



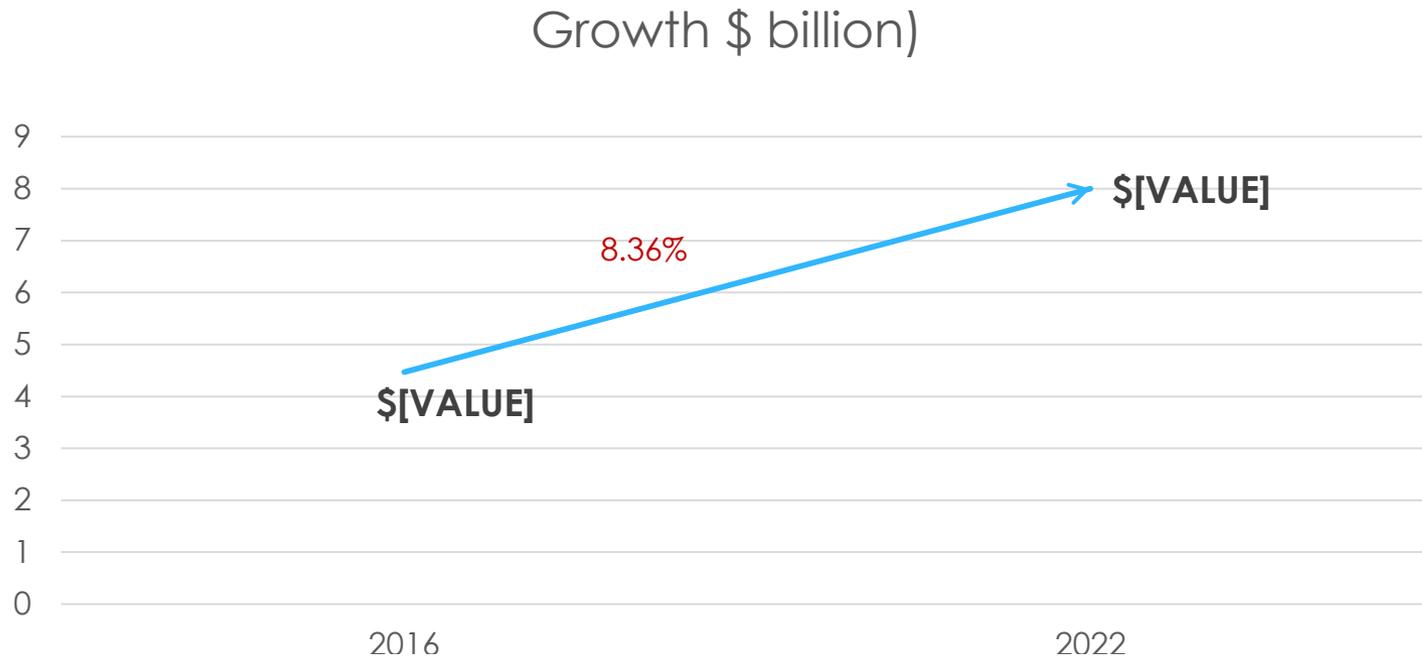
Leaded Batteries

Mapping the Toxic
waste trail

Known Facts

- Lead – one of the most toxic metal
- Lead acid battery industry- one of the largest consumers of lead
- Worst polluting industry globally
- *1.1 million people at risk from lead smelting industries, at more than 70 polluted sites around the world*
- Can be recycled indefinitely and efficiently with little loss if efficient recycling processes are deployed.

Market growth-India



Expansion of the market of automobiles, telecommunication infrastructure, solar power projects and the ever-growing IT industry

Battery Rules

- Notified in 2001
- Apply to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer
- Responsibilities of manufacturer/importer to ensure that the used batteries are collected back against new batteries sold and to set up collection centres either individually or jointly
- Direct these batteries to registered recyclers and buy recycled lead only from registered recyclers
- Consumers to return used batteries to dealers/manufacturers
- Bulk consumers can auction used batteries to registered recyclers
- Collection of batteries 50% in the first year, 75% in the second year and 90% from the third year onwards

