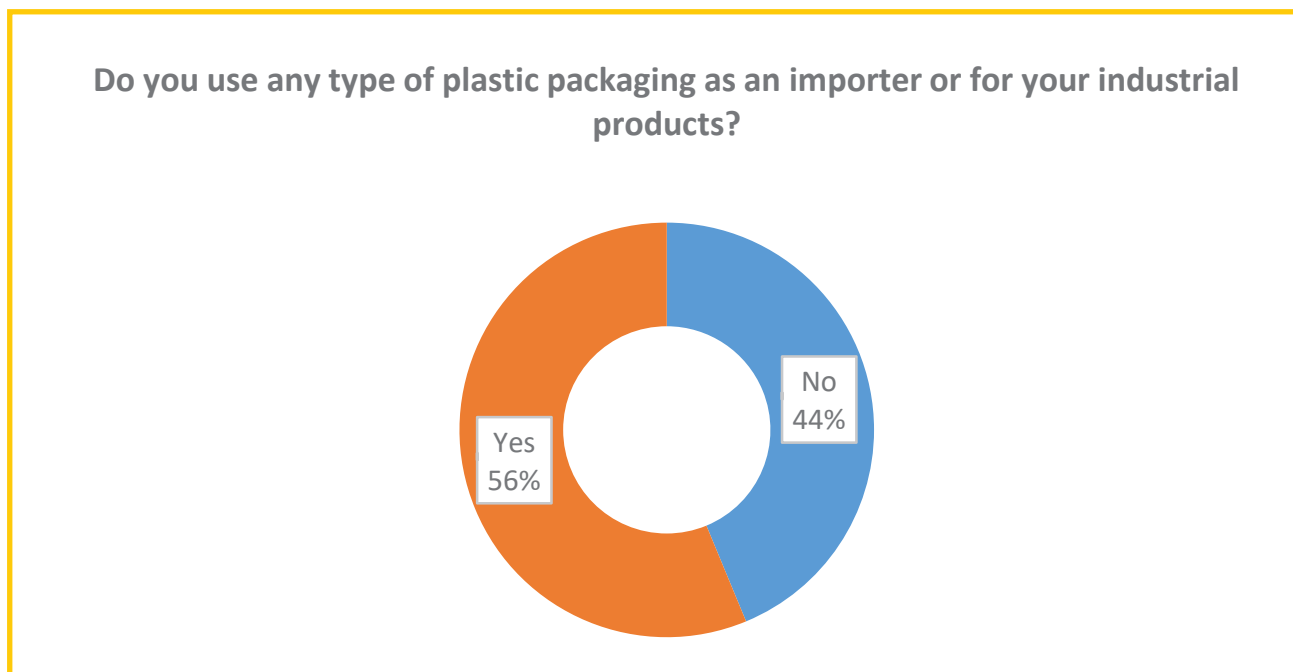


Figure 70: Types of Plastic Packaging as an Importer

When the industries were asked as to whether they use any type of plastic packaging as an importer or for any of their industrial products, 56% said they do where as 44% said they do not use any packaging.

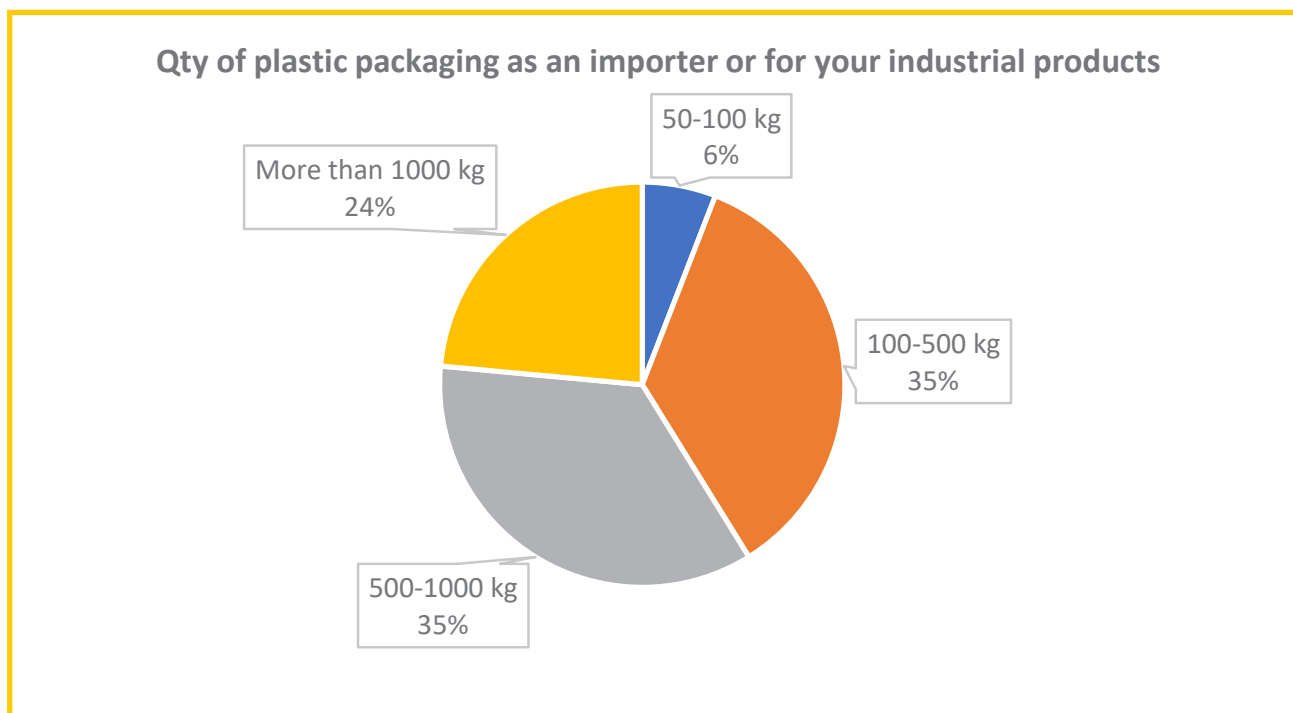


Figure 71: Quantity of Plastic Packaging as an Importer

The industries were also enquired about the quantity of plastic packaging as an importer or for their industrial use and 35% stated that the quantity is varying from 100-500 Kg/month whereas another 35% said that it is in between 500-1000 Kg/month. In the case of 24%, it was more than 1000 Kg/month.



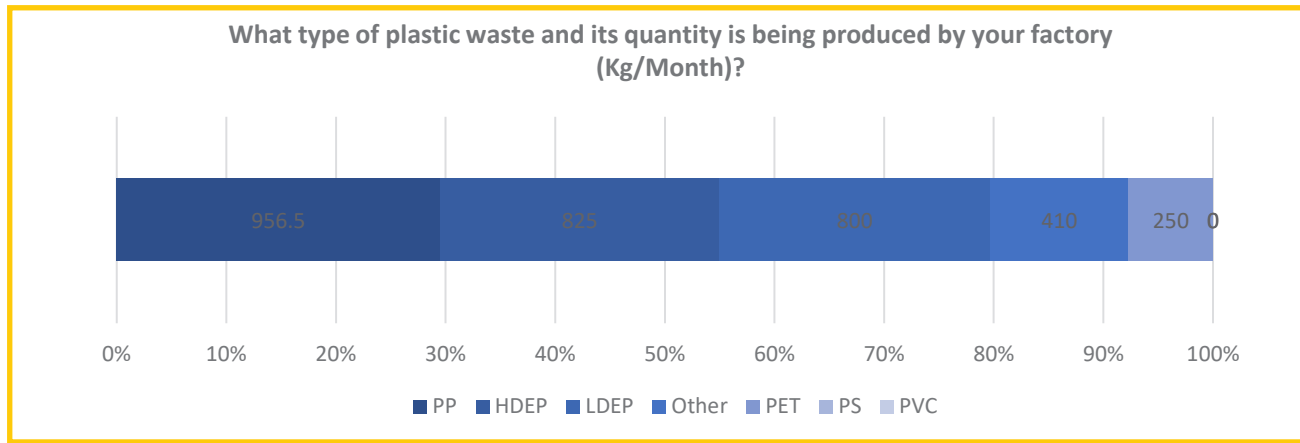


Figure 72: Type of Plastic Waste and Quantity Produced at Industries

Industries were also enquired about the type of plastic waste it generates and it was reported that PP (around 30%) was the major waste category followed by HDPE (around 25%), LDPE (around 25%), others (around 13%) and PET (around 8%).

On the question as to how the plastic waste generated by them is disposed of, 38% told that it is recycled in their recycling unit whereas 33% responded that it is sent to other recyclers. 24% of industrial units said that their waste is sent to aggregators and 5% responded that it is used in the municipal waste management system.

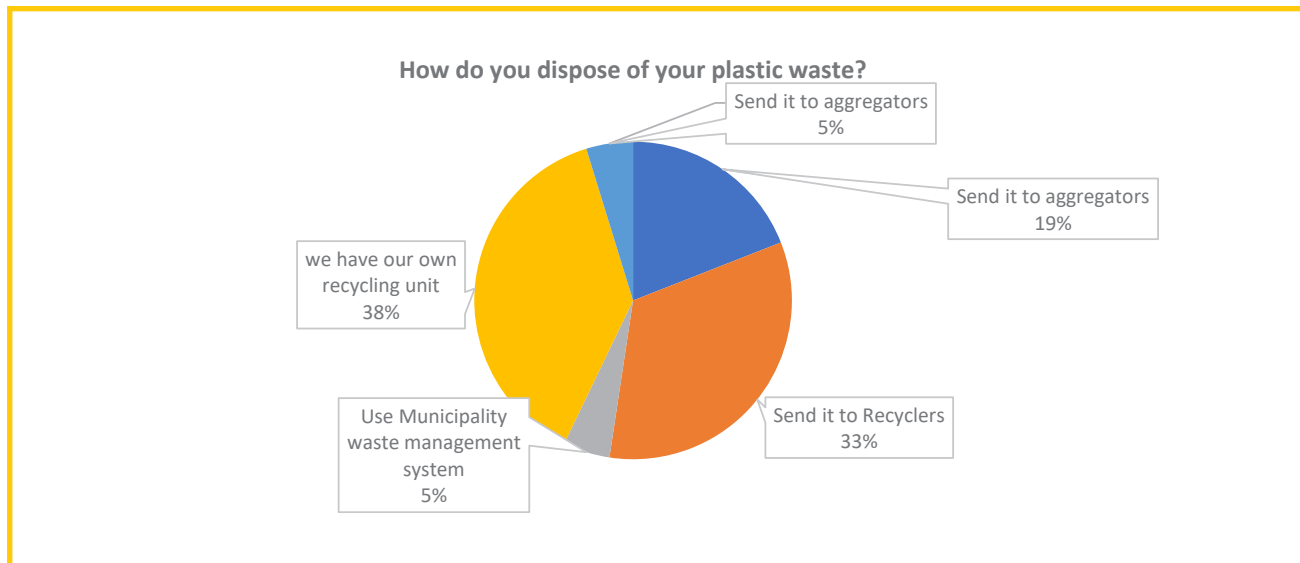


Figure 73: Method of Disposal of Plastic Waste



CHAPTER

13

Knowledge, Behaviour, and Practice Survey of Citizens





CHAPTER

13

Knowledge, Behaviour, and Practice Survey of Citizens

A survey of the citizens was conducted across all 15 cities to gauge the understanding of citizens towards issues related to waste management and to study their behavioral aspects. A total 767 citizens from various socioeconomic groups and strata of the society were interviewed and the data obtained were analysed.

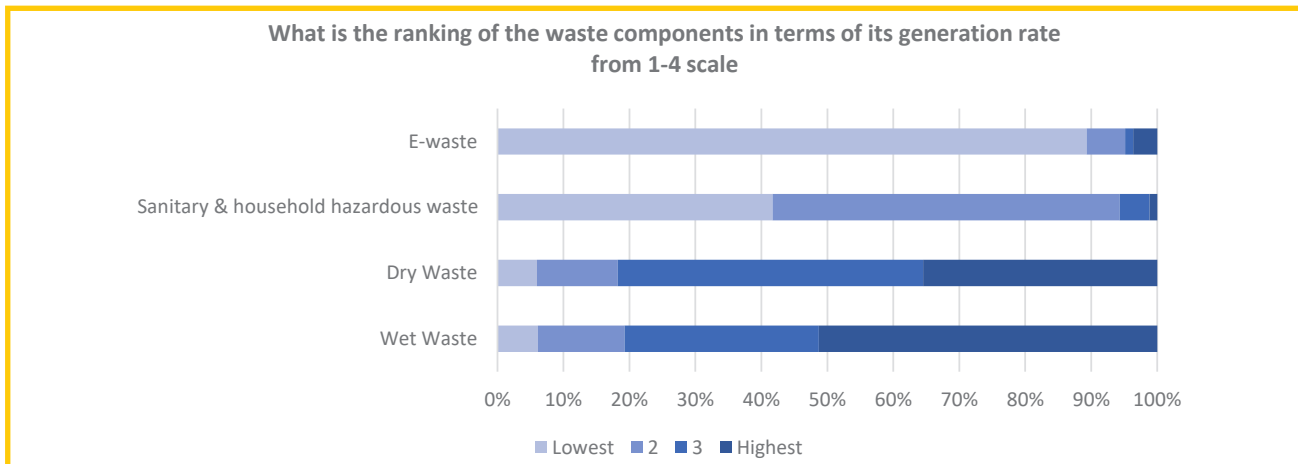


Figure 74 Ranking of the Waste Components

Citizens were asked about the ranking of the waste components in terms of generation rate and the overwhelming majority stated that wet waste and dry waste are the major waste streams generated by them. However, sanitary waste and e-waste were generated in very low quantities.

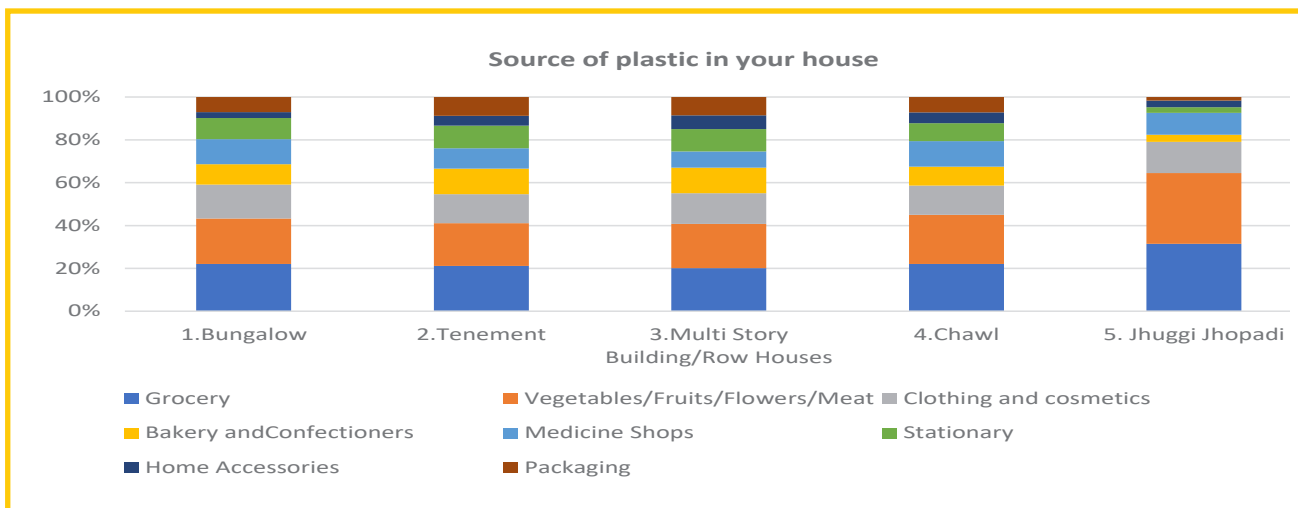
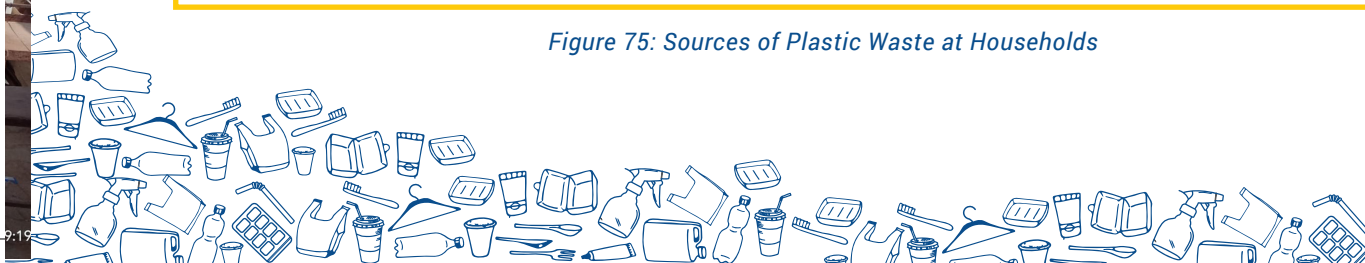


Figure 75: Sources of Plastic Waste at Households



Citizens were also asked about the source of plastic waste generated and most of the respondents across all income groups were of the opinion that most of the plastic waste is sourced from grocery and vegetable/flower/fruit/meat. However, more than 60% of people living in juggi-jhopadis were of this opinion as compared to only around 40% of people living in bungalows or multi-storied buildings, tenants, or chawls.

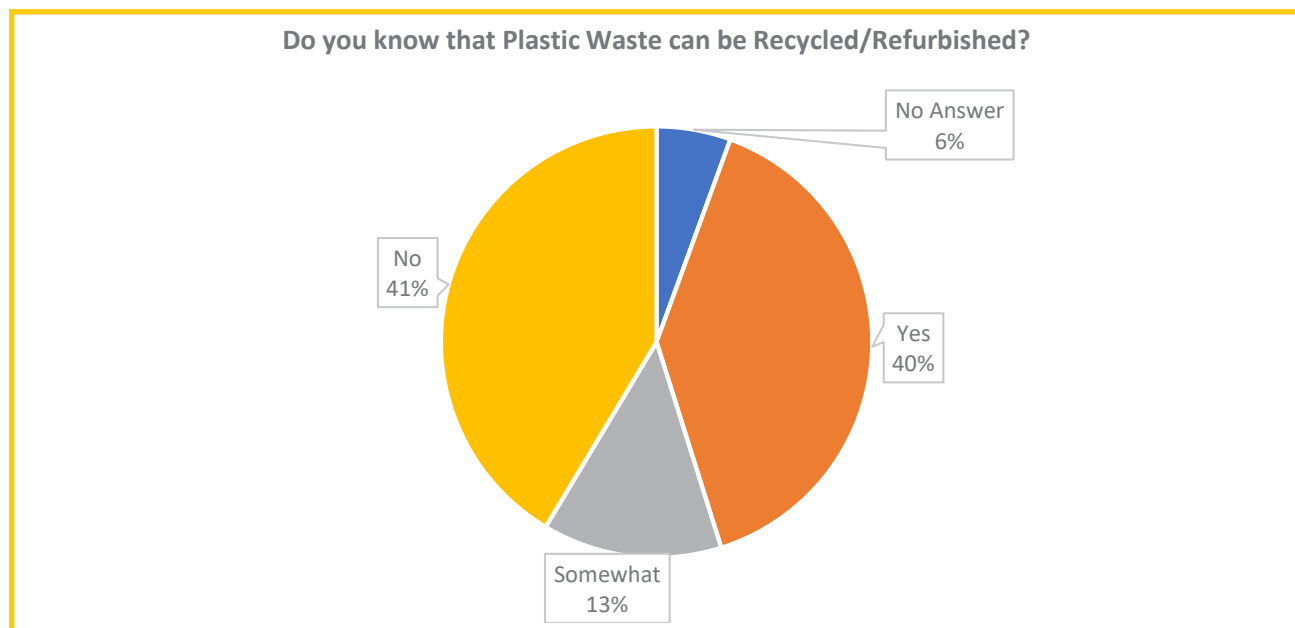


Figure 76: Knowledge of Recycling and Refurbishing

On the question of whether they have any idea that plastic waste can be recycled/refurbished, 40% respondents replied in affirmative whereas almost equal i.e., 41% didn't have any idea about the concept of recycling/refurbishment.

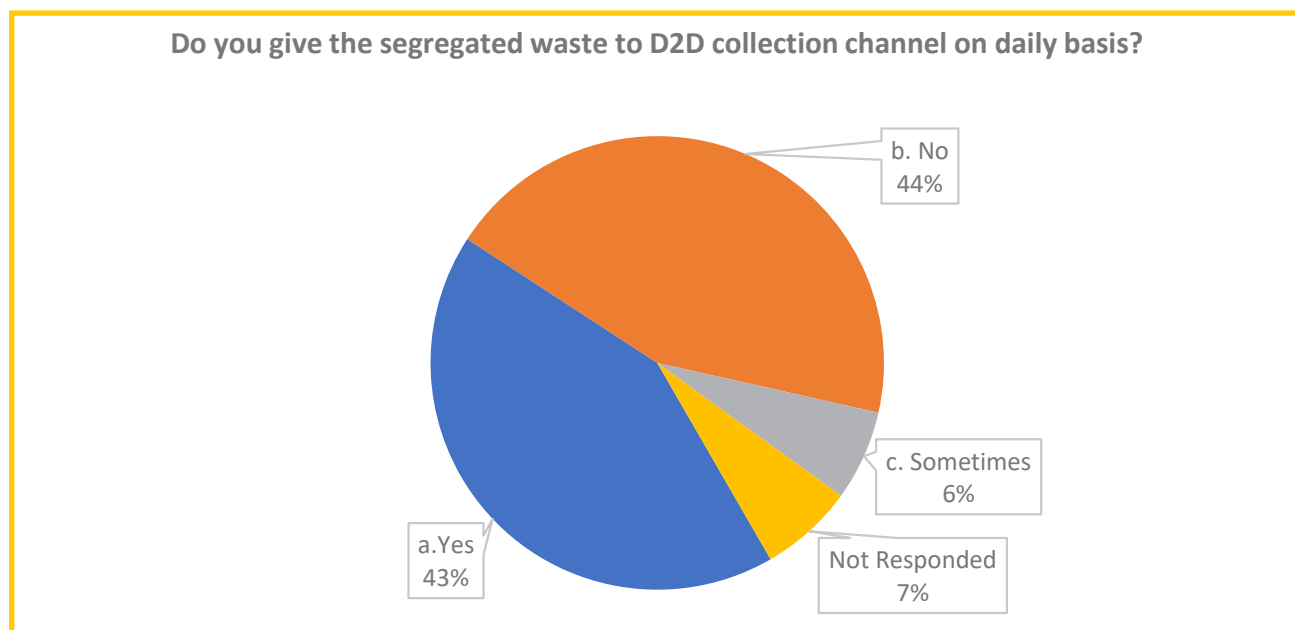


Figure 77: Result of survey for Segregation

Citizens were also enquired as to whether they carry out source segregation at home and give their segregated waste to the door-to-door collection agency. In reply, 43% responded that they



do source segregation and give segregated waste to the agency whereas 44% said that no source segregation is done. 6% of respondents said that they do carry out source segregation sometimes only and hand over segregated waste to the collection agency.

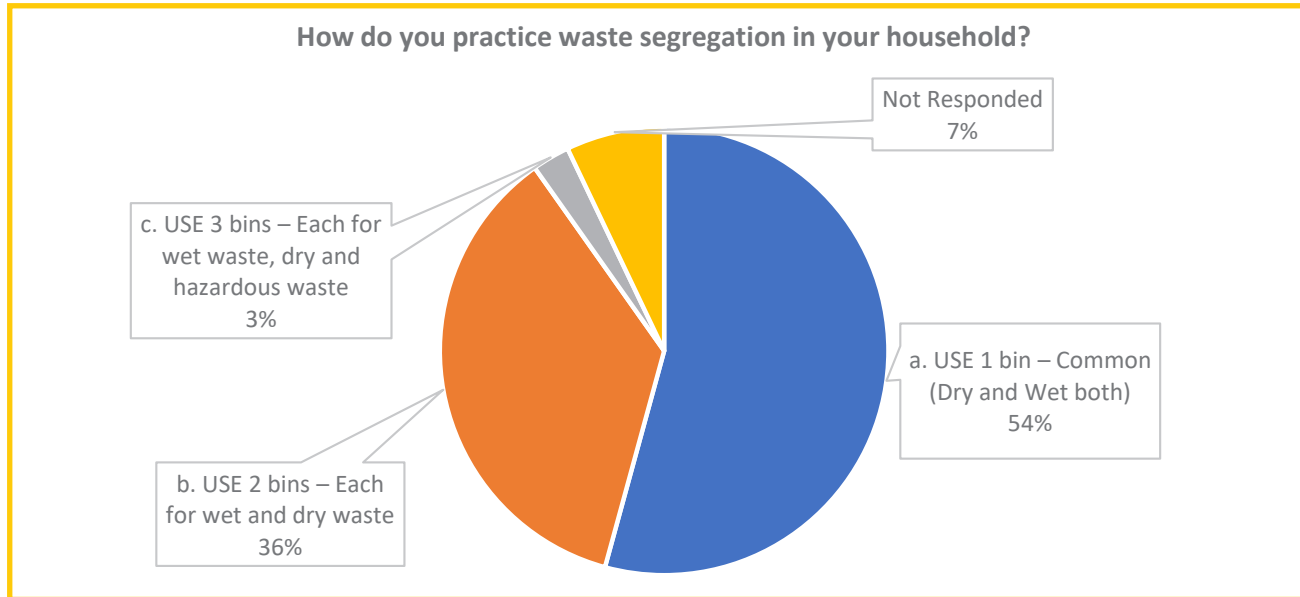


Figure 78 Result of Waste Management Practices at Households

On the question as to how do they practice waste segregation in their household, 54% stated that they only keep a single bin for both dry and wet wastes. However, 36% of citizens informed that they keep two bins one each for dry and wet waste whereas only 3% responded that they keep three bins one each for dry, wet, and domestic hazardous waste.

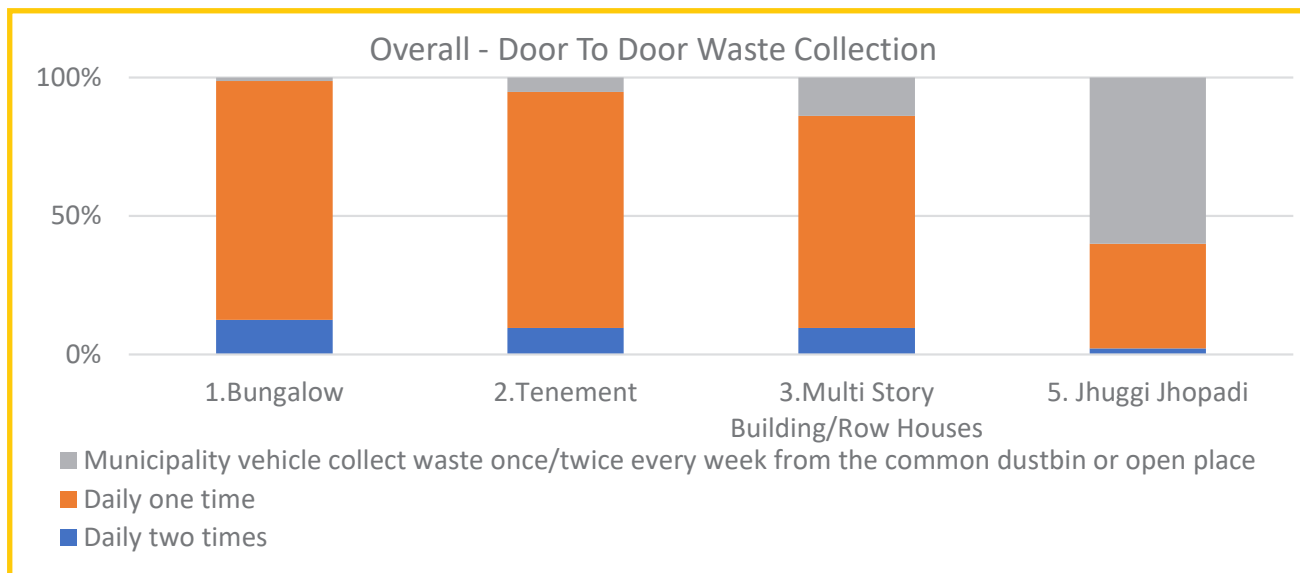


Figure 79 Percentage of Door-to-Door Waste Collection from Households

As regards the frequency of door-to-door waste collection, almost 90% of citizens living in bungalows, 80% living in tenements, and about 75% living in multi-storied houses reported daily one-time waste collection. However, only 25% of the people living in juggi-jhopadis reported daily one-time waste collection. In their case, about 60% of people reported waste collection once or twice a week.



