



Pratham

PLASTIC STORY

Study of Rural India

Provisional
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Executive Summary

The Plastic STORI (Plastic study of rural India) is a study conducted by Pratham, to understand different facets of the plastic waste problem plaguing rural India. We hope that this effort enable us to think about how to make children and youth aware of these issues. While our study is based on a convenience sample and is not necessarily representative, the insights from the 700 villages surveyed as part of this study paint a grim picture.

Plastic litter and garbage patches were commonly observed in the villages at were visited and litter was present near most establishments like general store, medical store, clinics, hospitals and eateries. More than 50% of the establishments that were assessed within the scope of this study had the presence of waste near them. Paper waste, cardboard, and plastic waste such as wrappers, bottles, and cans were commonly observed in their vicinity.

A majority of the villages lack infrastructure to adequately manage the solid waste generated within their villages. Basic waste management systems such as waste bins and community waste vehicles are present in less than 40% of the villages studied. Less than 20% of the villages have received any funds for setting up any solid waste management system within their village. Thus, most of these villages lack a formal mechanism for waste redressal.

The lack of formal infrastructure means that the village has to rely on informal arrangements such as kabadiwalas, who collect waste to sell. Almost 93% of the villages have regular access to a kabadiwala and most stakeholders are visited by the kabadiwala at least once a week, if not more. However, not all kinds of waste materials are readily accepted by the kabadiwala. While waste such as paper, metal and cardboard is readily collected, single-use plastics such as wrappers, sachets, plastic packaging are rejected. These single-use, low-quality plastics tend to remain within communities and contribute to the growing waste problem in rural India.

Meanwhile, plastic that is not readily collected by the kabadiwala is either burnt or thrown away with the rest of the garbage. Waste is either dumped near the establishment or at a common dumping spot. These results were consistent across all the stakeholders surveyed as a part of the study. Most stores and eateries are not frequently visited by any community waste disposal vehicles.

While our study is not a representative sample, the status of waste management across these 700 villages paints a grim picture. India's waste generation is rising, and so is the contribution of rural India towards these numbers. Waste was observed in most of the 700 villages studied as a part of the survey, however, there is a pronounced lack of mitigation systems to address the growing waste problem. This, coupled with the lack of awareness among the rural population poses a serious threat to the well-being of rural India.





Despite being banned by the National Green Tribunal in 2013, the burning of plastic continues to be prevalent. Out of the 8400+ households visited as a part of this study, 67% burn the plastic waste that the kabadiwala does not take. The amount of plastic waste just thrown away or burnt by establishments including medical stores and hospitals is alarming. Most stakeholders interviewed for the study burn plastic at least once a week. Stakeholders mostly burn their plastic waste next to their establishment, thereby exposing themselves and those around them to the associated ill effects. Often households burn plastic within their households in a chulha.

In a very welcome move, the Government of India banned the manufacture, import, stocking, distribution, sale, and use of single-use plastics on July 1, 2022. This coincided with completion of the study.

As in the case of many laws, unless there is widespread awareness and serious focus among citizens to ensure the implementation of laws, they remain on paper. The Plastic STORI is a step in the direction of helping children and youth families and communities become aware of the problem and find solutions to the management of plastic waste.





Commentary by Kedar Sohoni

Rural Waste Management

When we think of the problem of waste management, there are certain pictures that come to mind; large cities with enormous amounts of trash, streets with overflowing bins and mountain high landfills.

We rarely think of the 6 lakh+ villages that are soon becoming distributed islands of trash.

A few decades ago, the waste that village households generated largely consisted of food waste and some glass, paper, metal which was locally disposed of or upcycled/ recycled.

But the FMCG boom has changed the consumption landscape of villages. Consumption of packaged goods, both food and non-food usually packed in plastic wrappers / sachets has seen an enormous jump in the last 10-15 years.

There was hardly any infrastructure for waste management that was seen as necessary until a few years back, but now there is clearly an urgent need to set things up or else our villages will further drown into waste.

While there is an informal kabadiwala/ scrap dealer network near most villages, they are driven by largely economic considerations, and they only collect certain kinds of materials at a certain frequency. And that's where the biggest challenge lies.

Firstly, not all households may be diverting their waste through this network and may choose to dump/ burn it locally. Even if there is an informal system, the kabadiwala may not pick up all the waste, especially low value and/ or voluminous waste like product wrappers, PET bottles, plastic bags, Thermocol etc. All this waste is again dumped/ burnt locally causing air, soil and water pollution.

This is supported by the data that has come out of the plastic study. 90% of the villages have access to a kabadiwala, yet over 3/4th of the residents burnt their waste.

The key question is what kind of a waste management system should be set up and who should be putting it together. In any waste management project, there are various stakeholders involved, the waste generator (village community), producer (brand/ manufacturer), local body (gram panchayat) and the entrepreneur (scrap dealer, aggregator, recycler etc). It is critical to establish roles and responsibilities for each one of them to have a working system in place. Solid waste management laws already talk about such a system, but the on-ground implementation is lacking in most cases.

It is important for all waste generators to segregate their waste at source into compostable, recyclable and hazardous waste. They should also be willing to pay a small user fee to enable the gram panchayat to set up a system for door-to-door collection of this waste. Once collected, the compostable waste can be converted to manure and the recyclable and hazardous waste kept separately for disposal.





At this stage, the role of the brand becomes critical. As part of the extended producer responsibility, the brand needs to set up or support a system that can pick up this segregated waste and send it to the appropriate destinations. Relying on an informal scrap dealer system is not going to be enough. Those brands who are putting material like hard to recycle multilayer plastic into the market need to support costs involved in setting up and running a reverse logistics system. This is the biggest gap as on date, since the current market rates do not support collection and transportation of low value plastic from the villages.

This means that there should be a significant and consistent amount of gap funding provided to ensure there is enough incentive for the informal/ formal recycling system to collect, aggregate and transport waste from the villages to the recyclers.

Brands set up product distribution systems and push for rural expansion for their benefit. They spend large amounts of money to ensure their products are available in various corners of the country and they also pay the necessary retailer margins to ensure their products are stocked in various outlets. The same principle should apply for taking back post-consumer waste material. A reasonable per unit cost needs to be set aside for this activity on an ongoing basis. These extra costs can of course be passed on to the consumer and don't have to impact the company bottom line.

A recent study undertaken by GCF found that each kg of post-consumer multilayer plastic waste can have anything between 100 to 700 individual wrappers and the MRP of the goods sold which were in these wrappers ranges between Rs. 5000 and Rs. 15000. So if the brand spends even 1% of its MRP on setting up or supporting a system for taking back plastic waste, it will mean that Rs. 50-150 will be available for this activity per kg of plastic generated. This will be more than enough to ensure a large chunk of plastic waste which today gets dumped, burnt or littered will get collected and reach the appropriate destination like recycler/ co-processor.

As a next step, it will be great to see brands taking active interest in working in rural geographies with local stakeholders to support systems for taking back plastic waste.

Kedar Sohoni – Founder - Green Communities Foundation

Kedar is a technology entrepreneur who has built research and analytics companies including Cross Tab and Informate Mobile Intelligence. The latter was acquired by Nielsen. After a year of experimentation with waste management, he converted his society into a Waste Free Society and set up Green Communities Foundation (GCF) in 2017. GCF works in Mumbai and rural Maharashtra to prevent waste from getting littered, burnt or going into dumping grounds by implementing segregation at source and ensuring that the waste is composted or recycled.





Why this study

Recently, Pratham launched a program for training of youth. The idea was to provide participants in this program – YouthNet – opportunities for job training and/or for development of general skills and knowledge. In return they would help their community or village by assisting children with their education or other projects that would help the larger population.

Apart from helping pre-school and primary school children build foundational skills, Pratham is also working with children above the age of 10 on “beyond basics”. This part of the education program is divided into three segments. “Learning for school” – subjects like mathematics, science and English. “Learning for life” – domains like health, environment, wellbeing, music, creativity and “Learning for work” – skills that may help to earn a livelihood later in life. The Plastic STORI project belongs to the 'learning for life' segment.

Often children are expected to study environmental sciences as a part of their school curriculum. But there is a danger that, like most other subjects, this turns into a book-bound exercise unless children engage with their surroundings and learn about the issues, problems and solutions around them.

For example: Plastic pollution surrounds us and is present everywhere. Much is known about it in urban contexts, but very little has been studied about the problem of plastic issues in rural areas. We wanted to conduct this study, first and foremost, so that we could understand general issues of rural plastic pollution. This general understanding will be presented to children and youth so that they can compare it with their own specific contexts.

Simple questions need to be raised and answers sought in order to raise awareness. What kind of plastics enter our homes? What do we do after we have used them? What do our neighbors do with their waste? How does the village manage its plastics?

As we were concluding this study, the Government of India banned single use plastics. If this new restriction has to become effective, children and parents, families and communities will have to understand the grim situation. They will have to work individually and collectively to implement already existing laws as well as the new law right from their own doorsteps. They may realize that solutions are not easy to find even if they seem obvious.

One way to counter the problem of rote learning in our education system is to adopt the “learning by doing” approach. The Plastic STORI study uses this approach. The next step after this report is to help children and youth to learn about problems in their village and think of ways to solve them.

We hope that this study will be a lighthouse to guide voluntary efforts to solve the problem of rural plastic waste management.





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HOW DID WE STUDY





Timeline

JANUARY '22

External experts were consulted to identify key areas of environmental education in India.

Existing research on urban and rural solid waste management in India was reviewed.
Environmental education curriculum in India was reviewed.
The first draft of the questionnaire was prepared.

FEBRUARY '22

MARCH '22

The questionnaire was piloted in 5 states.
Based on the results of the first pilot, the questions and the process of administration were revised.

The questionnaire was further revised as per recommendations from expert advisors and the team from ASER centre.
The revised questionnaire was piloted.
Based on the results of the second pilot, questions were finalized and a digital version of the questionnaire was created.
Sample villages were selected.

APRIL '22

MAY '22

In-person training of master trainers was conducted over 3 days at 4 locations across the country. After this, master trainers conducted training for Pratham Institute of Vocational Skilling staff members and youth volunteers in 50 clusters across 15 states.
The study was conducted in 700 villages in 70 districts in 15 states of India by Pratham staff with the help of youth volunteers.
The study was monitored by master trainers, Senior team of Pratham monitor the field work in real-time by visiting and observing the surveyors.

Once the responses were received, data was analyzed.
The report was put together and a website was launched.

JUNE '22

JULY '22

Rural Plastic Waste Management Study 2022 report was released.



Process

STEP 1 - Introducing the study

Surveyors met the sarpanch/representatives of the village to inform them of the purpose of the study and sought permission to pose questions to community members about plastic waste management processes. Community members were assured that data such as village name, sarpanch or respondents' names and contact details would remain confidential.



STEP 2 - Village mapping

Surveyors walked around the entire village to do the following -

1. Create basic village maps that included notable landmarks. These maps were then verified by villagers.
2. Each village was divided into 4 sections or selected 4 hamlets.



STEP 3 - General observations

During the initial scouting and village mapping, surveyors also noted down some general observations (on visible waste management practices). These observations were entered in a form and submitted digitally.



STEP 4 - Household selection

Surveyors selected 3 households from each hamlet/section using the 'every 5th household rule'. If the residents of any selected house were not available, then an adjacent house was selected as a replacement. A total of 12 households were selected per village.



STEP 5 - Talking to the respondents

Surveyors introduced themselves. They explained the objectives of the study clearly to the respondents using a standardized introductory script.



STEP 6 - Administering the questionnaire

6 separate types of establishments or respondents were surveyed. These include households, eateries, general or medical stores, clinics or hospitals, kabadiwalas and sarpanch. Surveyors administered the household questionnaire to an adult in the 12 sampled households. Shop owners, doctors, kabadiwalas, sarpanch or a panchayat member answered their respective questionnaires. Data was submitted online in real-time.



States and districts where the study was conducted





Districts where the study was conducted

S.No.	State	District
1	Andhra Pradesh	Bapatla
		East Godavari
		Guntur
		Visakhapatnam
2	Assam	Sonitpur
3	Bihar	Gaya
		Muzaffarpur
4	Chhattisgarh	Balod
		Bilaspur
		Dhamtari
		Kondagaon
		Raipur
		Rajnandgaon
5	Jharkhand	Bokaro
		East Singhbhum
		Ranchi
		West Singhbhum
6	Karnataka	Kolar
		Mysore
7	Madhya Pradesh	Bhopal
		Damoh
		Indore
		Jabalpur
		Sehore
		Vidisha
8	Maharashtra	Amravati
		Ahmednagar
		Akola
		Aurangabad
		Beed
		Jalgaon
		Jalna
		Kolhapur
		Latur
		Nagpur
		Nashik
		Osmanabad

S.No.	State	District
		Parbhani
		Pune
		Raigad
		Sangli
		Satara
		Yavatmal
9	Odisha	Cuttack
		Ganjam
		Jajpur
		Malkangiri
		Sonepur
10	Punjab	Kapurthala
		Mohali
11	Rajasthan	Jaipur
		Jhalawar
		Jhunjhunu
		Udaipur
12	Tamil Nadu	Thiruvallur
13	Telangana	Bhadradi
		Kothagudem
		Mahabubabad
		Mahabubnagar
		Medak
		Nizamabad
14	Uttar Pradesh	Warangal
		Aligarh
		Gorakhpur
		Kanpur
		Kaushambi
		Lucknow
		Meerut
		Prayagraj
15	West Bengal	Varanasi
		Hooghly



Sample description

The Plastic STORI was conducted in 15 states, 70 districts and 700 villages of India. Although 10 villages were selected from each district, the distribution of districts across the 15 states was not equal. The villages were selected based on convenience sampling from Pratham's YouthNet program catchment area. Therefore it should be noted that this is not a representative study.

Table 1.1 Sample description of our study

State	Districts	Villages	Households	General/ medical stores	Snack stall/ tea stall/ dhabas	Clinics/ hospitals	Scrap dealer/ kabadiwala	Sarpanch
Maharashtra	18	180	2191	182	141	154	143	175
Uttar Pradesh	8	80	941	81	72	70	63	72
Telangana	6	60	698	54	36	34	20	50
Chhattisgarh	6	60	707	61	40	54	50	57
Madhya Pradesh	6	60	715	60	42	49	56	59
Odisha	5	50	597	45	36	33	23	46
Andhra Pradesh	4	40	469	48	51	35	29	34
Jharkhand	4	40	467	39	21	19	13	34
Rajasthan	4	40	494	41	26	30	20	37
Karnataka	2	20	234	16	1	14	7	12
Bihar	2	20	246	24	15	17	10	19
Punjab	2	20	232	21	16	19	15	19
West Bengal	1	10	117	11	7	9	8	8
Assam	1	10	116	11	7	7	2	8
Tamil Nadu	1	10	119	10	10	6	8	8
Total	70	700	8343	704	521	550	467	638



Chart 1.1 Distribution of villages by their proximity to the nearest town

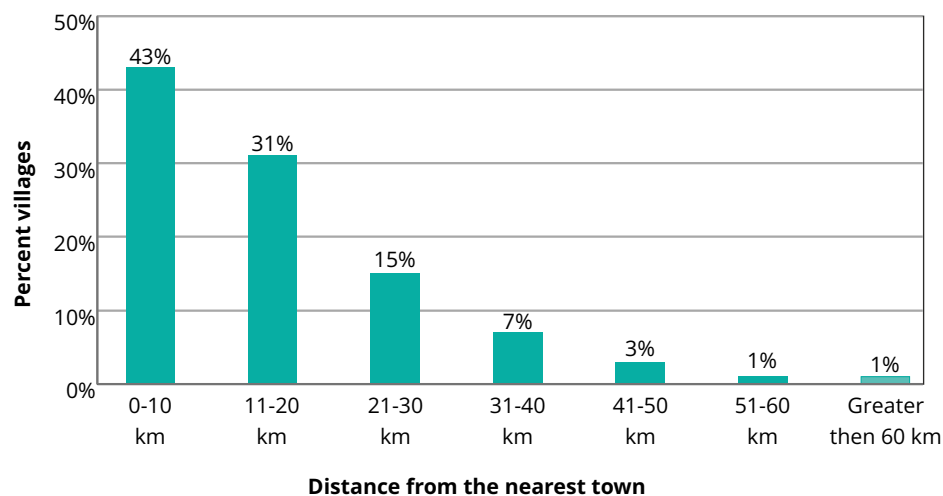
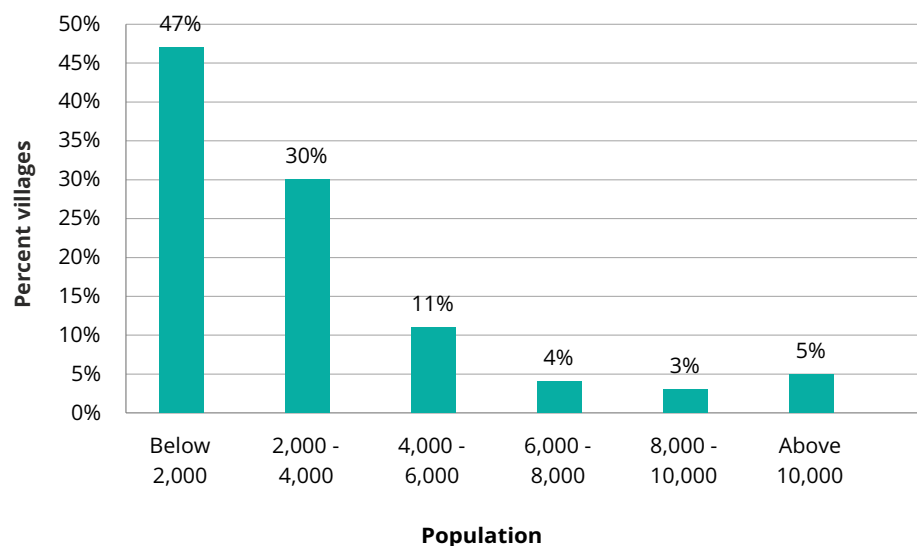


Chart 1.2 Distribution of villages by their population



Factors such as proximity to the nearest town and village population were considered while selecting the villages. Out of all the villages surveyed as a part of the study, 43% were within a 10km radius of the nearest town, while another 31% were within a 20 Km radius of the nearest town. A large majority of the villages (47%) had a population below 2000, and another 30% had a population between 2000 and 4000.