Perfect

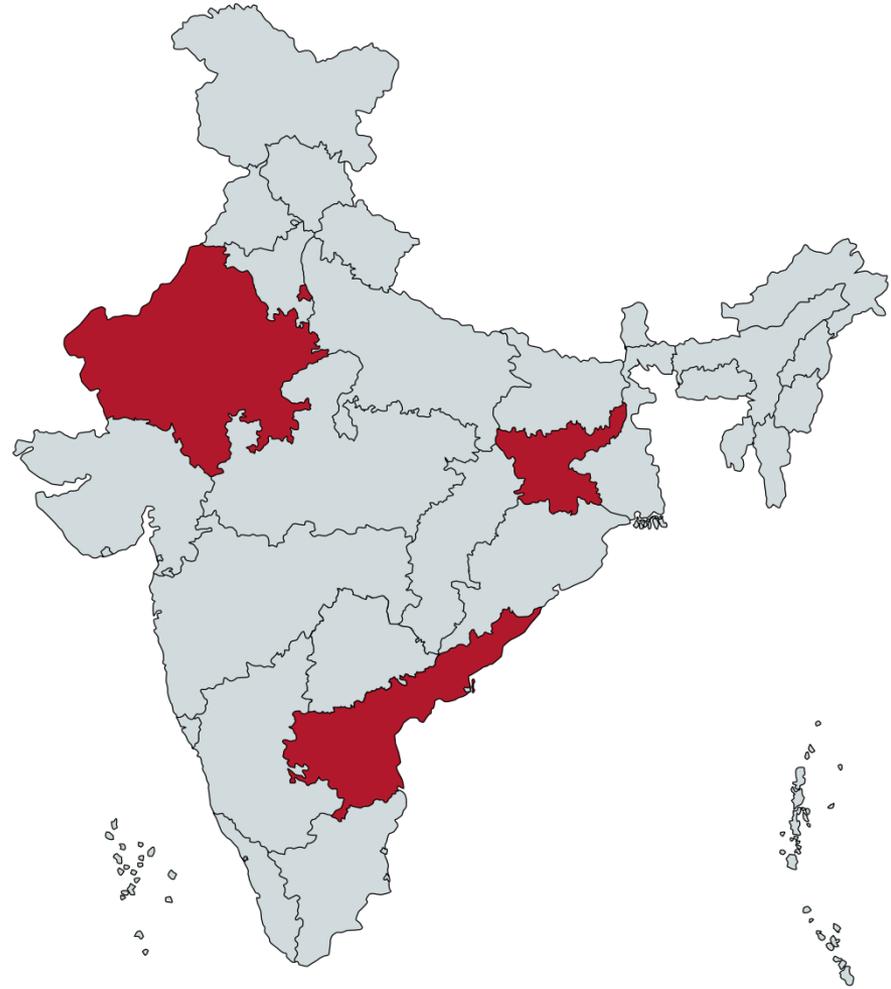
**The short answer:
No, not really**





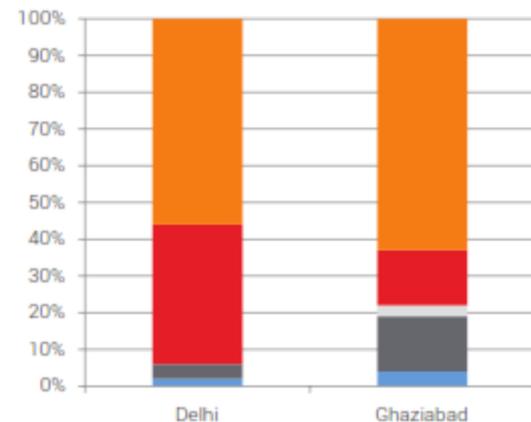
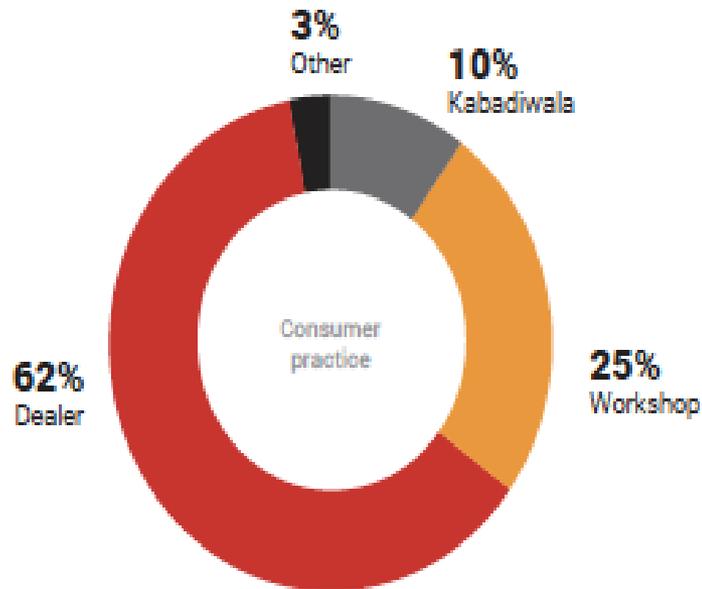
The Study

Four States- Delhi
(NCR), Rajasthan,
Jharkhand,
Andhra Pradesh



Consumer disposal practices

- In the larger cities, in all the four states covered in the survey, the consumers preferred dealers and workshops, with very little waste directly going to the kabadiwala
- But in smaller towns those percentages increased