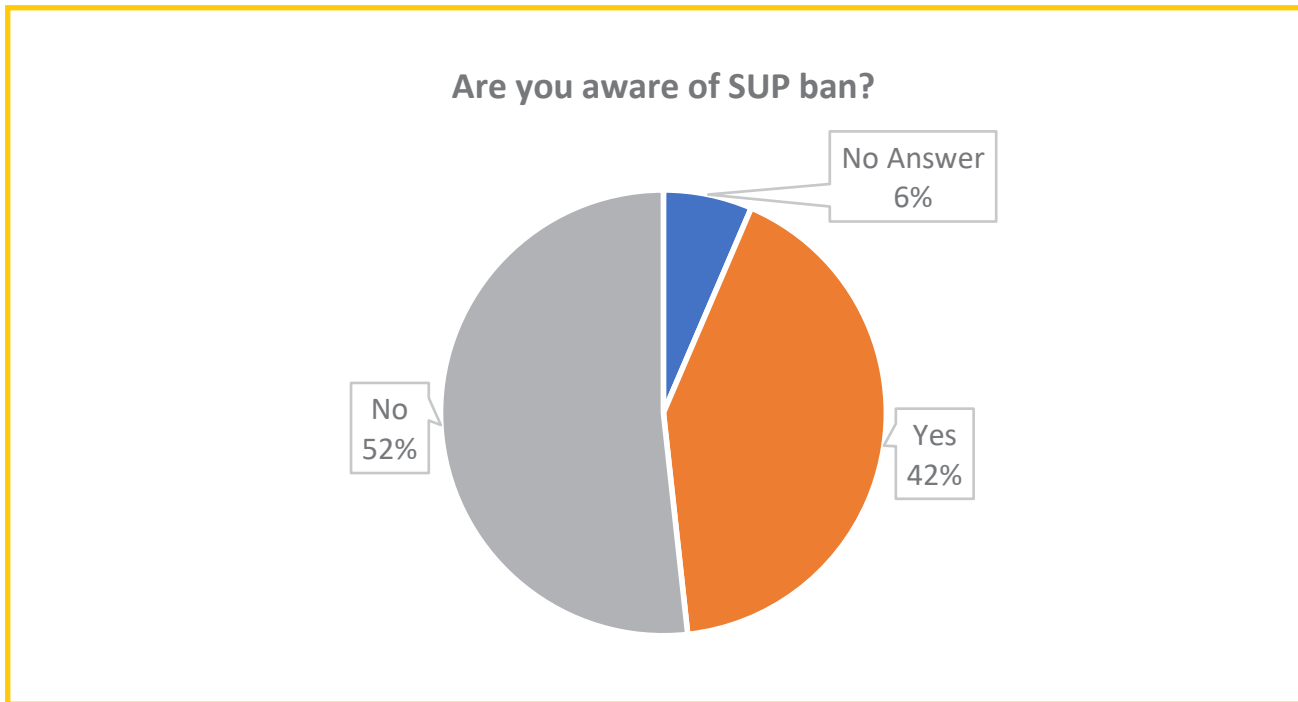


Figure 80 Awareness of SUP Ban

As regarding the ban on SUPs, only 42% citizens who were interviewed had any idea about the ban on SUPs whereas 52% respondents had no idea about the ban which underlines the need to spread awareness about the ban in more citizens.

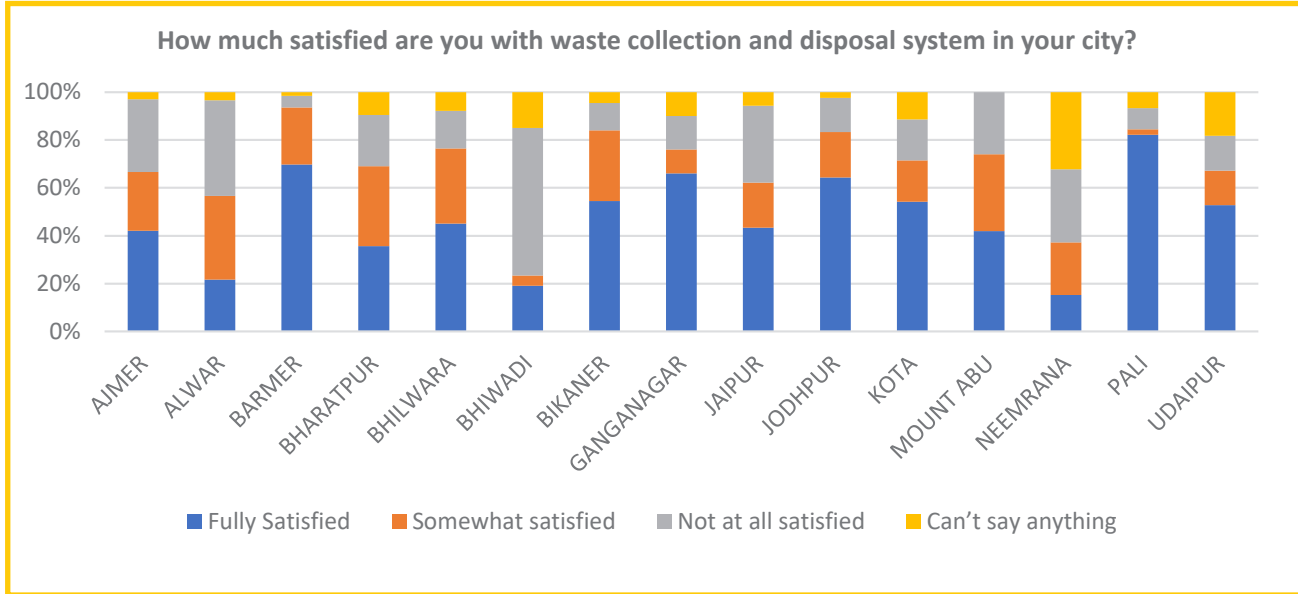


Figure 81: Survey Result on Satisfaction Level of Waste Collection and Disposal



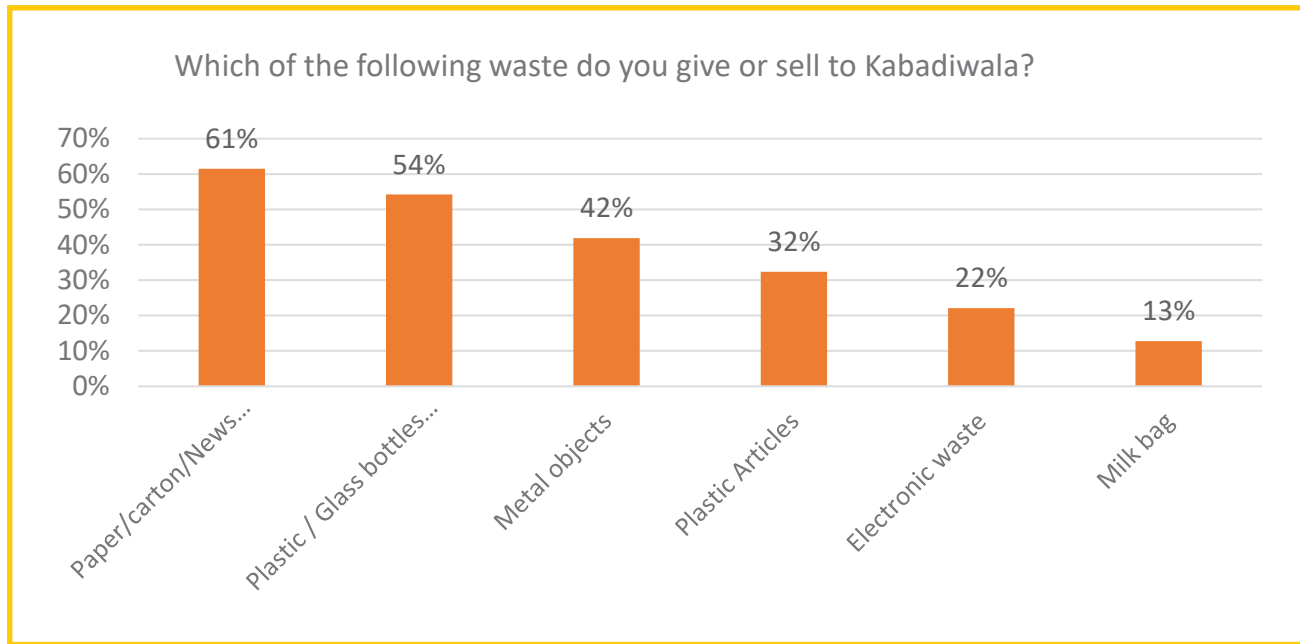


Figure 82: Waste given to Kabadiwalas

Citizens were also asked as to which waste they give or sell to kabadiwala and it was found that almost 61% of respondents give paper/cartons/newspaper to the kabadiwala followed by about 54% who said they give plastic /glass bottles etc. About 32% informed that they give plastic articles.

Respondents were asked about their level of satisfaction satisfied they are having with the waste collection and disposal system in their city. Out of 15 cities surveyed during the study, Pali was having the best satisfaction level with more than 80% of respondents saying they were satisfied with the services whereas Neemrana was having lowest satisfaction level with only about 15% of respondents saying that they are satisfied with the services. Bhiwadi was having worst satisfaction level with about 60% of respondents were not at all satisfied with the services and only 18% saying that they are satisfied with the services.

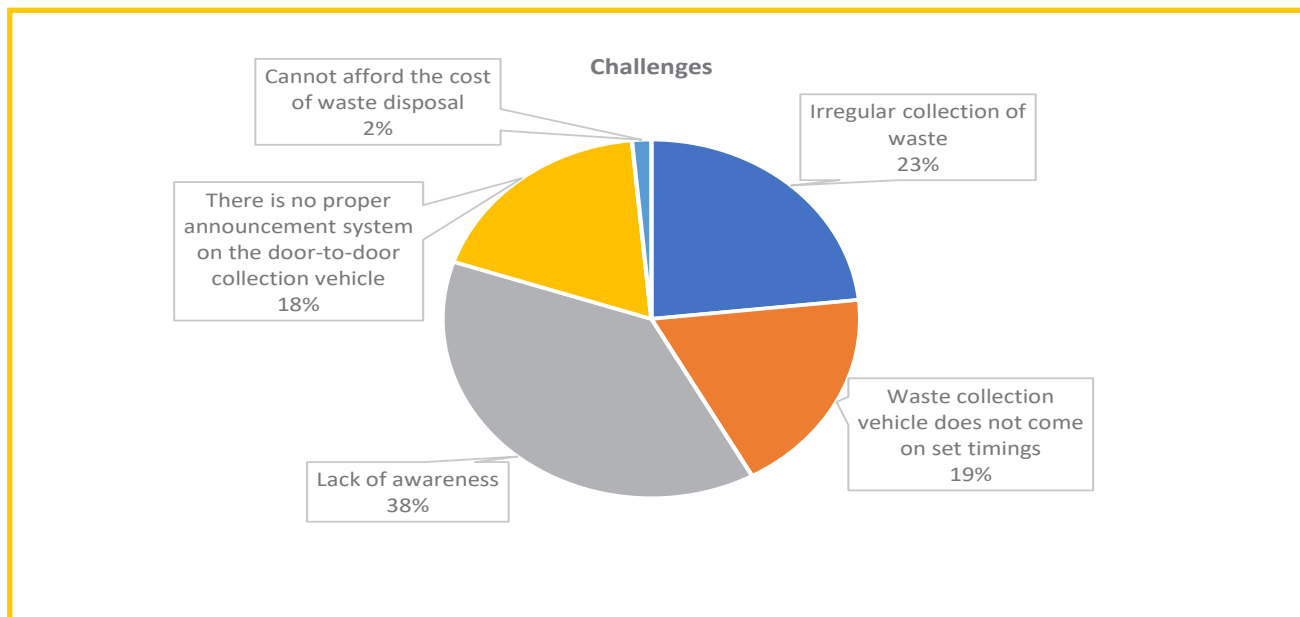
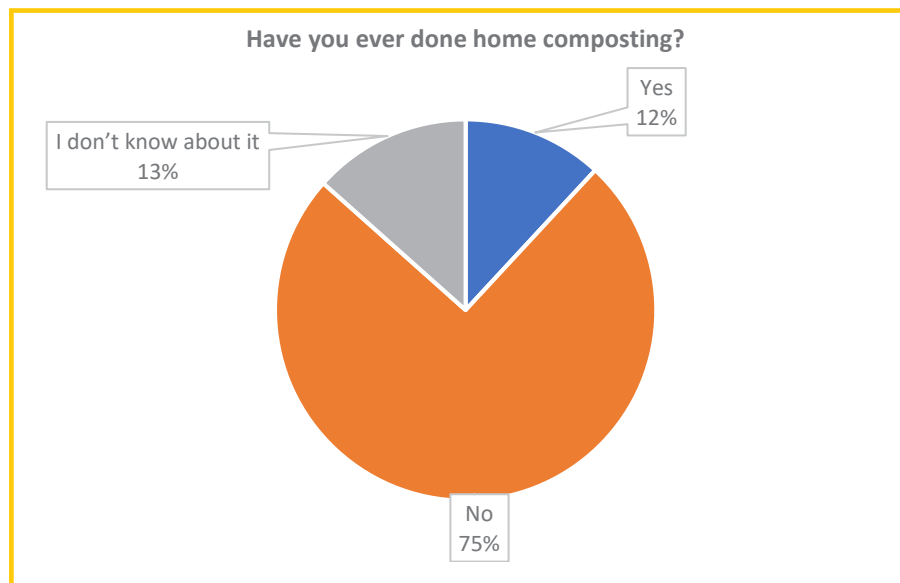


Figure 83: Challenges faced in Waste Management Practices



When the citizens were asked about the challenges faced by them in waste management, 38% responded that there is a lack of awareness about the issue in public whereas 23% said that collection vehicle does not come regularly or waste collection vehicle does not come on the appointed time (19%). 18% of respondents also complained about the lack of a proper announcement system during door-to-door collection.



When the respondents were asked whether they have tried treating the waste through composting to convert the waste into useful manure, 75% responded negative and only 12% replied in affirmative.

Figure 84: Result of Survey on Home Composting

Citizens were also asked about the concept of 3R (Reduce, Reuse, Recycle) and whether they are aware of the same. 62% of respondents showed ignorance about the concept with only 31% saying that they are aware of the concept.

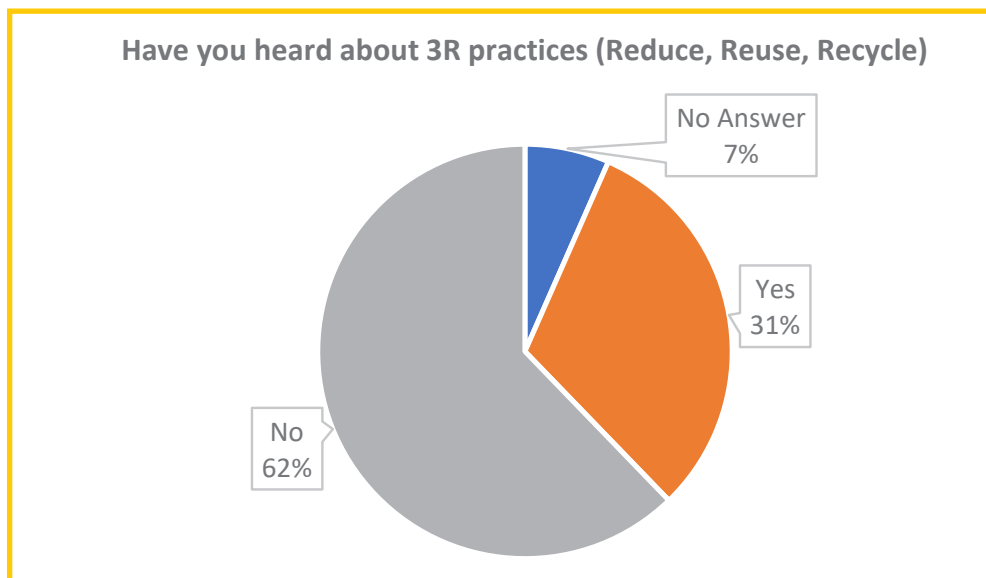


Figure 85: Survey Result on Awareness of 3R

Overall the citizen’s survey brought out quite interesting and useful information about waste management activities and several policy directions to the municipalities and other stakeholders associated with waste management in the urban areas.





CHAPTER

14

Informal Sector





CHAPTER

14

Informal Sector

14.1 Survey of Waste Collectors (Waste Pickers)

Waste Collectors or Ragpickers are an integral part of the waste management system which plays important role in collection of valuable waste fractions from dumpsites, commercial areas, markets etc. To understand the waste collection mechanism and their socio-economic conditions, a survey was carried out among waste collectors in all the 15 identified cities during which 94 male waste collectors and 46 female waste collectors were interviewed. The data obtained was analyzed based on gender as well as cumulatively to draw important inferences and trends.

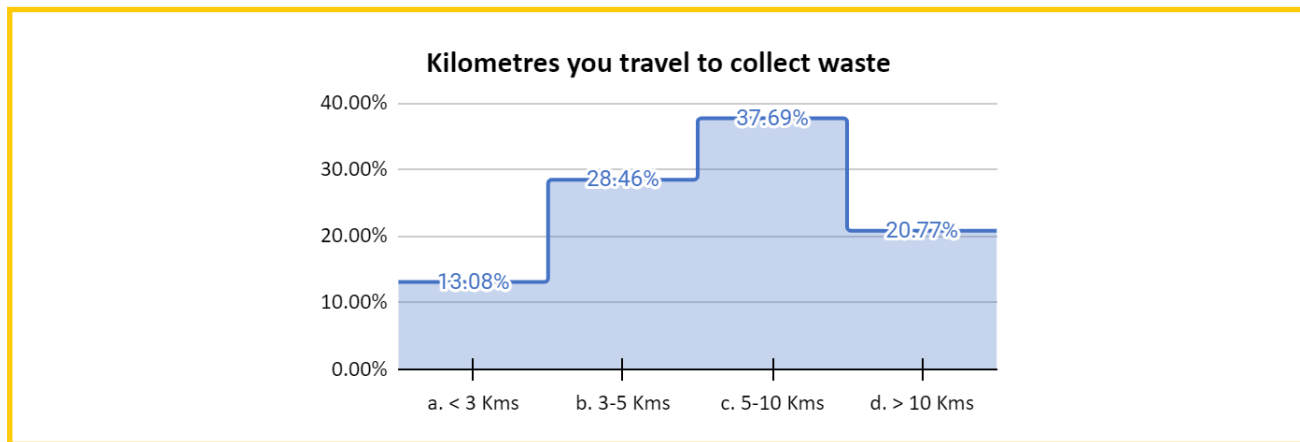


Figure 86: Kilometres Travelled by Waste Collectors to collect Waste

During the survey, the waste collectors were asked about the distance they need to travel every day for waste collection, it was observed that overall, about 38% of waste collectors travel a distance of about 5-10 km whereas 28% travel a distance of 3-5 km. However, about 33% male waste collectors travel a distance of about 5-10 km to collect their waste whereas 46.5% female waste collectors travel a distance of 5-10 km which shows that female waste collectors find it more difficult to collect waste as compared to male waste collectors.

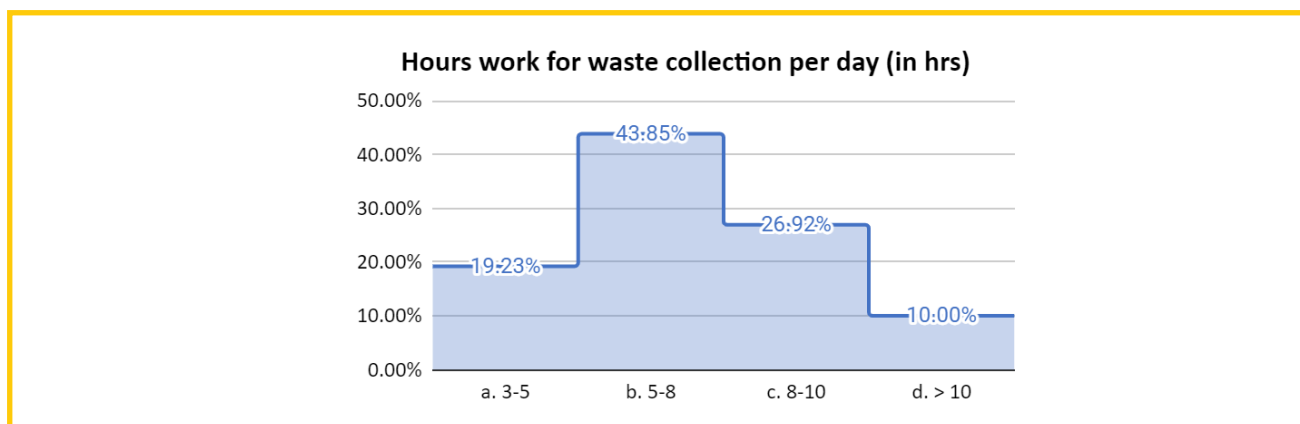
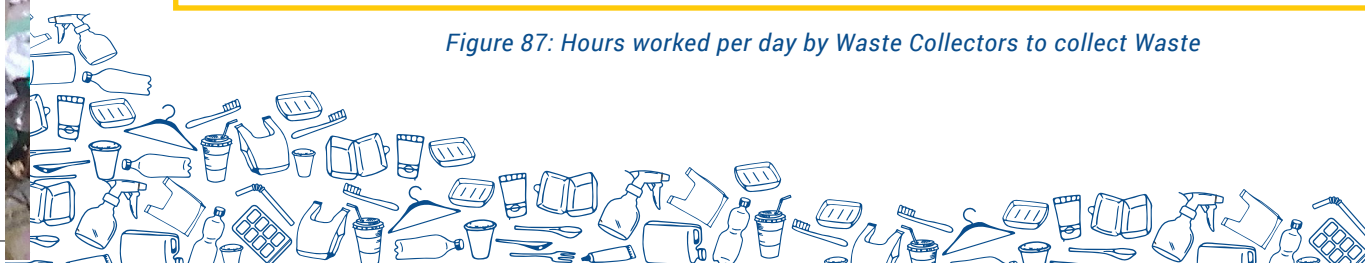


Figure 87: Hours worked per day by Waste Collectors to collect Waste



During survey, hours spent by the waste collectors for collecting the waste was also captured and it was noticed that 44% of the waste collectors spend 5-8 hr for the activity whereas around 27% spent even 8-10 hr. Only 10% waste collectors spends more than 10 hr for waste collection activity.

During survey, it was also noticed that majority of waste collectors (around 80%) do not take any safety or precautionary measures rendering them to possible injuries/infections. Only around 8% use hand gloves and only around 3% use any antiseptic lotion while collecting waste. Around 5% use both hand gloves and antiseptic lotion.

In another question, this has been reflected through the impact on health, as per the response around 57.7% has felt the poor health symptoms since they started the work in waste collection. Therefore, there is a strong need to improve working conditions of the waste collectors to save them from injuries and health related issues.

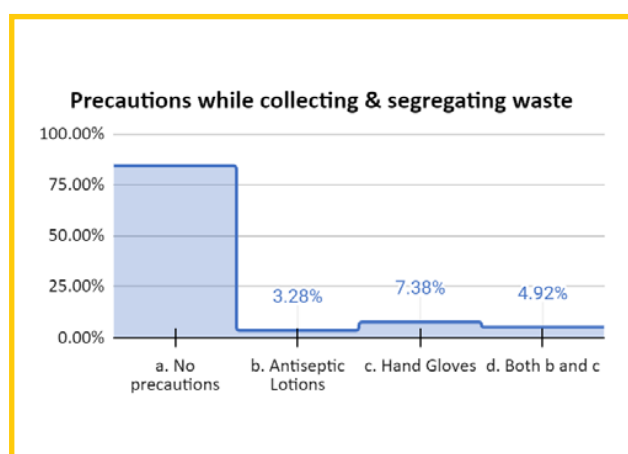


Figure 88: Precautions taken during Waste Collection

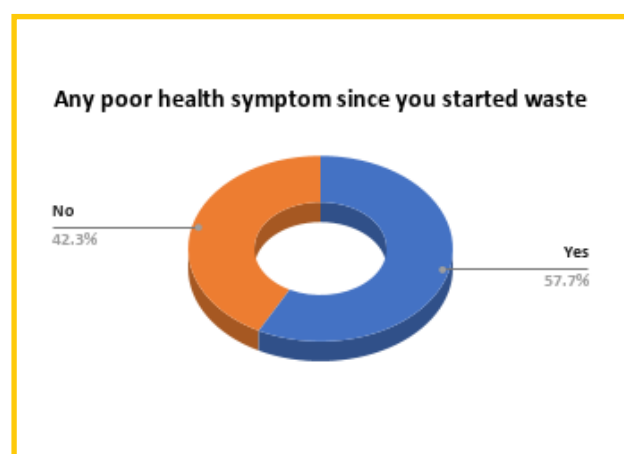


Figure 89: Health Symptoms due to Waste Collection

Waste Collectors were also asked about the preferred waste collection points and around 23% responded that they prefer to collect waste from shops/markets while 22% said that they collect from roadside. Around 18% waste collectors collected waste from dumpsites and around 17% collect waste from households. Hotels and restaurants were also favorable places for waste collection with around 8% collecting waste from these points. Hospitals and commercial establishments were the least preferred points for waste collectors.

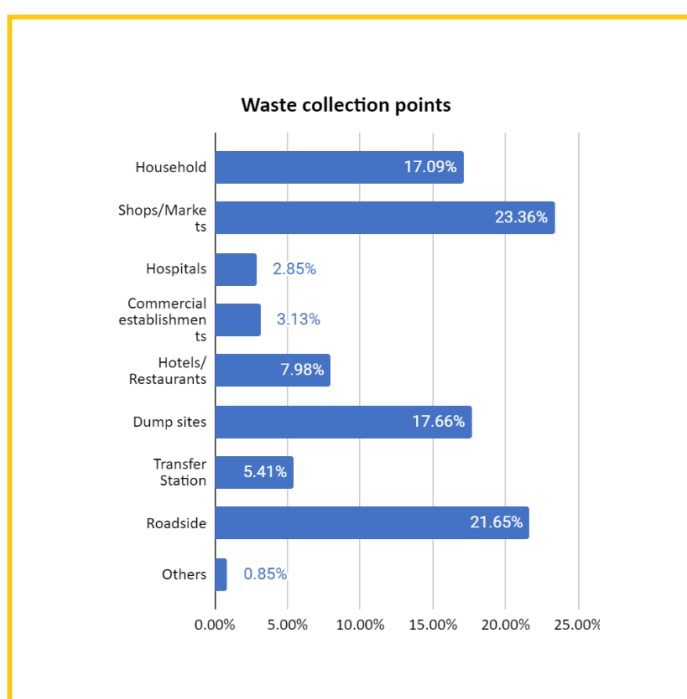


Figure 90: Various Waste Collection Points

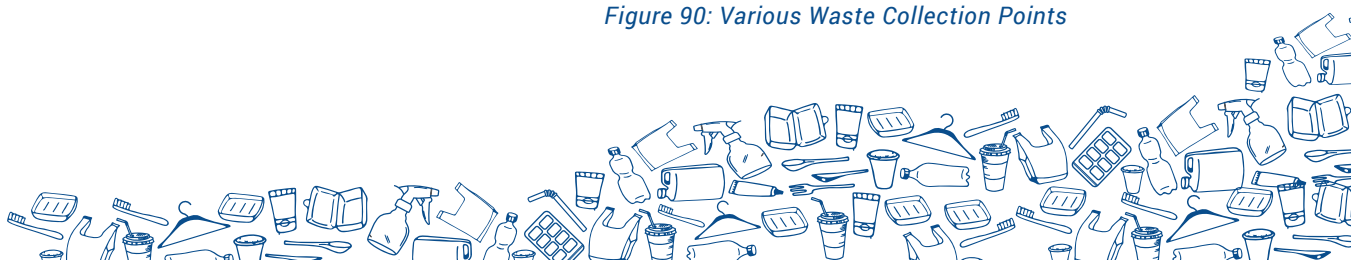




Figure 91: Waste Collection Points & Quantities

Waste Collection point wise quantities were also analyzed during the survey and it was found that shops/markets with 23% share and road side with 22% share were having the highest waste collection quantities which are also the most favorable collection points. Dump sites (18%) and households (17%) are other points from where waste collectors get good quantities of waste.