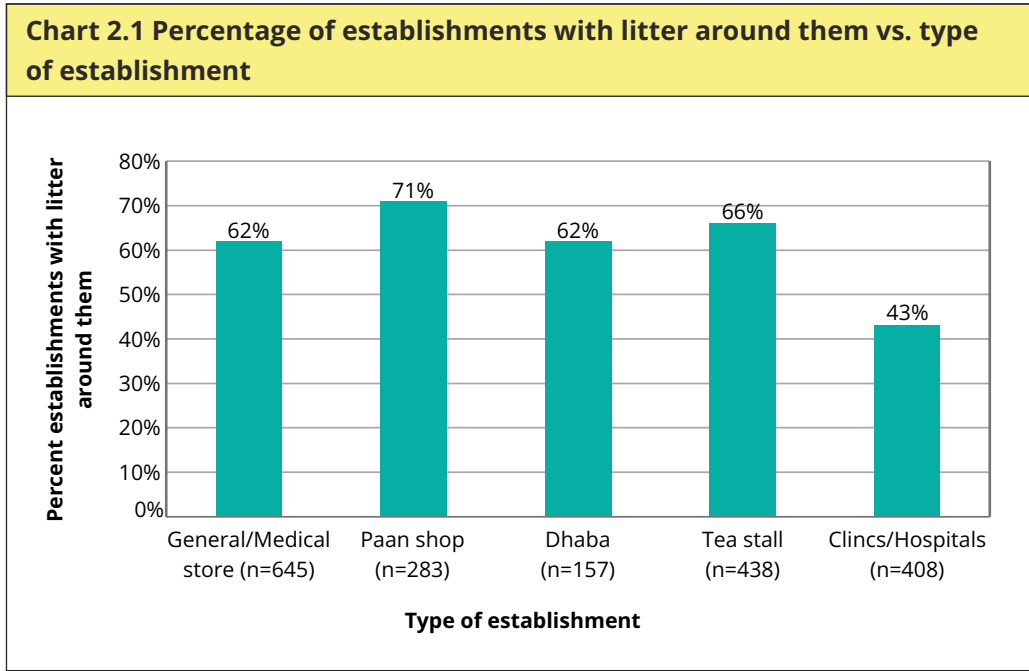


WASTE IN A VILLAGE





Plastic litter and patches of garbage heaps are commonly observed in villages.



Surveyors consistently observed litter around establishments. Across all villages, litter was observed near more than 50% of each type of establishment. The only exception to this were hospitals and clinics, where litter was observed near 43% of them. The above chart illustrates the percentage of establishments around which waste was observed.

Table 2.1 Waste observed near different establishments					
Establishment type and number observed	Type of waste observed by percent establishment				
	Paper waste /cardboard	Plastic wrappers	Plastic bottles and cans	Food waste	Other
Kirana/general store (n=645)	76%	72%	47%	40%	13%
Dhaba (n=157)	67%	66%	58%	56%	14%
Tea stall/snack stall (n=438)	51%	47%	32%	31%	7%
Dispensary/clinics/hospitals (n=408)	67%	61%	56%	21%	17%

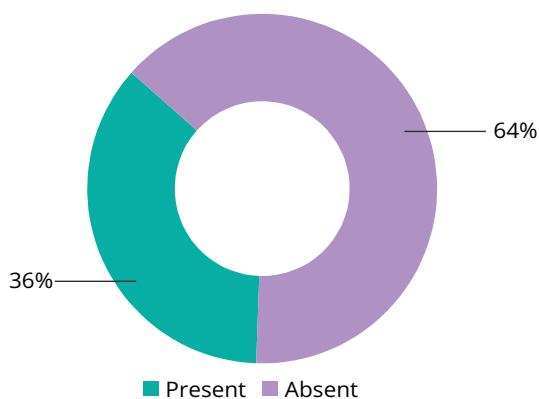
Each cell represents the percentage of the establishment where a certain type of waste was observed. For eg, 76% of the 645 eateries surveyed as part of the study had paper/cardboard waste lying around it. Since the surveyors could select more than one option, the numbers do not add up to 100.

Paper waste and cardboard are the most common types of waste generated by an establishment level, followed by plastic wrappers and plastic bottles and cans.



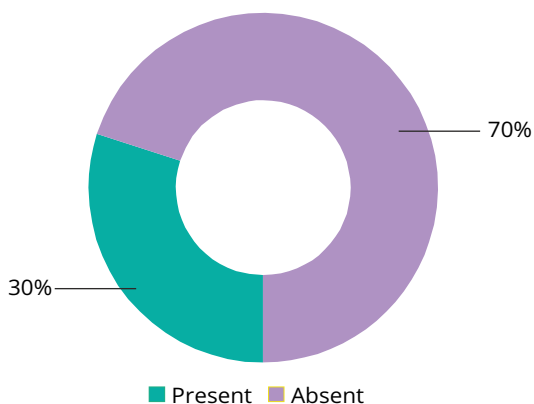


Chart 2.2 Public waste bins in the village



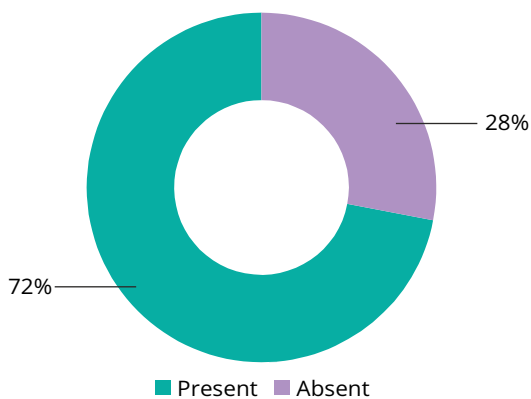
In the majority of the villages studied, garbage heaps were observed but no community waste collection bins. Only 36% of villages had a community waste collection bin. Garbage heaps were seen in 72% of villages, including many where waste bins were present.

Chart 2.3 Litter near drinking water sources in the village



In 30% of the villages, litter was found near water sources as well.

Chart 2.4 Garbage heaps in the village



We looked at a smaller sample to understand what kind of waste was present at the dumps. Plastic waste was the most commonly seen at the dumps, followed by paper waste.



Table 2.2: Major plastic waste generated by each establishment

Stakeholder/ Indicator	General/ medical store	Clinics/ hospitals	Snack/tea stall & dhabas
Major plastic waste generated	Plastic bags (80%)	Medicinal waste (83%)	Plastic bags (54%)

Note: Of all the plastic waste near general or medical stores, 80% was plastic bags.

Table 2.3: Percent establishments by type of plastic waste generated

Establishment type and number observed	Type of plastic waste generated				
	Plastic bottles and cans	Plastic bags	Plastic wrappers	Plastic packaging	Plastic cups, plates etc. and other waste
Eateries (n=520)	55%	65%	56%	30%	53%
Kirana store (n=629)	57%	82%	77%	48%	1%
Medical store/chemist (n=65)	54%	72%	62%	49%	8%

Each cell represents the percentage of the establishment where a certain type of plastic waste was observed. For eg, 55% of the 520 eateries surveyed as part of the study had plastic bottles and cans lying around it. Since the surveyors could select more than one option, the numbers do not add up to 100.



HOW IS WASTE TAKEN CARE OF?





How is waste taken care of at the village level?

Majority of the villages lack solid waste management infrastructure.

Out of the 700 villages covered in this study, public waste bins were observed in only 36% of villages. Merely 29% had a community waste collection vehicle, while less than half the villages had access to a safai karmachari. These trends were observed across all states and districts. Factors such as village population and/or proximity to the nearest town did not have a significant impact on these numbers.

Only 29% of villages (n=197) had access to a community waste collection vehicle; of these, only 87% had been visited by the waste collection vehicle in the 7 days before the study was conducted. This trend was similar across states and districts included in the sample.

Chart 3.1 Percent villages having waste management facilities

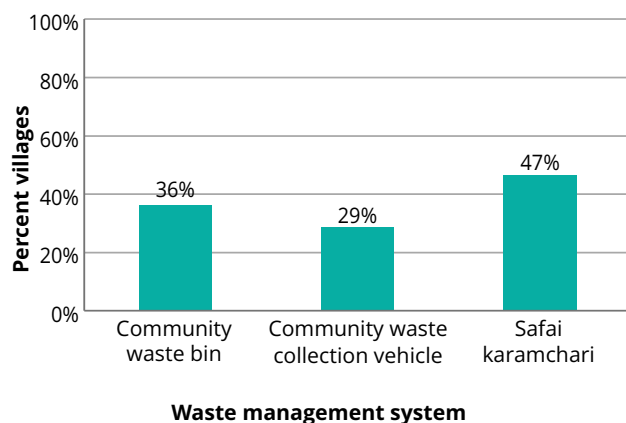
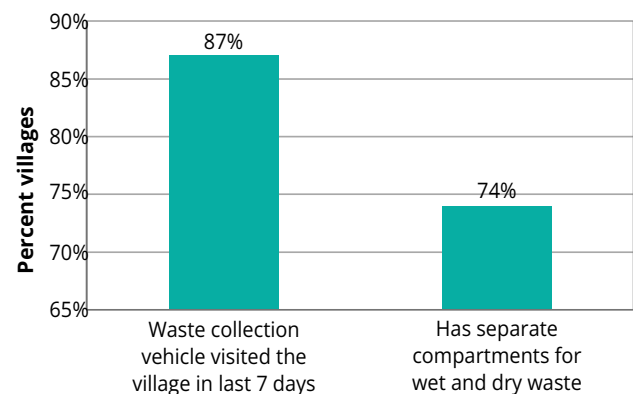


Chart 3.2 Status of waste collection vehicle in the 197 villages that have access to it



Very few villages claim to have received any funds or run any campaigns for plastic waste management.

Chart 3.3 Has gram panchayat received any funds for solid waste management?

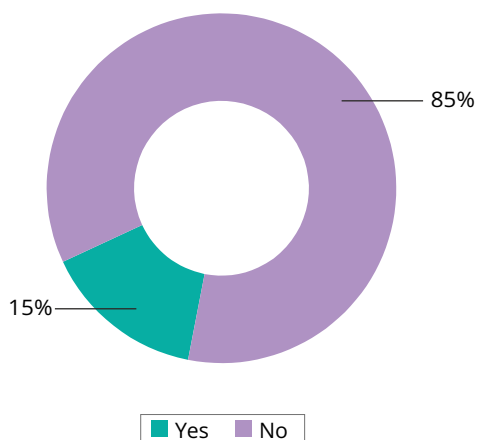
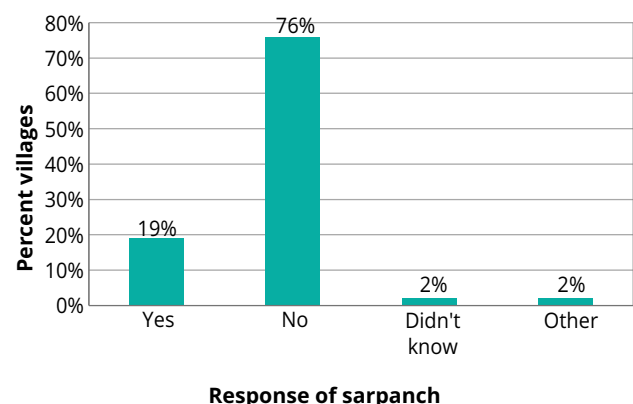


Chart 3.4 Are there government/NGO campaigns on reducing plastic waste?



Only 15% of the 700 villages studied claimed to have received any funds for solid waste management systems. Only 19% of villages had experience with any Govt/NGO campaigns that focus on the reduction of plastic waste.



How is waste taken care of at the establishment level?

Dumping and burning waste appear to be a common practice at establishments such as general/medical stores and eateries.



General/medical stores

Chart 3.5 Does a community waste vehicle visit the general/medical store?

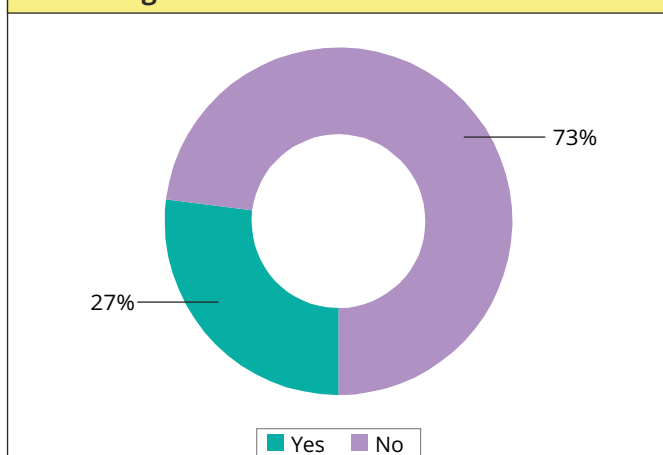
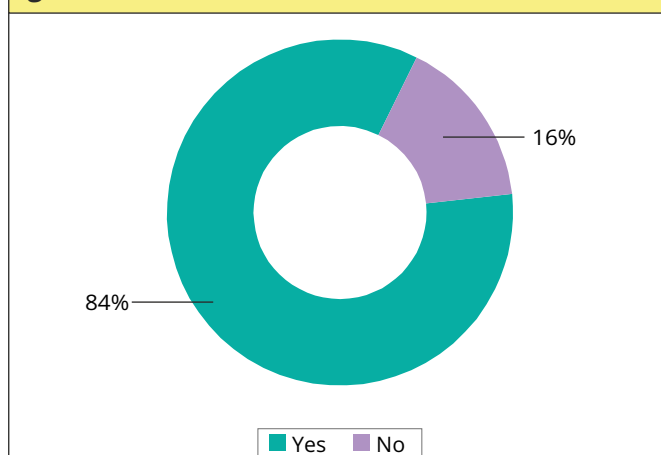
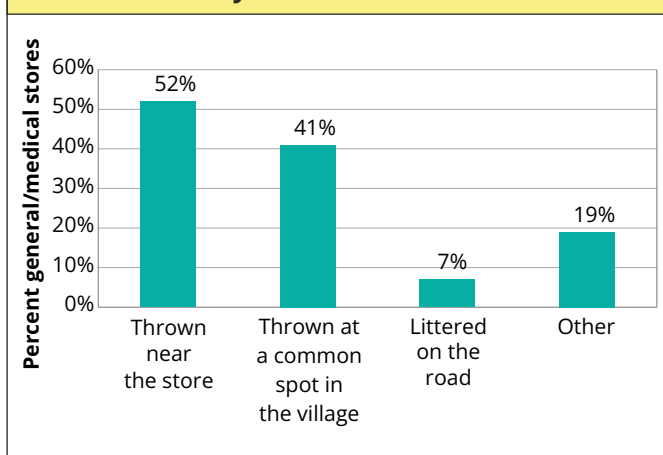


Chart 3.6 Does a kabadiwala visit the general/medical store?



While only 27% of the 704 stores surveyed were visited by a community waste collection vehicle, 84% were visited by a kabadiwala.

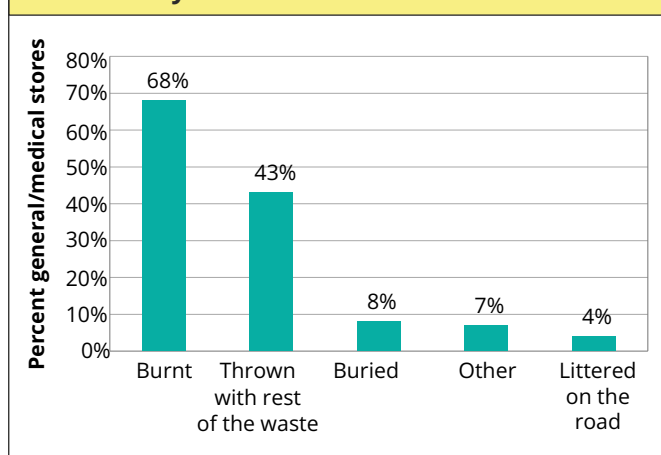
Chart 3.7 What is done with waste where there is no community waste vehicle?



The surveyors select more than one option for this question.

For the stores that do not have access to a community waste vehicle, the waste is dumped near the store, or at a common spot in the village.

Chart 3.8 What happens to the waste not collected by kabadiwala?



The surveyors select more than one option for this question.

The plastic waste that isn't collected by the kabadiwala is burnt or dumped with the rest of the waste.



Eateries

Out of the 520 eateries surveyed as a part of the study, only 29% had access to a community waste vehicle. Across all eateries, waste that was not collected by the community waste management vehicle was usually dumped near the stall or at a common spot in the village. There was an even split between the eateries that segregated their waste and those that didn't.

80% of the eateries covered in the study were visited by a kabadiwala. However, the plastic waste which was not purchased by the kabadiwala was mostly burnt (66%) or thrown away with the rest of the waste (44%).

Chart 3.9 Is dry and wet waste segregated at eateries?

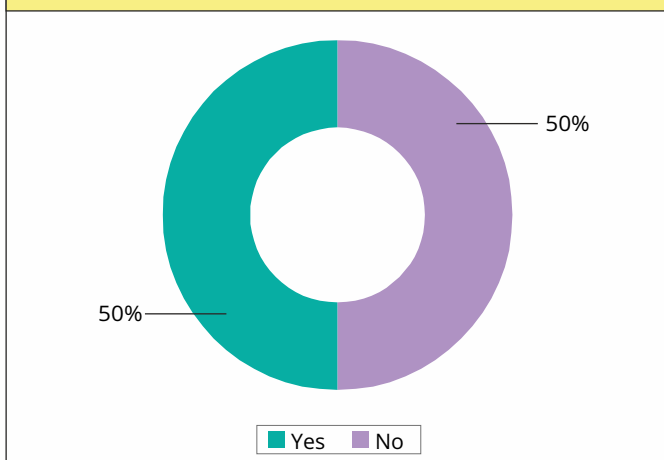


Chart 3.10 Does a kabadiwala visit the eatery?

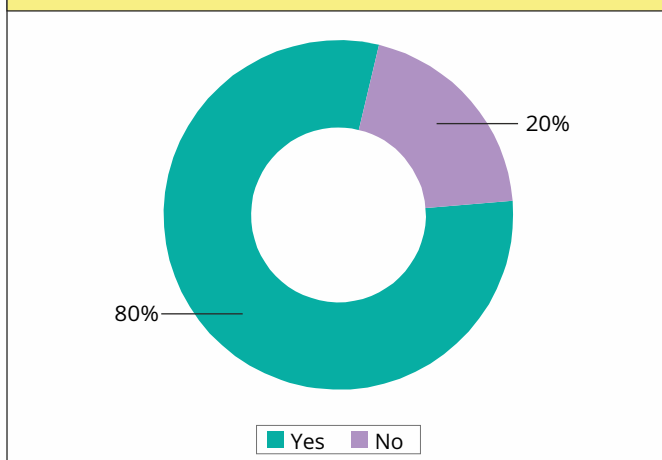


Chart 3.11 Does a community waste collection vehicle visit the eatery?

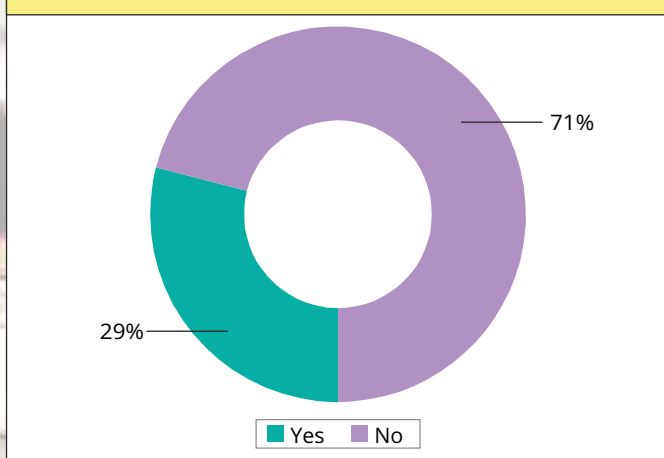
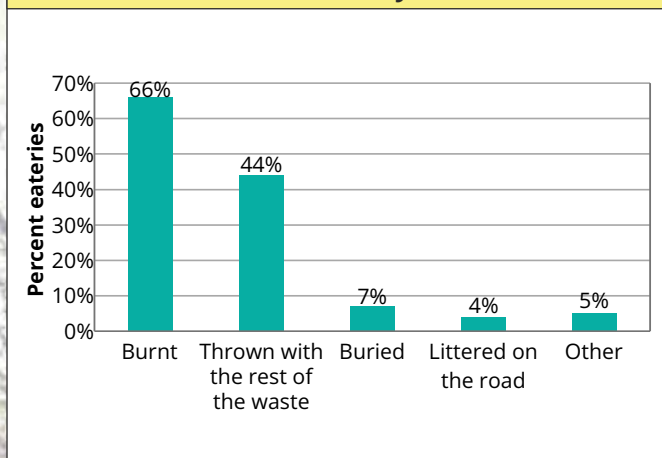


Chart 3.12 What is done with the plastic that the kabadiwala does not buy?



The surveyors select more than one option for this question.

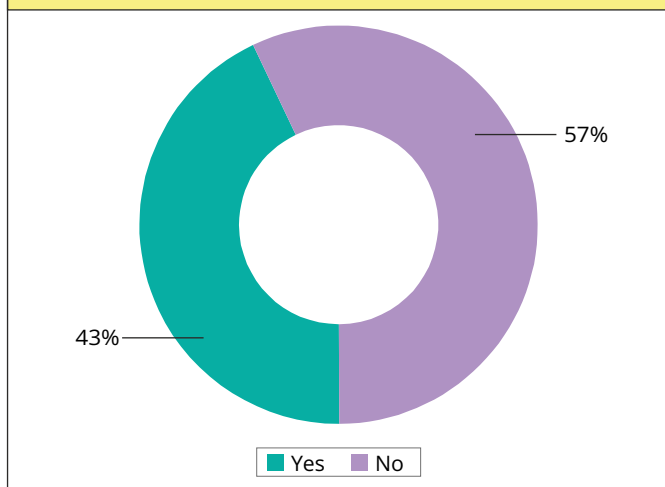


Clinic/hospitals

Less than half of the clinics/hospitals surveyed have access to special arrangements for biomedical waste collection.

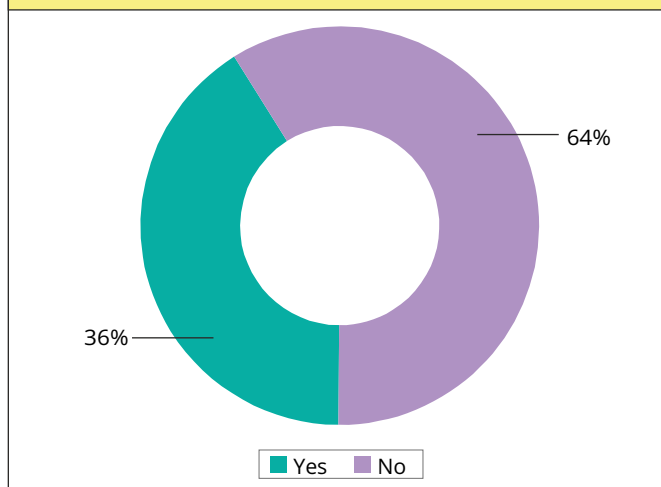
A total of 550 clinics/hospitals were surveyed in this study. 64% of these were present inside the village while 36% were situated outside the village.

Chart 3.13 Does a community waste vehicle collect waste from the clinic/hospital?



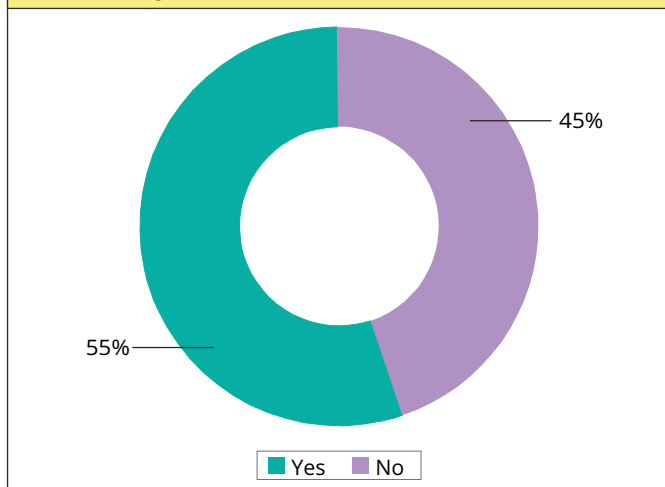
57% of clinics said that there is no community waste vehicle which collects waste from their establishment.

Chart 3.14 Does any special vehicle come to collect biomedical waste from the clinic/hospital?



Out of these 41%, majority said that the vehicle visits at least once a week.

Chart 3.15 Does a kabadiwala visit the clinic/hospital?



Amongst the 55% clinics/hospitals, majority are visited by a kabadiwala at least once a week.



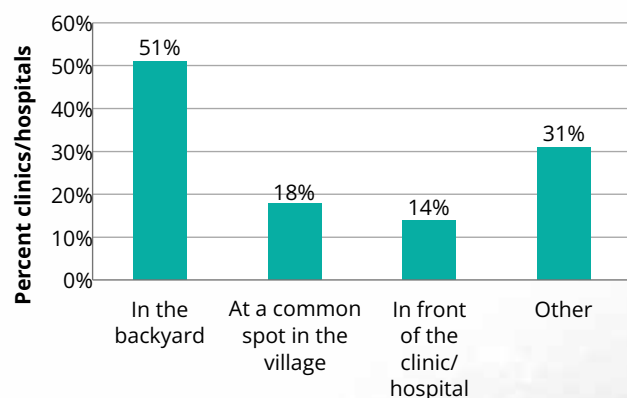


Dumping hazardous biomedical waste in the village appears to be a common practice by local clinics and hospitals.

The waste at clinics/hospitals which is not collected by the community waste vehicle or biomedical waste vehicle is most likely to be dumped near the clinic or at a common dumping spot. Burning of biomedical waste seems to be the second most common practice. However, the study did not uncover if these were done using safe and controlled incineration practices.

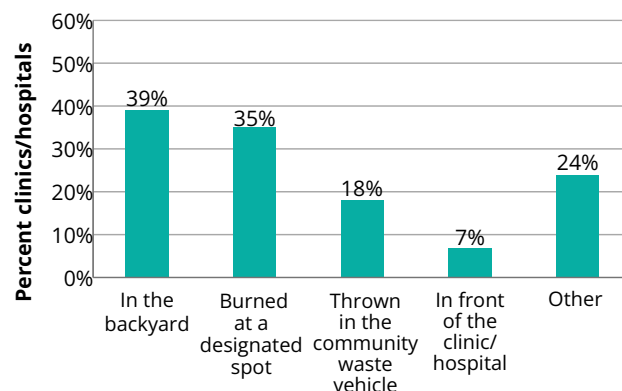
Although a kabadiwala visits more than half of the clinics surveyed, the waste that is not purchased by the kabadiwala is burnt, or discarded with the rest of the waste..

3.16 Where is waste thrown in the absence of community waste vehicle?



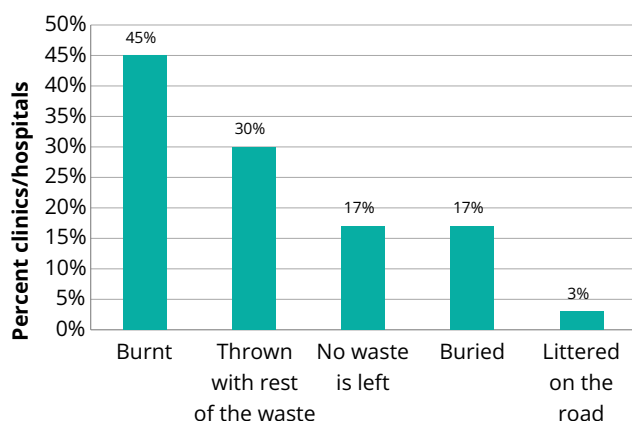
The surveyors select more than one option for this question.

3.17 Where is waste thrown in the absence of special vehicle for collecting biomedical waste?

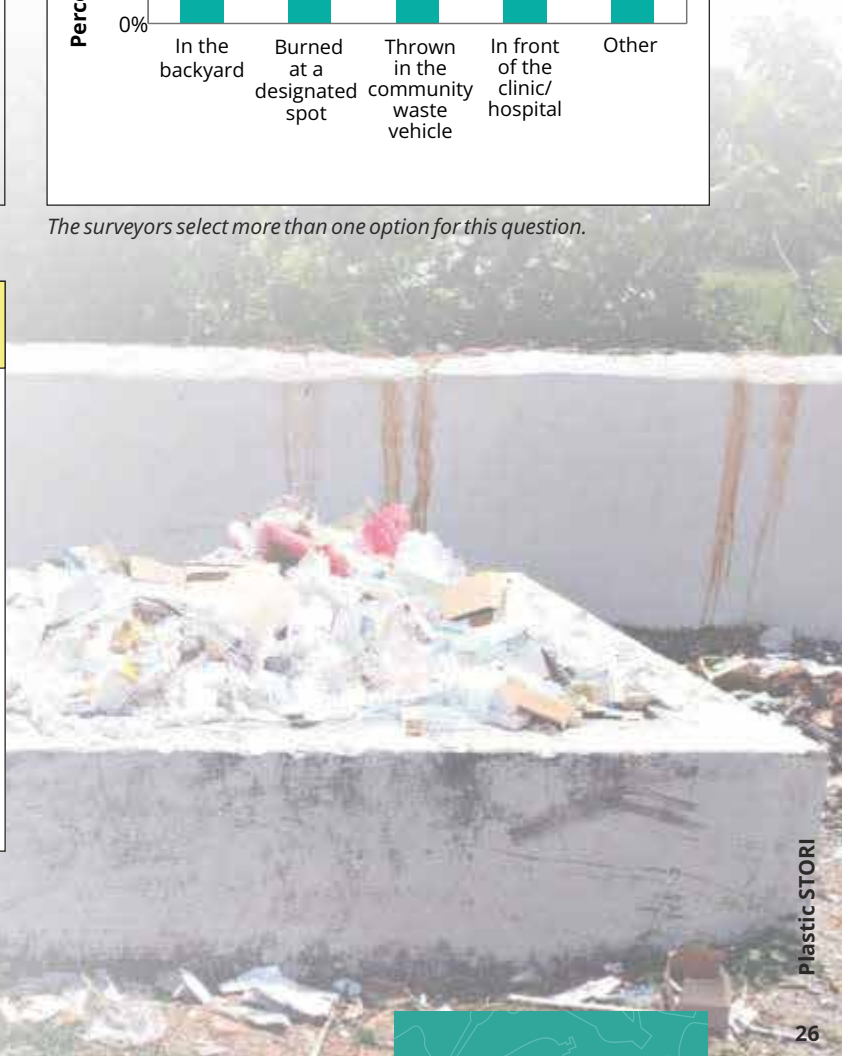


The surveyors select more than one option for this question.

3.18 What happens to the waste which the kabadiwala does not buy?



The surveyors select more than one option for this question.

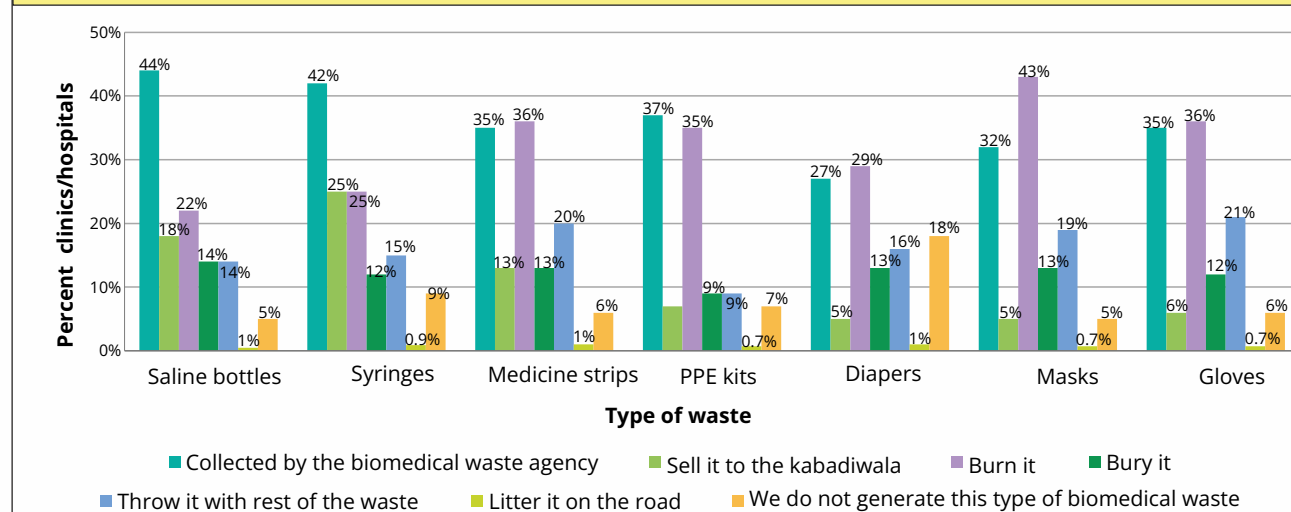




Management of specific types of biomedical waste.

Different types of plastic biomedical waste are generated by hospitals/clinics. While a large percentage of this plastic waste is collected by the waste vehicle van, it is also often sold to the kabadiwala, or burnt.

Chart 3.19 Ways plastic biomedical wastes are disposed



This chart represents the different ways in which plastic waste generated by clinics/hospitals are disposed.

44% of the respondents gave saline bottles to the biomedical waste collection van, while another 22% burnt the waste.

Similarly, 42% of the respondents gave away used syringes to a biomedical waste collection van, while 25% burnt them, and another 25% sold them to the kabadiwala.

Medicine strips are most often burnt (36%), closely followed by the giving it away to biomedical waste collection van (35%).

Only 37% of the respondents gave away their PPE kits to the Biomedical waste collection van, while 35% burnt it.

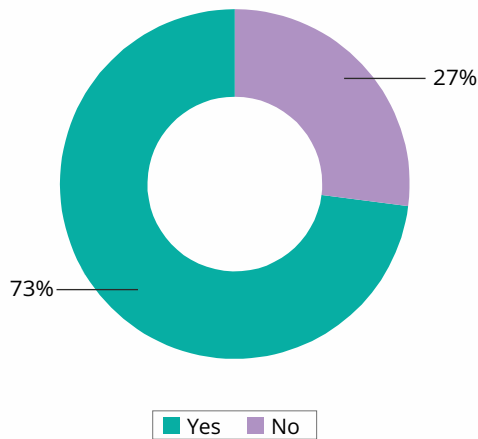




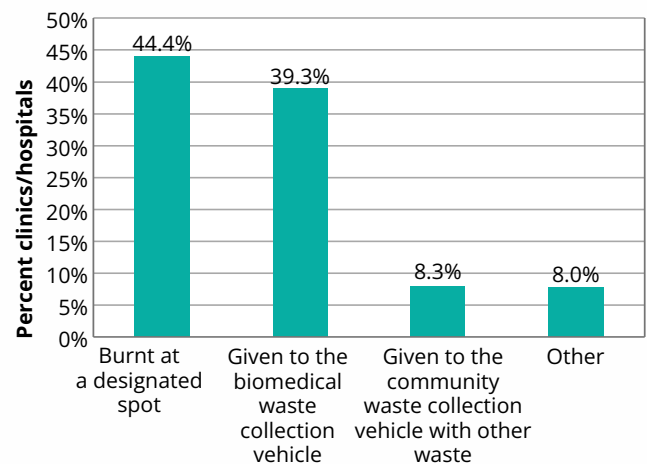
Disposal of biomedical waste at clinics/hospitals during the COVID-19 pandemic.

73% of the 550 clinics/hospitals said that they used PPE kits during the COVID-19 pandemic. Out of these 44% said that the PPE kits were disposed of by burning them near the hospitals, while 39% said that they were given to the biomedical waste collection vehicle. Other infectious items such as masks and gloves were mostly burnt.

Chart 3.20 Use of PPE Kits



3.21 How were the PPE Kits disposed?



The surveyors could select only one option for this question.



The government guidelines for disposal of PPE Kits were issued on the 19th of March 2020, and further revised on July 17th 2020.