Figure 92: Selling of Waste Collected

During survey, waste collectors were asked as to how the collected waste is sold. A majority, around 70%, informed that the waste is sold to Kabaadiwala whereas 23% said that is sold to scrapers. Only very few, 3.68% sell their waste to recyclers and only 2.37% sell to the factories. It is therefore evident that the collected waste mostly ends up with Kabaadiwalas from where possibility of it entering into informal recycling is quite strong.

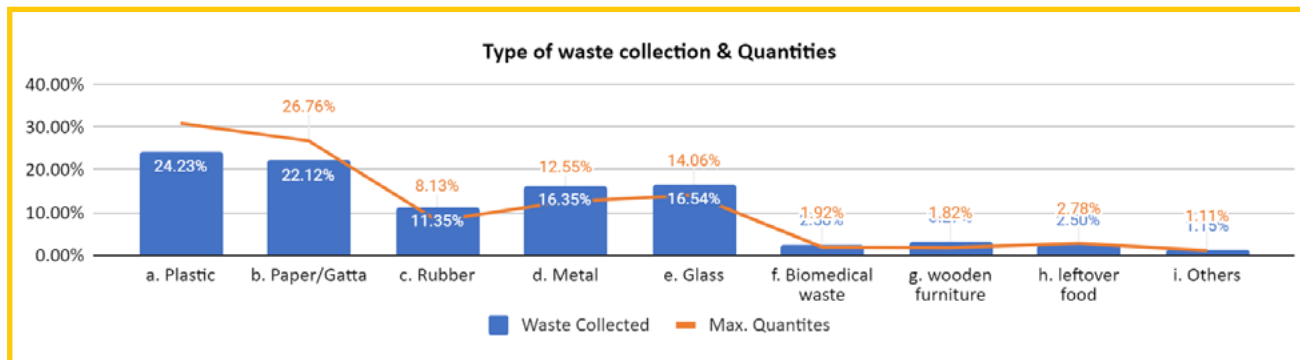
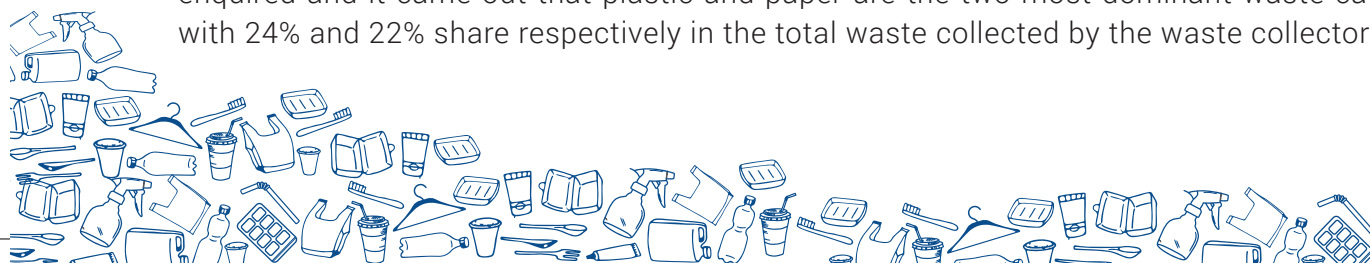


Figure 93 Types of Waste Collected and Quantities

During survey, types of waste collected by the waste collectors along with quantities was also enquired and it came out that plastic and paper are the two most dominant waste categories with 24% and 22% share respectively in the total waste collected by the waste collectors. Glass



(17%), metal (16%) and rubber (11%) are other waste categories normally picked up by the waste collectors.

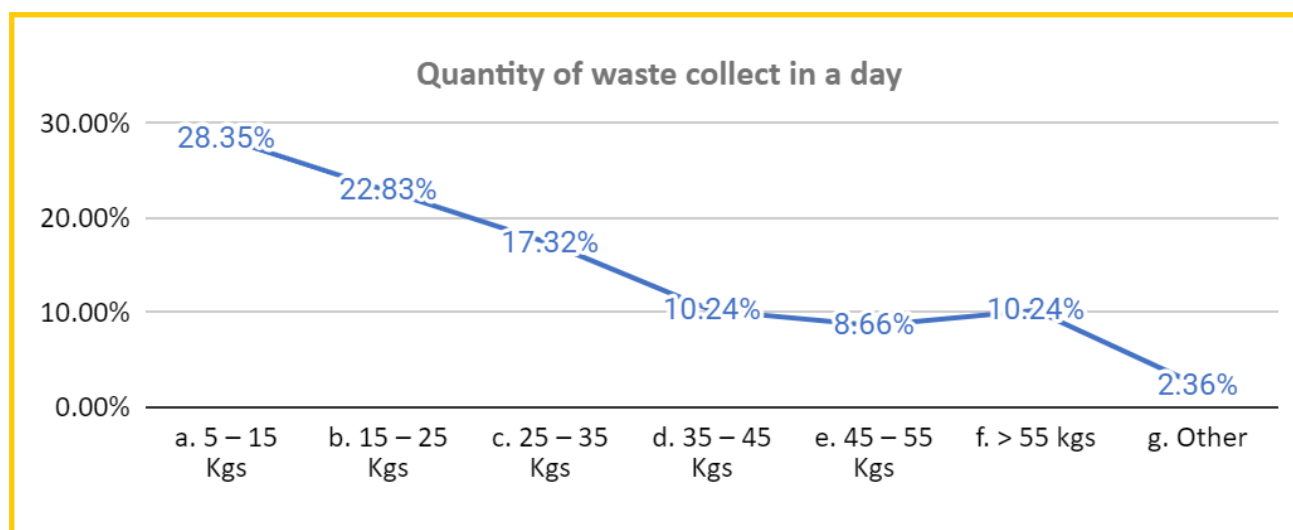


Figure 94 Quantity of Waste Collected per day

As regarding the quantity of waste collected in a day, it came out that around 28% collect waste in a range of 5-15 kg/day whereas 23% collect waste in the range of 15-25 kg/day. However, 10% are able to collect higher quantities in the range of 35-55% and another 10% even collect more than 55 kg/day.

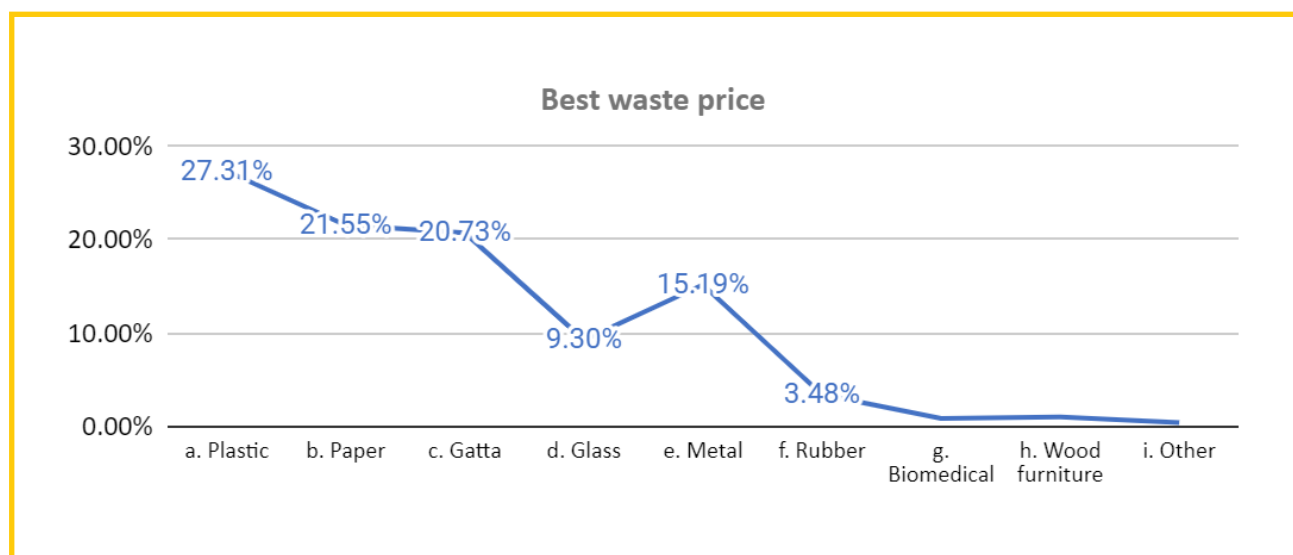


Figure 95 Best Waste Price

The waste collectors were also asked about which waste get the best price and it was revealed that 27% agreed that plastic gets the best price whereas 22% were of the opinion that paper fetches the best price whereas another 21% agreed said Gatta and 15% pointed out metals to get good price. However, biomedical waste and wood furniture fetched lowest prices.



Socio-economic status of the waste collectors was also ascertained and it was informed that 78% waste collectors have an Aadhar Card whereas 59% also have a ration card. Around 53% waste collectors have bank accounts and 39% have ID Cards. 23% of the waste collectors are able to arrange for education for their kids and 18% get some kind of pension and 10% also have family health cards whereas 9% have taken some kind of insurance. It is therefore evident that lot need to be done to improve the socio-economic status of the waste collectors by providing ID Cards to all, opening bank accounts and providing health benefits and education to their kids.

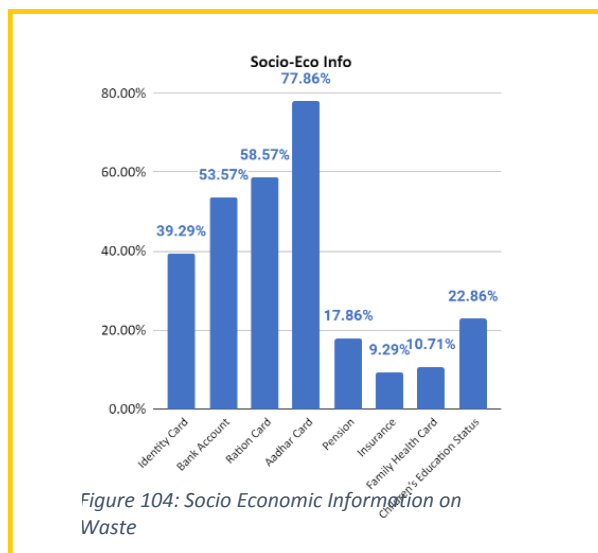


Figure 104: Socio Economic Information on Waste

Figure 96 Socio Economic Information on Waste

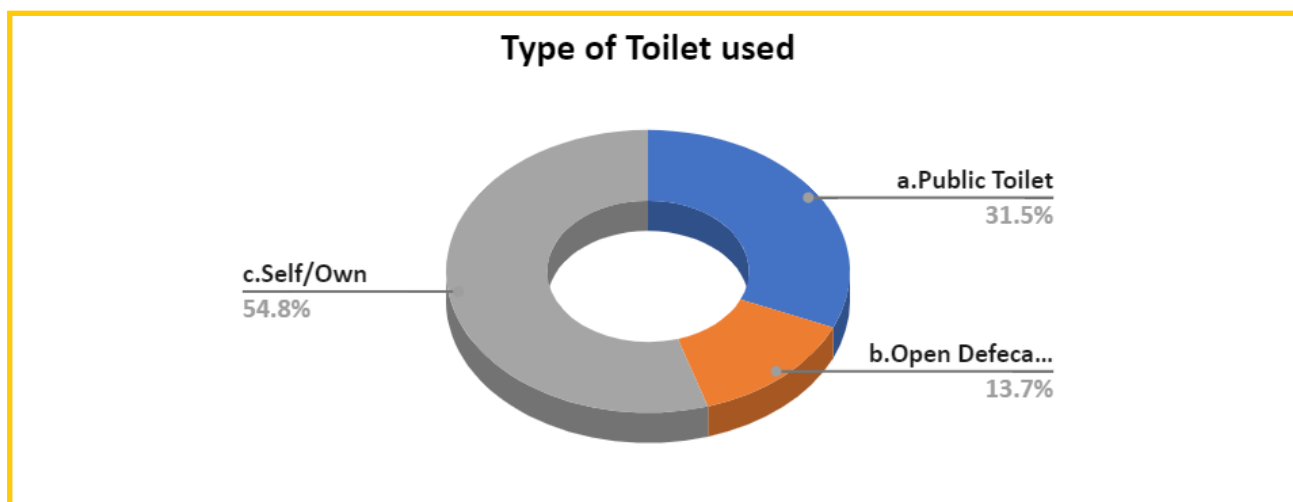


Figure 97: Types of Toilet used

As regarding toilet facilities, it was revealed that only 55% have their self/own toilets and rest either use public toilets (32%) or engaged in open defecation (14%).

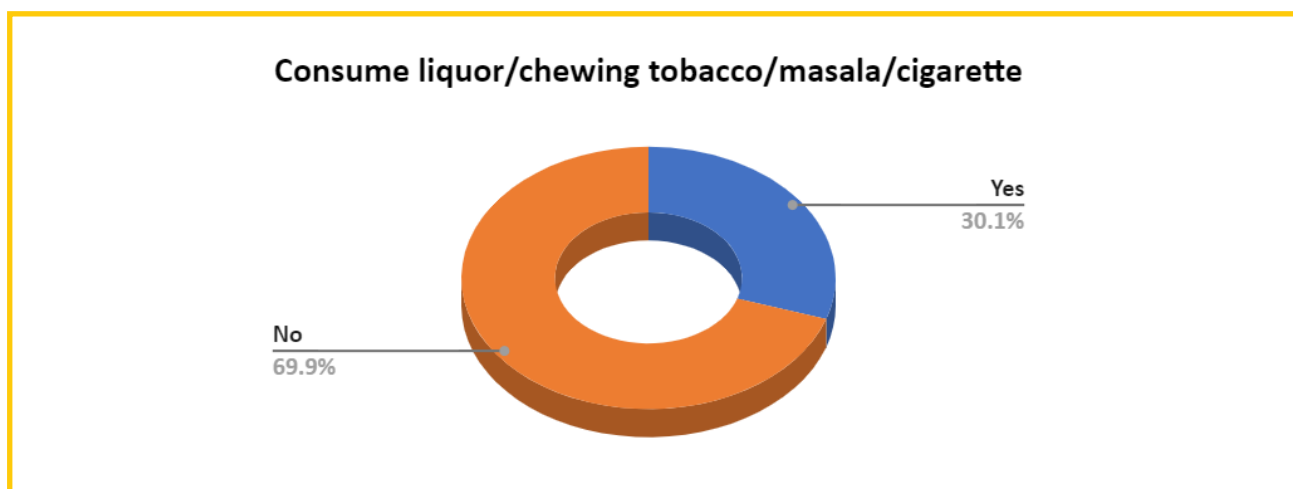


Figure 98: Percentage of people consuming liquor/ tobacco/ masala/ cigarette



Around 70% of waste collectors denied consumption of liquor/chewing tobacco/masala or cigarette and only 30% admitted using some kind of intoxicant or consumption of tobacco products.

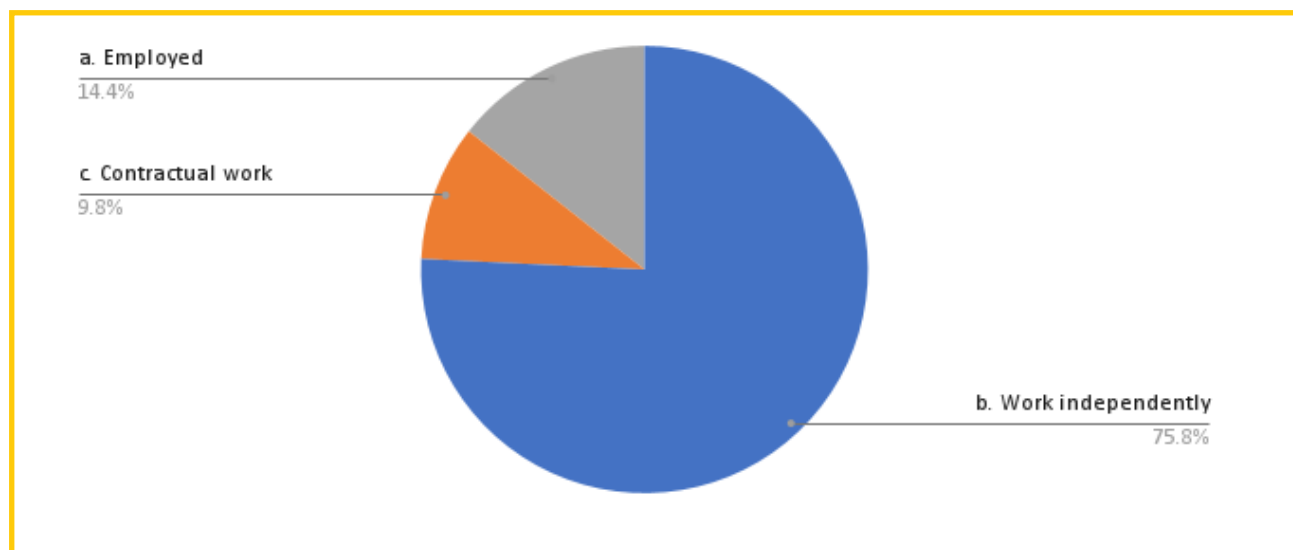


Figure 99: Type of Work

It was also brought out from the survey that around 76% of the waste collectors are working independently whereas only 14% are employed and around 10% are working on contractual basis.

The survey of the waste collectors brought out wealth of information about the mechanism of waste collection, type of waste collected and quantities and socio-economic status of the waste collectors. It will only help in not only in design evidence based schemes for upliftment of this very important stakeholder in waste management value chain but will also help to integrate waste collectors in formal waste collection mechanism.

14.2 Survey of Scrap Dealers

Survey of people engaged in buying and selling of plastic and other waste scraps was also undertaken in all the identified 15 cities. During the survey, data was collected from 105 scrap dealers in all the identified cities.

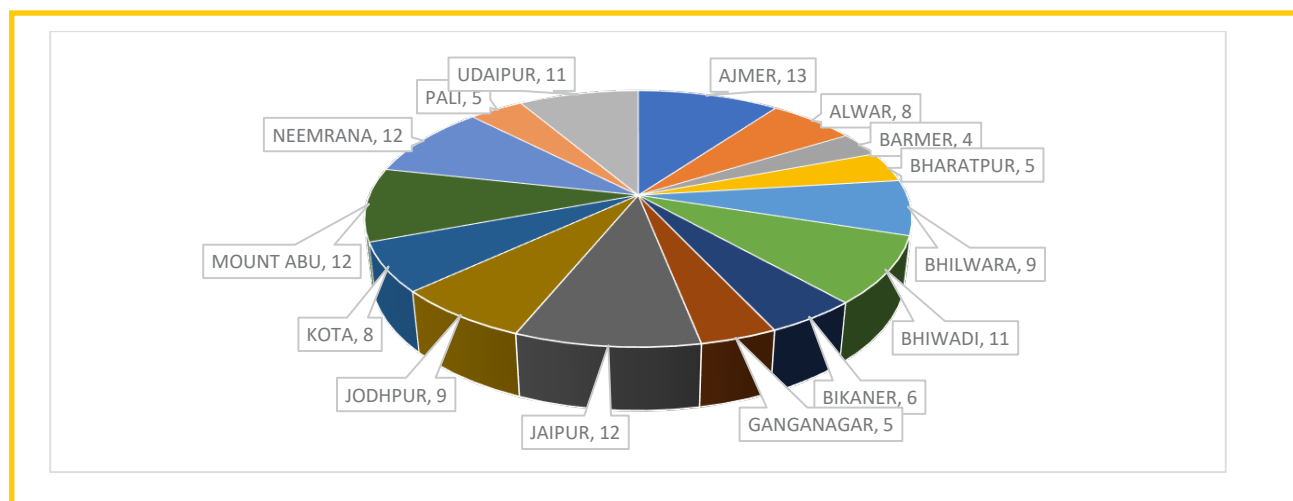
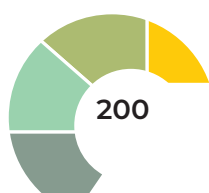


Figure 100: Number of Scrap Dealers Surveyed



Number of scrap dealers surveyed in each city are shown in Figure 100. As per the details, maximum, 12 dealers were surveyed in Mount Abu, Neemrana and Jaipur whereas in Barmer, only 4 dealers were surveyed.

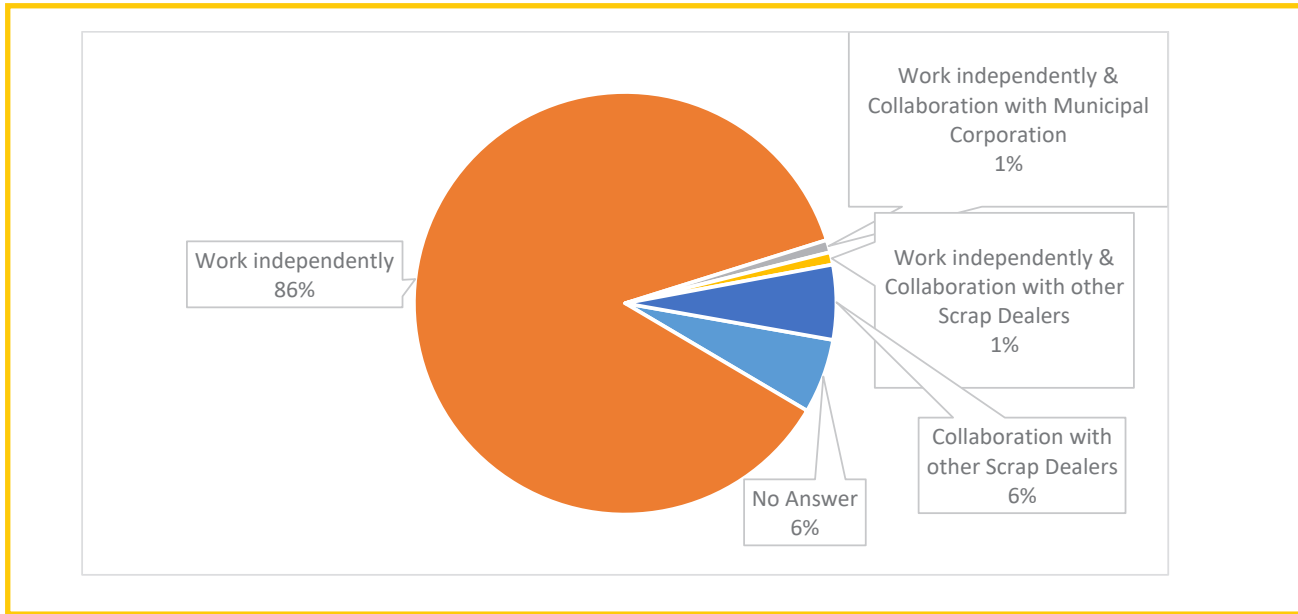


Figure 101: Mode of Operation

The Scrap Dealers were asked as to how do they run their business and 86% responded that they work independently whereas 6% told that they work in collaboration with some other scrap dealer. Only 1% responded that they work in collaboration with Municipal Corporations.

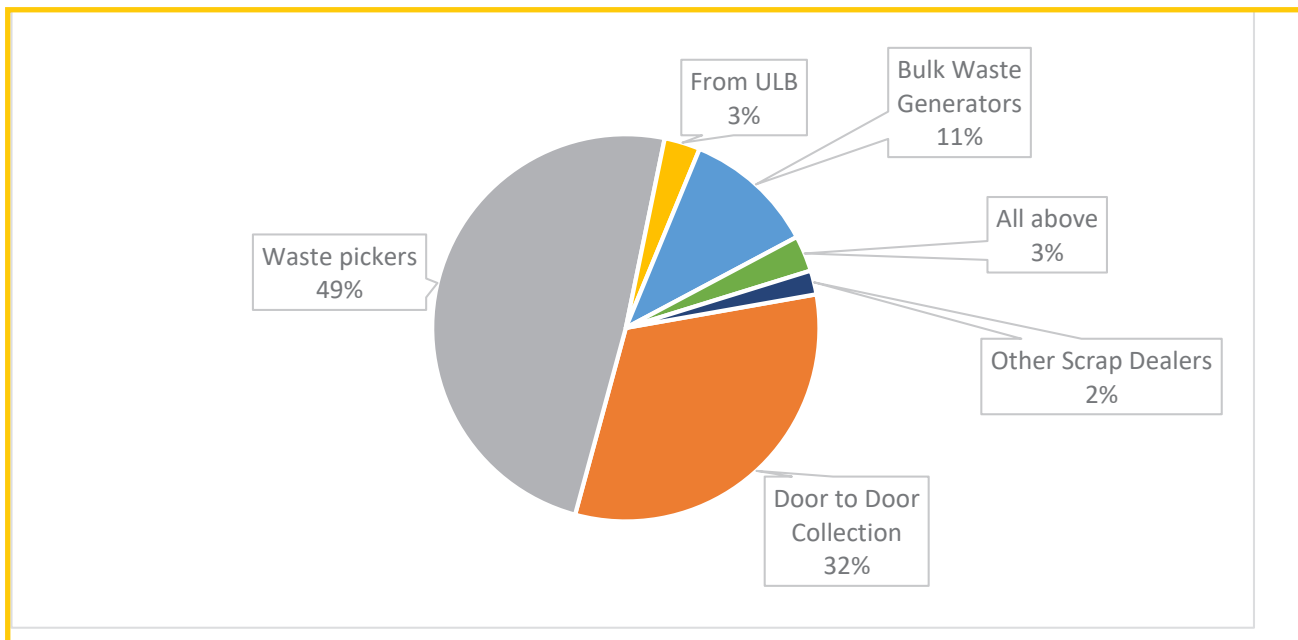
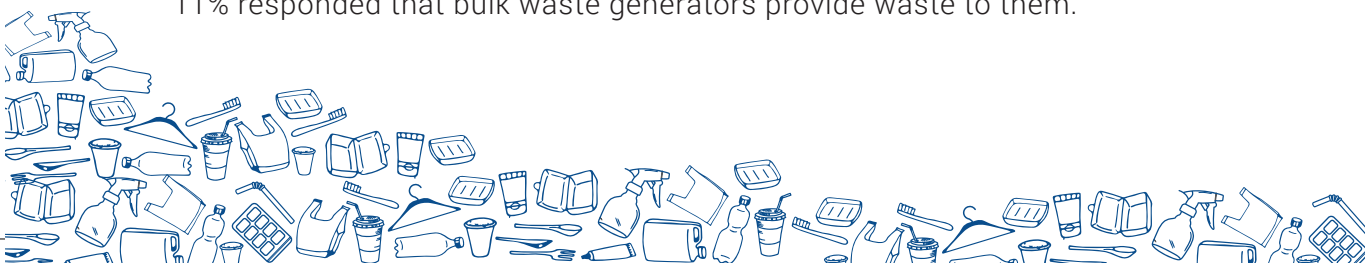


Figure 102: Source of Waste Collection

About the sources of waste collection, 49% responded that waste pickers are the main source of waste the get whereas 32% said that door to door waste collection is important source of waste. 11% responded that bulk waste generators provide waste to them.