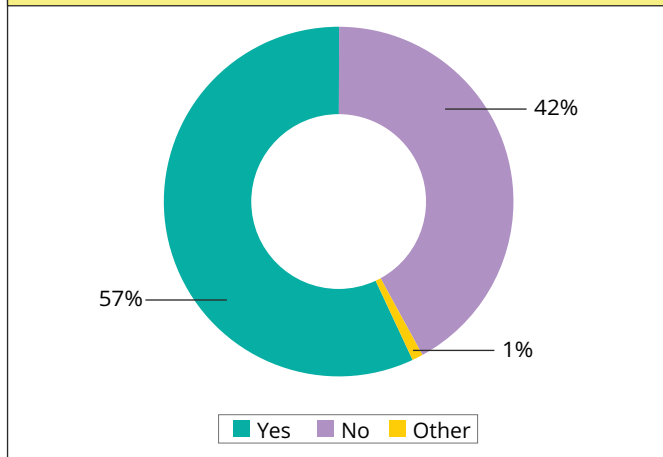
As per CPCB (Central Pollution Control Board) guidelines, used PPEs generated from COVID-19 isolation wards at healthcare facilities were to be segregated and sent to Common Facilities for disposal as per Bio-medical Waste Management Rules, 2016 (BMW Rules).





How is waste taken care of at the household level?

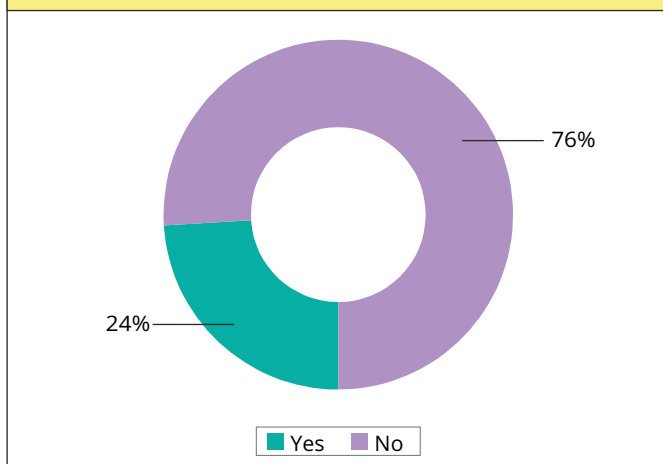
Chart 3.22 Do you keep dry and wet waste separately?



Segregation of dry and wet waste is a common practice at the rural household level.

Out of the 8437 households surveyed as a part of this study, 57% segregated their wet and dry waste. A majority of the kitchen waste - both cooked and uncooked - was either fed to the livestock or discarded with the other waste.

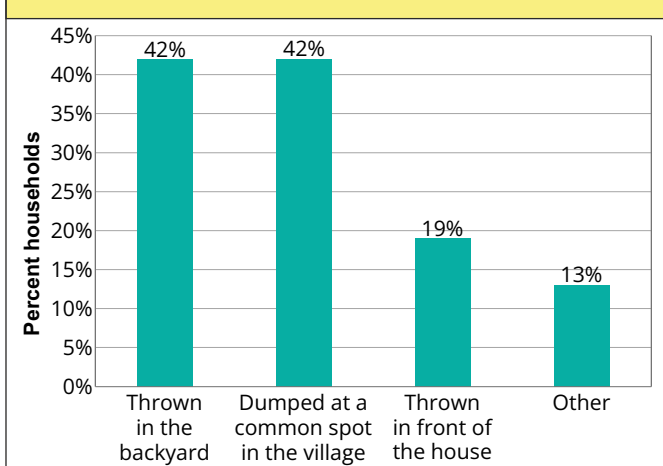
Chart 3.23 Are households visited by a community waste vehicle?



Community waste collection vehicles are usually inaccessible to households. Thus, dumping or burning waste is a common practice at the household level.

Only 24% of the 8437 households had access to a community waste collection vehicle. Out of these 38% of households said that the vehicle came every alternate day while 36% said that it came every day.

Chart 3.24 What happens to the waste not collected by community waste vehicle?



Households that do not have regular access to a community waste vehicle dump their waste near their homes or at a common spot in the village. These trends were observed across states. Factors such as village population or proximity to the nearest town did not have any significant impact on the data.



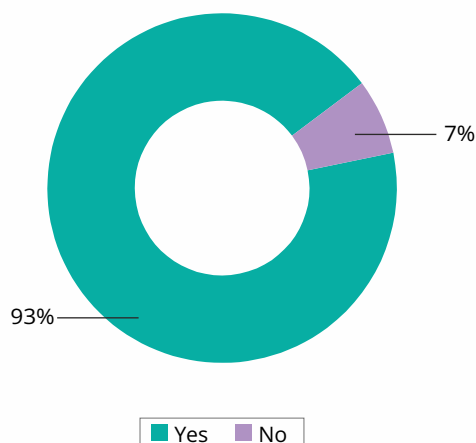
We asked a small group of respondents what was done with the waste collected by community waste vehicles. We learned that it was often burnt outside the village, or dumped in a dumping yard.

The surveyors select more than one option for this question.



Almost all households sell plastic waste to a kabadiwala. Kabadiwalas play an important role in the waste management system in villages.

Chart 3.25 How many households have access to a kabadiwala?



Plastic waste such as bottles, oil cans, shampoo bottles, broken pens, PVC pipes and broken toys are most often given to the kabadiwala. However, plastic such as polythene bags, wrappers and sachets are mostly burnt by the households.

Table 3.1 What happens to different types of plastic at the household level?

Type of plastic	Sold to kabadiwala	Throw with other waste	Burn	Bury	Other
Bottles, oil cans, shampoo bottles	70%	35%	29%	4%	2%
Broken pens, PVC pipes, broken toys	75%	33%	25%	4%	1%
Polythene bags, wrappers and sachets	27%	43%	58%	6%	3%

Each cell represents the what is done to a particular type of waste. For eg, 70% of the surveyed households sell bottles, oil cans, shampoo bottles to a kabadiwala. Since the surveyors could select more than one option, the numbers do not add up to 100.





The 7 types of plastics

Polymer Name	Resin Identification Code	Abbreviation	Recyclable?	Percentage recycled annually	How long to decompose under perfect conditions
Polyethylene Terephthalate		PET or PETE	Commonly recycled	36%	450 Years
High-density Polyethylene		HDPE	Commonly recycled	30-35%	100 Years
Polyvinyl Chloride		PVC	Sometimes recycled	<1%	Never
Low-density Polyethylene		LDPE	Sometimes recycled	6%	500-1000 Years
Polypropylene		PP	Occasionally recycled	3%	20-30 Years
Polystyrene		PS	Commonly recycled (but difficult to do)	34%	50 Years
All other plastics, including acrylic, fiberglass, nylon polycarbonate, and polylactic acid (a bioplastic)		Other	Difficult to recycle	Low	Majority of these plastics: never Polylactic acid: 6 months

Source: www.plasticsforchange.org/blog/different-types-of-plastic



THE ROLE OF THE KABADIWALA

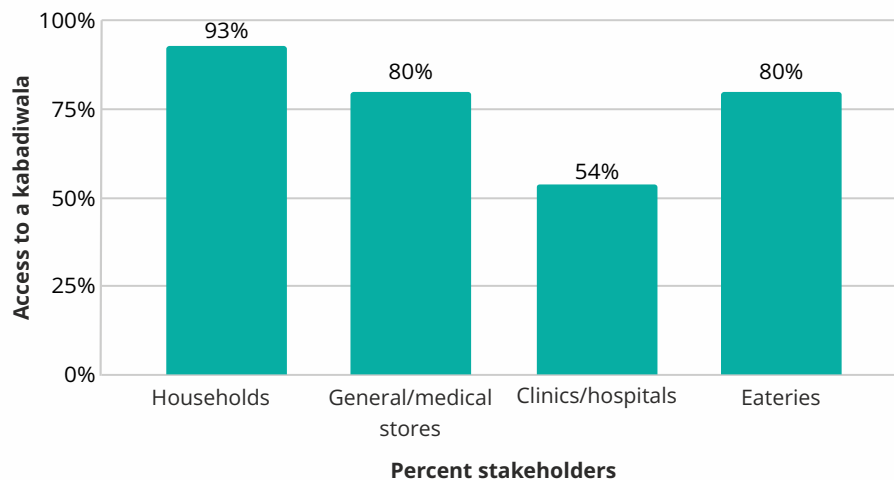




All stakeholders have regular access to the kabadiwala.

93% of the households, 80% of the general stores, 54% of the clinics/hospitals and 80% of the eateries can readily access a kabadiwala.

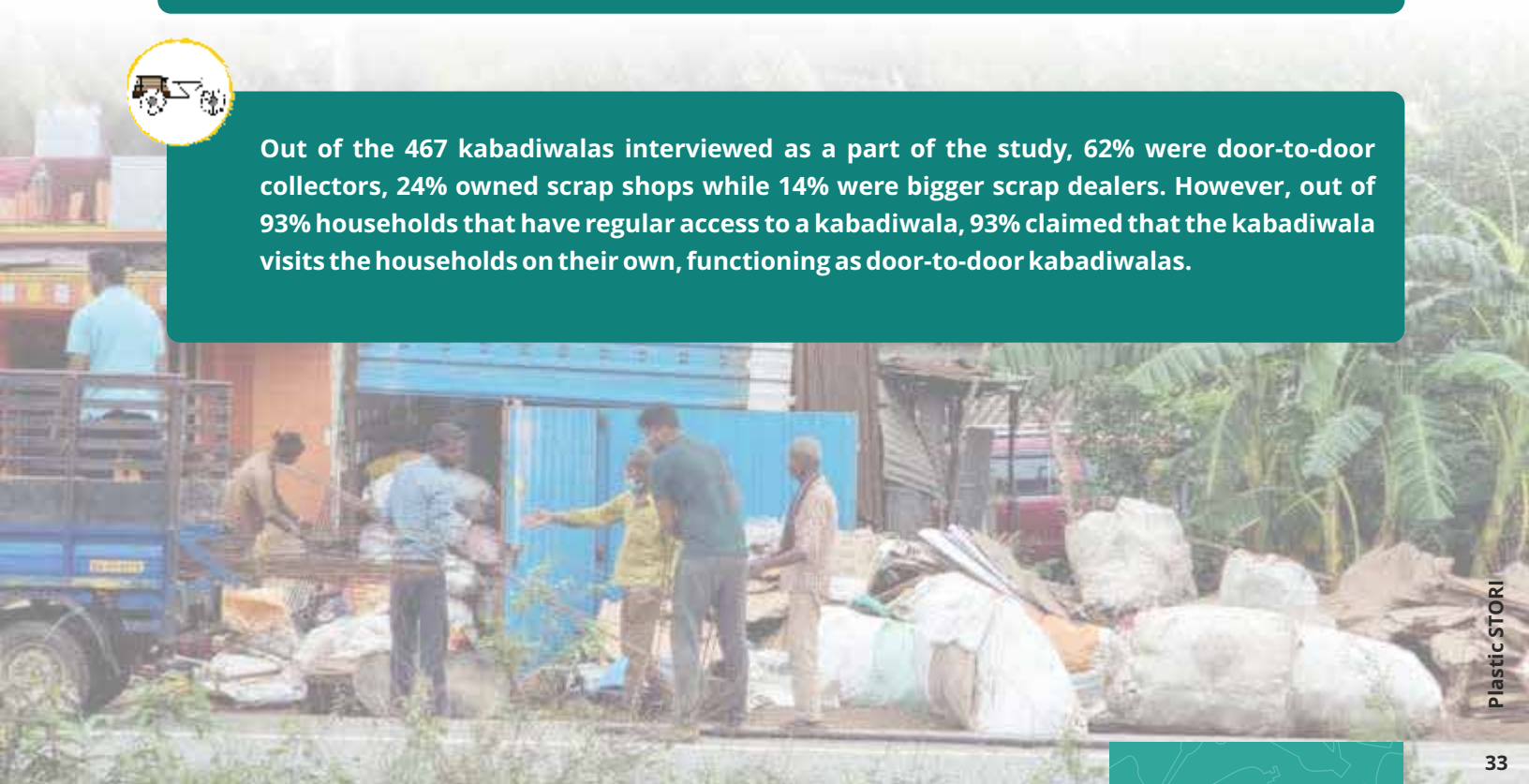
Chart 4.1 Percentage of stakeholders having access to a kabadiwala



The frequency of access for each stakeholder is also very high. Across the board, majority of the establishments and households are visited by the kabadiwala often- for e.g. everyday, once every two days or once a week.



Out of the 467 kabadiwalas interviewed as a part of the study, 62% were door-to-door collectors, 24% owned scrap shops while 14% were bigger scrap dealers. However, out of 93% households that have regular access to a kabadiwala, 93% claimed that the kabadiwala visits the households on their own, functioning as door-to-door kabadiwalas.

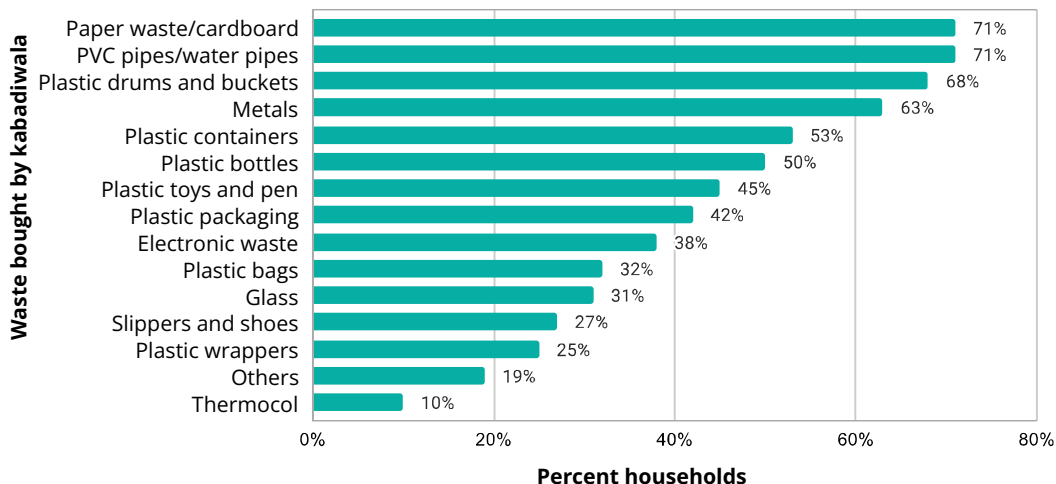




What does the kabadiwala buy?

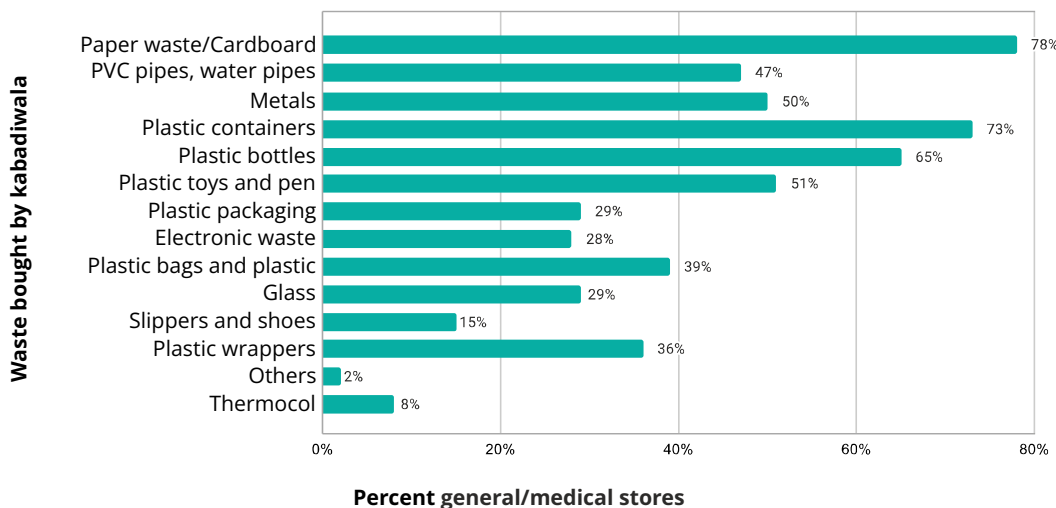
Type 7 plastic items such as packaging wrappers, and sachets are bought least by kabadiwalas across stakeholders.

Chart 4.2 What kind of waste is bought from households?



The adjacent chart represents the percentage of households selling a particular kind of waste to the kabadiwala. For eg, 71% of the surveyed households sell paper waste/cardboard to the kabadiwala. The surveyors could select multiple options.

Chart 4.3 What kind of waste is bought from general/medical stores?



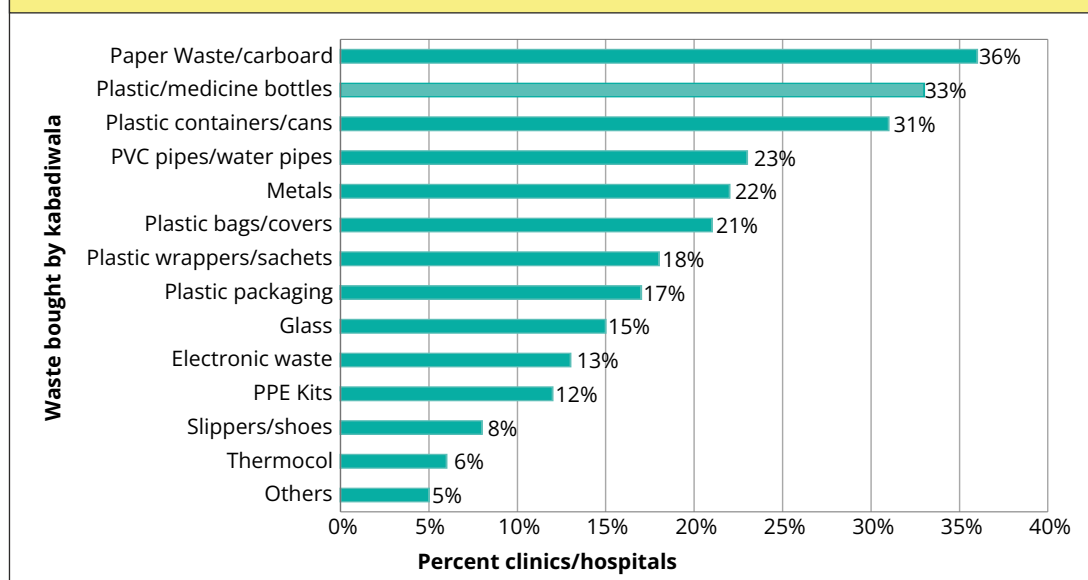
The adjacent chart represents the percentage of general/medical stores selling a particular kind of waste to the kabadiwala. For eg, 78% of the surveyed households sell paper waste/cardboard to the kabadiwala. The surveyors could select multiple options.

All households sell various types of waste to the kabadiwala. While paper waste, cardboard and plastic items such as PVC pipes, plastic drums and containers are readily collected, plastics such as wrappers and sachets and other plastic packaging are least likely to be bought by kabadiwalas.

Similar observations were also seen at the Kirana stores. Paper waste and cardboard were readily sold to the kabadiwala, but plastic items such as thermocol (Polystyrene - Type 6 plastic), wrappers and sachets (type 7 plastic) and plastic packaging were not sold to the kabadiwala and remained within the communities.



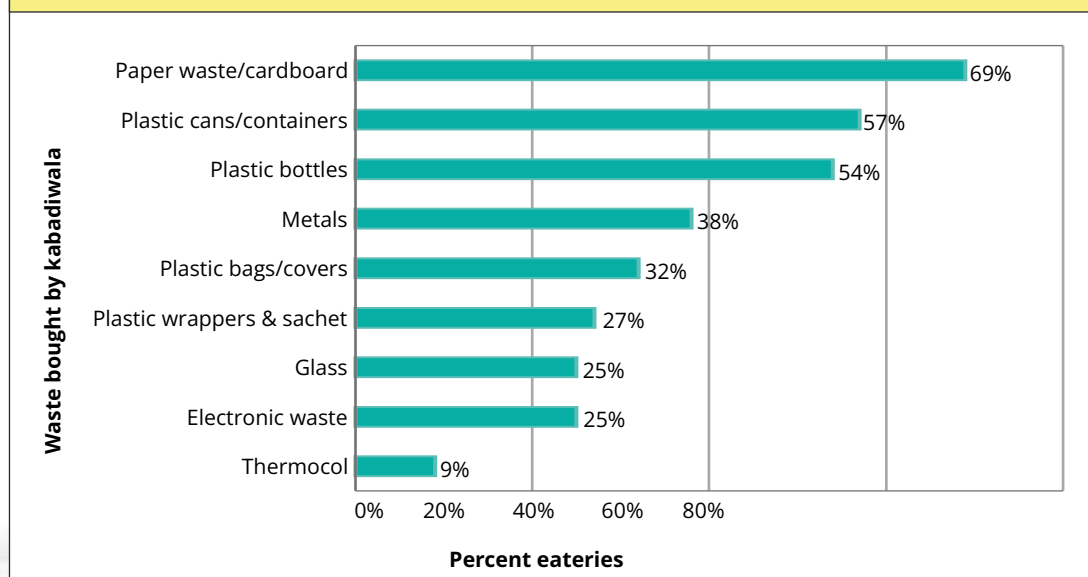
Chart 4.4 What kind of waste is bought from clinics/hospitals?



The adjacent chart represents the percentage of clinics/hospitals selling a particular kind of waste to the kabadiwala. For eg, 36% of the surveyed households sell paper waste/cardboard to the kabadiwala. The surveyors could select multiple options.

Less than 25% of clinics were gave type 7 plastic such as wrappers, sachets to the kabadiwala.

Chart 4.5 What kind of waste is bought from eateries?



The adjacent chart represents the percentage of eateries selling a particular kind of waste to the kabadiwala. For eg, 69% of the surveyed households sell paper waste/cardboard to the kabadiwala. The surveyors could select multiple options.



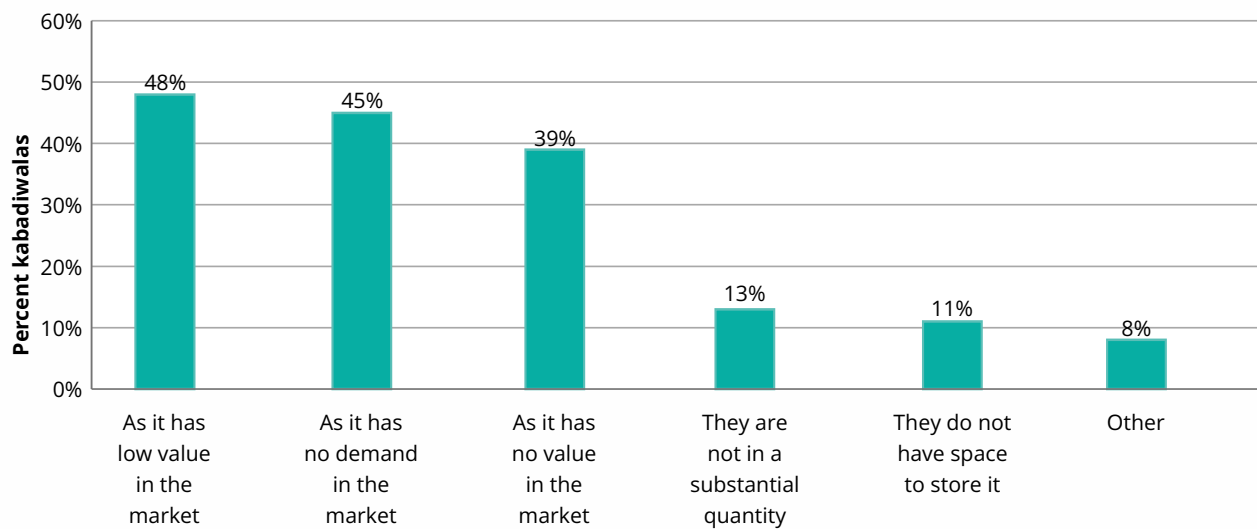
We also surveyed 467 kabadiwalas to understand what kind of plastic they accept. We learnt that less than 35% of the kabadiwalas accept single-use, low quality plastic such as wrappers, sachets and packaging.



Plastic waste collection by kabadiwalas is driven by market demand.

As illustrated in charts 4.2, 4.3, 4.4 and 4.5, certain kinds of plastics are less likely to be collected by the kabadiwalas from communities. When we asked the kabadiwalas about the same, we learnt that certain kinds of plastic were rejected due to it having low market value (48%), having no demand (45%) or having no value in the market (39%).

Chart 4.6 Why does a kabadiwala reject certain kinds of plastic?





PLASTIC - A BURNING ISSUE

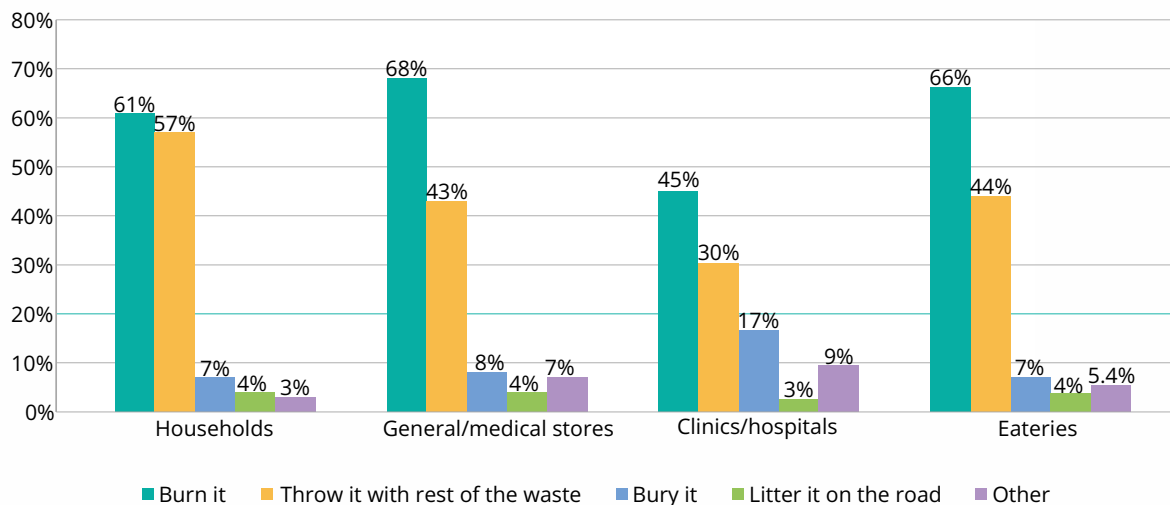




Burning of plastic waste is a common practice in villages.

514 out of the 700 villages covered in this study burned plastic waste either at individual household level and establishment-level or at the village level. Most stakeholders who burned plastic tend to burn it atleast once a week.

Chart 5.1 What does each stakeholder do with the plastic waste that the kabadiwala does not buy?



The above chart represent what is stakeholders with the plastic waste that is not purchase by the kabadiwala. So for e.g. 61% of surveyed household burn the plastic waste while 57% throw it with rest of the waste. The surveyor could select more than one option for each stakeholders.

As seen in the previous chapter, kabadiwalas play an important role in buying plastic waste from different stakeholders in the villages. However, a majority of the plastic waste not collected by the kabadiwala is either burnt or thrown away with the rest of the waste. 61% of the households, 68% of the general/medical stores, 45% of the hospitals/clinics and 66% of the eateries burn the plastic waste that is not collected by the kabadiwala. 57% of the households, 43% of the general/medical stores, 30% of the clinics and hospitals and 44% of the eateries that were surveyed as a part of this study practices discarded plastic waste along with other waste.

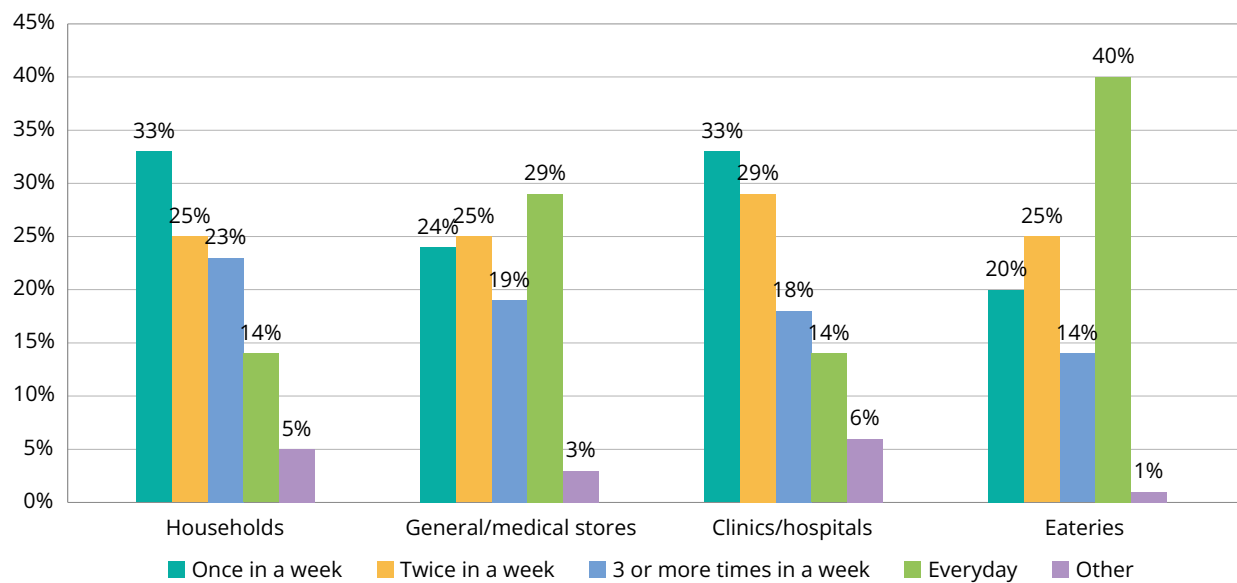




Frequency of burning plastic is quite high across stakeholders.

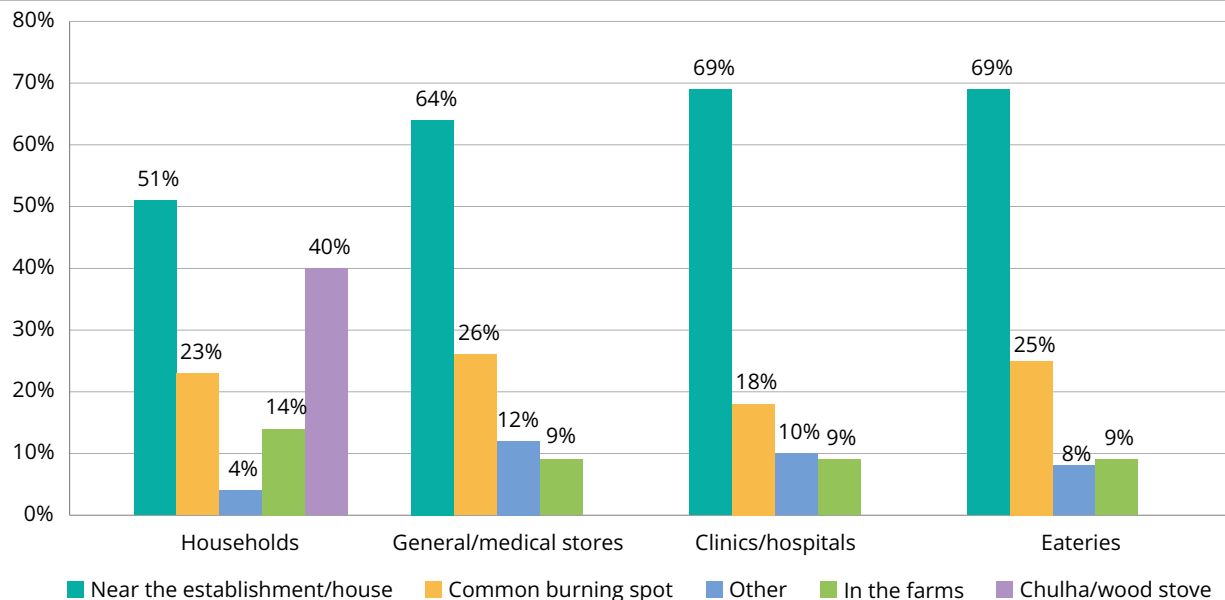
33% of the households who burn plastic said that they burn it atleast once a week. More alarmingly, the majority of establishments such as general/medical stores, and eateries burn plastic waste everyday.

Chart 5.2 How often does each stakeholder burn plastic?



Most stakeholders who burn plastic tend to burn it at least once a week.

Chart 5.3 Where is plastic burnt?



The surveyors select more than one option for this question.

Establishments that burned plastic tend to burn it at a nearby location. 64% of the general stores that burned plastic burn it near the store, similarly, 69% of the clinics burned plastic at a nearby location, and 69% of the eateries also burned plastic at a nearby location. Among the households, 51% burned it near the house. Additionally, 40% of the households burned plastic in their chulha.



There is a lack of awareness about the ill effects of burning plastic.



67% of the households surveyed as a part of the study burned plastic. However, out of those who burned plastic, only 26% are aware of the ill effects associated with burning plastic.



Incineration of plastic waste in an open field is a major source of air pollution. The burning of plastic releases toxic gases like Dioxins, Furans, Mercury and Polychlorinated Biphenyls into the atmosphere. Further, the burning of Poly Vinyl Chloride (PVC) liberates hazardous halogens and other pollutants into the air, contributing to climate change in the long term. The toxic substances thus released are posing a threat to vegetation, human and animal health and the environment as a whole. It can lead to aggravated heart disease, respiratory illnesses, emphysema and can also have negative impacts on the central nervous system.



Out of the households that burn plastic, 40% said that they burn plastic waste in a chulha (wooden stove/mud stove). We asked a smaller sample of households a few additional questions to understand how and why plastic is burnt in the chulha. A majority of the households use a chulha (wooden stove) for cooking and heating water. Plastic is generally used along with other fuel sources. Some households burn plastic along with twigs or kerosene. Most households that burn plastic in a chulha usually burn 1-2 pieces of plastic at a time.





CASE STUDY - MALEGAON





Malegaon: Recycling the 'non-recyclable'

As part of the Plastic STORI a team of Pratham employees visited Malegaon in May 2022 to learn about plastic recycling.

Situated at the confluence of two rivers, the city of Malegaon in the Nashik district of Maharashtra is well-known for its textile industry. However, Malegaon is also the largest hub for the processing and recycling single-use plastic bags. At present, the number of recycling units or factories is so high in Malegaon that the 'raw materials', i.e. plastic waste, is sourced from not only Malegaon or Maharashtra but from other parts of India as well. The plastic waste commonly considered 'non-recyclable' in other parts of India comes to Malegaon on a daily basis. Large trucks loaded with plastic waste, heaps of plastic lying by the roadside and a suffocating foul odour are common sights and smells in Malegaon.

The recycling units and factories are located just at the periphery of the city, concentrated in various pockets. Here, one can see units such as plastic waste godowns, plastic segregation units, scrap washing, shredding, plastic gitti (lumps) manufacturing plants, granules manufacturing plants, manufacturing recycled plastic items from lumps and granules.

We visited one such garbage collection site owned by Mr. Khalid on the outskirts of the city. The garbage heaps were sorted according to their source location such as Pune, Mumbai, Nashik, Panvel, Goa, and Hyderabad. This is generally brought in from the large dumping grounds in those cities. Khalid mentioned that in the next 10 days, all the waste will be cleared and new truck loads of garbage will arrive to replace it. There are 7 employees at the site who manually pick out and sort plastic bags from the waste heaps. The bags segregated according to the type of plastic they are composed of - PP (Polypropylene), HDPE (High Density Poly Ethylene) and LDPE (Low Density Poly Ethylene). All other kinds of plastic waste, metal pieces etc are sold by the employees to scrap dealers to earn some extra money. Other waste is either dumped in the dumping grounds or burnt. According to Khalid, out of the 10 tons of waste that is brought to the site, only 2 tons of plastic bags (20%) are of any use. "We collect 4-5 tons of 'useful' plastic bags and then send them to the processing units.", he said.