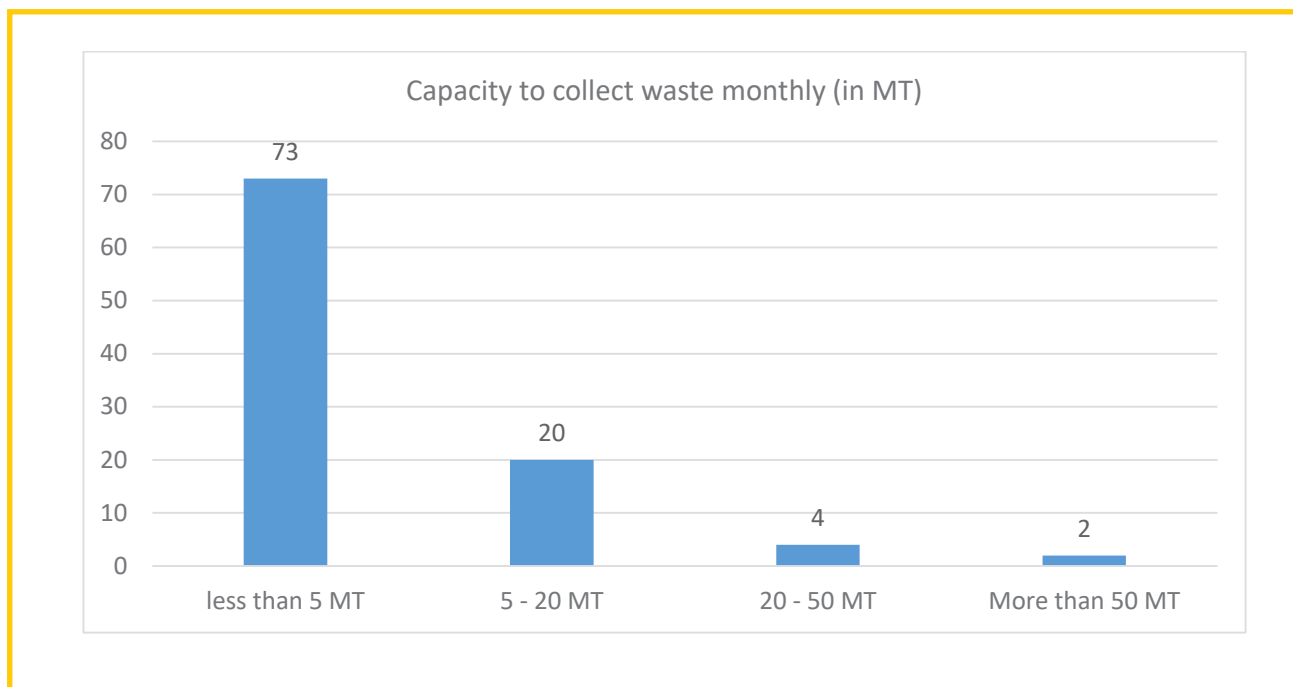


Figure 103: Capacity to Collect Waste per Month

About capacity of the waste collected by them every month, 73 scrap dealer responded that it is less than 5 MT per month whereas 20 scrap dealers said that their capacity is between 5-20 MT per month. 4 scarp dealers were having collection capacity in between 20-50 MT/month whereas only 2 scrap dealers reported their capacity is more than 50 MT per month.

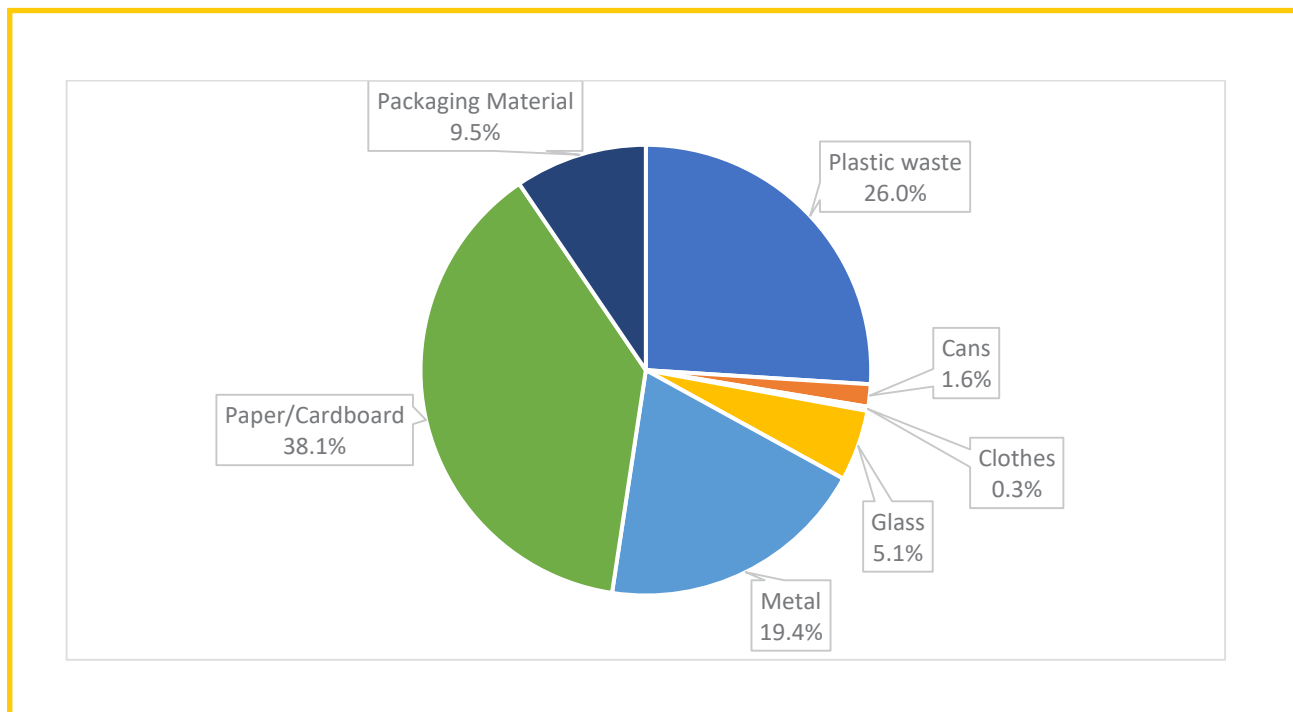
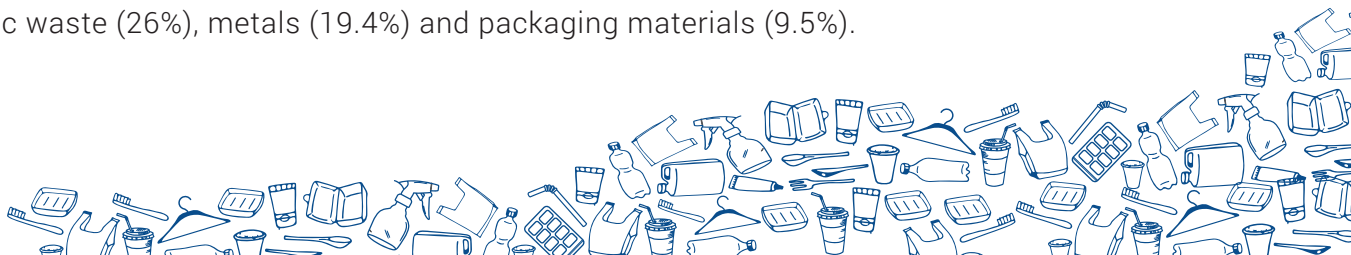


Figure 104: Category of Waste Collected

The Scrap Dealers were also asked about the categories of waste purchased by them and 38.16% responded that paper/cardboard is the major waste category received by them followed by plastic waste (26%), metals (19.4%) and packaging materials (9.5%).



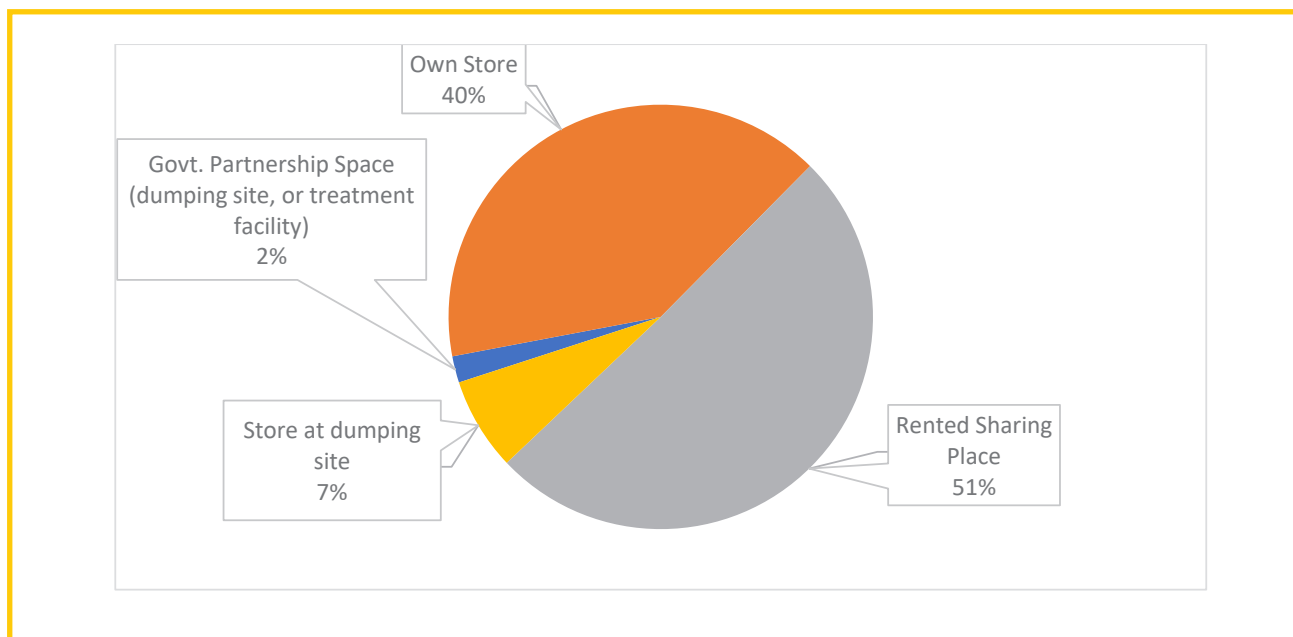


Figure 105: Waste Storage

As regarding storage of the collected waste is concerned, 51% scrap dealers store their waste in rented sharing spaces whereas 40% have their own storage space. Surprisingly, 7% are storing the waste at the dumping site itself.

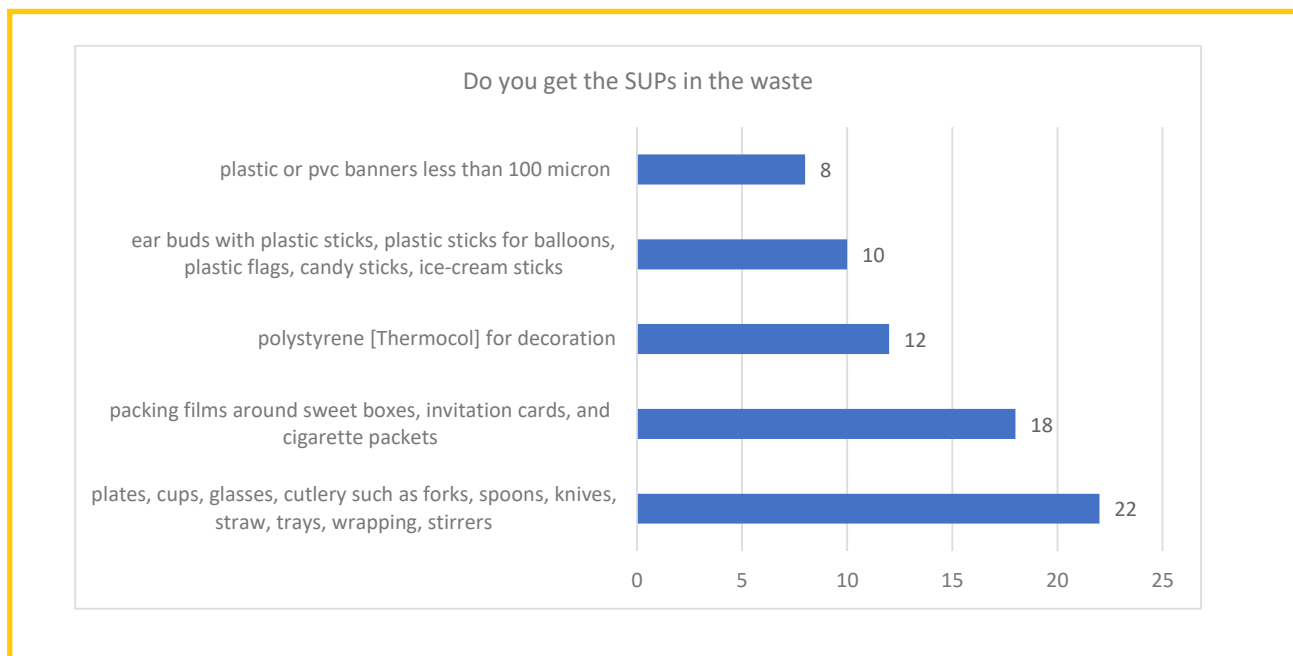
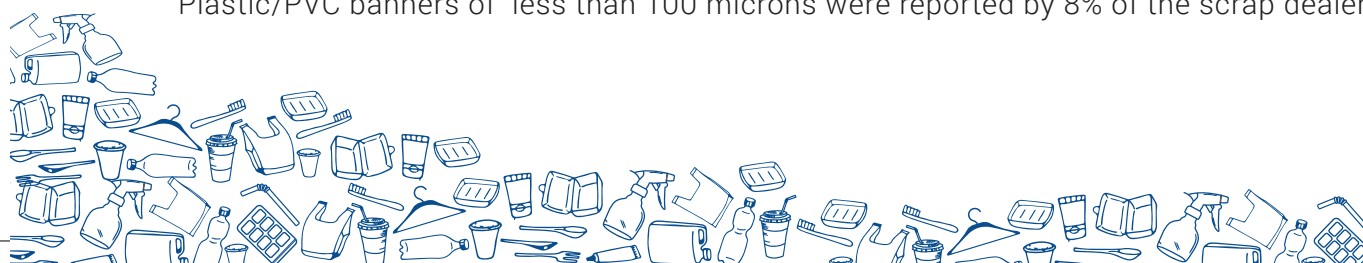


Figure 106: Amount of SUPs in Waste

On the question as to what kind of SUPs they get in the waste received by them, 22% responded that plates, cups, glass, cutlery items and wrappings are the major SUP categories they receive whereas 18% reported that packaging films around sweet boxes/invitation cards are major types of SUPs they get. 12% Scrap Dealers reported that they get polystyrene (thermocol) used for decoration and 10% said that they get ear buds, balloons, flags and candies with plastic sticks. Plastic/PVC banners of less than 100 microns were reported by 8% of the scrap dealers.



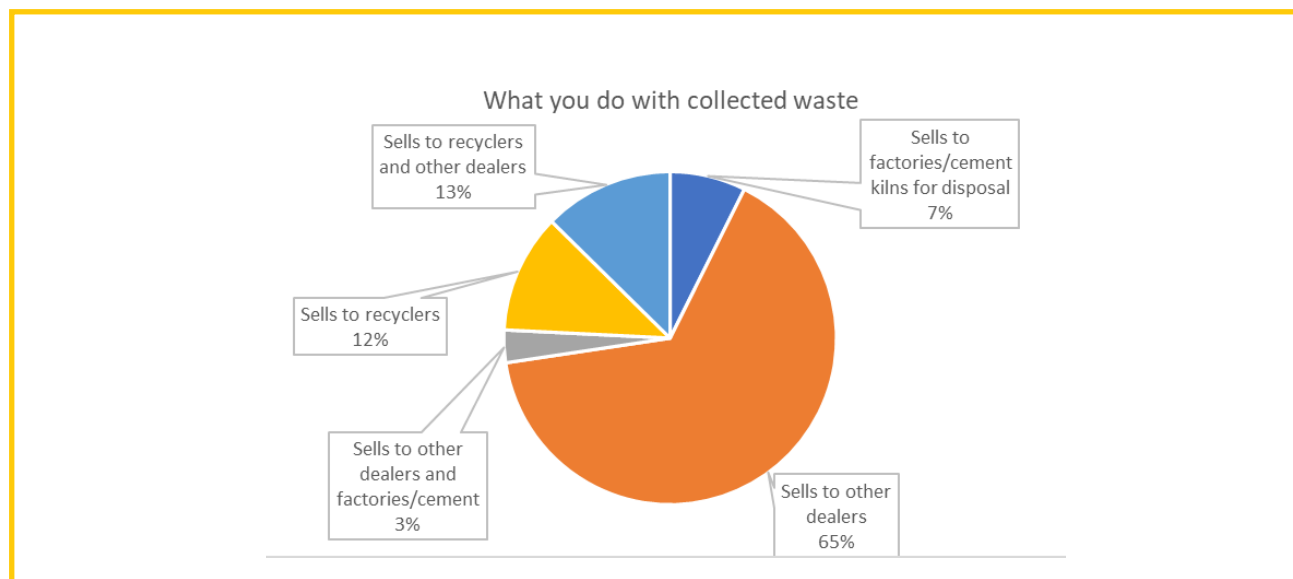


Figure 107: Treatment of Waste

On the question as to how the waste collected by them is disposed/sold, 65% responded that it is sold to the other dealers whereas only 12% said that it goes to the recyclers for further recycling. 13% were selling to the recyclers and other dealers whereas 7% sold to the factories/ cement kilns for disposal.

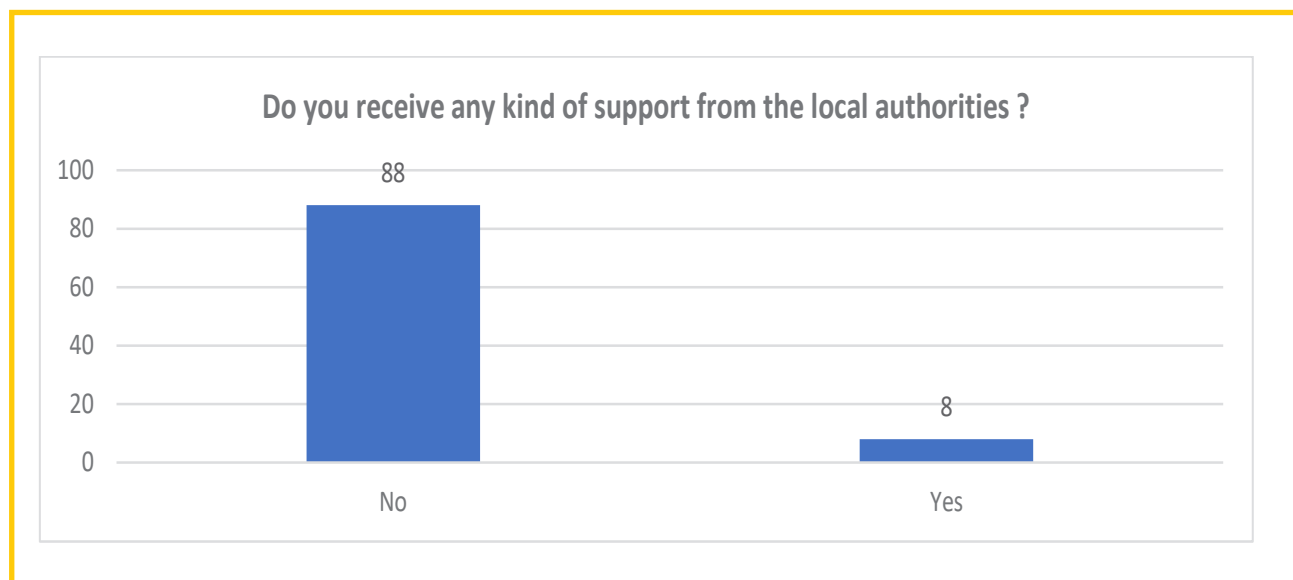


Figure 108: Support received from the Local Office

On enquiring whether they get any kind of support from the local authorities, only 8 scrap dealers responded in yes and 88 dealers said that they do not receive any support.

Overall, the survey has highlighted important issues faced by scrap dealers which are a vital part of the waste management hierarchy. Data presented will be valuable in integration of scrap dealers in the entire waste management ecosystem.



CHAPTER

15

Major Challenges & Recommendations





Major Challenges & Recommendations

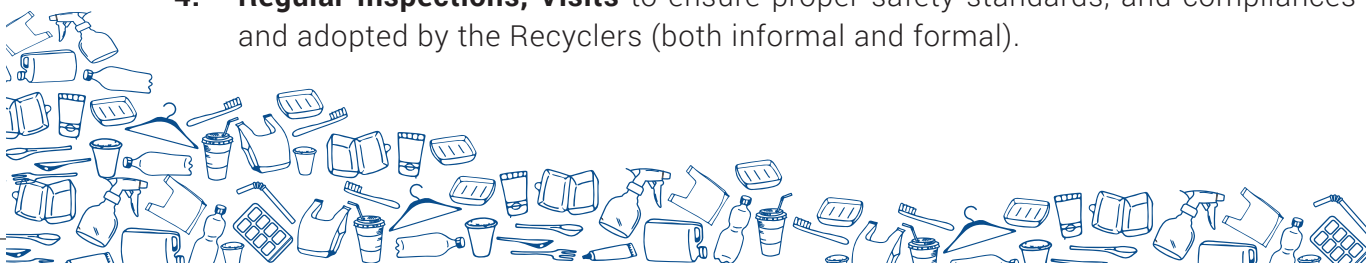
1. Plastic Recycling Units

Challenges

1. Recyclers: Most small, medium recyclers don't have access to knowledge and awareness on the modalities and benefits from the New Rules issued by CPCB for Plastics Extended Producers Responsibility (EPR)
2. Recyclers: There is NO organized data system for informal recycling units functioning and registration at the district and the state levels.
3. Recyclers: Limited long-term vision in state and recyclers for both Circular Economy principles; Less incentives by state towards the recycling industry.
4. Informal recycling units: Limited understanding, skills, training, awareness and capacities for adoption of legal laws required to be adhered for recycling. Therefore, NO rigorous monitoring of proper safety and fire hazard compliances, ESG status as per Rules for the informal units.
5. Informal recycling units: The informal sector recycling units not adhering to rules laid down for use, and treatment of water and effluent discharge, emissions, residues, and optimal and legal (with bills) use of electricity?
6. Informal recycling units: In the informal sector - use of old, non-productive, polluting technology. Limited exposure, expertise and experience in use of modern recycling technologies. Limited access to funds, investments and loans availability limited due to high-risk sector, not recognized as a MSME; since no legal status.
7. **Recyclers are not interested in collection and recycling of** low-density polyethylene due to high collection, transportation and processing costs.

Findings & Recommendations

1. **Immediate steps** to Create awareness; Promote startups; Invest into enterprises within Circular Economy Approaches, including Repairability, Recycling and Refurbishing & Upcycling within the Government Atal Innovation Mission/Yojana; MSME in an integrated waste management.
2. **Separate Facilitation Desk & Published materials Access** needs to be considered at RSPCB Head Office (HO) and Regional Offices (ROs) to link Waste Aggregators, Implementing Agencies, Recyclers, PIBOs for creating better and safe disposal systems, knowledge on EPR policies (different sectors) available.
3. **Regular Workshops & Operational trainings** to build skills, capacities, fire safety drills, legal laws, punitive measures, penalties & fines, and EPR.
4. **Regular Inspections, Visits** to ensure proper safety standards, and compliances are met and adopted by the Recyclers (both informal and formal).

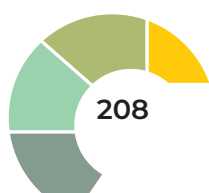


5. **LDPE forms bulk of the plastic waste (plastics is 7-9% of total waste)** generated in the state, study points 48%. Strategy at state level to collect, segregate and CEE approaches and recycling facilities in LDPE.
6. **Paper and Textiles waste forms 65% of the total dry waste.** Both these types of waste important resource for paper packaging units; Sanganer area in Jaipur has large number of such units. Better segregation at source is a must.
7. **Quantity of MLP in the state was estimated as 97.46 TPD** (19.63% of total plastic waste generated) and presents a good opportunity for MLP recycling in the state.
8. **The PET forms nearly 9.78% of the plastics and is 99% is recovered. Most of PET is collected before it even before it comes in the transported waste to the dumpsites.**
9. Out of total 126 plastic waste recyclers, only a few are registered at CPCB portal under the EPR Regulations.
10. Most of the plastic waste recyclers in the state are converting the plastic waste into low-cost, low value items like chips, granules, sutli etc. However, there are very few units which are up-cycling the waste into more valuable products which fetches good market value. **Therefore, the recyclers need to be exposed to the latest technology shows, B-2-B, fairs etc and innovative ideas** to bring more value to the recycling process thus making it a profitable business.
11. **Separate policy** on release and management of micro plastics residues generated during processing and recycling of plastics waste needs to be addressed.
12. **Recycling of the problematic plastics waste** encouraged through start-ups by providing financial incentives, technology and other required facilitation. It may be declared at priority sector by the state government.
13. **New labelling requirements for sanitary pads, wet wipes, and related materials** to inform consumers on environmental impacts, and safe disposal systems.
14. **Huge potential in plastic waste recycling and CE approaches exists** in state for more jobs, investments to boost local economy; *plastic waste recycling capacity utilization only half being put to use in state. Technology transfer and local capacities needs to be assessed.*
15. **More efforts to define the adoption of sanitary landfills approach rather than dumpsites continuation as it is affecting the local biodiversity conservation, grasslands and soil contamination.**

2. Urban Local Bodies (ULBs)

Challenges

1. Source segregation and adoption of the SWMgt. 2016, 2018 and PWM Rules 2022 at all stakeholders' levels in the state is low in the cities.
2. Segregation and collection are largely happening through informal channels of waste pickers, aggregators for only PET, rigid plastics valuable materials. The thin and MLPs needs to be equally collected.
3. Non-functional Processing Facilities e.g., MRFs, recycling facilities etc. Many require repairs and trained manpower; actual systems for operations and management in a business model

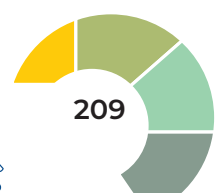
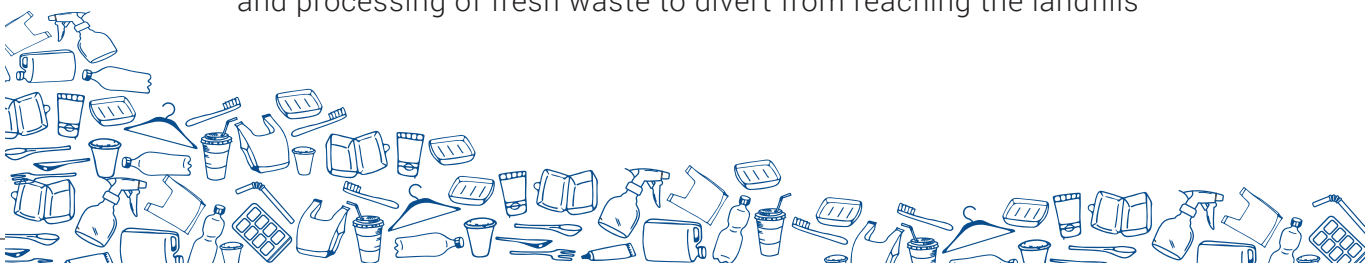


approach. The actual hand holding is required for operations; limited records maintenance in the incoming and outgoing waste processing.

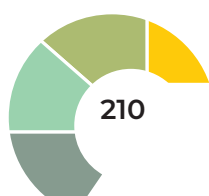
4. In Cities, processing capacity of dry waste established is less than that of the waste generated in the cities. More investments required. More jobs can be created.
5. Absence of cost effective and efficient waste processing operational systems needs to be considered and adopted at the Municipal Corporations/Municipality.
6. State policy in the adoption of the systemic waste management practices, including agencies needs to be contracted for better delivery at the Municipal Corporations/Municipality levels.
7. Small towns such as Bharatpur, Mount Abu and Bhiwadi were analyzed generating high per capita wet waste in various income categories as compared to larger cities which is mainly due tourism, and increasing industrial investments sector. The study pointed out that Mount Abu and Bharatpur also have highest per capita plastic waste generation during characterization.
8. ULBs being the key stakeholder in the management and operations of the waste in cities/ towns. ULBs do not have performance-based agreements with the concessioners, WMAs with limited clauses defined in the tender documents to invest in segregated collections, MRFs establishments, and inclusivity of the waste pickers/reclaimers.
9. No to limited cities exercise punitive measures for non-segregation of waste on the small/ bulk waste generators and HHs waste generators on the polluter's pay principle.
10. Low encouragement and limited incentives to have informal sector inclusivity at the ULB levels.
11. Poor route planning of vehicles leads to more traffic, noise, pollution, more consumption of resources. All this leads to decreased quality of life in cities and towns.
12. Not timely and proper maintenance and obsolete vehicles in use leads to increase pollution, costs and poor collection.

Findings & Recommendations

1. **Enforcement of existing policies and adoption of new policies** for augmentation of revenue generation through scientific collection, transportation, treatment and disposal of solid waste
2. **Incentivize** source segregation, home composting, decentralized management and treatment, incentivize composting/ bio methanation by bulk generators
3. **Training, Capacity building, Handholding and Exposure** (for better managed MRFs in the State & Cities) of the sanitation workers (SWs), ULB staff.
4. **Only 18% of the total municipal solid waste collected** is treated which is mainly due to low segregation of the waste at source. Out of 213 ULBs, source segregation is practiced only in 81 ULBs that is also only partially. Therefore, to increase recycling of plastic and other municipal solid waste, segregation of waste at source needs to be implemented in all the ULBs at the earliest.
5. **Bio-remediation/mining of existing dumpsites** for reclamation of land, re-use of reclaimed land for economic activities, gainful utilization of mined fractions and maximum treatment and processing of fresh waste to divert from reaching the landfills



6. **Improvisations to be captured in SOPs for material movement digitally** captured through app based - I cloud services, Mobile Apps creating traceability, transparency, and accountability.
7. **Digital monitoring through QR codes** and apps can help access levels of segregations from a ward, helping city strategies its plan of actions.
8. **Digital and GPS Systems:** Install Digital and GPS devices in vehicles for solid waste management, and optimize transport systems which has resulted in a net saving of fuel per day and check carbon emissions. Municipal authorities should carefully study these successful models and suitably adopt to bring efficiency in waste management.
9. **Best practices to be published** and shared with ULBs on regular basis.
10. **ULBs and State LSG to engage** civil society, NGOs/CBOs, Companies, start-ups to implement IEC/BCC activities for source segregation awareness campaigns and SUP ban policy to increase better discipline at all stakeholders.
11. **State to Encourage CSR expenditure for waste management** and operations in a more Circular Economy approach - **through a CSR meet in the State**
12. **In Low Income Groups:** As regarding frequency of door-to-door waste collection, only **25% of the people** living in jhuggi-jhopadis reported daily one time waste collection. In their case, **about 60% people reported** waste collection once or twice a week. Therefore, ULBs are required to also focus more on low-income group areas, and improve waste collection system in these localities.
13. **Prepare City climate change strategies,** identify emissions from waste sector and undertake GHG emission reduction through circular economy-based initiatives.
14. **Incorporate incentives in local municipal by-laws** for promotion of circular economy-based waste management approaches.
15. **Promote integrated waste management systems** in which the WMAs for ecosystem (collection, segregation, waste recycling/reprocessing and safe disposal) is same so that the concerned WMA has total control on the entire process and can be held accountable for any lapses in the waste management system.
16. **Assessing feasibility** for putting up and incentivizing biomethanation plants
17. **Waste Disposal:** It has been noticed that the waste is disposed of indiscriminately at dump sites, barring in the cities of Udaipur and Bhilwara (where greater efforts are made for segregation). This is presently in an unhygienic manner; leading to problems of health and environmental degradation of the ecosystem. Greater sedimentation and contamination of soils.
18. Encourage decentralized Material Recovery Facilities one after every 20,000 HHs, related markets and the concerned institutions. **This will encourage the idea of segregation, collection and recovery at doorstep.**
19. **RIICO industrial area, Bhiwadi:** The dumpsite located in RIICO industrial area, Bhiwadi contain high fraction of plastic waste which was 12.3%. It may be due the pre-consumer plastic waste generated by the industries located in the industrial town. Fraction of dry waste other than plastics was also high at 6.3%. Need to explore the status in other large industrial areas.

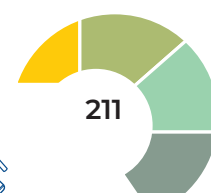
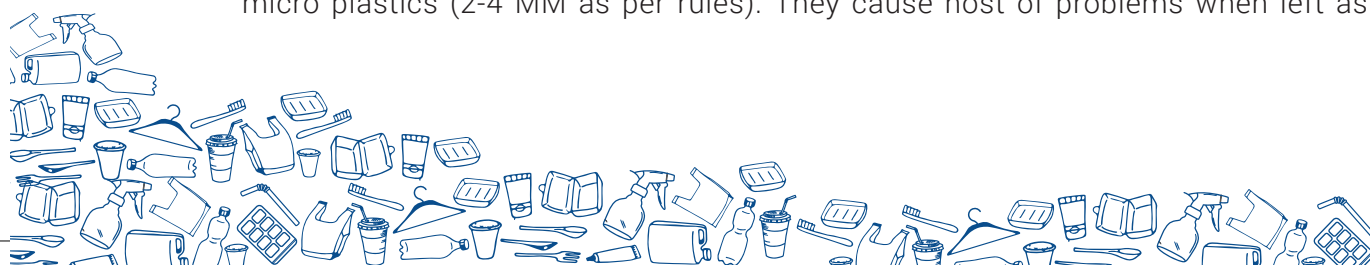


20. **Limited organized system of door-to-door waste collection**, segregation and recycling at the industrial areas. Need to establish a scientific system of non-hazardous waste management in industrial areas.
21. **Fruit & Vegetable Mandis: Waste generated from the vegetable and fruit mandis** has very high fraction nearly 92% of wet waste and extremely suitable for biogas/bio-CNG production. State Government should encourage setting up of bio-gas/bio-CNG plants inside the mandi premises by bringing out suitable policy package for private entrepreneurs to set up such plants in mandis.
22. **Dumpsite Management:** It has been observed that many of the dumpsites lack systems for leachate collection, landfill gas collection and monitoring, nor do they use inert materials to cover the waste. This results in the ground and water contamination from runoff and lack of covering, public health problems due to mosquitoes and scavenging animals. The children with the waste pickers are deeply affected through such actions.
23. Encourage pro-active IEC mechanisms with Citizen's engagement. Rath yatras (vehicles) sharing the jingles, kiosks or drop points for dry waste as plastic lao mask pao (PLMP) or Plastic lao thiala (carry bag of cotton) pao (PLTP) in the times of COVID.
24. Encourage wall paintings and many innovative ideas as shared in the various MOHUA/State SBM department guidelines. Continuous engagement with the visual and print media.
25. Ensure technology adoption, in route optimization of vehicles, app-based approach during collection and digital flow of data at the city level.
26. City digital technology supported control room/platform for proper digital monitoring systems in place for managing the complex systems of the waste management.
27. Strengthen RWAs to take responsibility of segregation and collection. Provide incentive systems in partnerships. Promote to have legal agreements.
28. Informal sector workers encouraged to form a local institution e.g., cooperative, companies and contribute to the collection aspect of the solid waste management value chain.
29. The informal sector should be provided space to work within the city and boundary limits.
30. Establish transparent stakeholder information with database entities on the collection, segregation, transportation, processing and disposal of waste.

3. Single Use Plastics (SUPs)

Challenges

1. Consumer behavior demands alternatives; which are not easily available at an affordable price in the market.
2. There is limited availability of cost-effective technologies to make alternative products to meet the demand of the market.
3. Limited experience in recycling, alternative to manage multi layered plastics, which are light and often littered and collected.
4. Problems associated with Single-Use Plastics (SUPs) are well documented. Plastics do not break down or biodegrade, instead they fragment into smaller pieces, known as micro plastics (2-4 MM as per rules). They cause host of problems when left as litter in



the ecosystem, they impede the flow and adsorption of water into soil and waterways, contaminating them and exacerbating a threat to the life of species dependent on such soil and water.

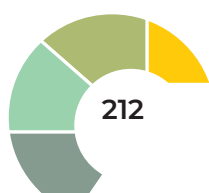
Findings & Recommendations

1. **During survey of SUP Alternate Manufacturing units**, study revealed that only 15 units have been setup so far for manufacturing of SUP alternatives. Financial and other incentives as low GST rates; low taxes should be encouraged to set up startups.
2. State or Central government set-up a committee/agency for standardization and evaluation of SUP alternates; which are environmentally sustainable, later introduced in the market.
3. Intensive awareness needs to be launched to educate general public including school kids and sellers about the problems in management of SUPs, therefore needs to be refused to use, reduced in consumption.
4. In the case of **Ghana**, UNDP supports Government's agenda and as such, citizens support the implementation of the Plastic Waste Management Policy.
5. We need to learn that many UN bodies like UNEP, UNDP are itself working to ensure and put in place determined measures as part of its own operations – mandatory sensitization of all staff; banning the use of many single-use plastics from offices, cafeterias, catering and events with immediate effect and updating UNDP's sustainable procurement policy and promoting the lifetime cost approach for more sustainable options can be seen.
6. Need products to be designed to ease recycling, refurbishing. Industry and retailers should try to reduce plastic packaging.
7. Ensure that ULBs should provide more and better collection facilities for plastic waste. We think people should be educated on how to reduce their plastic waste. May be also think consumers should be charged/fined for using SUP goods and cutlery.
8. Like Europe we need to also ponder what specific SUPs need to be banned along the coast line. PIBOs to contribute to awareness-raising, clean-up, collection, waste treatment and introduce new labelling on the environmental impact of the product and recycling options for consumers.
9. Keeping, Sustainable Development Goals (SDGs) framework in perspective, the need is to **build an ecosystem wherein all stakeholders are pooling together their efforts**, instead of governments working in silos, in order to curb the danger caused by SUPs.

4. Co-processing Units (Cement Manufacturers)

Challenges

1. **Mixed waste** is coming as RDF with high moisture content (25-40%) and low calorific value (1500-2000 CV).
2. **High maintenance cost** is required by Cement Co processors during processing to segregate stones, silt and sand.
3. **Co-processors increasing expenditures** in processing of low-quality RDF is limiting them not to use more RDF materials as alternative fuel. Restrict only for mandatory CPCB guidelines; lest remain on coal. (which is not an environment friendly due to its high cost of



mining and ash content).

4. **Poor calorific value in RDF** is leading for additional combustible (agro base) materials.
5. **Unable to track** the quantity of plastic waste received in RDF for EPR certification.
6. Plants are running below capacity.
 - JK Cement: Total Processed RDF: 16765.35
 - MTPA Capacity: 110,000. (Total Processed from Rajasthan: 662 MTPA (3.94%)
 - ULTRATECH: Total Processed RDF: 18522.38
 - MTPA capacity: 219,000, (Total Processed from Rajasthan: 16123MTPA (7.36 %)

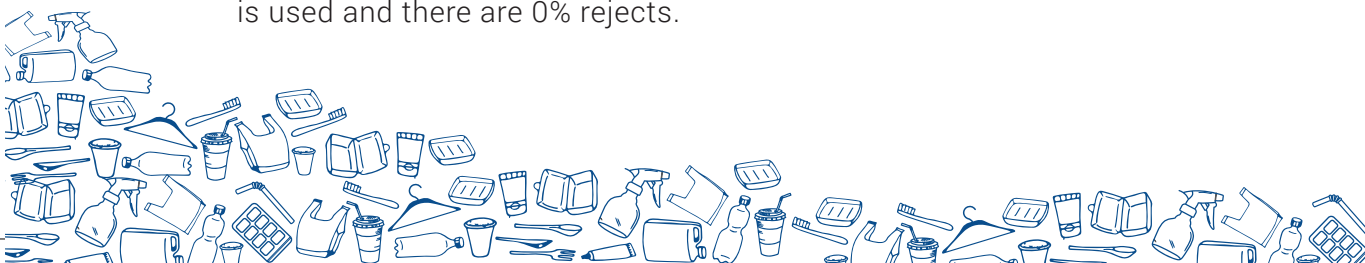
Findings & Recommendations:

1. **RSPCB to give directives to co-processors** that 1st priority for the co processing of waste to be the waste generated from Rajasthan. (% of waste co-processed from the state is very low).
2. **RSPCB to give directives to SBM, ULBs and Waste Management Agencies (WMAs) working with ULBs** to provide good quality RDF; should not have stones, silt and sand; and low moisture content.
3. **RSPCB to organize roundtable discussion on urgent basis** with ULBs, MRF operators, waste management agencies, co-processing units and RSPCB officials.
4. **ULB should regularly monitor RDF quality** that is going for co-processing units.
5. **Segregated waste collection** at source will get quality RDF.
6. **Co-processing units do not have facility**, systems to assess various fractions of dry waste (largely plastics) in RDF.
7. **The ULB should keep track** of the different types of plastics/all plastics used as RDF in cement plants. This will also help in fulfilling EPR certifications
8. ULBs/PIBOs to encourage Waste Management Agencies for collection and processing of plastics in rejected waste in cement plants to avail Plastics EPR.

5. Plastic Manufacturers, Industries and PIBOs:

Challenges

1. Gaps in the data, list of the manufacturers available with RSPCB; LSG, DIC departments and others (secondary sources).
2. The plastic manufacturers lack knowledge on Plastics EPR; how to get registered, and access plastic EPR benefits.
3. Illegal dumping of pre consumer waste after processing as rejects/discards. This is more prevalent particularly at RIICO and other industrial estates. The existing systems encourages dumping at a charge at these sites.
4. Largely multi state PIBOs were registered with CPCB. Those only in the state are not registered in some cases with RSPCB.
5. PIBOs to ensure that the products are manufactured in such a way that recyclable material is used and there are 0% rejects.



Findings & Recommendations

1. Centralized digital data system needs to be maintained. Real time changes need to be captured, automatically updated with capacity details, facility data requirements.
2. RIICO defines policy guidelines on the pre-consumer waste management for Bhiwadi and other similar industrial areas.
3. Total 42 industrial units were surveyed in 15 cities; and the units were questioned as to how satisfied they were with the city infrastructure, services managing the waste generated by their industry. 14 industries responded they were not satisfied; whereas 10 units mentioned partially satisfied in their respective cities. Therefore, need for improvement in waste management services in the industrial areas. Promote better scientific collection, and recovery.
4. PIBOs to address refurbishing, redesigning on product packaging.
5. New PIBOs finding difficult to get registered with CPCB/state authorities.
6. PIBOs to prepare and submit action plans on plastics EPR periodically to RSPCB.
7. **PIBOs to invest under CSR & EPR into strengthening the waste management infrastructural support (MRFs) through waste management agencies or ULBs.**
8. The quantity of packaged plastic materials has increased significantly due to packaged products use, both through food beverages (drinks, juices) etc. and online purchases of goods. More consumers awareness on this is required.
9. All industrial units, including plastics, pharma should give their plastic waste to only the authorized recyclers/processors.
10. Set up an **integrated recycling park** including different sector recycling units; cross-learnings from similar centers established in the country.

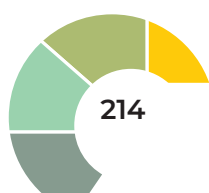
6. Material Recycling Facility (MRF)

Challenges

1. Total 11 MRFs surveyed but only five operational, but to limited capacities. Teams handling MRFs require trainings, exposure and hand holding in management, operations and data management in a more business case scenario.
2. In most of the MRFs, limited records both manual and digital on the dispatch/sale, purchases were available.
3. No centralized data records available on waste processing and tracking at State level.
4. Supply of mixed waste at MRFs is a major problem that impedes smart management & operations.

Findings & Recommendations

1. In the cities of Ajmer, Alwar, Barmer, Bhiwadi, Jaipur, Jodhpur, Mt Abu, Pali and Udaipur, MRF facilities installed, except Barmer, Pali and Udaipur, all the MRFs facilities found non-functional.
2. ULBs needs to consider set up proper teams to manage MRFs in a business model or transfer the MRFs to waste management agencies **(WMAs) on a charge basis for the**



waste. Technology, machinery installed requires an upgradation.

3. Introduce bio-metric technology in the MRFs to record waste workers attendance by name. The information can be uploaded to a management information system.
4. RDF and recyclables quality ensured so that it can fetch better price.
5. Segregated MLPs, thin LDPE materials from MRFs to be sent to registered recyclers and avial EPR credits.

7. Waste Management Agency (WMA)

Challenges

1. ULBs to streamline regular and timely payment of service fees to waste pickers and collectors for door-to-door garbage collection.
2. Overcome the poor quality of segregation process from solid biodegradable waste incoming at MRFs.
3. Lack of energy efficient, sustainable technology's introduction for achieving better segregation and recovery of dry waste fractions.
4. Poor economic viability of ongoing dump-site remediation.

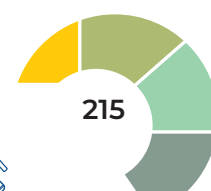
Findings & Recommendations

1. Ensure 100% collection and source segregation of the waste. All the segregated waste recovered should be processed and recycled.
2. Reduced landfills through constructive handling and processing of waste as a resource. Regular assessments of the waste that it is not contaminated.
3. Integrate and Inclusivity of Safai Sathis, kabadiwalas, aggregators and other stakeholders in waste management system.
4. Performance based contracts for WMAs on segregated waste collection, processing and treatment should be performance based, linked with quantity and quality of outputs in a timeframe.
5. Startups and NGOs are engaged in Jaipur, Udaipur and other towns in door-to-door waste collection, segregation and other activities. Need to encourage and incentivize them with new technologies for safe disposal.
6. WMAs, to emphasis in reuse, refurbishing, upcycling, reparability of waste in a circular economy approach.
7. Simplifying the process of environmental clearances for waste processing plants to foster installation and commissioning aligned with SBM 2.0 mission milestones

8. Littering Hot Spots

Challenges

1. Littering hot spots emerging due to poor collection, no penalties to citizens, identified at road sides, housing corners; empty vacant plots; market areas; more prominent temples etc.
2. Citizens poor behavior and indiscipline in self-disposal of waste.



Findings & Recommendations

1. During survey, 75 littering hot-spots were identified in 15 cities. About 51% of these hot-spots were in market areas; weak waste collection system in market areas. The ULBs need to strengthen collection system in market places.
2. Littering should be penalized. Measures initiated to stop littering of the waste. On spot fines to the road side shops, and kiosks.
3. The littered waste hotspots should be collected and littering spots to be cleaned, created into gardens.
4. Citizens should be made aware to stop littering of the waste.

9. Waste Pickers

Challenges

1. Informal Sector waste pickers, sweepers are not mainstreamed. Bereft of legitimate and accrued benefits as citizens; they are important pillar in the waste management sector.
2. Oppressed and exploited by all the stakeholders in the ecosystem and forced to live and work in unhygienic and uncouth conditions.
3. All payments for waste pickers to be made through bank accounts system so that all can access the direct benefits under government schemes.

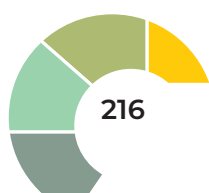
Findings & Recommendations

1. ULBs to have baseline and demographic profiling, inclusivity of waste pickers.
2. Survey of waste collectors (safai sathis) done in all the 15 cities to understand the waste collection mechanism and their socio-economic conditions. It was found nearly 80% of waste collectors are not extended safety measures and are exposed to injuries/infections and ill health. Further, 57.7% felt poor health symptoms since engaged in waste collection. Therefore, need to improve working conditions of waste collectors.
3. Survey revealed that 78% waste collectors have an Aadhar Card; 59% also have a ration card. Around 53% waste collectors have bank accounts and 39% and 23% of the waste collectors are able to arrange for education for their kids and 18% get some kind of pension. 10% also have family health cards whereas 9% have taken some kind of insurance. **Compelling need for inclusivity of waste collectors.**
4. Trainings & capacity building for the waste pickers/collectors working in the collection of segregated waste - in the use, upkeep and maintenance of machines at the material recovery centres. Waste management agencies provide technical support.

10. Scrap Dealers

Challenges

1. Most of scrap dealers are in informal sector. Do not want to get registration as MSME, Shop- act or recyclers. Most of them dealing in CASH trade and NO GST No. No incentives.
2. Limited access to knowledge, information on laws, assistance (financial) and recognition, inclusivity of their role by LSG, MSME Department or ULBs.



Findings & Recommendations

1. 72% of waste collectors sell their waste to small/large Kabadiwalas. Only 3.68% sell their waste to recyclers and only 2.37% sell to the factories. This collected waste mostly ends up with Kabadiwalas from where it enters into informal recycling.
2. Need to develop a robust system for channelization of waste collected from the waste collectors to the recyclers; to promote formal recycling. ULBs to consider developing the material recycling centers directly or with recycling partners.
3. Government support and promotion should be done under the respective Acts to ensure better inclusivity and ensuring the requisite knowledge and information is shared with them..
4. They can also be considered as a SMART channel partner in the ecosystem for EPR benefits.
5. Prepare technical guidelines for environmental performance standards of dry waste recycling, based upon each material stream.

11. NGOs, CBOs and Self-Help Groups

Challenges

1. Not many Waste Management Agencies (WMAs) NGOs, SHGs or community-based institutions working in the state of Rajasthan in the waste value chain in cities. More so not much in the organized, transparent waste management system.
2. Many NGOs, CBOs, WMAs, lack proper real data management systems adapted by them on waste; leading to low trust and creditability in accounting systems with key stakeholders.
3. Limited adoption of digital technologies for monitoring, maintaining transparency and traceability of waste flow systems.
4. Limited capacities in managing better business decisions with inventory management, and tracking; and inbound and outbound activities, planning and management at MRFs in Cities.
5. Limited knowledge base in operational insights with material flow analysis, cost controls.

Findings & Recommendations

1. Strengthen NGOs, SHGs, WMAs, and waste companies working in the field of waste management in the range of issues, material flow analysis at MRFs, business models, digital applications, and EPR applications.
2. Partner ULBs in waste collection, segregation, education and improvement of lives of waste pickers, integration of other stakeholders such as Kabadiwalas in the formal waste management system.
3. SHGs should be formed with the members of the waste pickers to institutionalize decentralized waste management.
4. Better segregation and processing can be insured through the engagement of the SHG members for long term sustainability and institutional building. .



12. Citizens

Challenges

1. Lack of awareness and sensitization; a detailed assessment will cover the behavior.
2. Non-Segregated waste at HHs level will not to be collected by the ULB or the Concessioner. Proper measures defined.
3. More systemic engagement required by the ward councillors with citizens in finding solutions, Grievance/public addressable systems not in place therefore leading to limited trust between stakeholders. Open information access through a common Citizens platform of a centralized control room with public helpline.
4. No Incentives, (or penalties) and other benefits extended for segregation at Household (HH) levels.

Findings & Recommendations

1. Proper segregation benefitting all stakeholders with better returns, incomes in dry waste & plastic waste value chain.
2. Incentivize systems adopted for source segregation for the citizens, several cities have announced property tax rebate of 2-6 percent for source segregation.
3. Residential Societies should work in tandem with Municipalities to ensure 100% door to door collection and segregation, creating awareness about ban on SUPs and stop littering in their colonies/residential societies.
4. Survey of the citizens conducted across all the 15 cities to measure understanding of citizens towards issues related to waste management and to study their behavioral aspects.
5. A total 767 citizens from various socioeconomic groups and strata of the society were interviewed and data obtained was analyzed. During the analysis it is revealed that only small percentage of citizens (40%) have any idea about waste recycling and only 42% had no idea about the ban on single use plastic items.
6. Set up 24-hour city helpline for grievances addressable through a ULB driven central control room.

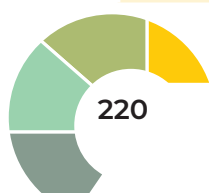


Actionable Points for stakeholders

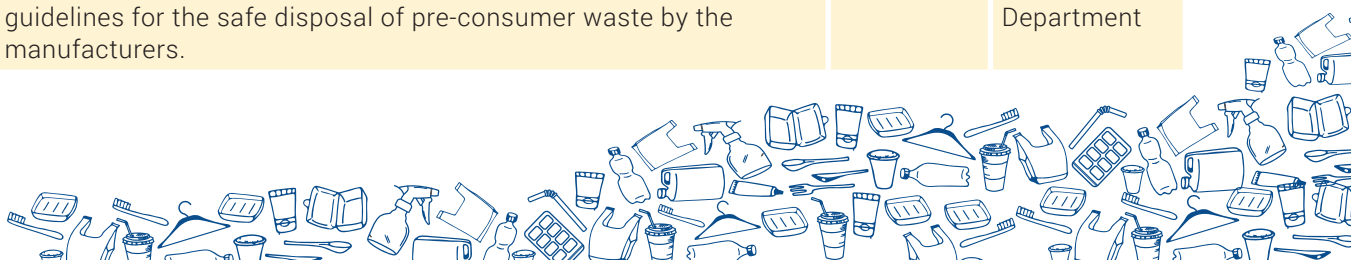
S. No.	Action Points	Timeline	Monitored By
Actionable Points for Plastic Recycling Units:			
1	An Advisory Committee to be constituted under the chairmanship of the Chief Secretary /as the case be; to ensure follow up and monitoring of all the actions and recommendations from the report. ONE Member at least each from RSPCB, and Government LSG a must. A retired legal person/NGT Judge can also be considered to be a member by State.	Immediate	RSPCB/LSG
2	State to develop White Paper, Strategy for Start-Ups, MSMEs in Plastics, MLPs, cardboard and textiles recycling with CE approaches.	6 months	MSME Department
3	RSPCB to issue directions to Government LSG, Industries Deptt. MSME, to promote decentralized recycling units for LDPE, PP, PPE plastics at district or ULB level.	1-3 months	RSPCB
4	RSPCB to issue instructions/circular to its Regional Offices (ROs) to hold decentralized awareness workshops on laws, statutory compliances ensure fire, safety, insurances, and inclusivity of informal sector, waste pickers. Also, on EPR benefits for state and Recyclers.	Immediate	RSPCB
5	RSPCB to hold workshops, issue letters/notices to all the plastic waste recyclers to get registered at the CPCB portal immediately to draw benefits under EPR least face paneities.	1-3 months	RSPCB
6	RSPCB write to State to link National and International Exhibitors to have an ecosystem approach and exposure on latest technological access, cost-effectiveness, interventions for localized recyclers, waste management agencies, start-ups. E.g., IFAT, MRAI, AIPMA, RACE and PLASTSIND.	1-3 months	RSPCB
Actionable Points for Urban Local Bodies (ULBs):			
1	LSG to issue instructions to all ULBs for compliance. Mandatory segregation of waste at source to be done at households, bulk waste generators, small aggregators - collection of <u>only segregated waste</u> by ULB or its service provider. Proper <u>decentralized waste collection plans ward wise, punitive methods</u> need to be published in newspapers.	Immediate	LSG
2	Performance based Contracts between ULBs & Service Providers to be signed, defining the TORs for informal sector inclusivity; public awareness actions and defined collection points in innovative matters like KOISKs in Markets and common places for Self-Deposit systems and get incentives.	1-3 months	LSG/ULBs
3	Dedicated policy for management of landfill facilities outside the jurisdiction of the ULBs which will be mandatorily operated on the basis of a landfill fee model – such policy will also impose ban on dumping of wet waste in the landfill (chargeable to the ULBs or concessionaire depending on the case).	1-3 months	ULBs
4	State/RSPCB to issue directions to LSG and ULBs for capacity building, training and exposure and for Sanitation Workers, ULB and concerned staff of related departments in sustainable management of waste.	Immediate	LSG/ULBs



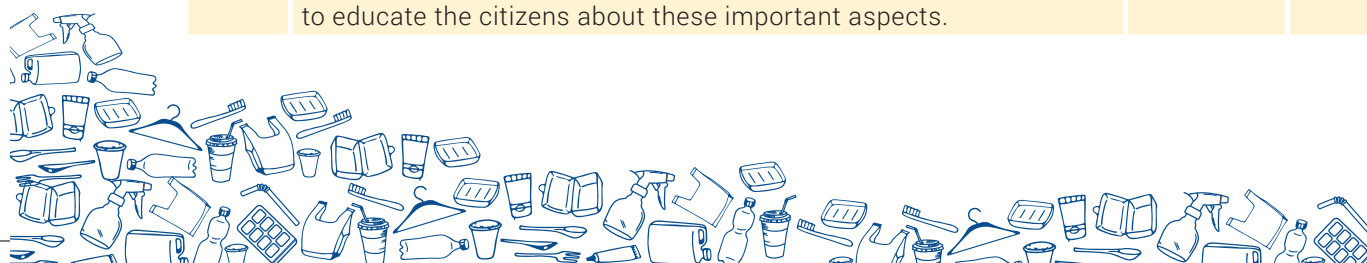
S. No.	Action Points	Timeline	Monitored By
5	State Government should encourage setting up of bio-gas/bio-CNG plants inside the mandi premises by bringing out suitable policy package for private entrepreneurs to set up such plants in mandis. Can be on a PPP mode.	1-3 months	LSG/MSME
6	LSG to develop a Communication Strategy and Plan (sync with Waste management plans) for behavior change for effective source segregation, collection of waste-	Immediate	LSG/ULBs
7	State LSG to invest in setting up decentralized MRFs in partnerships with Central Funds and CSR through WMAs.	1-3 months	LSG/ULBs
8	State to establish a scientific system of non-hazardous waste management in industrial areas in the state.	1-3 months	ULBs/RIICO
9	RSPCB to write to State LSG for introducing digital technological interventions (APPS, GPS etc.) for better accountability and transparency to have greater EPR benefits.	6 months	ULBs
Actionable Points for Single Use Plastics (SUPs):			
1	State Government needs to encourage, incentivize more SUP alternate manufacturers, users to establish their units in the state.	1-3 months	RSPCB
2	RSPCB to issue directions on SUP Policy to ULBs, State LSG to involve Civil Society creating better visibility and sensitivity NOT to use SUPs.	Immediate	LSG/ULBs
3	Citizens round tables in the Cities through RSPCB Regional Offices (Ros) needs to be considered. Aggressive engagement with Citizen's forums, industrial associations etc.	1-3 months	ROs/ULBs
4	State to all Offices to adopt their own greening plans and share success stories.	6 months	RSPCB/LSG
Actionable Points for Co-processing Units (Cement Manufacturers):			
1	RSPCB issues directions , and monitors good quality RDF from ULBs or its service providers; WMAs; State LSG to Co-processors- Cement Plants.	1-3 months	RSPCB
2	ULBs issue strict directions in monitoring RDF quality to WMAs and City Waste Concessioners/Agencies. It should meet the standards laid down by Ministry of Urban Development and Housing, Gol.	1-3 months	ULBs
3	RSPCB pen to ISI on RDF standards for assessment of the quality of RDF waste.	1-3 months	RSPCB
4	Directions and systems of strict enforcement by RSPCB to all stakeholders.	Immediate	RSPCB
5	RSPCB to issue directions to the State and Agriculture Deptt. to send stubble as valuable resource for co-processing than burning to increase the calorific value.	1-3 months	State Agriculture Department
Actionable Points for Plastic Manufacturers, Industries and PIBOs			
1	RSPCB to have at HQ & ROs level workshops with plastic and other manufacturers at least once a year and regular updates to be shared through digital social media network.	1-3 months	ROs-RSPCB
2	RSPCB writes to the Industries Department to act on policy guidelines for the safe disposal of pre-consumer waste by the manufacturers.	Immediate	Industries Department