The classification of plastic bags into various categories is not based on visible markings, but rather through judgement calls made by the employees. Transparent and noisy bags are generally classified as PP, bags that are slightly stretched but not easily torn are LD, and slightly sturdy bags are





generally classified as HD. Each type gets a different price. Recycled PP is used to make chairs, suitcases, car parts etc. while recycled LDPE plastic is used to make water pipes for agriculture. These pipes are 50% less expensive than the usual PVC pipes. Women from very poor backgrounds play a vital role as segregators in the plastic recycling ecosystem in Malegaon. Walking through garbage heaps, we met Shamim, a young mother of four.. Leaving her three older children at home, Shamim came with her 8 month old baby to the garbage collection unit every morning at 9 am and worked until 6:30 pm on primary classification. Shamim is one of the thousands of women who earn their daily wages by segregating and classifying plastic waste. Their wages are determined by the quantity of waste they segregate. Rs. 150 to 200 is considered as good income for a day's work. Selling other scrap items found in the waste serves as an additional source of income for these women.

The manufacture plastic gittis (lumps) from plastic bags is one of the dominant features of the recycling industry in Malegaon. Gitti manufacturing units make plastic blocks which are used to make recycled products or pellets. A machine locally known as 'jhatak machine' cleans the plastic bags which are then shredded into smaller pieces. The small pieces are then heated to high temperatures and thrown into a gitti making machine. This process of recycling plastic waste into gitti and granules emits an extremely foul smell, unbearable to an outsider. Poor migrant workers from states like Madhya Pradesh, Chhattisgarh, Jharkhand are employed in these units at meagre wages. Long working hours and no vacations help the owners profit in this business. In a day, 500-600 kg of gitti (lumps) are made at a unit with a profit of around Rs. 1.5-2 per kg. However, gitti making can only recycle 50% of the plastic waste. In other words, there is 50% wastage in this recycling process. This 'wastage plastic' is ultimately burnt in Malegaon.

Gittis or granules are made as per demand by plastic product manufacturers. Pure LDPE or pure HDPE quality blocks are more expensive. Demand for mixed quality granules allows the processing units to add type 7 packaging plastics as well, such as food wrappers, product packaging etc. The quality of recycled products depends on the quality of gitti. Special filters are used to define the quality of gitti production.

However, despite such a thriving plastic recycling industry, the city of Malegaon is extremely polluted. Heaps of waste, burning of plastic, the foul odour and extreme heat emitting from the processing units makes one question the current ways of plastic recycling in India.





ANNEXURE





Pratham

Every Child in School and Learning Well

Consent Letter

Pratham Education Foundation is one of India's largest Non Profit Organization, with registered offices in Mumbai and New Delhi. Currently, Pratham is conducting a first of its kind rural plastic waste management survey, to understand the plastic waste patterns in rural india.

While all of the data obtained at the village level will be kept anonymous, we would like to document the process of the survey. This would involve taking video footage or photos of the respondent as they conduct the survey. We will ensure that no identifying information about the respondents will be revealed in any media related to the survey.

For this, we request your consent to take your photograph and record videos of our conversation. We assure you that these materials will not be misused in any way.

Please sign below if you consent to this request.

I have been briefed about the rural plastic waste management survey and, I grant permission to take pictures and record videos of our conversation. I understand that these will be used only for documentation purposes.

Name of respondent: _____

Signature : _____

Name of Surveyor : _____

Stakeholder : _____

Name of village : _____

Date : _____

Thank you
Neel Pathak
Content Head
Pratham Education Foundation





Study guidelines and training manual

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A. Current status of plastic waste in India

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Section 2: How to make general observations in the village?

Section 3: Mapping the village, making sections and selecting households

Section 4: What to do in each hamlet/section?

E. Guidelines for conducting study



A. CURRENT STATUS OF PLASTIC WASTE IN INDIA

Plastic products have become an integral part of our daily lives as a result of which it is produced a massive scale worldwide. On an average, the production of plastic globally crosses 150 million tonnes per year.

The Swachh Bharat Mission - Plastic Waste Book on Plastic Waste Management issues, Solutions, and Case studies released by the Ministry of Housing and Urban Affairs (MoHUA) in March 2019 states that **India generates approximately 9.49 million tonnes per annum (MTA) of plastic waste, which is 25,940 tonnes of plastic waste per day (TPD)**. A very small amount of total plastic production (less than 10%) is effectively recycled; the remaining plastic is either sent to incinerators, where its toxic compounds get released into the atmosphere and pollute the environment, or to the landfills, where it lies untreated for years and releases toxic chemicals which seep into groundwater, flowing downstream into lakes and rivers. The seeping of plastic also causes soil pollution and decreases the fertility of the soil. While some kinds of plastic do not decompose at all, others could take up to 450 years to break down. The disposal of plastics is one of the least recognized and most highly problematic. Ironically, one of the plastics most desirable traits: its durability and resistance to decomposition, is also the source of one of its greatest liabilities when it comes to the disposal of plastics.

The increased presence of plastic on the ocean surface has resulted in more serious problems. When oceanic creatures and even birds consume plastics, they either die due to suffocation or because of ingesting the plastic. Plastic is now reaching human too through the food chain.

The burning of plastics releases many toxic gases. Collectively, these harmful chemicals are known to cause the following severe health problems: cancer, endometriosis, neurological damage, damage to the heart, endocrine disruption, birth defects, child developmental disorders, reproductive damage, immune damage, asthma, and multiple organ damage.

An increasing fraction of this plastic waste is found in rural areas, as the reach of retail corporations and commercial organizations grows. Plastic waste disposal methods in rural India are often primitive and unscientific and poses challenges. However, there is very little reliable data available regarding plastic waste management patterns in rural India.

B. THE RURAL PLASTIC WASTE MANAGEMENT STUDY (2022)

A CSE report titled Managing Plastic Waste in India Challenges and Agenda (2018-19) has highlighted that 66 percent of the plastic waste generated in the country is being generated in seven states alone, with the remaining 28 states and Union Territories generating the other 34 percent. States like Maharashtra, Tamil Nadu, Karnataka, West Bengal, and Delhi, which have metro cities with highly consumerist lifestyles, generate 48 percent of the total plastic waste. This indicates that plastic consumption increases with affluence, possibly due to higher disposable income, widespread and easy availability of packaged products, and lack of responsible consumption. In most Indian cities, items such as carry bags, gutkha/ paan masala pouches, and sachets, styrofoam items, disposable cutlery items, materials such as wrappers of packaged food like chocolates, sweets and chips, PET bottles, and tetra pack items form the major part of plastic litter.

There is no such data available for rural India and to bridge that gap Pratham decided to find out the practices followed in rural parts of the country for managing plastic waste. Since environment education forms a critical part of Pratham's Learning for Life curriculum for children and youth, it is essential to understand the problem of plastic in the rural parts of India before spreading awareness or taking any action.



The Rural Plastic Waste Management study by Pratham aims to find qualitative data on the current practices of plastic waste disposal and management at the village level. In our first attempt, we are currently including only those communities where we work, thus the data will not represent the entire country.

The study includes various stakeholders who play an important role in generating and managing plastic waste in rural areas. The stakeholders who will be a part of the study are the residents of the village, eateries & shop owners, medical establishments, people representing the school, the village sarpanch, and the people who collect plastic waste from households or different establishments (Kabadiwala).

C. STUDY PROCESS

The Plastic study will be conducted over two days in one village. Two surveyors will be assigned to each village.

A step-wise overview of the entire process of the Plastic study in a village is given below:

- A team of two surveyors will go to the village assigned to them, ensuring that they have the JotForm links of the appropriate forms.
- The surveyor will talk to the sarpanch/representatives of the village to inform them about the study, informing them about the need for the study as well as assuring them that their data will be confidential.
The surveyor will then walk around the entire village and do the following:
 1. Make a rough map of the village, marking the important landmarks in the village. Once the surveyor have walked around the entire village, they will make a final map.
 2. Fill up the general observation form based on what they observe in the village.
- Next, the surveyor will begin the household study. They will:
 1. Divide the map into 4 sections or select 4 hamlets.
 2. Randomly select 3 households from each hamlet/section using the every 5th household rule.
 3. Study 12 households from the selected sections - (3 households in each hamlet)
- While studying the households, also engage with the other stakeholders and enter your observations carefully in the form.

D. WHAT TO DO IN THE VILLAGE?

Section 1: Talking to the Sarpanch

Purpose: Inform the sarpanch about the Plastic waste study process and request cooperation for the study.

- Go to the village assigned to you. Two surveyors will study one village.
- Once you are in the village, meet the sarpanch and explain the purpose and importance of conducting the Plastic waste study. If the sarpanch is not present, then meet a village representative, such as the Panchayat Secretary.
- Assure the sarpanch that Pratham is gathering the data only for study purposes. The village and individual names will be kept anonymous.
- People may come up to you and ask what you are doing. Use the same points to explain the purpose of your visit.





Section 2: How to make general observations in the village?

Purpose: To note the presence or absence of some basic facilities in the village.

Format: JotForm

- Enter the name of the village, Block and the name of the nearest town along with its distance from that village.
- The surveyor needs to make these observations by himself/herself. They need not ask anyone to fill out this form. He /She needs to carefully observe the mentioned practices in the village.
- The surveyor should note the observations in the JotForm as they notice them. Do not fill out the form based on memory after the visit.
- The form includes observations about the general plastic waste management scenario of the village as well as observations about establishments like one general or medical store, one pan shop, one dhabba or small eateries, one tea stall or small snack stall, one school, one dispensary or clinic or hospital.
- If there is more than 1 establishment of a particular type, then choose any 1 to record your observations. For example, if there are 3 tea stalls in the village, choose any 1 of them and record your observations.
- After you have walked around the entire village, if any of the establishments mentioned on the DDE App were not present in the village, then select 'Absent'.
- If in any village all the three mentioned establishments i.e., dispensary, clinic and hospitals are present, then choose the hospital to record your observations. If only a dispensary and clinic are available then choose the establishment generating a larger amount of biomedical waste.
- Look for any dispensary/clinic/doctor indicating that there is a private health facility/ medical practice of any kind. This does NOT include alternative medicine like practiced by Hakims, Vaidis etc.
- Once you have selected 'Present' for a particular establishment then look for the following things near it.

Observations to make	Instructions
Litter around the establishment	
Are there any dustbins near it?	Select 'Yes' if there is any dustbin present to collect the waste from that establishment
What kind of waste is lying around it?	You should select all the applicable options and if anything else needs to be entered, then select the 'Others' option and enter the details
Is this a similar situation for other establishments that you have observed?	If the situation is not similar for all such establishments then select No and specify how many such establishments out of all those that you have observed had this situation.

Section 3: Mapping the village, making sections and selecting households

Purpose: To divide the village into hamlets/sections and randomly select households. Use this map for the recheck process.

Format: Blank sheet for map

1. Making the map

Step 1: Get to know the village: Walk around the village and talk to the local people. Ask them questions like What and where are the starting and ending points of the village?

How many hamlets/sections the village have and where are they located?

You could ask the villagers/village children to take you around as well.



Step 2: Make a rough map: As you walk around, draw a rough map of how the village is laid out. The rough map will help you understand the pattern of habitations in the village. Use the help of local people to show you the main landmarks, such as places of worship, river, schools, bus stops, panchayat bhavans, anganwadis, ponds, clinics, ration shops, etc. Mark the main roads/streets/pathways through the village prominently on the map.

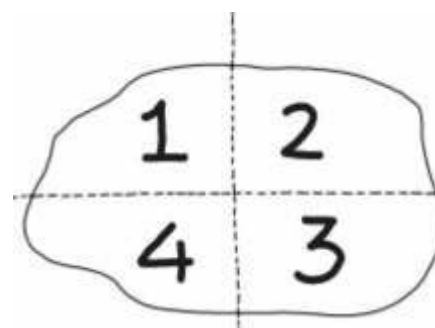
Step 3: Verify the rough map: Get the sarpanch or any other person who knows the village well to verify your rough map. Once everyone agrees that the map is a good representation of the village, finalize it.

2. Dividing the map into sections

Once the final map has been made, make and number the sections as explained below.

Case 1. For Continuous village

- Divide the entire village into 4 sections geographically.
- Assign each section a number. Write the number on the map (as shown in the picture below).
- Select 3 households from each section.



Case 2. For Village with hamlets/ sections

Assign each hamlet/section a number. Write the number on the map.

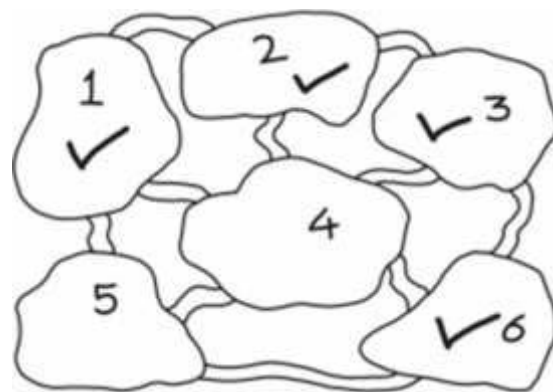
If the village has:

2 Hamlets/Sections: Divide each hamlet/section in 2 parts so that now you have 4 parts in all. Select 3 households from each part.

3 Hamlets/Sections: Take 4, 4 and 4 households from the 3 hamlets, respectively.

4 Hamlets/Sections: Select 3 households from each hamlet/section.

More than 4 Hamlets/Sections: Randomly pick 4 hamlets/sections. (For example, make chits with the name or number of all hamlets/sections and then ask a villager to pick any 4 chits. These will be your 4 hamlets/sections for the study.) Select 3 households from each of the 4 hamlets/sections. Don't forget to tick the hamlets/sections chosen for the study on the map (as shown in the picture).



Section 4: What to do in each hamlet/ section?

Purpose: To randomly select 12 households from the hamlets/sections.

You need to pick 3 households from each of the 4 hamlets/ sections that you have selected, by using the following procedure:

- Go to the selected hamlet/section. Try to find the central point in that hamlet/section. Standing in the middle of the hamlet/section, select the first household on your left. Begin the study from this household.
- Thereafter, you must select every 5th household. This means that after you have studied the first household, skip the next 4 households and select the 5th one. While selecting households, count only those dwellings that are residential. 'Household' refers to every 'door or entrance to a house from the street'.
- If you have reached the end of the hamlet/section before studying 3 households, go around the same hamlet/section again using the 'every 5th household rule'.





- If a studied household gets selected again, go to the next/adjacent household, and continue till you have 3 households from the hamlet/section.
- If the hamlet/section has less than 3 households, then study all the households in the hamlet/section and study the remaining households from other hamlets/sections.
- If the village has 12 or less than 12 households, then study all the households in the village.

Some special cases

- **Household locked:** If the selected household is closed or if there is nobody at home then do not include this household in the household study form. Move to the next/ adjacent household.
- **No response:** If a household refuses to participate in the study, **this household does not count as a studied household. Do not include this household in the Household study form.** Move to the next/adjacent household.

Stop after you have completed 3 households in the first hamlet/section. Now move to the next hamlet/ section. Follow the same process in all hamlets/sections to be studied.

Important: Ensure that you go to households only when the adults in the house are likely to be at home. This means that you should not study the children of the household.

E. GUIDELINES FOR CONDUCTING STUDY

1. The surveyor needs to assure the respondent that their identities and their responses are confidential and we won't disclose their names or any such information.
2. The surveyor will study the village in a team of two where one person will be the Pratham staff member and the other will be Pratham's youth. Do not split up while studying.
3. The staff member needs to carry his/her Pratham ID for the study.
4. The team needs to study 12 households along with 1 establishment of every type in each village.
5. The surveyor should read out questions from the JotForm and provide options to the people whom they are studying.
6. There are three types of questions asked in the study and the surveyor needs to fill them carefully.
 - a. **Multiple choice questions:** In this type of question, you can select only one option as your answer. The surveyor should select the response given by the respondent carefully.
 - b. **Multiple select questions:** In this type of question, you can select as many valid options as applicable. Multiple select questions are clearly marked in the JotForm. The surveyor should select all those options that represent the response by the respondent. If in any case, the given options are not representative enough and the surveyor finds the need of adding more information based on the response then he/she should select all the applicable options and select the 'Other' option as well to add the information in the blank space provided in that option.
 - c. **Open-ended questions:** No options are provided in the open-ended questions. Instead, a blank space is provided and the surveyor needs to type the response by the respondent in that space.
7. Wherever there is a need to enter the answers by the respondent either for the Other (specify) option or for the open-ended questions, the surveyor needs to type the answer in an English transcript only.
8. You are advised to fill the JotForm in an area with internet connectivity capable of pushing the form.
9. For the form on kabadiwala, the surveyor needs to include either the door-to-door kabadiwala or a kabadiwala owning a small shop.



Establishment	Number to be included in the study
Household	12
General/medical store	Either 1 general store or 1 medical store
Dispensary/clinic/hospital	If there is a hospital in the village, give preference to the hospital and study it. If there is no hospital, then study 1 dispensary/clinic present in the village. If none of these are present in the village, you can choose 1 hospital or 1 dispensary or 1 clinic within 5kms of your selected village. Do not go beyond 5kms. In that case, you will simply mark it 'absent'.
Tea stall/snacks stall/dhaba	Either 1 tea stall or 1 snack stall or 1 dhaba
School	Either 1 primary school or 1 upper primary school or 1 high school or 1 junior college
Village sarpanch	1 sarpanch or 1 upsarpanch or 1 panchayat committee member
Scrap dealer/kabadiwala	Give preference to 1 scrap dealer with a scrap shop if present in the village. Otherwise, 1 kabadiwala who collects scrap door to door. If none of these are present in the village, you can choose 1 scrap dealer with a scrap shop or 1 kabadiwala within 5kms of your selected village. Do not go beyond 5kms. In that case, you will simply mark it 'absent'.