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S. No.	Action Points	Timeline	Monitored By
3	RSPCB to keep a regular check through ROs on the registration of the PIBOs.	Immediate	ROs-RSPCB
4	RSPCB directions for online agencies, and Food suppliers on not use SUPs.	Immediate	RSPCB
Actionable Points for Material Recycling Facility (MRF)			
1	RSPCB to write the state LSG to be managed in a more business model by ULBs or its partners.	6 months	LSG/ULBs
Actionable Points for Waste Management Agency (WMA)			
1	RSPCB with ULBs to draft the standard operating procedures for working in a more business model approach with WMAs in Cities.	1-3 months	ULBs
2	WMAs need to be more focused in the pickup and creating a more systemic approach.	1-3 months	ULBs
3	RSPCB or other Regulatory functional authority create dedicated rule for management of nonbiodegradable waste (especially for paper, glass, ceramic, metals, textiles, tyres and rubbers, etc.) with specific focus on source segregation (primary and secondary) and collection of segregated dry waste for maximum recovery and recycling efficiency.	1-3 months	ULBs
Actionable Points for Littering Hot Spots			
1	RSPCB to write to LSG to ensure that littering hotspots are tackled and effective actions put in place. Penal actions defined through posters, hoardings and mass media.	Immediate	LSG/ ULBs
Actionable Points for Waste Pickers			
1	RSPCB to ensure through state LSG or social welfare department to have a comprehensive study of their existence, numbers and working and living conditions.	6 months	LSG/ULBs
2	RSPCB to write to the state that the waste pickers, waste collectors given dignity and respect as safai sathis or safai mitras and not rag pickers. State may enact an act for their dignity at work stations and inclusivity in the society.	1-3 months	ULBs
Actionable Points for Scrap Dealers			
1	RSPCB to have awareness sessions, workshops at ROs and HQs levels; to integrate them as an ecosystem partner and to mainstream them into formal channel, strengthen the GST collections.	1-3 months	State GST Department
Actionable Points for NGOs, CBOs and Self-Help Groups			
1	RSPCB to write to the concerned department for provide incentives to NGOs, SHGs working in the field of waste management and lay down proper systems and procedures.	1-3 months	ULBs
2	Regular trainings and capacity building workshops organized through the RSPCB and the City Regional offices of the RSPCB, trade associations, etc.	1-3 months	ULBs
Actionable Points for Citizens			
1	RSPCB to ULBs and State LSG to have strict segregation systems implemented.	Immediate	ULBs
2	State government should launch a massive public awareness drive to educate the citizens about these important aspects.	1-3 months	ULBs



S. No.	Action Points	Timeline	Monitored By
3	State government should launch a massive public awareness drive to educate the citizens about these important aspects.	Immediate	ULBs
4	Cities Commissioners/Mayors who have adopted rebates, incentives should be encouraged and supported by state to deliver on their policy declarations.	1-3 months	ULBs
5	Set up 24-hour city helpline for grievances addressable through a ULB driven central control room. Proper and timely actions monitored on daily basis.	Immediate	ULBs

References in the Report

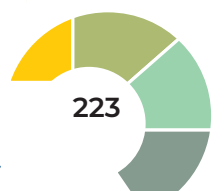
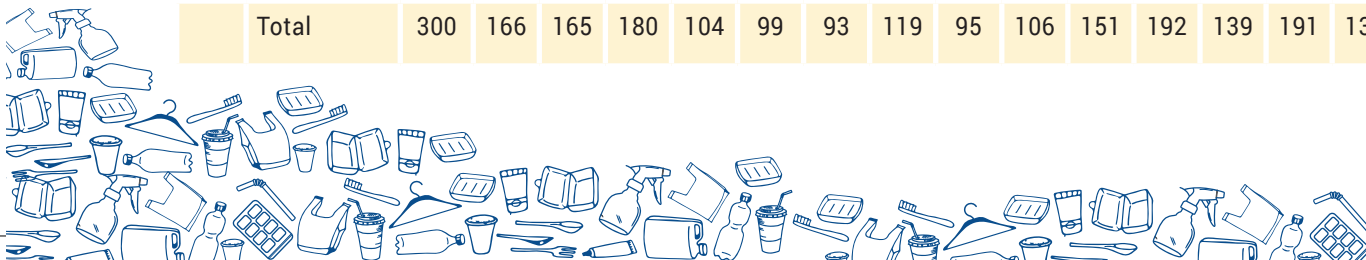
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12. <https://aviralganga.in/admin/reports/upload/Baseline%20Launch%20Report%2020210823-1630041260.pdf>
13. <https://tinyurl.com/2p8nvp93>
14. <https://eprplastic.cpcb.gov.in/#/plastic/home/nationalDashboardSpcb>
15. <https://pib.gov.in/PressReleasePage.aspx?PRID=1799170>



Annexures

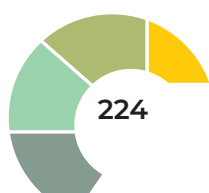
1. City-Wise Survey Count

	Stakeholders	Jaipur	Udaipur	Bhilwara	Ajmer	Bharatpur	Kota	Bikaner	Jodhpur	Ganganagar	Pali	Barmer	Neemrana	Bhiwadi	Alwar	Mount Abu	Total
1	HH/ Citizens	53	57	51	69	42	45	44	51	50	45	63	59	28	60	50	767
2	SUPS Market Suppliers	20	21	21	20	20	19	11	18	16	17	26	32	20	33	20	314
3	SUPB Market Buyers	21	20	20	20	18	20	8	19	7	19	29	30	17	25	21	294
4	Scrap Dealers	9	10	10	10	4	6	6	7	4	5	2	10	5	10	11	109
5	Industrial Units	4	5	3	4	4	-	5	1	2	2	3	4	1	4	-	42
6	Manufac- turers	161	17	13	21	4	3	4	4	2	4	3	19	51	20	2	328
7	Waste Collectors/ Safai karmi	6	13	24	10	5	9	7	9	4	6	16	15	-	10	10	144
8	NGOs/ CBOs	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3
9	Littering Hotspots	5	5	7	5	4	3	2	4	4	2	4	6	4	5	5	75
10	Material Recovery Facilities	1	1	1	1	-	-	-	1	1	1	1	-	1	1	1	11
11	Plastic Recyclers	8	9	10	7	-	-	3	1	2	-	-	9	25	13	3	90
12	Waste Aggregators	3	1	3	5	1	2	-	2	1	1	2	2	1	3	1	28
13	Waste Management Agencies	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	14
14	ULB Municipal Officials	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
15	PIBOs	7	-	-	1	-	-	-	-	-	1	-	-	-	-	-	9
16	Bulk Generators	0	2	0	5	0	0	0	0	0	1	0	5	1	5	5	24
	Total	300	166	165	180	104	99	93	119	95	106	151	192	139	191	131	2231

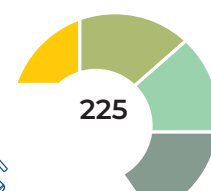


2. City-wise sample details of Waste Characterization

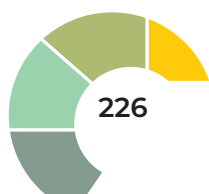
City Name:	Ajmer
Low Income	Nagphani, Ajmer (Ward no 7)
Middle Income	Prem Nagar (Ward no 5)
High Income	Panchsheel (Ward No. 76)
Market	Dargah road to ana sagar jheel
Mandi	Karyalaye Krishi Vpaj Mandi Samiti (Phal-Sabji)
Hotel	Hotel Bravia, Ajmer
Institution	St. Stephen School
Landfill	Dumpsite Ajmer
City Name:	Alwar
Low Income	Dilli darwaza ward-11 Kachchi Basti
Middle Income	Pahadganj Colony
High Income	Arya Colony (SCHEME NO 1), Ward 7
Market	Naoki circle,
Mandi	Kristin upaj mandi alwer
Hotel	Ashoka tourist, Atlantic
Institution	Institutions were closed
Landfill	Dumpsite Alwar
City Name:	Barmer
Low Income	Gandhi Nagar Colony
Middle Income	Rae Colony (ward no 53-54)
High Income	Mahaveer Nagar
Market	Station Road Market
Mandi	Sabji mandi barmer
Hotel	Hotel kailash international
Institution	Army Camp, Barmer
Landfill	Dumpsite Barmer



City Name:	Bharatpur
Low Income	Kachhi Basti (Ward No 65)
Middle Income	Shyam Nagar, Surajmal Nagar (Ward 55)
High Income	Krishna Nagar, Colony
Market	Bijli ghar road
Mandi	Nai mandi bharatpur
Hotel	Lakshmi Vilas palace
Institution	Institutions were closed
Landfill	Dumpsite Bharatpur
City Name:	Bhilwara
Low Income	Ambedkar Nagar
Middle Income	Mahaveer Nagar
High Income	Shastri Nagar, Bhilwara
Market	Main market bhilwara
Mandi	Bhilwara Mandi
Hotel	Sample was not taken
Institution	Mahila Vidyalaya, Bhilwara
Landfill	Dumpsite Bhilwara
City Name:	Bhiwadi
Low Income	Satlka, Bhiwadi
Middle Income	UIT Colony
High Income	Bhagat Singh Colony
Market	Main market
Mandi	Upaj mandi
Hotel	Country inn, Golden tulip
Institution	Institution were closed
Landfill	Dumpsite Bhiwadi



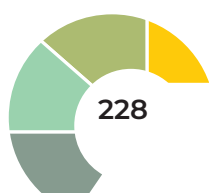
City Name:	Bikaner
Low Income	Ward No 53
Middle Income	Ward No 65
High Income	Ward No 12
Market	Main market
Mandi	Bikaner upaj mandi
Hotel	Hotel sagar, hotel chirag
Institution	Institution were closed
Landfill	Dumpsite Bikaner
City Name:	Ganganagar
Low Income	Rana Pratap Colony
Middle Income	Vinoba basti
High Income	Indira colony
Market	Gole Bazar ward-35
Mandi	Sabji mandi ganganagar
Hotel	Grand Ashish
Institution	Institution were closed
Landfill	Dumpsite Ganganagar
City Name:	Jaipur
Low Income	Jagannathpuri Basti
Middle Income	Krishna Nagar, Sachhivalaya Colony 1/2
High Income	Mahavir Nagar, T BLOCK (Ward no 128)
Market	Atish market or near by area
Hotel	Raj Vilas Hotel, Jaipur
Institution	Malviya National Institute of Technology Jaipur
Landfill	Dumpsite Jaipur
City Name:	Jodhpur



Low Income	Madhena Colony
Middle Income	Subhash Chok
High Income	Vidhya Park, Suhash Colony, Patel Nagar
Market	Sector-9 main market
Mandi	Tree house rajbagh
Hotel	Sriram International, Hotel Prince, Hotel Mansion, Hotel Firoz,
Institution	Balniketan School, Badalchand School, Mahavir Public School
Landfill	Dumpsite Jodhpur
City Name:	Kota
Low Income	Rangbari kachchi basti
Middle Income	Dadabari colony
High Income	Gayatri vihar
Market	Kota bharu central market
Mandi	Mahavir nagar sabji mandi
Hotel	Hotel navrang, hotel calark
Institution	Institutions were closed
Landfill	Dumpsite Kota
City Name:	Mount Abu
Low Income	Bapu basti, bhil colony
Middle Income	Gua gaoun, choudhry gali
High Income	Dhelwara
Market	Main Bazar, chaha museum to nirmala school
Mandi	Gujarat hotel to main market
Hotel	Hotel blue valley
Institution	Army cantonment
Landfill	Dumpsite Mount Abu

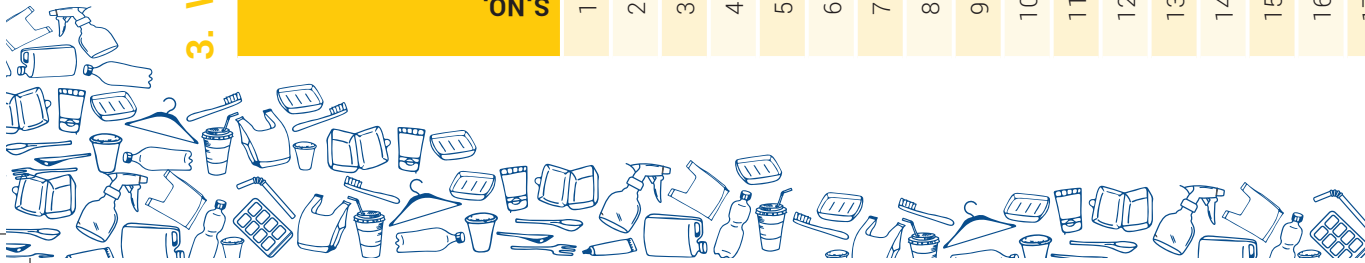


City Name:	Neemrana
Low Income	Mahaveer Dhera
Middle Income	Tehsheel Area
High Income	Krishna Tower
Market	Tehsheel Area
Mandi	Street mandi
Hotel	Hotel royal orbit
Institution	Institutions were closed
Landfill	Dumpsite Neemrana
City Name:	Pali
Low Income	Mahaveer nagar kachchi basti
Middle Income	Girasiya colony Ward-23
High Income	Sindhi colony
Market	SurajPol Main Market
Mandi	Mastan Baba Sabji Mandi
Hotel	District Club Pali , Kesar Hotel and Kheteswar Restaurant
Institution	MBM School, Bangad College, BR Birla School, Baliya School
Landfill	Dumpsite Pali
City Name:	Udaipur
Low Income	Paras swaraj nagar, Kachchi Basti
Middle Income	Rao ji ka hata area
High Income	Uday pole area, golamber road
Market	Market-Small street Shops mix
Mandi	Udaipur mandi
Hotel	Hotel sarover, marigold
Landfill (RDF)	Reject waste after secondary segregation at MRF as RDF
Landfill	Dumpsite Udaipur

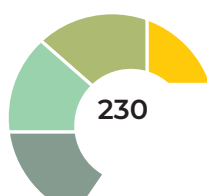


3. Waste Characterization of All ULBs of Rajasthan:

S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
1	JAIPUR	JAIPUR GREATER (MC)	0.39	866.74	59.89	14.03	12.65	3.20	19.90	13.53	70.92	654.98	17.64
2	JAIPUR	JAIPUR HERITAGE (MC)	0.43	641.70	27.43	6.17	17.75	1.70	9.44	10.70	39.92	515.39	13.21
3	KOTA	KOTA	0.40	569.11	19.81	4.39	12.13	0.85	4.85	6.09	29.49	484.01	7.50
4	JODHPUR	JODHPUR	0.44	556.22	18.27	3.15	17.17	1.62	9.40	7.33	29.08	457.96	12.24
5	BIKANER	BIKANER	0.39	311.55	5.90	0.19	1.25	0.73	6.46	2.61	18.18	263.95	12.30
6	AJMER	AJMER	0.29	194.00	12.07	1.34	3.36	0.97	2.35	1.69	18.19	149.91	4.12
7	UDAIPUR	UDAIPUR (M CL)	0.32	174.83	13.35	1.18	4.99	0.70	4.29	3.56	13.34	129.21	4.23
8	BHILWARA	BHILWARA (M CL)	0.29	126.63	10.68	1.57	7.90	0.33	1.91	1.00	13.29	86.71	3.24
9	ALWAR	ALWAR (M CL)	0.49	188.54	8.84	0.97	6.52	0.61	0.63	1.77	10.30	153.82	5.08
10	BHARATPUR	BHARATPUR (M CL)	0.54	168.91	10.65	1.29	3.50	0.22	2.27	3.43	11.87	132.68	3.01
11	SIKAR	SIKAR (M CL)	0.54	158.99	10.02	1.21	3.30	0.21	2.13	3.23	11.18	124.89	2.83
12	PALI	PALI (M CL)	0.32	89.62	7.04	1.12	6.36	0.24	1.36	0.80	7.64	62.74	2.32
13	GANGANAGAR	GANGANAGAR (M CL)	0.46	126.18	2.36	0.28	1.32	0.30	2.57	0.95	7.84	106.94	3.62
14	TONK	TONK (M CL)	0.32	64.39	5.06	0.81	4.57	0.17	0.98	0.57	5.49	45.08	1.66
15	AJMER	KISHANGARH (M CL)	0.32	60.34	4.74	0.76	4.28	0.16	0.92	0.54	5.15	42.24	1.56
16	HANUMANGARH	HANUMANGARH (M CL)	0.46	84.83	1.59	0.19	0.89	0.20	1.73	0.64	5.27	71.90	2.43
17	AJMER	BEAWAR (M CL)	0.32	56.68	4.45	0.71	4.02	0.15	0.86	0.50	4.83	39.68	1.46
18	DHAULPUR	DHAULPUR (M)	0.32	49.08	3.86	0.61	3.48	0.13	0.75	0.44	4.19	34.36	1.27



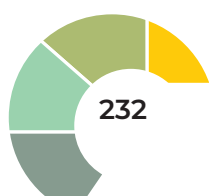
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
19	SAWAI MADHOPUR	SAWAI MADHOPUR (M)	0.32	47.18	3.71	0.59	3.35	0.13	0.72	0.42	4.02	33.03	1.22
20	CHURU	CHURU (M CL)	0.32	46.69	3.67	0.58	3.31	0.12	0.71	0.42	3.98	32.68	1.21
21	SAWAI MADHOPUR	GANGAPUR CITY (M)	0.32	46.39	3.65	0.58	3.29	0.12	0.71	0.41	3.96	32.48	1.20
22	JHUNJHUNUN	JHUNJHUNUN (M CL)	0.32	46.15	3.63	0.58	3.27	0.12	0.70	0.41	3.94	32.31	1.19
23	BARAN	BARAN (M)	0.32	45.96	3.61	0.58	3.26	0.12	0.70	0.41	3.92	32.18	1.19
24	CHITTAURGARH	CHITTAURGARH (M)	0.32	45.35	3.56	0.57	3.22	0.12	0.69	0.40	3.87	31.74	1.17
25	KARALI	HINDAUN (M)	0.32	41.08	3.23	0.51	2.91	0.11	0.63	0.37	3.50	28.76	1.06
26	ALWAR	BHIWADI (M)	0.47	61.13	1.19	0.13	0.44	0.03	0.36	0.47	1.59	55.46	1.45
27	BUNDI	BUNDI (M)	0.32	40.23	3.16	0.50	2.85	0.11	0.61	0.36	3.43	28.17	1.04
28	NAGAU	NAGAU (M)	0.32	40.07	3.15	0.50	2.84	0.11	0.61	0.36	3.42	28.05	1.04
29	CHURU	SUJANGARH (M)	0.32	39.55	3.11	0.50	2.81	0.11	0.60	0.35	3.37	27.69	1.02
30	BANSWARA	BANSWARA (M)	0.46	56.19	2.38	0.90	4.67	0.09	2.19	0.24	3.37	40.29	2.06
31	BARMER	BARMER (M)	0.46	54.09	2.29	0.86	4.50	0.09	2.11	0.23	3.24	38.78	1.98
32	CHURU	SARDARSHAHAR (M)	0.46	53.91	2.29	0.86	4.48	0.09	2.11	0.23	3.23	38.66	1.98
33	NAGAU	MAKRANA (M)	0.46	52.33	2.22	0.83	4.35	0.09	2.04	0.22	3.14	37.52	1.92
34	SIKAR	FATEHPUR (M)	0.46	52.05	2.21	0.83	4.33	0.09	2.03	0.22	3.12	37.32	1.91
35	DAUSA	DAUSA (M)	0.46	48.32	2.05	0.77	4.02	0.08	1.89	0.20	2.90	34.65	1.77
36	KARALI	KARALI (M)	0.46	46.63	1.98	0.74	3.88	0.08	1.82	0.20	2.79	33.44	1.71
37	BARMER	BALOTRA (M)	0.46	41.87	1.78	0.67	3.48	0.07	1.64	0.18	2.51	30.02	1.53



S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
38	CHURU	RATANGARH (M)	0.46	39.98	1.70	0.64	3.32	0.07	1.56	0.17	2.40	28.67	1.46
39	GANGANAGAR	SURATGARH (M)	0.46	39.65	1.68	0.63	3.30	0.07	1.55	0.17	2.38	28.43	1.45
40	RAJSAMAND	RAJSAMAND (M)	0.46	38.11	1.62	0.61	3.17	0.06	1.49	0.16	2.28	27.33	1.40
41	JHALAWAR	JHALAWAR (M)	0.46	37.62	1.60	0.60	3.13	0.06	1.47	0.16	2.25	26.97	1.38
42	NAGAU	LADNU (M)	0.46	36.86	1.56	0.59	3.06	0.06	1.44	0.15	2.21	26.43	1.35
43	JAISALMER	JAISALMER (M)	0.46	36.80	1.56	0.59	3.06	0.06	1.44	0.15	2.21	26.39	1.35
44	JAIPUR	CHOMU (M)	0.46	36.21	1.54	0.58	3.01	0.06	1.41	0.15	2.17	25.96	1.33
45	JHUNJHUNUN	NAWALGARH (M)	0.46	35.95	1.52	0.57	2.99	0.06	1.40	0.15	2.15	25.77	1.32
46	DHAULPUR	BARI (M)	0.46	35.26	1.50	0.56	2.93	0.06	1.38	0.15	2.11	25.28	1.29
47	BIKANER	NOKHA (M)	0.46	35.24	1.49	0.56	2.93	0.06	1.38	0.15	2.11	25.27	1.29
48	NAGAU	KUCHAMAN CITY (M)	0.46	34.83	1.48	0.56	2.90	0.06	1.36	0.15	2.09	24.98	1.28
49	CHITTAURGARH	NIMBAHERA (M)	0.46	34.82	1.48	0.56	2.90	0.06	1.36	0.15	2.09	24.97	1.28
50	CHURU	RAJGARH_CH (M)	0.46	33.27	1.41	0.53	2.77	0.06	1.30	0.14	1.99	23.86	1.22
51	SIROHI	ABU ROAD (M)	0.46	31.25	1.33	0.50	2.60	0.05	1.22	0.13	1.87	22.41	1.14
52	JALOR	JALOR (M)	0.46	30.40	1.29	0.48	2.53	0.05	1.19	0.13	1.82	21.80	1.11
53	SIKAR	LACHHMANGARH (M)	0.46	30.01	1.27	0.48	2.50	0.05	1.17	0.13	1.80	21.52	1.10
54	ALWAR	LAXMANGARH	0.46	30.01	1.27	0.48	2.50	0.05	1.17	0.13	1.80	21.52	1.10
55	NAGAU	DIDWANA (M)	0.46	29.98	1.27	0.48	2.49	0.05	1.17	0.13	1.80	21.49	1.10
56	BIKANER	DUNGARGARH (M)	0.46	29.96	1.27	0.48	2.49	0.05	1.17	0.13	1.80	21.48	1.10
57	AJMER	NASIRABAD	0.46	28.56	1.21	0.46	2.37	0.05	1.12	0.12	1.71	20.48	1.05



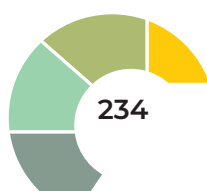
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
58	JODHPUR	PHALODI (M)	0.34	21.00	0.74	0.29	2.14	0.02	0.17	0.35	1.04	15.91	0.34
59	HANUMANGARH	NOHAR (M)	0.34	21.00	0.74	0.29	2.14	0.02	0.17	0.35	1.04	15.91	0.34
60	JAIPUR	KOTPUTLI (M)	0.47	28.66	0.56	0.06	0.21	0.01	0.17	0.22	0.75	26.01	0.68
61	JALOR	BHINMAL (M)	0.36	21.00	0.74	0.29	2.14	0.02	0.17	0.35	1.04	15.91	0.34
62	DUNGARPUR	DUNGARPUR (M)	0.36	21.00	0.74	0.29	2.14	0.02	0.17	0.35	1.04	15.91	0.34
63	NAGOUR	MERTA CITY (M)	0.35	20.00	0.70	0.28	2.04	0.02	0.16	0.34	0.99	15.15	0.32
64	BHARATPUR	DEEG (M)	0.34	19.00	0.67	0.26	1.94	0.02	0.15	0.32	0.94	14.39	0.31
65	DAUSA	BANDIKUI (M)	0.35	19.00	0.67	0.26	1.94	0.02	0.15	0.32	0.94	14.39	0.31
66	JHUNJHUNUN	CHIRAWA (M)	0.35	19.00	0.67	0.26	1.94	0.02	0.15	0.32	0.94	14.39	0.31
67	PALI	SOJAT (M)	0.36	19.00	0.67	0.26	1.94	0.02	0.15	0.32	0.94	14.39	0.31
68	JHALAWAR	BHAWANI MANDI (M)	0.35	18.00	0.63	0.25	1.84	0.02	0.14	0.30	0.89	13.64	0.29
69	PRATAPGARH	PRATAPGARH (M)	0.35	18.00	0.63	0.25	1.84	0.02	0.14	0.30	0.89	13.64	0.29
70	RAJSAMAND	NATHDWARA (M)	0.35	18.00	0.63	0.25	1.84	0.02	0.14	0.30	0.89	13.64	0.29
71	AJMER	KEKRI (M)	0.35	18.00	0.63	0.25	1.84	0.02	0.14	0.30	0.89	13.64	0.29
72	KOTA	RAMGANJ MANDI (M)	0.35	18.00	0.63	0.25	1.84	0.02	0.14	0.30	0.89	13.64	0.29
73	HANUMANGARH	BHADRA (M)	0.36	18.00	0.63	0.25	1.84	0.02	0.14	0.30	0.89	13.64	0.29
74	JODHPUR	BILARA (M)	0.35	17.00	0.60	0.24	1.73	0.02	0.14	0.29	0.84	12.88	0.27
75	SIROHI	SIROHI (M)	0.35	17.00	0.60	0.24	1.73	0.02	0.14	0.29	0.84	12.88	0.27
76	BHARATPUR	BAYANA (M)	0.36	17.00	0.60	0.24	1.73	0.02	0.14	0.29	0.84	12.88	0.27
77	ALWAR	KHAIRTHAL (M)	0.34	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26