People who can be a part of the study

Name of the JotForm/ Stakeholder/ Establishment	Person who can be included
Household	Either any middle-aged woman or man of the family. If they are not available then, any other elder in the family. No child can be included.
General/medical store	The owner of the store If the owner is unavailable then the shopkeeper.
Dispensary/clinic/hospital	Either the doctor or any other medical staff who works closely with the establishment
Tea stall/snacks stall/dhaba	The owner of the establishment
School	Either someone from the school administration or the Principal or Teacher
Village sarpanch	Either the sarpanch or any member of panchayat
Scrap dealer/kabadiwala	The kabadiwala





Study questionnaires

Questionnaire 1: General observations in a village

Village Name:

Block:

Name of the nearest town:

Distance from the nearest town (in kilometres):

- | | | |
|--|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> 0 - 10 km | <input type="checkbox"/> 10-20 km | <input type="checkbox"/> 20-30 km |
| <input type="checkbox"/> 30-40 km | <input type="checkbox"/> 40-50 km | <input type="checkbox"/> 50-60 km |
| <input type="checkbox"/> More than 60 km | | |

Kirana (general) store/medical store

- | | |
|---|---|
| <input type="checkbox"/> Present | <input type="checkbox"/> Absent |
| - Did you see litter around it? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| - Are there any dustbins near it? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| - What kind of waste is lying around it? (Multiple Select) | |
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Plastic wrappers |
| <input type="checkbox"/> Plastic bottles and cans | <input type="checkbox"/> Food waste |
| <input type="checkbox"/> Other (Specify) _____ | |
| - Is this a similar situation for other general/ medical stores that you have observed? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> If no, specify |

Paan shop

- | | |
|---|---|
| <input type="checkbox"/> Present | <input type="checkbox"/> Absent |
| - Did you see litter around it? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| - Are there any dustbins near it? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| - What kind of waste is lying around it? (Multiple Select) | |
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Plastic wrappers |
| <input type="checkbox"/> Plastic bottles and cans | <input type="checkbox"/> Food waste |
| <input type="checkbox"/> Other (Specify) _____ | |
| - Is this a similar situation for other pan shops that you have observed? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> If no, specify |

Dhaba

- | | |
|----------------------------------|---------------------------------|
| <input type="checkbox"/> Present | <input type="checkbox"/> Absent |
| - Did you see litter around it? | |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |



- Are there any dustbins near it?
☐ Yes ☐ No
- What kind of waste is lying around it? (Multiple Select)
☐ Paper waste/cardboard ☐ Plastic wrappers
☐ Plastic bottles and cans ☐ Food waste
☐ Other (Specify) _____
- Is this a similar situation for other dhaba that you have observed?
☐ Yes ☐ No ☐ If no, specify

Tea stalls or small snack stalls

- ☐ Present ☐ Absent
- Did you see litter around it?
☐ Yes ☐ No
- Are there any dustbins near it?
☐ Yes ☐ No
- What kind of waste is lying around it? (Multiple Select)
☐ Paper waste/cardboard ☐ Plastic wrappers
☐ Plastic bottles and cans ☐ Food waste
☐ Other (Specify) _____
- Is this a similar situation for other tea stalls/ snack stalls that you have observed?
☐ Yes ☐ No ☐ If no, specify

Schools/colleges

- ☐ Present ☐ Absent
- What type of school is it?**
- ☐ Primary school (Std 1 to 4/5) ☐ Upper primary school (Std 1 to 7/8)
- ☐ High school (Std 1 to 10/12) ☐ Secondary school (Std 6 to 8/10/12)
- ☐ Other (Specify)
- Did you see litter around it?
☐ Yes ☐ No
- Are there any dustbins near it?
☐ Yes ☐ No
- What kind of waste is lying around it? (Multiple Select)
☐ Paper waste/cardboard ☐ Plastic wrappers
☐ Plastic bottles and cans ☐ Food waste
☐ Other (Specify) _____
- Is this a similar situation for other schools that you have observed?
☐ Yes ☐ No ☐ If no, specify

Dispensary/clinics/hospitals

- ☐ Present ☐ Absent
- Did you see litter around it?
☐ Yes ☐ No





- Are there any dustbins near it?
☐ Yes ☐ No
- What kind of waste is lying around it? (Multiple Select)
☐ Paper waste/cardboard ☐ Plastic wrappers
☐ Plastic bottles and cans ☐ Food waste
☐ Other (Specify) _____
- Is this a similar situation for other tea stalls/ snack stalls that you have observed?
☐ Yes ☐ No ☐ If no, specify

Did you see a public waste bin in the village?

☐ Yes ☐ No

Did you see any waste collection van (in working condition) in the village?

☐ Yes ☐ No

Did you see any place/location in the village where waste is burned? (If yes, click a photo.)

☐ Yes ☐ No

Did you see any waste littered near drinking water sources? (If yes, click a photo.)

☐ Yes ☐ No

Did you see any scrap shop in the village?

☐ Yes ☐ No

Did you see any kabadiwala visiting the village?

☐ Yes ☐ No

Did you see any locations with garbage heaps?

☐ Yes ☐ No





Questionnaire 2: Households

General Information

Village name:

Block name:

District name:

State name:

Full name of respondent:

Household size:

Dealing with specific waste items

Do you keep your dry and wet waste separately?

- ☐ Yes ☐ No ☐ If no, specify

What do you do with the uncooked kitchen waste? (Multiple select)

- ☐ Compost ☐ Feed it to cattle/goats
☐ Use it for mulching ☐ Throw it with rest of the waste
☐ Throw it in nearby drain ☐ Other (Specify) _____

What do you do with the cooked kitchen waste? (Multiple select)

- ☐ Compost ☐ Feed it to cattle/goats
☐ Use it for mulching ☐ Throw it with rest of the waste
☐ Throw it in nearby drain ☐ Other (Specify) _____

What do you do with plastic waste such as bottles, oil cans, shampoo bottles? (Multiple select)

- ☐ Sell it to a kabadiwala ☐ Burn it
☐ Bury it ☐ Throw it with rest of the waste
☐ Other (Specify) _____

What do you do with plastic waste such as broken pens, PVC pipes, children's toys? (Multiple select)

- ☐ Sell it to a kabadiwala ☐ Burn it
☐ Bury it ☐ Throw it with rest of the waste
☐ Other (Specify) _____

What do you do with plastic waste such as polythene bags, wrappers & sachets? (Multiple select)

- ☐ Sell it to a kabadiwala ☐ Burn it
☐ Bury it ☐ Throw it with rest of the waste
☐ Other (Specify) _____

Community waste collection

Does a community waste collection vehicle collect waste from your household?

- ☐ Yes ☐ No

a) If yes, how often does the vehicle come?

- ☐ Everyday ☐ Every alternate day
☐ Once in a week ☐ Once in a month



- O Other (Specify) _____
- b) If yes, what kind of waste do you give this vehicle? (Multiple select)
- | | |
|--|---|
| <input type="checkbox"/> Kitchen waste | <input type="checkbox"/> Paper waste/cardboard |
| <input type="checkbox"/> Plastic bottles and can | <input type="checkbox"/> Plastic wrappers, milk packets and other plastic waste |
| <input type="checkbox"/> Other (Specify) _____ | |
- c) If no, where do you throw the waste? (Multiple select)
- | | |
|--|---|
| <input type="checkbox"/> In the backyard | <input type="checkbox"/> At a common place in the village |
| <input type="checkbox"/> In front of the house | <input type="checkbox"/> Other (Specify) _____ |

Kabadiwala

Does a Kabadiwala come to your village?

- ☐ Yes ☐ No

- a) How often?
- | | |
|---|---|
| <input type="radio"/> Everyday | <input type="radio"/> Every alternate day |
| <input type="radio"/> Once in a week | <input type="radio"/> Once in a month |
| <input type="radio"/> Other (Specify) _____ | |
- b) Do you call him or does he come on his own?
- | | |
|---|---|
| <input type="radio"/> He comes when called | <input type="radio"/> He comes on his own |
| <input type="radio"/> Other (Specify) _____ | |
- c) What kind of waste is bought by the Kabadiwala? (Multiple select)
- | | |
|--|--|
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Glass |
| <input type="checkbox"/> Metals | <input type="checkbox"/> Thermocol |
| <input type="checkbox"/> Electronic waste | <input type="checkbox"/> Plastic containers and cans |
| <input type="checkbox"/> Plastic wrappers and sachets | <input type="checkbox"/> Plastic bottles and shampoo bottles |
| <input type="checkbox"/> Plastic bags and plastic covers | <input type="checkbox"/> Plastic toys and pen |
| <input type="checkbox"/> Plastic packaging | <input type="checkbox"/> Slippers and shoes |
| <input type="checkbox"/> PVC pipes, water pipes | <input type="checkbox"/> Plastic drums and bucket |
| <input type="checkbox"/> Other (Specify) _____ | |
- d) How/where do you store this plastic till the kabadiwala comes? (Multiple select)
- | | |
|--|-----------------------------------|
| <input type="checkbox"/> In a box | <input type="checkbox"/> In a bag |
| <input type="checkbox"/> Other (Specify) _____ | |

What do you do with the plastic that the kabadiwala does not buy? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify) _____ | |



Burning plastic waste

Do you burn plastic waste?

☐ Yes ☐ No

How many times do you burn it in a week?

☐ Once ☐ Twice
☐ More than twice ☐ Everyday
☐ Other (Specify) _____

Where do you burn the plastic? (Multiple select)

☐ Chulha ☐ Common burning spot in the village
☐ In farms ☐ Burn it near the house
☐ Other (Specify) _____

Do you know the harmful effects of burning plastic?

☐ Yes ☐ No

Household indicators

Type of house

☐ Pucca (with walls and roof of brick and cement) ☐ Semi-pucca (pucca house with katcha roof)
☐ Kutchha

Motorised 4-wheeler

☐ Yes ☐ No

Motorised 2-wheeler

☐ Yes ☐ No

Electricity connection (look for wires and fittings)

☐ Yes ☐ No

If electricity in household, was there electricity today?

☐ Yes ☐ No

Toilet in the household

☐ Yes ☐ No

TV in the household

☐ Yes ☐ No

Mobile in the household

☐ Yes ☐ No

If yes, is any mobile a smartphone

☐ Yes ☐ No

Has anyone in the household completed 12th standard?

☐ Yes ☐ No

Do you use wood stove for any purpose?

☐ Yes ☐ No





Questionnaire 3: General/medical store

General Information

Village name:

Block name:

District name:

State name:

Full name of respondent:

Type of establishment

☐ Kirana store (General store)

☐ Medical store/ Chemist

Type of waste

What kind of waste is generated at your establishment? (Multiple select)

☐ Paper waste/cardboard

☐ Plastic waste

☐ Food waste

☐ Electronic waste

☐ Other (Specify)_____

What is the major kind of plastic waste produced?(Multiple select)

☐ Plastic bottles and cans

☐ Plastic bags

☐ Plastic wrappers

☐ Plastic packaging

☐ Other (Specify)_____

How often do customers bring their own bags for shopping?

☐ Always

☐ Mostly

☐ Sometimes

☐ Never

How do you pack items for customers who don't have their own bags? (Multiple select)

☐ In newspaper/ Paper bag

☐ In plastic bags

☐ In cloth bags

☐ Other (Specify)_____

Community waste collection

Does a community waste collection vehicle collect waste from your establishment?

☐ Yes

☐ No

If yes, how often does the vehicle come?

☐ Everyday

☐ Every alternate day

☐ Once in a week

☐ Once in a month

☐ Other (Specify)_____

If yes, what kind of waste do you give to this vehicle? (Multiple select)

☐ Plastic containers

☐ Paper waste/cardboard

☐ Plastic bottles and can

☐ Plastic wrappers, plastic packaging and plastic bags

☐ Other (Specify)_____



If no, where do you throw the waste? (Multiple select)

- | | |
|--|---|
| <input type="checkbox"/> Anywhere in the streets | <input type="checkbox"/> At a common place in the village |
| <input type="checkbox"/> Near the shop | <input type="checkbox"/> Other (Specify)_____ |

Kabadiwala

Does a kabadiwala come to your establishment?

- ☐ Yes ☐ No

How often?

- | | |
|--|---|
| <input type="radio"/> Everyday | <input type="radio"/> Every alternate day |
| <input type="radio"/> Once in a week | <input type="radio"/> Once in a month |
| <input type="radio"/> Other (Specify)_____ | |

Do you call him or does he come on his own?

- ☐ He comes whenever they call him
- ☐ They do not call him instead he comes on his own on a regular basis
- ☐ Other (Specify)_____

What kind of waste is bought by the kabadiwala? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Glass |
| <input type="checkbox"/> Metals | <input type="checkbox"/> Thermocol |
| <input type="checkbox"/> Electronic waste | <input type="checkbox"/> Plastic containers and cans |
| <input type="checkbox"/> Plastic wrappers and sachets | <input type="checkbox"/> Plastic bottles and shampoo bottles |
| <input type="checkbox"/> Plastic bags and plastic covers | <input type="checkbox"/> Plastic toys and pen |
| <input type="checkbox"/> Plastic packaging | <input type="checkbox"/> Slippers and shoes |
| <input type="checkbox"/> PVC pipes, water pipes | <input type="checkbox"/> Others (Specify)_____ |

How/where do you store this plastic till the kabadiwala comes? (Multiple select)

- | | |
|---|-----------------------------------|
| <input type="checkbox"/> In a box | <input type="checkbox"/> In a bag |
| <input type="checkbox"/> Other (Specify)_____ | |

What do you do with the plastic that the kabadiwala does not buy? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | |

Burning plastic waste

Do you burn plastic waste?

- ☐ Yes ☐ No

How many times do you burn it in a week?

- | | |
|--|------------------------------------|
| <input type="radio"/> Once in a week | <input type="radio"/> Twice a week |
| <input type="radio"/> More than twice | <input type="radio"/> Everyday |
| <input type="radio"/> Other (Specify)_____ | |

Where do you burn the plastic? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> Common burning spot in the village | <input type="checkbox"/> In farms |
| <input type="checkbox"/> Burn it near the shop | <input type="checkbox"/> Other (Specify)_____ |





Questionnaire 4: Clinic/hospital

General Information

Village name:

Block name:

District name:

State name:

Full name of respondent:

Household size:

Type of waste

Where is the dispensary/ clinic/ hospital located?

- ☐ In the village ☐ Outside the village
☐ If outside the village, please specify _____

What kind of waste is generated at your establishment? (Multiple select)

- ☐ Paper waste/cardboard ☐ Plastic waste
☐ Electronic waste ☐ Biomedical waste
☐ Other (Specify) _____

What is the major kind of plastic waste produced? (Multiple select)

- ☐ Plastic bottles and cans ☐ Plastic bags
☐ Plastic wrappers ☐ Medicinal waste
☐ Other (Specify) _____

Community waste collection

Does a community waste collection vehicle collect waste from your establishment?

- ☐ Yes ☐ No

If yes, how often does the vehicle come?

- ☐ Everyday ☐ Every alternate day
☐ Once in a week ☐ Once in a month
☐ Other (Specify) _____

If yes, what kind of waste do you give this vehicle? (Multiple select)

- ☐ Medicinal waste ☐ Paper waste/cardboard
☐ Plastic bottles and can ☐ Plastic wrappers and packagings
☐ Other (Specify) _____

If no, where do you throw the waste?(Multiple select)

- ☐ In the backyard of the dispensary/hospital/clinic ☐ At a common place in the village
☐ In front of the dispensary/hospital/clinic ☐ Other (Specify) _____

If there an special Arrangement to collect to biomedical waste ?

- ☐ Yes ☐ No



Does any special vehicle come and collect hazardous/biomedical waste?

☐ Yes ☐ No

If yes, how often does the vehicle come?

☐ Everyday ☐ Every alternate day
☐ Once in a week ☐ Once in a month
☐ Other (Specify)_____

If yes, what kind of waste do you give this vehicle? (Multiple select)

<input type="checkbox"/> X- ray reports	<input type="checkbox"/> Medicine strips
<input type="checkbox"/> Used medicine bottles	<input type="checkbox"/> Human & animal anatomical waste
<input type="checkbox"/> Blood bags	<input type="checkbox"/> Tubing
<input type="checkbox"/> Catheters	<input type="checkbox"/> Broken and discarded vials
<input type="checkbox"/> Needles and blades	<input type="checkbox"/> Saline bottles
<input type="checkbox"/> Syringes	<input type="checkbox"/> PPE kits
<input type="checkbox"/> Masks	<input type="checkbox"/> Gloves
<input type="checkbox"/> Diapers	<input type="checkbox"/> Cotton
<input type="checkbox"/> Bandages	<input type="checkbox"/> Other (Specify)_____

If no, where do you throw the waste? (Multiple select)

☐ In the backyard of the dispensary/hospital/clinic
☐ In front of the dispensary/hospital/clinic
☐ It is burned at a designated spot in the dispensary/clinic/hospital
☐ Throw it in the community waste vehicle with other waste
☐ Other (Specify)_____

During the COVID pandemic, did the doctors use PPE kits?

☐ Yes ☐ No

If yes, how did they dispose it ?

☐ By giving it to the biomedical waste collection vehicle
☐ By burning it at a designated spot in the dispensary/clinic/hospital
☐ By throwing it in the community waste vehicle with other waste
☐ Other (Specify)_____

Kabadiwala

Does a Kabadiwala come to your establishment?

☐ Yes ☐ No

a) How often?