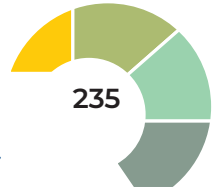
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
78	BHARATPUR	KAMAN (M)	0.34	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
79	TONK	NIWAI (M)	0.34	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
80	CHITTAURGARH	RAWATBHATA (M)	0.35	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
81	JHALAWAR	JHALRAPATAN (M)	0.35	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
82	HANUMANGARH	PILIBANGA (M)	0.35	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
83	PALI	SUMERPUR (M)	0.35	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
84	JODHPUR	PIPAR CITY (M)	0.35	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
85	HANUMANGARH	SANGARIA (M)	0.36	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
86	SIKAR	NEEM-KA-THANA (M)	0.36	16.00	0.56	0.22	1.63	0.02	0.13	0.27	0.79	12.12	0.26
87	CHURU	BIDASAR (M)	0.34	15.00	0.53	0.21	1.53	0.01	0.12	0.25	0.74	11.36	0.24
88	HANUMANGARH	RAWATSAR (M)	0.35	15.00	0.53	0.21	1.53	0.01	0.12	0.25	0.74	11.36	0.24
89	DAUSA	LALSOT (M)	0.35	15.00	0.53	0.21	1.53	0.01	0.12	0.25	0.74	11.36	0.24
90	DHAULPUR	RAJAKHERA (M)	0.34	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
91	JAIPUR	CHAKSU (M)	0.34	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
92	ALWAR	RAMGRAH	0.34	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
93	JAIPUR	PAVATA PRAGPURA	0.34	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
94	SIKAR	RAMGARH (M)	0.34	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
95	JALOR	SANCHORE (M)	0.35	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
96	CHURU	TARANAGAR (M)	0.35	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
97	BARAN	ANTAH (M)	0.35	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23



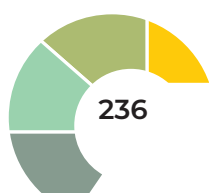
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
98	BARAN	CHHABRA (M)	0.35	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
99	GANGANAGAR	VIJAINAGAR (M)	0.35	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
100	AJMER	BIJAINAGAR (M)	0.35	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
101	SIKAR	SRI MADHOPIUR (M)	0.36	14.00	0.49	0.19	1.43	0.01	0.11	0.24	0.69	10.61	0.23
102	JAIPUR	BAGRU (M)	0.34	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
103	GANGANAGAR	ANUPGARH (M)	0.34	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
104	BHILWARA	SHAHPURA_BH (M)	0.35	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
105	JAIPUR	SHAHPURA_J (M)	0.35	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
106	JHUNJHUNUN	PILANI (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
107	BUNDI	LAKHERI (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
108	ALWAR	BEHROR (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
109	DUNGARPUR	SAGWARA (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
110	TONK	MALPURA (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
111	JHUNJHUNUN	UDAIPURWATI (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
112	JAIPUR	KISHANGARH RENWAL (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
113	SIKAR	KHANDELA (M)	0.36	13.00	0.46	0.18	1.33	0.01	0.10	0.22	0.64	9.85	0.21
114	SIKAR	LOSAL (M)	0.34	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
115	GANGANAGAR	RAISINGHAGAR (M)	0.34	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
116	CHURU	RAJALDESAR (M)	0.36	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
117	PALI	SADRI (M)	0.36	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19



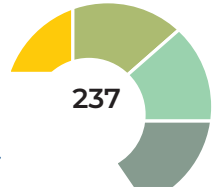
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
118	ALWAR	BANSUR	0.36	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
119	BHILWARA	GULABPURA (M)	0.36	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
120	SIROHI	SHEOGANJ (M)	0.36	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
121	KOTA	ITAWA	0.36	12.00	0.42	0.17	1.22	0.01	0.10	0.20	0.59	9.09	0.19
122	ALWAR	RAJGARH_AL (M)	0.34	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
123	BHARATPUR	NADBAI (M)	0.34	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
124	JHALAWAR	AKLERA (M)	0.34	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
125	SIKAR	REENGUS (M)	0.34	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
126	JAIPUR	BASSI	0.34	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
127	BHARATPUR	NAGAR (M)	0.35	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
128	BARAN	MANGROL (M)	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
129	GANGANAGAR	SADULSHAHAR (M)	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
130	DAUSA	MAHWA	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
131	PALI	FALNA (M)	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
132	ALWAR	TIJARA (M)	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
133	BARAN	ATRU	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
134	BUNDI	KESHORAIPATAN (M)	0.36	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
135	SIROHI	PINDWARA (M)	0.37	11.00	0.39	0.15	1.12	0.01	0.09	0.19	0.54	8.33	0.18
136	KOTA	SULTANPUR	0.33	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
137	KOTA	KAITHOON (M)	0.34	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16



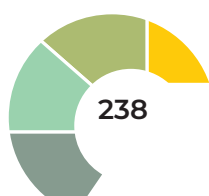
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
138	TONK	TODARASINGH (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
139	JAISALMER	POKARAN (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
140	BHARATPUR	KUMHER (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
141	NAGOUR	KUCHERA (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
142	JHUNJHUNUN	MANDAWA (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
143	JAIPUR	PHULERA (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
144	JHUNJHUNUN	BISSAU (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
145	KARALI	TODABHIM (M)	0.35	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
146	SIROHI	MOUNT ABU (M)	0.54	15.31	0.97	0.20	0.75	0.08	1.03	0.25	1.23	10.24	0.57
147	DHAULPUR	BASERI	0.36	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
148	UDAIPUR	FATEHNAGAR (M)	0.36	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
149	PALI	JAITARAN (M)	0.36	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
150	BHARATPUR	UCCHAIN	0.36	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
151	JAIPUR	SAMBHAR (M)	0.36	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
152	NAGOUR	NAWA (M)	0.37	10.00	0.35	0.14	1.02	0.01	0.08	0.17	0.49	7.58	0.16
153	TONK	DEOLI (M)	0.33	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
154	JODHPUR	BHOPALGARH	0.33	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
155	KOTA	SANGOD (M)	0.33	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
156	JHUNJHUNUN	SURAJGARH (M)	0.34	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
157	AJMER	PUSHKAR (M)	0.34	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15



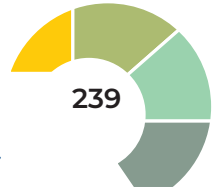
S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
158	GANGANAGAR	KARANPUR (M)	0.34	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
159	DHAULPUR	SARMATHPURA	0.35	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
160	CHITTAURGARH	KAPASAN (M)	0.35	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
161	BUNDI	KAPRAIN (M)	0.35	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
162	CHITTAURGARH	BEGUN (M)	0.35	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
163	BHILWARA	JAHAZPUR (M)	0.36	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
164	JAIPUR	VIRATNAGAR (M)	0.36	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
165	AJMER	SARWAR (M)	0.36	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
166	NAGAU	DEGANA	0.37	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
167	BHARATPUR	BHUSAWAR (M)	0.37	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
168	PALI	BALI (M)	0.37	9.00	0.32	0.13	0.92	0.01	0.07	0.15	0.44	6.82	0.15
169	CHURU	CHHAPAR (M)	0.33	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
170	BUNDI	NAINWA (M)	0.33	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
171	BHARATPUR	WEIR (M)	0.34	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
172	BHILWARA	GANGAPUR (M)	0.35	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
173	BIKANER	DESHNOKE (M)	0.35	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
174	JHUNJHUNUN	MUKANDGARH (M)	0.35	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
175	GANGANAGAR	PADAMPUR (M)	0.35	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
176	PRATAPGARH	CHHOTI SADRI (M)	0.35	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
177	JHUNJHUNUN	KHETRI (M)	0.36	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13



S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
178	UDAIPUR	BHINDER (M)	0.36	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
179	ALWAR	KHERLI (M)	0.37	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
180	RAJSAMAND	DEOGARH (M)	0.37	8.00	0.28	0.11	0.82	0.01	0.06	0.14	0.40	6.06	0.13
181	RAJSAMAND	AMET (M)	0.33	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
182	BHARATPUR	SIKRI	0.33	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
183	NAGAU	MUNDWA (M)	0.34	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
184	PALI	TAKHATGARH (M)	0.34	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
185	GANGANAGAR	LALGARH JATTAN	0.34	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
186	BHILWARA	ASIND (M)	0.34	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
187	UDAIPUR	SALUMBAR (M)	0.35	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
188	BHARATPUR	RUPBAS	0.36	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
189	CHITTAURGARH	BARI SADRI (M)	0.36	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
190	JHUNJHUNUN	VIDYAVIHAR (M)	0.36	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
191	NAGAU	PARBATSAR (M)	0.38	7.00	0.25	0.10	0.71	0.01	0.06	0.12	0.35	5.30	0.11
192	JHUNJHUNUN	BAGGAR (M)	0.34	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
193	GANGANAGAR	KESRISINGHPUR (M)	0.35	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
194	PALI	RANI (M)	0.35	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
195	BHILWARA	MANDALGARH (M)	0.35	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
196	JAIPUR	KHATUSHYAMJI (M)	0.36	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10

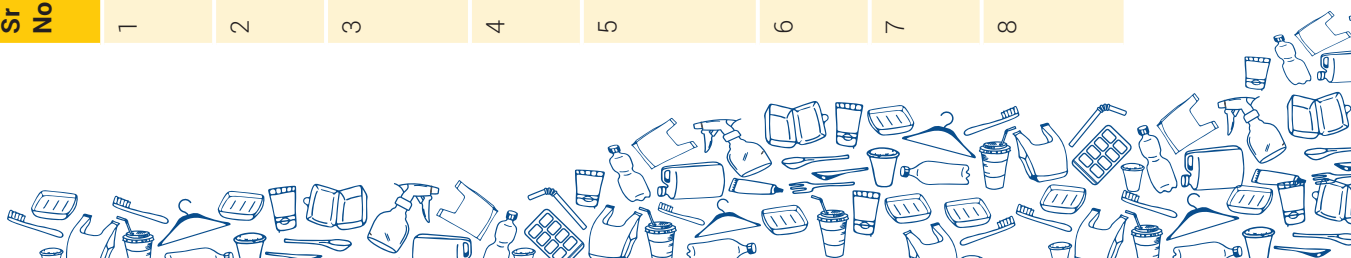
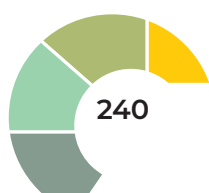


S.NO.	District Name	ULB name	Waste Generation Per Capita	Waste Generation (TPD)	Paper	Leather and Shoes	Textile	Metal	Glass	Domestic Hazardous	Plastic Waste	Wet Waste	Inerts Waste
197	ALWAR	THANAGAZI (M)	0.36	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
198	SAWAI MADHOPUR	BAMANWAS	0.36	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
199	UDAIPUR	KANOR (M)	0.37	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
200	CHURU	RATANNAGAR (M)	0.38	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
201	JHALAWAR	PIRAWA (M)	0.38	6.00	0.21	0.08	0.61	0.01	0.05	0.10	0.30	4.55	0.10
202	TONK	UNIARA (M)	0.32	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
203	ALWAR	KISHANGARHBAS MB	0.33	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
204	JAIPUR	JOBNER (M)	0.36	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
205	KARAULI	SAPOTRA	0.36	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
206	DAUSA	MANDAWARI	0.38	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
207	BANSWARA	PARTAPUR GARHI (M)	0.38	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
208	BANSWARA	KUSHALGARH (M)	0.38	5.00	0.18	0.07	0.51	0.00	0.04	0.08	0.25	3.79	0.08
209	SIROHI	JAWAL	0.32	4.00	0.14	0.06	0.41	0.00	0.03	0.07	0.20	3.03	0.06
210	GANGANAGAR	GAJSINGHPUR (M)	0.33	4.00	0.14	0.06	0.41	0.00	0.03	0.07	0.20	3.03	0.06
211	BUNDI	INDRAGARH (M)	0.33	3.00	0.11	0.04	0.31	0.00	0.02	0.05	0.15	2.27	0.05
TOTAL			-	7823.2	369.12	86.89	412.08	17.31	137.11	97.49	496.51	6025.5	181.16

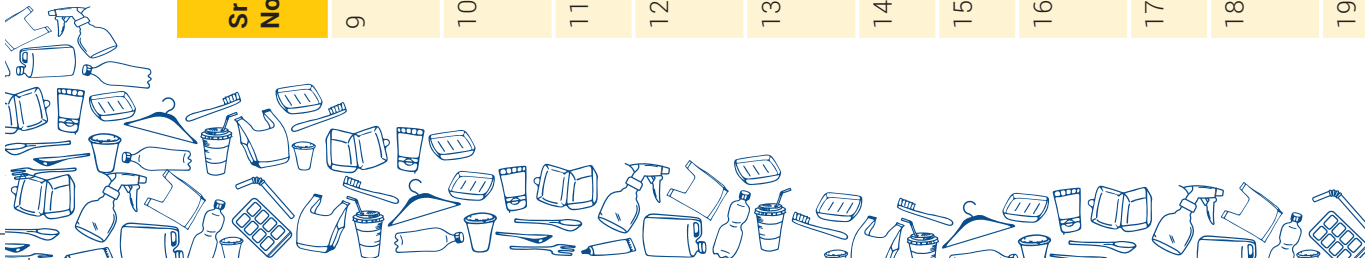


4. List of Plastic Manufacturers: (Other than PIBOs)

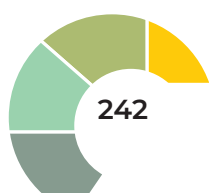
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
1	Aai Ji Polymers LLP	Ajmer	E1 - 69 RIICO Industrial Area Palra	31-01-2027	PVC	PVC Pipes And Tanks	1,72,500 Pieces/Year		
2	Parth Enterprises	Ajmer	G-1-265riico Industrial Area Palra	Ackn.	PP	Plastic Articles		26.4386819	74.7039182
3	Sagar Industries	Ajmer	Plot No G-1-280, RIICO Industrial Area, Ajaymeru, Palra	31-12-2025	PETE or PET	Pet Bottles	1560 MTPA		
4	Sanitech Industries	Ajmer	Plot No. 6, 07, 2nd Phase, RIICO, Silara	31-08-2026	PVC	PVC Water Tank	36500 NOS. PER YEAR	26.5390431	74.8844096
5	Aditya Polyspin Pvt.Ltd.	Ajmer	Kh No 243 Lamana Amargarh Road, Village Amargarh , Tahsil Pisangan	CTE 31-05-2023	other	Filler & Colour Master Batch	4320 MT/ ANNUM	26.2253818	74.4790081
6	Manan Polymers Pvt. Ltd.	Ajmer	Plot No. 5, Khasra No. 29T, VIL- Amargarh	31-12-2030	PE, PP	Filler Master Batch	2400 MTPA	26.2215645	74.4806935
7	NUMBA Polyfabs Pvt. Ltd.	Ajmer	Plot No. A1, JPTL, RIICO Area, Kishangarh	In Process	other	Others			
8	Thar Polypaper Industries Llp	Ajmer	Khasra No 9/1,C-24-27,,Vill Purohit Ki Dhani, Kishangarh	31-12-2030	PE	Paper Cup Plate And Disposal Items	2500 MTPA	26.5463581	74.8135728



Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
9	M/S Radix Engineerings	Alwar	F-599, MIA, Alwar Alwar	31-12-2030	other	Plastic / Frp Parts For Automobiles & Other Industries	113000 NOS./ ANNUM	27.519936	76.687326
10	Manglam Polymers	Alwar	J-1020 RIICO Industrial Area Khushkhara	Ackn.	PVC	PVC Compound	35 Lac Pieces/month	24.648651	73.83579
11	National Sales Corporation	Alwar	H1-477-478, MIA Alwar	In Process	PVC	Others			
12	Premium Packaging	Alwar	B - 37 (B), MIA, Tehsil:Ramgarh District:Alwar	28-02-2026	PS	Thermocole	100 MTPA	27.518426	76.682252
13	Samarth Industries	Alwar	H-1-883 , MIA , Alwar	CTE - 31/10/2015	PETE or PET	Pet Bottle	96 LACS PCS / ANNUM	27.522529	76.689197
14	Shri Gangotri Pipe	Alwar	Plot No C-158 B, Mia, Alwar	Ackn.	HDPE	HDPE Pipes	550 MTPA	27.529041	76.667923
15	Amrit Industries	Alwar	G-177b Mia, Alwar Alwar	Ackn.	Others	Plastic Products			
16	Polymoon Irrigation	Barmer	Kh, No.468/2,Samdari Foad,Balotra	Ackn.	PE	Hdpe Pipes	0.320 MT/ DAY		
17	Metallic Oxide & Chemical	Bharatpur	6b & 8b Industrial Estate Bharatpur	Ackn.	PETE or PET	Pet Bottles			
18	Aadinath Polymer Industries	Bhilwara	Araji No. 12660, Nh. 08, Village-, Balato Ki Guhar	In Process	PP	Packaging		25.6407818	74.59199873
19	Balaji Flex	Bhilwara	Plot No 51, 52, 54, 55 And 56 Suwana Tehsil:Bhilwara	Ackn.	PVC	Pvc Pipe	5000 MTPA	25.34980171	74.63531852



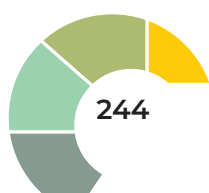
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
20	Kanchan Pvt. Ltd	Bhilwara	Gurudwara, Nanakpur, Bhilwara	Ackn.	PETE or PET	Synthetic Fabric	60,000.00 METERS/DAY	25.39781369	74.61949419
21	7 Star Toys Industry Corporation	Bhiwadi	Plot No-G1-1287, Ria Rampur Mundana Bhiwadi RIICO Industrial Area , Bhiwadi	Ackn.	PC,PP,ABS	Plastic Toys	3000 pieces/Day	282202032	76.87253
22	Aarjun Plastic Engniyringt	Bhiwadi	G1/1034 ,RIICO Ind. Bhiwadi	Ackn.	PETE or PET	Plastic Coating On Battery Poles	60,000 PCS/day.	28.209358	76.857854
23	Ace Garment Accessories Pvt Ltd	Bhiwadi	H-55B 456A Phase 3 Bhiwadi	In Process 30-09-2014	other	Plastic Moulded Articles	36.00 LAKH NOS./ ANNUM		
24	Akash Industries	Bhiwadi	F-21a Ind. Area Bhiwadi	Ackn.	PC,PE,PP,ABS	Others	0.99 MT/ Day	28.20781	76.854386
25	Aksh Optifibre Ltd	Bhiwadi	P-1075-1081,Riico Ind. Bhiwadi	31-12-2026	PE,PP,PET,PVC	Optical Fibre Cable	180 MT/ Annum		
26	Alpha Plus Automotive	Bhiwadi	H1 1375 Rampur, RIICO	Refuse	PC,PP	Industrial Containers			
27	Arham Enterprised	Bhiwadi	G-971 Phase 3 Bhiwadi	30-04-2027	PVC	PVC Pipes	300 MT/ ANNUM	28.207131	76.8577711
28	Bestech Polymers	Bhiwadi	Phase-5 H-1, 1373 RIICO Ind. Area Rampu, Bhiwadi	30-11-2027	LDPE	Plastic Articles	100 MTPA	28.252663	76.857702
29	Chandra Industries	Bhiwadi	F-5E Near RIICO Choke Bhiwadi	Ackn.	PE,PP,PET	Plastic Goods	150 MT/ Month	28.211657	76.855234
30	Denex International	Bhiwadi	812,G1 ,Riico Ind.	In Process	PC,PE,PP,ABS	Industrial Containers		28.201989	76.851046



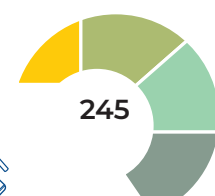
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
31	Durga Plastics	Bhiwadi	H1 343 RIICO Industrial Area , Tapukada Tehsil:Tijara	Ackn.	PETE or PET	Plastic Bottles And Caps	50000 PCS/MONTH		
32	Goldmedal Electricals	Bhiwadi	Spa-531 (RIICO) Ind. Area Bhiwadi	In Process	PVC	Sups			
33	Goldstar Garment Accessories Pvt. Ltd.	Bhiwadi	812/E-27 B Samtal Zone, Bhiwadi	31-08-2029	-	Button	50 MTPA		
34	Goyal International	Bhiwadi	G1/12929(A) Phase-V Bhiwadi	30-11-2027	PE	Bags	100 MTPA		
35	Gyanjyot Enterprises Pvt. Ltd.	Bhiwadi	F-142 RIICO Ind. Bhiwadi	Ackn.	PE	HDPE Containers	500 Pics/Day		
36	M/S Relaxo Footwears Ltp.	Bhiwadi	A-1130&130a, Phase-3 RIICO Bhiwadi	31-07-2030	PE	Hawaii Chappal (Slipper)	200,000.00 PAIR/DAY		
37	M/S. Prayag Palymers Pvt. Ltd.	Bhiwadi	A-1129,RIICO Ind. Area Phase-3,Bhiwadi	28-02-2027	PC,PP,PET,ABS	Cpvc Pvc Pipes & Fitting	1600 MTPA	28.200399	76.855786
38	Manoj Auto Industries	Bhiwadi	Plot No- H1-877 Phase-III RIICO Indarea Phase III RIICO Industrial Area , Bhiwadi	Ackn.	PP	Bottles/Cups	9 MT/Month		
39	Mayank Pakeging Industries	Bhiwadi	-	In Process	PE,PP	Packaging			



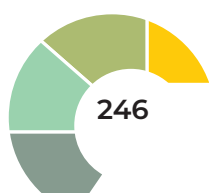
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
40	Mohit India	Bhiwadi	F-21D Phase 1 RIICO Industrial Ara Bhiwadi	Ackn.	PE,PVC	Plastic Pipe	11 MT/ MONTH		
41	Nidhi Cables Pvt. Ltd.	Bhiwadi	E-1104 H-3 RIICO Ind. Area Bhiwadi	31-05-2027	PP,PVC	PVC Compound, Wire And Cable	1300 MTPA	28.199268	76.857202
42	Octel Cables	Bhiwadi	G-1/954,Riico Ind. Area Ph-3,Bhiwadi	Ackn.	PE,ABS	Others		28.194845	76.861027
43	Payal Plastic Products	Bhiwadi	H1-1212 A RIICO Industrial Area , Bhiwadi	Ackn.	PP,PET	Plastic Container And Caps	7 MT/ MONTH	28.205035	76.868552
44	Rustagi Plastic Industries	Bhiwadi	Plot No. 812/E, Somtal Zone Bhiwadi	31-03-2034	PE,PP	Plastic Moulded Goods	1500 MTPA	28.21947	76.84147
45	Shakkarwal & Co.	Bhiwadi	G,1439 Rampura Bhiwadi	31-08-2027	PVC	PVC Footwear	15 LACS PAIR/ ANNUM		
46	Sarash Polu Product	Bhiwadi	J-905(8) Ria, Bhiwadi	31-01-2026	PVC	PVC Compound	600 MTPA	28.209662	76.872302
47	Cuper Cable Private Limited	Bhiwadi	Sp-531 C-3 RIICO Ind. Aera Bhiwadi	30-09-2023	PE,PP,PVC	Wire & Cable	720 MTPA		
48	Shree Prabble Ind.	Bhiwadi	Near Dsr Factory Phase-2 RIICO Ind. Area Bhiwadi	In Process	PP,PE	Bottles/Cups & Industrial Containers		28.205004	76.849449
49	Shree Ram Industry	Bhiwadi	Plot No. H1 1369/72 Bhiwadi	Ackn.	-	Others		28.186176	76.875093
50	Starlite Moulding Products Ltd	Bhiwadi	G1/1022 Phase-3 RIICO Industrial Area Bhiwadi	Ackn.	PC,PP,ABS	Plastic Moulded Products	366 MTPA	28.198926	76.858508



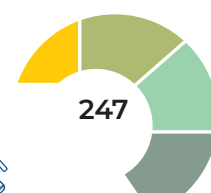
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
51	Superior Polyteck	Bhiwadi	H1-1134a, Phase-3, RIICO Ind Area Bhiwadi	Ackn.	PVC	Plastic Parts Of Motor And Industrial Seals			
52	Toyzone Impex Pvt Ltd	Bhiwadi	F-1159 Phase3 Riico Ind Area Bhiwadi	30-04-2032	PC,ABS	Plastic Toys	3000 PCS PER DAY	28.199749	76.852096
53	Uttam Polyruhs India Pvt. Ltd.	Bhiwadi	G-1/1060-63,Phase3 RIICO Ind.Area Bhiwadi	31-01-2032	PP	Eva Sheet	3000 MTPA		
54	Yash Polymers	Bhiwadi	H1-854 RIICO Ind. Bhiwadi	In Process	PVC	Others			
55	Arham Enterprises	Bhilwara	Near Gatta Factory Haled	Ackn.	PVC	PVC Pipes	250000 Nos Per Year	25.350644	74.633421
56	Bhilwara Polymers	Bhilwara	7km Stone Ajmer Road Bhilwara	31-10-2024	HDPE	UHMW HDPE Sheets	100 MTPA	25.410529	74.611389
57	Jindal Saw Limited (Hdpe Pipe Plant)	Bhilwara	Khasra No. 6708 Pur, Bhilwara	Ackn.	PE	HDPE Pipes	1000 MTPA		
58	Mcm Industry	Bhilwara	F-90 RIICO Industrial Area	In Process	other	Others		25.623784	74.597295
59	S.R.G Industries	Bhilwara	G-1-410 Growth Center Bhilwara	Ackn.	PVC	PVC Pipes	760 MTPA	25.213575	74.628895
60	Shiv Vijay Polyfab Pvt Ltd	Bhilwara	F-188(B) Frouth Center RIICO Area Bhiwadi	Ackn.	PVC	PVC Pipes		25.219112	74.630604
61	Blue Bottles	Bikaner	H-1-391-390,RIICO Industrial	In Process	PETE or PET	Bottles/Cups & Industrial Containers			
62	Haluy Food And Beveragns	Bikaner	H-1-391-390,RIICO Industrial	In Process	PETE or PET	Bottles/Cups			



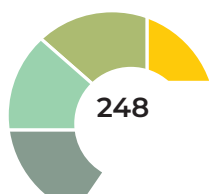
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
63	Balaji Plastic Industry	Hanuman-garh	F-814, RIICO Ind. Area	Ackn.	LDPE	Others			
64	Aarkay Polymers	Jaipur	No.-12, Shraavan Vatika, Badarna Industrial Area, Taj Marbles	In Process	HDPE	Others			
65	Agrewal Electro Plast	Jaipur	H-2157, RIICO	30-11-2030	PVC	PVC COMPOUND And PVC Conduit Pipe	19 MT/ Month	26.780368	75.88574
66	Ajanta Plastic Industries	Jaipur	E-168/A, Road No. 9(J), VKIA, Jaipur	CTE 30-06-2022	PVC	PVC Compound	400 MT/ ANNUM	26.984793	75.780408
67	Arihant Industries	Jaipur	G-1/26, RIICO Ind. Area, Bindayaka	30-06-2030	PE	HDPE Pipe Fittings	2400 MTPA	26.921292	75.654903
68	Armaan Traders, On Rent At Farhan Polymers	Jaipur	169 Jhotwara Industrial Area Jhotwara Jaipur	In Process	PETE or PET	Bottles/Cups			
69	Bhagwati Plastic And Pipe Industries	Jaipur	H-457-458, Sarana Dungan ,Jhotwara Extn 2	31-12-2029	PE	HDPE/MDPE/ LDPE Sprinkler Pipes	25 MT/Day	27.003412	75.702643
70	Dhabariya Polywood Ltd.	Jaipur	B-9 , D-1 , Maluiya Industrial Area	In Process	PVC	Others			
71	G.B. Petcon	Jaipur	Jhotwara Industrial Area	CTO 31/08/2011	PETE or PET	Bottles/Cups	30 MTPA		
72	Innotex (India) Pvt Ltd	Jaipur	C-181, Road No 9 VKIA Jaipur	31-07-2032	PVC	PVC Flex Banner	0.800 MT/ Month	26.986475	75.783797
73	Joya Bags	Jaipur	Near Delhi Bypass	In Process	PVC	Others			



Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
74	Kamal Plastic	Jaipur	Khasra No 329, Akhapura, Road No 17, Vkiarea,Jaipur, Raj Jaipur	Ackn.	PVC	Plastic Modulated Items			
75	Karnawat Tarpo	Jaipur	39, Nagaur Nagar, Near 1st Pillar Of Mansarovar Metro Station	In Process	-	Others			
76	Khandelwal Industries	Jaipur	B1 , Maluiya Nagar Industrial Area	Ackn.	-	Others			
77	M M Contaners	Jaipur	Road No.- 12 , G1-458(G), VKI, Jaipur	In Process	PETE or PET	Cutlery		26.991917	75.774788
78	M/S Gsr Industries	Jaipur	J-500 B, Gsr Industries, Sarna Dungar Industrial Area, Jaipur	In Process	LDPE	Others			
79	M/S Varsha Polypipes Pvt. Ltd.	Jaipur	H1-92, Road No. 05, Bindayaka	28-02-2028	PE	H.D.P.E. Pipe	3000 MTPA	26.915289	75.644384
80	Mohit Polytech Pvt. Ltd.	Jaipur	F-139, Road No. 06,Ria,Jaipur	30-09-2028	PE	Hdpe Pipes	6226 MTPA	26.916259	75.644285
81	Natraj Plastic	Jaipur	G843 Road No. 14 Vki Jaipur	CTO - 31/08/2012	PP	Plastic Sutali	100 MTPA	26.995888	75.786555
82	Oswal Pappes	Jaipur	A-24 Kaladera	31-08-2023	other	Media Craft Paper	40000 MTPA		
83	Rathi Irrigation Ltd	Jaipur	E-227b,Road No 9e, Vkia, Jaipur	31-03-2028	PE	Hdpe Pipe & Coil	50 MT/ MONTH	29.984452	75.783743



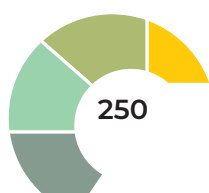
Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
84	Shree Balaji Enterprises	Jaipur	33,Vigyan Nagar,Sarna Dungar Industrial Area	Ackn.	PVC	PVC Pipes	365 MTPA		
85	Shree Shyam Industries	Jaipur	H-478 Ind.Area Jhotwara , Extn., Sarna Doongar	CTO - 31-08-2013	HDPE	Rigid Containers	365 MTPA		
86	Shree Shyam Marketing	Jaipur	UK - 14, 1st Floor, Umber Tower	Ackn.	PVC	Others	26.933982	75.795392	
87	Ssm Caps And Closures Pvt. Ltd.	Jaipur	G-227, VKI, Jaipur	Ackn.	PP,PE	Plastic Caps	300000 Pcs/Day	26.986707	75.782854
88	Synet Agro	Jaipur	Jhotwara Industrial Area	In Process	PE	Plastic Net			
89	Tirupati Plastomatics Pvt. Ltd.	Jaipur	B-141a, Road No-09, V.K.I., Jaipur	31-01-2028	PE,PP,PVC	HDPE, DWC, SWC Pipe, Nylone Swc Pipe	10000 KM/ YEAR	26.990551	75.779594
90	Vinayak Polycon International Ltd.	Jaipur	S-1314, Heerawala Industrial Area, Kanauta, Jaipur	Ackn.	PETE or PET	Bottles/Cups		26.92822	75.807822
91	Voluminous Energy India Pvt Ltd	Jaipur	F-145,Road No 07,Ricco Industrial Area	Ackn.	PE	Hdpe Pipe	3000 MTPA		
92	Alambic Placta Pack	Jodhpur	E-390 2s Phase Basni	In Process	LDPE	Packaging			
93	Alwar Pipe Industries	Kota	3-D Chambal Small Ind. Area	In Process	PVC	Plastic Articles		27.509278	76.67367



Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
94	Sobha Industries	Kota	Plot Noh-226-P, Road No5, IPIA Kota	Ackn.	PE,PP	Others		25.1268755	75.8647813
95	V.R. Marketing	Kota	444 Sastri Nagar	In Process	PVC	Sups		25.1582617	75.8695191
96	Prestine Ind. Ltd.	Mount Abu	B-129, Ambaji Industrial Area Abu Road	In Process	PP	Sups		24.448273,	72.752513
97	Alchem Internantional Pvt.Ltd.	Neemrana	Sp-25,RIICO Industries Area Neemrana	30-04-2023	-	Others	0.200 MT/ Day		
98	Coster India Packaging Pvt Ltd	Neemrana	E 200, EPIP Neemrana	30-04-2027	PE,PP	Manufacturing And Assembly Of Mechanical Spray Pumps & Valves	20.00 MILLION / ANNUM		
99	G.D. Foods Mfg. Pvt. Ltd.	Neemrana	Sp15-16, Ria, Neemrana	In Process	-	Bottles/Cups		27.974175	76.387422
100	Ginni International Ltd.	Neemrana	Plot No. Sp2(1a), Ricco Industrial Area	30-09-2023	-	Woven Fabric	30 MT/Day		
101	Kunstocom India Ltd	Neemrana	E-134&135 EPIP RIICO Industrial Area	CTE - 31/10/2013	PP, ABS	Plastic Moulded Components	647 MTPA		
102	N.T.F. Gandra Pvt Ltd	Neemrana	F-6, 7, 38,39 EPIP Neemrana	30-09-2027	PP,ABS	Plastic / FRP Parts	30000 PCS PER MONTH	27.965282	76.364899
103	Nexgen Fluoro Poltmers Pvt. Ltd.	Neemrana	E202 EPIP Neemrana	30-06-2027	other	Polymers(PTFE/ PFA/FEP)	200 MTPA	27.966169	76.370389
104	Ping Telematic Pvt. Ltd.	Neemrana	G-165,RIA, Neemrana	Ackn.	PP,ABS	Plastic Moulded Component	200 MTPA	27.974153	76.368009

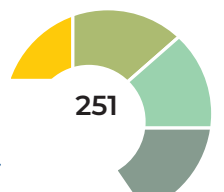
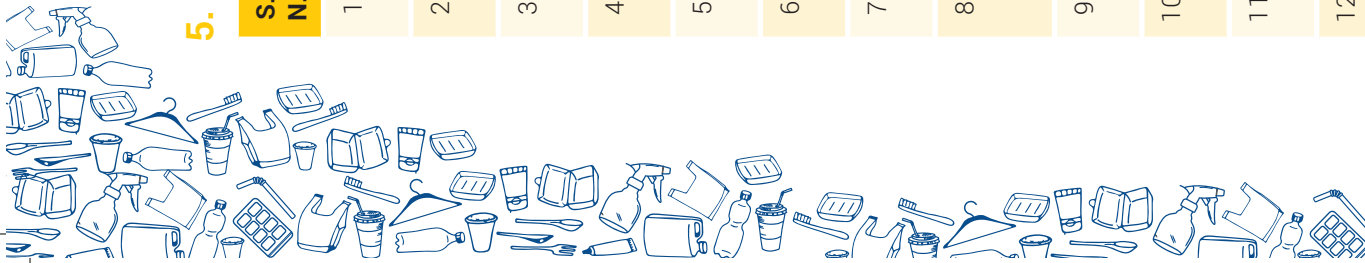


Sr No	Name of Industry	City of Survey	Address	Validity of Consent to Establish (CTE)	Type of plastic polymer used for manufacturing	"Type of products"	Capacity	Longitude	Latitude
105	The Wipe Hotwire India Pvt. Ltd.	Neemrana	E-3, EPIP Neemrana Tehsil:Behror	31-01-2028	PVC	Wire & Cable	4000 KM / DAY	27.960236	76.364926
106	Trin	Neemrana	Sp-2 60 To 64 In Japanese Jone Neemrana	In Process	other	Others			
107	Wavin India Pipes & Fitting Manufacturing Pvt. Ltd.	Neemrana	Sp- 14 D, RIICO Industrial Area	29-02-2032	PE, PVC	CPVC/HDPE Pipes & Fittings	850 MTPA	27979118	76.392892
108	Atlas Industry	Pali	Ga-197 , Mandia Road	Ackn.	HDPE	Plastic Pipe & Fittings	365 MTPA	25.772575	73.307641
109	Monika Packers	Pali	F-269, Mandia Road, Ind. Area, Pali Rajasthan Pali	CTE - 28-02-2019	HDPE	Sealing Of Plastic Tirpal	150 MTPA		
110	Bhaironath Polymers	Udaipur	H1-181 Kaladwas	In Process	Others	Others			
111	Bharat Polycab Industry	Udaipur	H 202, RIICO Industrial Area,	In Process	PVC	Others			
112	Mehta Enterprises	Udaipur	G-1-190, Road No.6, RIICO Ind. Area, Gudli Gudli	30-06-2027	PVC	Rigid Pvc Pipe	720 MTPA	24.643315	73.8401874
113	Mrinali Plastic Udyog	Udaipur	95 Hastinapur , Madari Industrial Area	In Process	PP,ABS	Others		24.581566	73.753819
114	Speciality Masterbatches Lip	Udaipur	F-328 Bia Udaipur	Ackn.	PP	Filler And Colour Master batch	570 MT/ Month	24.732733	73.778252



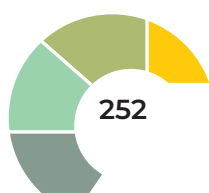
5. Survey list of Plastic SUP Manufacturers:

S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
1	M/S Ecosheets India Private Limited	S2b, Trimurty Dave Apartment, SJS Highway, S2b, Bani Park, Jaipur	City	Done	HDPE Items
2	Bhawani Enterprises	2900, Patwo Ka Chowk, Chandpole, 2900, Chandpole Bazar, Jaipur	City	Enterprise Not Found on location	
3	Radha Govind Plastics	779, Ram Chandra Ji Ki Gali, Jaipur, 779, Kishanpole Bazar, Jaipur	City	Done	Bag Beddings
4	Bhavya Laxmi Enterprises	Plot Number-5, Bhavya Laxmi Enterprises, Railway Station Road, Plot Number-5, Near Sindhi Camp, Jaipur	City	Location Not Found	
5	M/S SAMRIDHI PETROCHEM	B41, Shivam, Keshav Path Suraj Nagar West, B41, Civil Lines, Jaipur	City	Location Not Found	
6	Ahaan Plastic	C-12, Jalupura, Sansar Chand Road, C-12, Mukandgarh House, Jaipur	City	Location Not Found	
7	M/S Bihani Udyog	303-A, Jaipur Tower, M.I.Road, 303-A, 0, Jaipur	City	Enterprise Not Found on location	
8	Ansh Chem	Ansh Chem, 2165-66, Raja Shivdas Ji Ka Rasta, Ansh Chem, Gangori Bazar, Jaipur	City	Done	Packaging material for Feviquick Liquid Dropper Bottles
9	M/S Gupta Chemicals Private Limited	N.K.Towers, Purohitji Ka Bagh, Gopi Nath Marg,, M.I.Road, N.K.Towers, ,, Jaipur	City	Enterprise Not Found on location	
10	M/S Shree Shyam Marketing	UL 14 I St FLOOR, AMBER TOWER, SANSAR CHANDRA ROAD, UL 14 I St FLOOR, I St FLOOR, JAIPUR	City	Done	Packaging foam
11	Joya Bags	3895, Julyiwalo Ki Gali, Chandpole Bazar, 3895, Chandpole, Jaipur	City	Done	Bags
12	Jai Sinter Polycon Pvt Ltd	312, Navjeevan Complex, Station Road, 312, 29, Jaipur	City	Done	No Response

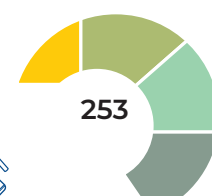


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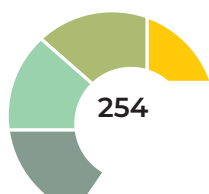
S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
13	Shree Balaji Trading Company	G 5, Windsor Plaza, Sansar Chandra Road, G 5, 0, Jaipur	City	Enterprise Not Found on location	
14	Aviral Enterprises	570, ,, Kishanpole Bazar, 570, ,, Jaipur	City	Location Not Found	
15	Shree Traders	749, Badarna Ji Ka Mandir, Chandpole Bazar, 749, -, Jaipur	City	Location Not Found	
16	Ridhi Shidhi Boxes	544/5, Munsiram Das Ka Rasta, Jhorawar Singh Gate, 544/5, Jhorawar Singh Gate, Jaipur	City	Done	Plastic Coating on Paper Boxes
17	Sudarshan Herbs	8 A B Ganesh Colony, Nia Ke Samne, Jhorawar Singh Gate, 8 A B Ganesh Colony, Jaipur, Jaipur	City	Done	Plastic Packaging
18	M/S Shiba Industries	D-53/B-2, Khansal Sadan, Jhakheshwar Marg Banipark, D-53/B-2, Na, Jaipur	City		No Response
19	M/S Vinayak Polycon International Limited	312, Navjeevan Complex, Station Road, 312, 29, Jaipur	City	Done	Plastic Packaging Material
20	Aarkay Polymers	Flat No 404,, Siddha Basil, B 14,, Shiv Marg, Flat No 404,, Near Meera Hospital, Jaipur	City	Done	Trading Agriculture Pipes
21	Bharat Plastic Industries	301, -, Chora Rasta, 301, Opposite Amar Jain Hospital, Jaipur	City	Done	Plastic Packaging Trading (Not SUP)
22	Shree Shyam Marketing	Ul 14 1st Floor, Amber Tower, Sansar Chandra Road, Ul 14 1st Floor, Near Govt. Hostel, Jaipur	City	Done	Trading of Plastic Items (Not SUP)
23	S. B. Polytex	8/235, S B Polytex, Sector 8, 8/235, 0, Jaipur	City	Done	PP Plastic Bag
24	M.W. Enterprises	45, ,, Kishanpole Bazar, 45, ,, Jaipur	City	Enterprise Not Found on location	
25	Karnawat Tarpo	39, Nagour Nagar, Jaipur, 39, 39, Jaipur	Jaipur	Done	Tent Material (For Rajasthan Police)
26	Krishna Pacakging	122, Laxminarayan Puri, Jhotwara Industrial Area, 122, Jaipur, Jaipur	Jhotwara	Done	HDPE Items



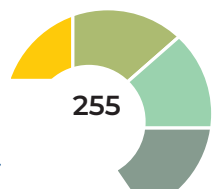
S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
27	Shri Parshu Ram Polymers	60 B, Shri Parshuram Polymers, Industrial Area, 60 B, Jhotwara, Jaipur	Jhotwara	Enterprise Not Found on location	
28	New Trimurti Kitchen And Gift Emporium	Shop No. 1, Bhomiya Nagar, Kalwar Road Jhotwara, Shop No. 1, Bhomiya Nagar, Jaipur	Jhotwara	Done	General Store (Not SUP)
29	Veeco Rubber Rolls	Plot No. 1 A, Jhotwara, Jhotwara, Plot No. 1 A, Industrial Area, Jaipur	Jhotwara	Done - Repeat Address	Manufacturing of Rubber Items
30	Sarju Polymers	111, Bhawani Niketan Colony, Jhotwara Industrial Area, 111, 0, Jaipur	Jhotwara	Location Not Found	
31	Youwani Enterprises	20, Ambedkar, Jaisa Bohra, 20, Nangal, Jaipur	Jhotwara	Location Not Found	
32	Agra Packaging	122, Laxminarayanpuri, Jhotwara Industrial Area, 122, Jhotwara, Jaipur	Jhotwara	Done	Plastic Packaging (Not SUP)
33	Akshita Enterprises	24, -, Mohit Nagar, 24, Jhotwara, Jaipur	Jhotwara	Enterprise Not Found on location	
34	Lucky Polymers	Road No 12, Plot No 148, JHOTAWARA INDUSTRIAL AREA, Road No 12, N/A, Jaipur	Jhotwara	Done	Plastic Film
35	Raj Sales Corporation	Flat No. G-2, Plot No. 7, Sai Appartment, Sunrise City, Flat No. G-2, ,, Jaipur	Jhotwara	Enterprise Not Found on location	Trading of Plastic Items
36	Shagun Packaging	49-A, Agrasen Nagar, Kalwar Road , Jhotwara, 49-A, Near Boring Crossing, Jaipur	Jhotwara	Enterprise Not Found on location	Trading of Plastic Items
37	Mahira Collection	C-343, Vaishali Nagar, Vaishali Nagar, C-343, Jhotwara, Jaipur	Jhotwara	Closed	
38	Mahalaxmi Fancy And Gift Store	34, Old, Road, 34, Niwaru, Jaipur	Jhotwara	Done	General Store (Not SUP)
39	M/S Petkon Industries	71, Shri Ram Puri, Jaipur, 71, Jhotwara, Jaipur	Jhotwara	Location Not Found	
40	Skynet Agro & Ployomers	176d, Rcs Compound, Jhotwara, 176d, Riico Industrial Area, Jaipur	Jhotwara	Done	Green Nets



S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
41	Unique Industries	PLOT NO 40, PRIYA NAGAR-4, JHOTWARA, PLOT NO 40, RIICO INDUSTRIAL AREA, Jaipur	Jhotwara	Done	PET Bottle
42	Aaradhya Enterprises	P-148, Ashok Nagar 2nd Niwaru Road, Niwaru Road, P-148, 2nd, Jaipur	Jhotwara	Location not Found	
43	Nmc World 100 Handloom	A-256, A-256, Tara Nagar Khirmi Fatak, A-256, A, Jaipur	Jhotwara	Done	General Store (Not SUP)
44	Mahakal Telecom	19, -, Amer, 19, Nangal Susavtan, Jaipur	Jhotwara	Location Not Found	
45	Jallan Enterprises	9/2, Jallan Enterprises, Industrial Area, 9/2, Niwaroo Road, Jaipur	Jhotwara	Location Not Found	
46	Mateshwari Marketing	S-1, Plot No. 73, Sunrise City, Jhotwara, S-1, Plot No. 73, Jaipur	Jhotwara	Done	Trading of plastic Items
47	M/S Colored Bin Energy Private Limited	R-1, Swarg, Behind Motor Aids Petrol Pump, Shyam Marg, Jhotwara Road, R-1, Swarg, Jaipur	Jhotwara	Location Not Found	
48	J S Enterprises	Plot No 140, Street No 03, Jaipur, Plot No 140, Jhotwara, Jaipur	Jhotwara	Location Not Found	
49	Megha Polymers	112, Godown No 11, Jhotwara, 112, Industrial Area, Jaipur	Jhotwara	Enterprise Not Found on Location	
50	M/S Sidharth Polysacks Private Limited	137-138, Sidharth Polysacks Private Limited, Industrial Area, Jhotwara, 137-138, Jhotwara, Jaipur	Jhotwara	Done - Repeat Address	
51	G B Petcon	140-1, Industrial Area, Jhotwara, 140-1, Road No-12, Jaipur	Jhotwara	Done	PET Bottle
52	Surya Polypacks	106, SURYA Polypacks, Sikar Road, 106, Shiv Nagar, Jaipur	Jhotwara	Location Not Found	
53	Siddhi Plastics	Plot No 30, Jhotwara Industrial Area, Near Kabani Chouraha, Plot No 30, Jhotwara, Jaipur	Jhotwara	Enterprise Not Found on Location	
54	Ram Ram Polymers	Plot No 7a, Priya Nagar, Jhotwara, Plot No 7a, Jhotwara, Jaipur	Jhotwara	Enterprise Not Found on Location	

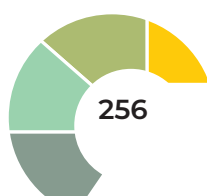


S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
55	M/S Uprise Laminators Private Limited	4a, Uprise Laminators Pvt Ltd, Jhotwara Industrial Area, 4a, Jhotwara, Jaipur	Jhotwara	Done	No Response
56	Medix Line Supplyzer	174, Shree Rampuri, Niwaru Road, 174, Jaipur, Jaipur	Jhotwara	Done	Trader of Disinfectants (Harpic etc)
57	M/S Alliance Polysacks Private Limited	137-138, Alliance Polysacks Private Limited, Industrial Area Jhotwara, 137-138, Jaipur, Jaipur	Jhotwara	Done - Repeat Address	
58	Shree Gopal Flexo	104-A, Industrial Area Jhotwara, Jhotwara Road, 104-A, Jaipur, Jaipur	Jhotwara	Done	Plastic Film
59	M/S Supreme Polymers Private Limited	137-138, Supreme Polymers Private Limited, Jhotwara Industrial Area, 137-138, Jhotwara, Jaipur	Jhotwara	Done	Plastic Items (Not SUP)
60	Adinath Poly Packers	13, Nangal Jaisa Bohra, Jhotwara, 13, Jhotwara, Jaipur	Jhotwara	Done	Green Nets
61	Rishi Enterprises	Plot No. 43, Mayour Vihar, Jhotwara, Plot No. 43, Nangal Jaisa Bohra, Jaipur	Jhotwara	Done	General Store Plastic Items (Not SUP)
62	Shree Shanshah Pet Industries	184/4, Industrial Area, Jhotwara, 184/4, Jhotwara, Jaipur	Jhotwara	Location Not Found	
63	Bajrang Industries	57, Moti Nagar, Jaipur, 57, Jhotwara, Jaipur	Jhotwara	Location Not Found	
64	Adi Shakti Polyplast	25, Ganesh Nagar, Benad Road, 25, Jhotwara, Jaipur	Jhotwara	Done	PP Rafiya Bags
65	Wonder Poly Packers	S-51, Shiv Marg, Jhotwara, S-51, Jhotwara, Jaipur	Jhotwara	Done	Plastic Packaging
66	M/S Shree Shyam Enterprises	Pitiliya Ki Bagichi, Amar Path, Janta Colony, Pitiliya Ki Bagichi, Shamsan Ghat, Jaipur	Rajasthan University	Done - Repeat Address	
67	Shree Shyam Packaging	Pitaliyon Ki Bagichi, Shree Shyam Packaging, Amar Path, Janta Colony, Pitaliyon Ki Bagichi, Pitaliyon Ki Bagichi, Jaipur	Rajasthan University	Done - Repeat Address	
68	Riddhi Enterprises	Pitaliyon Ki Bagichi, Riddhi Enterprises, Janta Colony, Pitaliyon Ki Bagichi, Amar Path, Jaipur	Rajasthan University	Done - Repeat Address	Manufacturer of PP Rafiya Bags

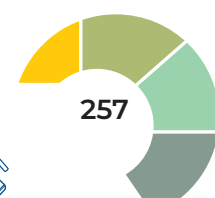


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S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
69	Shree Shyam Polymers	Pitaliyon Ki Bagichi, Shree Shyam Polymers, Janta Colony, Pitaliyon Ki Bagichi, Amar Path, Jaipur	Rajasthan University	Done - Repeat Address	
70	Khandelwal Traders	Pitaliyon Ki Bagichi, Khandelwal Traders, Janta Colony, Pitaliyon Ki Bagichi, Amar Path, Jaipur	Rajasthan University	Done	No Response
71	Ganga Industries	05, Mohit Udyog Nagar, Sarna Dungar, 05, Sarna Dungar, Jaipur	Sarnadungar	Done	No Response
72	Balaji Industries	Shop No. 02, Sarna Dungar, Jaipur, Shop No. 02, Jaipur, Jaipur	Sarnadungar	Location Not Found	
73	Shri Sharda Industries	50, Ramkunj, Sarna Doongar,, 50, Jaipur, Jaipur	Sarnadungar	Closed	
74	Hitech Industries	106, Shyam Nagar, Extension Benad, 106, ., Jaipur	Sarnadungar	Location Not Found	
75	Vikash Pet	1,10,11, Priya Nagar, Sarna Dungar, 1,10,11, Jhotwara, Jaipur	Sarnadungar	Done	PET Bottle
76	Shri Vankteshwara Plastic	Khasara No.125/395, Gram Bawadi, Sarna Dungar, Khasara No.125/395, Sarna Dungar, Jaipur	Sarnadungar	Location Not Found	
77	M/S Zastic Container Private Limited	J 509 C, 509, Jhotwara, J 509 C, Sarna Dungar, Jaipur	Sarnadungar	Enterprise Not Found on Location	
78	Jai Laxmi Industries	H1-124 (A1), Riico Industrial Area, Sarna Dungar, H1-124 (A1), Jhotwara Ext, Jaipur	Sarnadungar	Done	Big Plastic Containers
79	Krishna Poly Bags	Plot No. 11, Bajrang Colony, Benar Road, Plot No. 11, Jhotwara, Jaipur	Sarnadungar	Location Not Found	
80	Shree Balaji Enterprises	H-1124 B, Sarna Dungar, Jaipur, H-1124 B, Jaipur, Jaipur	Sarnadungar	Done	Fiber sheets for shade
81	Gurdav Shikshan Santhan	Plot No. J-497 B, Riico Industries Area, Jaipur, Plot No. J-497 B, Sarna Dungar, Jaipur	Sarnadungar	Location Not Found	
82	Ruby Packing Material	Plot No. 11, Bajrang Colony, Benar Road, Plot No. 11, Jhotwara, Jaipur	Sarnadungar	Location Not Found	
83	Om Shiv Industries	H395, Sarna Dungri, Jaipur, H395, Jhotwara, Jaipur	Sarnadungar	Done	Food Product Packaging



S. N.	Industry Name	Communication Address	Area	Remarks	Manufacturing Product
84	M/S Pratibha Polymers	G1-380, Riico Industrial Area Sarna Dungar, Vki, G1-380, 6, Jaipur	Sarnadungar	Done	Biscuit and Chips Packaging
85	Shree Siddhi Vinayak Polymers	C 13, Vikash Nagar, Vijay Bari Path No 7, Sikar Ro, C 13, Jaipur, Jaipur	Sarnadungar	Location Not Found	
86	Shree Shyam Industries	J 503b, Sarna Dungar Industrial Area, Benar Road, J 503b, Jhotwara, Jaipur	Sarnadungar	Done	Big Oil Containers
87	G R Plastic	H 1-517, Jhotwara Industrial Area Vistar, Jaipur, H 1-517, Sarna Dungar, Jaipur	Sarnadungar	Closed	
88	Shree Sideshwar Packaging & Marketing	Plot No.05, Priya Nagar-1st, Sarna Dungar Ind Area, Plot No.05, Jhotwara, Jaipur	Sarnadungar	Done	Small Size Plastic Can
89	Om Shiv Polymers	Plot No. 25, Om Shiv Polymers, Benad Road, Plot No. 25, Sarna Dungar Industrial Area, Jaipur	Sarnadungar	Location Not Found	
90	Tanwar Industries	Plot No J-506, Phase Ii Riico Industrial Area, Sarna Dungar, Plot No J-506, Jhotwara, Jaipur	Sarnadungar	Location Not Found	
91	Vinayak Plastic Industries	H1- 418(B), Sarna Doongar, Jhotwara Ext., H1 - 418(B), Phase 2, Jaipur	Sarnadungar	Done	Plastic Packaging
92	M/S. G.S.R. Industries	J-500 B, G.S.R. Industries, Sarna Dungar, J-500 B, Sarna Dungar Industrial Area, Jaipur	Sarnadungar	Done	No Response
93	Pioneer Packaging	Plot No 06, Ganesh Industries, Saarna Doongar, Plot No 06, Baori, Jaipur	Sarnadungar	Location Not Found	
94	Shree Radha Govind Enterprises	C 13, Vikash Nagar, Sikar Road, C 13, Vijay Bari Path No 7, Jaipur	Sarnadungar	Location Not Found	
95	Vaibhav Polymers	H 423, Sarna Industries, Near Sarda Dharm Kata, Jaipur, H 423, H, Jaipur	Sarnadungar	Done	No Response
96	M/S Santosh Kumar Saini	21 Nahar Tibha Ki, Charan Nadi Jwala Mata Ka Mandir, Jaipur, 21 Nahar Tibha Ki, Jaipur, Jaipur	Sarnadungar	Location Not Found	



Centre for Environment Education Ahmedabad was established as a Centre of Excellence under the Ministry of Environment, Forest and Climate Change, Govt. of India, working in the field of Environmental Education and Education for Sustainable Development. CEE is registered as a Society under Societies Registration Act 1860 vide registration No. GUJ/1043/Ahmedabad having its registered Office at Thaltej Tekra Ahmedabad.

As a national institution, CEE's mandate is to promote environmental awareness nationwide. CEE develops innovative programmes and educational material and builds capacity in the field of Education for Sustainable Development (ESD). It is committed to ensure that Environmental Education (EE) leads to action for sustainable development. It undertakes field projects that demonstrate and validate the role education can play in sustainable development.



The Rajasthan State Pollution Control Board was constituted under section 4 of the Water (Prevention and Control of Pollution) Act, 1974 on 7th February 1975, with the objectives of prevention, and control of water pollution and maintaining or restoring of wholesomeness of water[j1]. Later, it was also entrusted with the responsibilities of prevention, control and abatement of Air Pollution under the provisions of Air (Prevention and Control of Pollution) Act, 1981. Water (Prevention and Control of Pollution) Cess Act, 1977 has been enacted to make the State Board financially independent. Under this act the State Board has been given powers to collect Cess on the basis of water consumed by the industries etc.

Enactment of the Environment (Protection) Act, 1986 has further widened the scope of the activities of the Board. This Act being umbrella legislation, different rules for addressing the problems of various sectors have been enacted under this Act. The State Board is engaged in implementation of the rules made under the Environment Protection Act, 1986.