☐ Everyday ☐ Every alternate day
☐ Once in a week ☐ Once in a month
☐ Other (Specify)_____





- b) Do you call him or does he come on his own?
- ☐ He comes whenever they call him
- ☐ They do not call him instead he comes on his own on a regular basis
- ☐ Other (Specify)_____
- c) What kind of waste is bought by the kabadiwala? (Multi select)
- | | |
|--|---|
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Glass |
| <input type="checkbox"/> Metals | <input type="checkbox"/> Thermocol |
| <input type="checkbox"/> Electronic waste | <input type="checkbox"/> Plastic containers and cans |
| <input type="checkbox"/> Plastic wrappers and sachets | <input type="checkbox"/> Plastic bottles and medicine bottles |
| <input type="checkbox"/> Plastic bags and plastic covers | <input type="checkbox"/> PPE kits |
| <input type="checkbox"/> Plastic packaging | <input type="checkbox"/> Slippers and shoes |
| <input type="checkbox"/> PVC pipes, water pipes | <input type="checkbox"/> Others (Specify)_____ |
- d) How/where do you store this plastic till the kabadiwala comes? (Multiple select)
- ☐ In a box ☐ In a bag
- ☐ Other (Specify)_____
- e) What kind of plastic biomedical waste is bought by the kabadiwala? (Multiple select)
- | | |
|--|---|
| <input type="checkbox"/> X- ray reports | <input type="checkbox"/> Medicine strips |
| <input type="checkbox"/> Used medicine bottles | <input type="checkbox"/> Tubing |
| <input type="checkbox"/> Catheters | <input type="checkbox"/> Saline bottles |
| <input type="checkbox"/> Syringes | <input type="checkbox"/> PPE kits |
| <input type="checkbox"/> Masks | <input type="checkbox"/> Gloves |
| <input type="checkbox"/> Diapers | <input type="checkbox"/> Cotton |
| <input type="checkbox"/> Bandages | <input type="checkbox"/> Other (Specify)_____ |

What do you do with the plastic that the kabadiwala does not buy? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> Not applicable |

Dealing with specific waste items

What do you do with plastic biomedical waste such as (Multiple select)-

- a) Saline bottles
- | | |
|---|--|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | |
| <input type="checkbox"/> We do not generate this type of biomedical waste | |



- b) Syringes
- | | |
|---|---|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> We do not generate this type of biomedical waste |
- c) Medicine strips
- | | |
|---|---|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> We do not generate this type of biomedical waste |
- d) PPE kit
- | | |
|---|---|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> We do not generate this type of biomedical waste |
- e) Diapers
- | | |
|---|---|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> We do not generate this type of biomedical waste |
- f) Masks
- | | |
|---|---|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> We do not generate this type of biomedical waste |
- g) Gloves
- | | |
|---|---|
| <input type="checkbox"/> Collected by the biomedical waste agency | <input type="checkbox"/> Sell it to the kabadiwala |
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | <input type="checkbox"/> We do not generate this type of biomedical waste |

What do you do with biomedical waste such as used cotton, bandages, needles etc? (Multiple select) ? Collected by the biomedical waste agency

- | | |
|---|--|
| <input type="checkbox"/> Sell it to the kabadiwala | <input type="checkbox"/> Burn it |
| <input type="checkbox"/> Bury it | <input type="checkbox"/> Throw it with rest of the waste |
| <input type="checkbox"/> Litter it on the road | <input type="checkbox"/> Other (Specify)_____ |
| <input type="checkbox"/> We do not generate this type of biomedical waste | |





Burning plastic waste

Do you burn plastic waste?

- ☐ Yes ☐ No

How many times do you burn it in a week?

- | | |
|--|---|
| <input type="radio"/> Everyday | <input type="radio"/> Every alternate day |
| <input type="radio"/> Once in a week | <input type="radio"/> Once in a month |
| <input type="radio"/> Other (Specify)_____ | |

Where do you burn the plastic? (Multiple select)

- ☐ Common burning spot in the village
- ☐ In farms
- ☐ Burn it near the dispensary/clinic/hospital
- ☐ Other (Specify)_____





Questionnaire 5: Snack stall/tea stall/dhaba

General Information

Village name:

Block name:

District name:

State name:

Full name of respondent:

Household size:

Type of establishment

☐ Snack stall

☐ Dhaba

☐ Tea stall

Type of waste

What kind of waste is generated at your establishment? (Multiple select)

☐ Paper waste/cardboard

☐ Plastic waste

☐ Food waste

☐ Thermocol waste

☐ Other (Specify)_____

What is the major kind of plastic waste produced? (Multiple select)

☐ Plastic bottles and cans

☐ Plastic bags

☐ Plastic wrappers

☐ Plastic cups, plates and spoons

☐ Plastic packaging (containers etc.)

☐ Other (Specify)_____

How do you serve food to your customers? (Multiple select)

☐ In Paper plates

☐ In Plastic plates (non-reusable)

☐ In Plastic plates (reusable)

☐ Steel plates

☐ Other (Specify)_____

How do you pack food for takeaway orders? (Multiple select)

☐ In plastic containers

☐ In aluminium foil

☐ In paper

☐ Other (Specify)_____

Community waste collection

Does a community waste collection vehicle collect waste from your establishment?

☐ Yes

☐ No

If yes, how often does the vehicle come?

☐ Everyday

☐ Every alternate day

☐ Once in a week

☐ Once in a month

☐ Other (Specify)_____

If yes, what kind of waste do you give this vehicle? (Multiple select)

☐ Kitchen waste

☐ Paper waste/cardboard

☐ Plastic bottles and can

☐ Plastic wrappers, milk packets and other plastic waste

☐ Plastic packaging (containers etc.)

☐ Other (Specify)_____



If no, where do you throw the waste? (Multiple select)

- | | |
|--|---|
| <input type="checkbox"/> Anywhere in the streets | <input type="checkbox"/> At a common place in the village |
| <input type="checkbox"/> In front of the stall | <input type="checkbox"/> Other (Specify)_____ |

Kabadiwala

Does a kabadiwala come to your establishment?

- ☐ Yes ☐ No

How often?

- | | |
|--|---|
| <input type="radio"/> Everyday | <input type="radio"/> Every alternate day |
| <input type="radio"/> Once in a week | <input type="radio"/> Once in a month |
| <input type="radio"/> Other (Specify)_____ | |

Do you call him or does he come on his own?

- ☐ He comes whenever they call him
- ☐ They do not call him instead he comes on his own on a regular basis
- ☐ Other (Specify)_____

What kind of waste is bought by the Kabadiwala? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Glass |
| <input type="checkbox"/> Metals | <input type="checkbox"/> Thermocol |
| <input type="checkbox"/> Electronic waste | <input type="checkbox"/> Plastic containers and cans |
| <input type="checkbox"/> Plastic wrappers and sachets | <input type="checkbox"/> Plastic bottles |
| <input type="checkbox"/> Plastic bags and plastic covers | <input type="checkbox"/> Plastic plates, cups and spoons |
| <input type="checkbox"/> Plastic packaging | <input type="checkbox"/> PVC pipes, water pipes |
| <input type="checkbox"/> Others (Specify)_____ | |

How/where do you store this plastic till the kabadiwala comes? (Multiple select)

- | | |
|---|-----------------------------------|
| <input type="checkbox"/> In a box | <input type="checkbox"/> In a bag |
| <input type="checkbox"/> Other (Specify)_____ | |

What do you do with the plastic that the kabadiwala does not buy? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | |

Dealing with specific waste items

Do you keep your dry and wet waste separately?

- ☐ Yes ☐ No ☐ Other (Specify)_____

What do you do with food waste? (Multiple select)

- | | |
|---|--|
| <input type="checkbox"/> Composting | <input type="checkbox"/> Throw it with rest of the waste |
| <input type="checkbox"/> Other (Specify)_____ | |



Burning plastic

Do you burn plastic waste?

☐ Yes ☐ No

How many times do you burn it in a week?

- | | |
|--|------------------------------------|
| <input type="radio"/> Once in a week | <input type="radio"/> Twice a week |
| <input type="radio"/> More than twice | <input type="radio"/> Everyday |
| <input type="radio"/> Other (Specify)_____ | |

Where do you burn the plastic? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> Common burning spot in the village | <input type="checkbox"/> In farms |
| <input type="checkbox"/> Burn it near the stall | <input type="checkbox"/> Other (Specify)_____ |





Questionnaire 6: Schools

General Information

Village name:

Block name:

District name:

State name:

Full name of respondent:

Household size:

Which type of school is it?

☐ Government

☐ Private

☐ Madarsa

☐ Other (specify)

How many students study there? (Open ended) _____

Upto what level of education is available at the school?

☐ Primary school (Std 1 to 4/5)

☐ Upper primary school (Std 1 to 7/8)

☐ High school (Std 1 to 10/12)

☐ Secondary school (Std 6 to 8/10/12)

☐ Other (Specify)_____

Type of waste

What kind of waste is generated at your establishment? (Multiple select)

☐ Paper waste/cardboard

☐ Plastic waste

☐ Food waste

☐ Electronic waste

☐ Other (Specify)_____

What is the major kind of plastic waste produced? (Multiple select)

☐ Plastic bottles and cans

☐ Plastic bags

☐ Plastic wrappers

☐ Other (Specify)_____

Community waste collection

Does a community waste collection vehicle collect waste from your establishment?

☐ Yes

☐ No

If yes, how often does the vehicle come?

☐ Everyday

☐ Every alternate day

☐ Once in a week

☐ Once in a month

☐ Other (Specify)_____

If yes, what kind of waste do you give this vehicle? (Multiple select)

☐ Kitchen waste

☐ Paper waste/cardboard

☐ Plastic bottles and can

☐ Plastic wrappers, milk packets and other plastic waste

☐ Other (Specify)_____



If no, where do you throw the waste? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> In the backyard | <input type="checkbox"/> At a common place in the village |
| <input type="checkbox"/> In front of the school | <input type="checkbox"/> Other (Specify)_____ |

Kabadiwala

Does a Kabadiwala come to your establishment?

- ☐ Yes ☐ No

How often?

- | | |
|--|---|
| <input type="radio"/> Everyday | <input type="radio"/> Every alternate day |
| <input type="radio"/> Once in a week | <input type="radio"/> Once in a month |
| <input type="radio"/> Other (Specify)_____ | |

Do you call him or does he come on his own?

- ☐ He comes whenever they call him
- ☐ They do not call him instead he comes on his own on a regular basis
- ☐ Other (Specify)_____

What kind of waste is bought by the kabadiwala? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Paper waste/cardboard | <input type="checkbox"/> Glass |
| <input type="checkbox"/> Metals | <input type="checkbox"/> Thermocol |
| <input type="checkbox"/> Electronic waste | <input type="checkbox"/> Plastic containers and cans |
| <input type="checkbox"/> Plastic wrappers and sachets | <input type="checkbox"/> Plastic bottles |
| <input type="checkbox"/> Plastic bags and plastic covers | <input type="checkbox"/> Plastic pens and other stationary |
| <input type="checkbox"/> Plastic packaging | <input type="checkbox"/> PVC pipes, water pipes |
| <input type="checkbox"/> Others (Specify)_____ | |

How/where do you store this plastic till the kabadiwala comes? (Multiple select)

- | | |
|---|-----------------------------------|
| <input type="checkbox"/> In a box | <input type="checkbox"/> In a bag |
| <input type="checkbox"/> Other (Specify)_____ | |

What do you do with the plastic that the kabadiwala does not buy? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Burn it | <input type="checkbox"/> Bury it |
| <input type="checkbox"/> Throw it with rest of the waste | <input type="checkbox"/> Litter it on the road |
| <input type="checkbox"/> Other (Specify)_____ | |

Dealing with specific waste items

Do you keep your dry and wet waste separately?

- ☐ Yes ☐ No ☐ Other (Specify)_____

What do you do with food waste? (Multiple select)

- | | |
|---|--|
| <input type="checkbox"/> Composting | <input type="checkbox"/> Throw it with rest of the waste |
| <input type="checkbox"/> Other (Specify)_____ | |



What do you do with paper waste? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Sell it to the kabadiwala | <input type="checkbox"/> Burn it |
| <input type="checkbox"/> Bury it | <input type="checkbox"/> Throw it with rest of the waste |
| <input type="checkbox"/> Litter it on the road | <input type="checkbox"/> Other (Specify)_____ |

What do you do with plastic waste such as wrappers, broken pens, bottles etc.? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Sell it to the kabadiwala | <input type="checkbox"/> Burn it |
| <input type="checkbox"/> Bury it | <input type="checkbox"/> Throw it with rest of the waste |
| <input type="checkbox"/> Litter it on the road | <input type="checkbox"/> Other (Specify)_____ |

Burning plastic waste

Do you burn plastic waste?

- ☐ Yes ☐ No

How many times do you burn it in a week?

- | | |
|--|------------------------------------|
| <input type="radio"/> Once in a week | <input type="radio"/> Twice a week |
| <input type="radio"/> More than twice | <input type="radio"/> Everyday |
| <input type="radio"/> Other (Specify)_____ | |

Where do you burn the plastic? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> Common burning spot in the village | <input type="checkbox"/> In farms |
| <input type="checkbox"/> Burn it near the school | <input type="checkbox"/> Other (Specify)_____ |





Questionnaire 7: Village sarpanch

General Information

Village name:

Name of the sarpanch/ up-sarpanch/member of panchayat

Block name:

District name:

State name:

Village population (number of people)

- | | |
|----------------------------------|------------------------------------|
| <input type="radio"/> Below 2000 | <input type="radio"/> 2000-4000 |
| <input type="radio"/> 4000-6000 | <input type="radio"/> 6000-8000 |
| <input type="radio"/> 8000-10000 | <input type="radio"/> Above 10,000 |

Community waste collection

Is there a waste collection vehicle in your village?

- ☐ Yes ☐ No

a) If yes, did the waste collection vehicle visit the village in last 7 days?

- ☐ Yes ☐ No ☐ Other (Specify)_____

b) If yes, does it have different compartments for wet and dry waste?

- ☐ Yes ☐ No ☐ Other (Specify)_____

c) If no, then what is the system of waste collection? (Multiple select)

- ☐ People throw their waste at a common area in the village
☐ People throw their waste in their backyard and then burn it
☐ People throw their waste anywhere in the village
☐ Other (Specify)_____

Community waste management

How is the waste segregated?

- | | |
|---|---|
| <input type="radio"/> At household level | <input type="radio"/> After the collection of the waste |
| <input type="radio"/> Waste is not segregated | <input type="radio"/> Other (Specify)_____ |

If the waste is segregated, then what is done with the wet waste? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> It is composted | <input type="checkbox"/> It is sent to the farms for the cattles |
| <input type="checkbox"/> It is burned along with the dry waste | <input type="checkbox"/> Other (Specify)_____ |

If the waste is segregated, what is done with the plastic waste? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> It is burned | <input type="checkbox"/> It is sent to the kabadiwala |
| <input type="checkbox"/> Other (Specify)_____ | |

If the waste is not segregated, where is it dumped? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> Outside the village in an open field | <input type="checkbox"/> In the village |
| <input type="checkbox"/> In another village | <input type="checkbox"/> Other (Specify)_____ |



Is there any safai worker to clean the streets and public areas of the village?

- ☐ Yes ☐ No ☐ Other (Specify)_____

Plastic recycler

Are there any plastic aggregators (people who collect and store plastic as it is) in or near your village?

- ☐ Yes ☐ No
☐ Dont know ☐ Other (Specify)_____

Are there any plastic recyclers (people who convert the plastic items into pellets or fibre) in or near your village?

- ☐ Yes ☐ No
☐ Dont know ☐ Other (Specify)_____

If yes, where are they located? (Ask them to connect you with some recyclers and aggregators.) (Open-ended)

Government or NGO initiatives

Are there any government/ non-government campaign to reduce plastic waste in your village?

- ☐ Yes ☐ No
☐ Dont know ☐ Other (Specify)_____

If yes, specify. (Open-ended)_____

Has Gram Panchayat received any funds at all for Solid Waste Management?

- ☐ Yes ☐ No ☐ If yes, please specify.

If yes, how has the fund been utilized?(Multiple select)

- ☐ For construction of compost pits for individual households
☐ For construction of community compost pits for a group of households
☐ For operation & maintenance of community compost pits and composting unit
☐ For construction of shed for segregation and processing of wet and dry waste
☐ For purchase of tricycles/other battery-operated vehicles for door to door

Collection of waste

- ☐ For services of collection & transportation of waste from household to treatment site
☐ For purchase of equipment for cleaning of waste management premises
☐ For purchase of segregation and litter bins to be fixed at public places
☐ For purchase of segregation bins (twin bins) for households to ensure segregation of waste at source into

Wet waste and dry waste.

- ☐ For any other operation and maintenance needs related to solid waste management
☐ For construction of plastic waste storage unit to ensure plastic is stored well till transported to disposal site
☐ Other (Specify)_____



Questionnaire 8: Scrap dealer/kabadiwala

General Information

Village name:

Block name:

District name:

State name:

Full name of respondent:

Type of kabadiwala

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> Door to door collector | <input type="checkbox"/> Shop owner |
| <input type="checkbox"/> Bigger scrap dealer | |

Catchment area (How many villages do you cover?) (Open-ended) _____

If a scrap shop, how many Kabadiwala come to you to sell plastic? (Open-ended) _____

Do you have any of these machines at your shop? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Bailing machine (manual/mechanical) | <input type="checkbox"/> Shredding machine |
| <input type="checkbox"/> Conveyor belt | <input type="checkbox"/> Other (Specify) _____ |

Details about the scrap

What kind of scrap do you mainly buy from people? (Multiple select)

- | | |
|----------------------------------|--|
| <input type="checkbox"/> Metals | <input type="checkbox"/> Clothes |
| <input type="checkbox"/> Glass | <input type="checkbox"/> Paper |
| <input type="checkbox"/> Plastic | <input type="checkbox"/> Other (Specify) _____ |

What kind/type of plastic do you accept? (Multiple select)

- | | |
|--|--|
| <input type="checkbox"/> Plastic containers and cans | <input type="checkbox"/> Plastic wrappers and sachets |
| <input type="checkbox"/> Plastic bottles and shampoo bottles | <input type="checkbox"/> Plastic bags and plastic covers |
| <input type="checkbox"/> Plastic toys and pen | <input type="checkbox"/> Plastic packaging |
| <input type="checkbox"/> Slippers and shoes | <input type="checkbox"/> PVC pipes, water pipes |
| <input type="checkbox"/> Plastic plates, spoons and glass | <input type="checkbox"/> Plastic drums and bucket |
| <input type="checkbox"/> PVC casings and cables | <input type="checkbox"/> Plastic CDs and cassettes |
| <input type="checkbox"/> Other (Specify) _____ | |

Why do you reject the remaining types of plastic? (Multiple select)

- | | |
|---|---|
| <input type="checkbox"/> As it has low value in the market | <input type="checkbox"/> As it has no value in the market |
| <input type="checkbox"/> They do not have space to store it | <input type="checkbox"/> They are not in a substantial quantity |
| <input type="checkbox"/> They have no demand in the market | <input type="checkbox"/> Other (Specify) _____ |

What is the minimum quantity of plastic that you accept/buy? (Open-ended) _____

How much plastic waste do you buy in a month? (Open-ended) _____

To whom do you sell the plastic waste? (Open-ended) _____



Do you further segregate the plastic before selling?

☐ Yes ☐ No ☐ Other (Specify)_____

If yes, what is the basis of further segregation? (Multiple select)

- ☐ Based on colour
- ☐ Based on the material used (PET, HDPE,PVC, LDPE, PP, PS & OTHER)
- ☐ Based on the thickness of plastic
- ☐ Other (Specify)_____

Are there different buyers for different kinds of plastic?

☐ Yes ☐ No ☐ Other (Specify)_____

Where does this plastic go from that facility? (Open-ended)_____





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