Still sounds good? Then check this

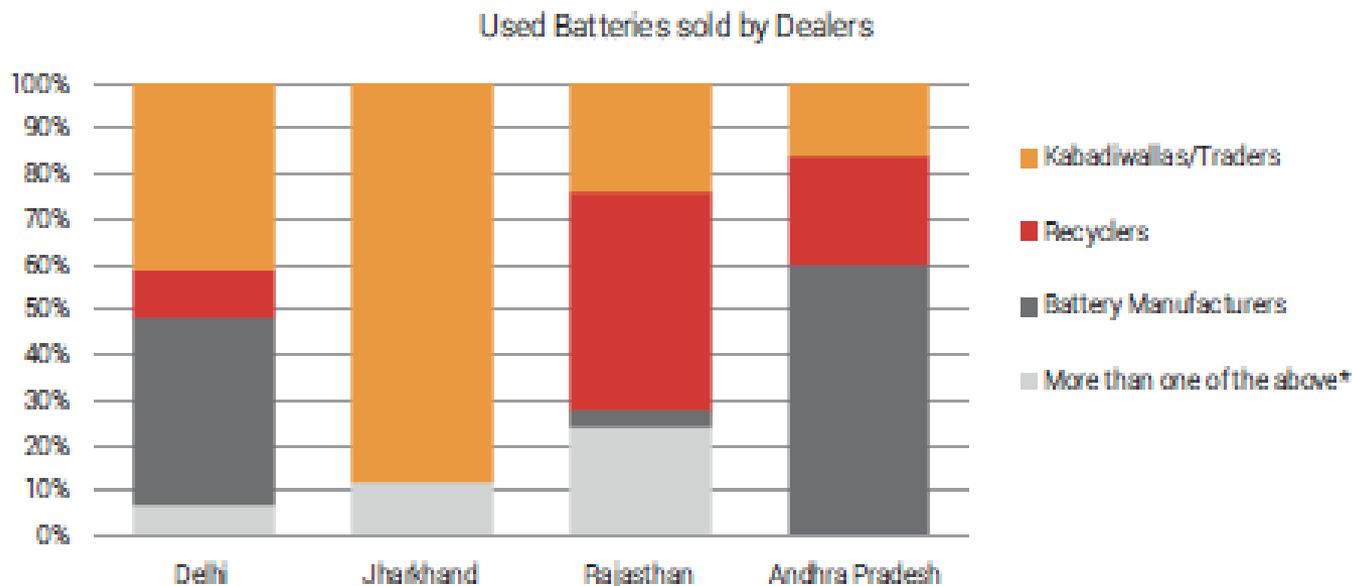
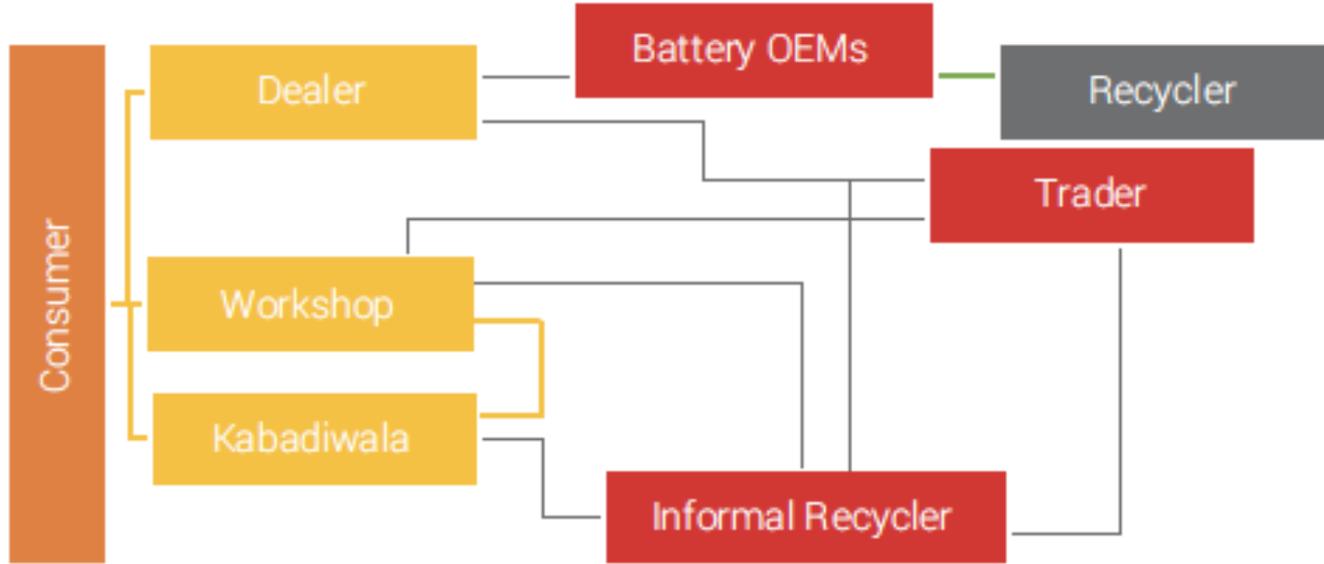
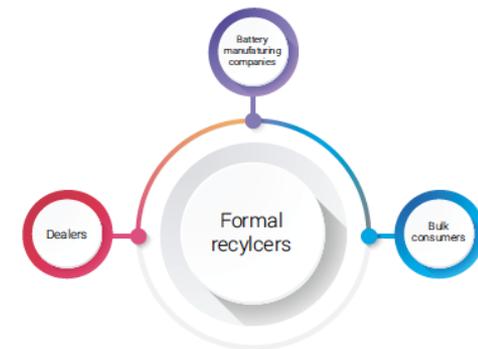


Figure 45: Dealer practice- State wise

*Depending on Convenience and Monetary Gains

FLOW

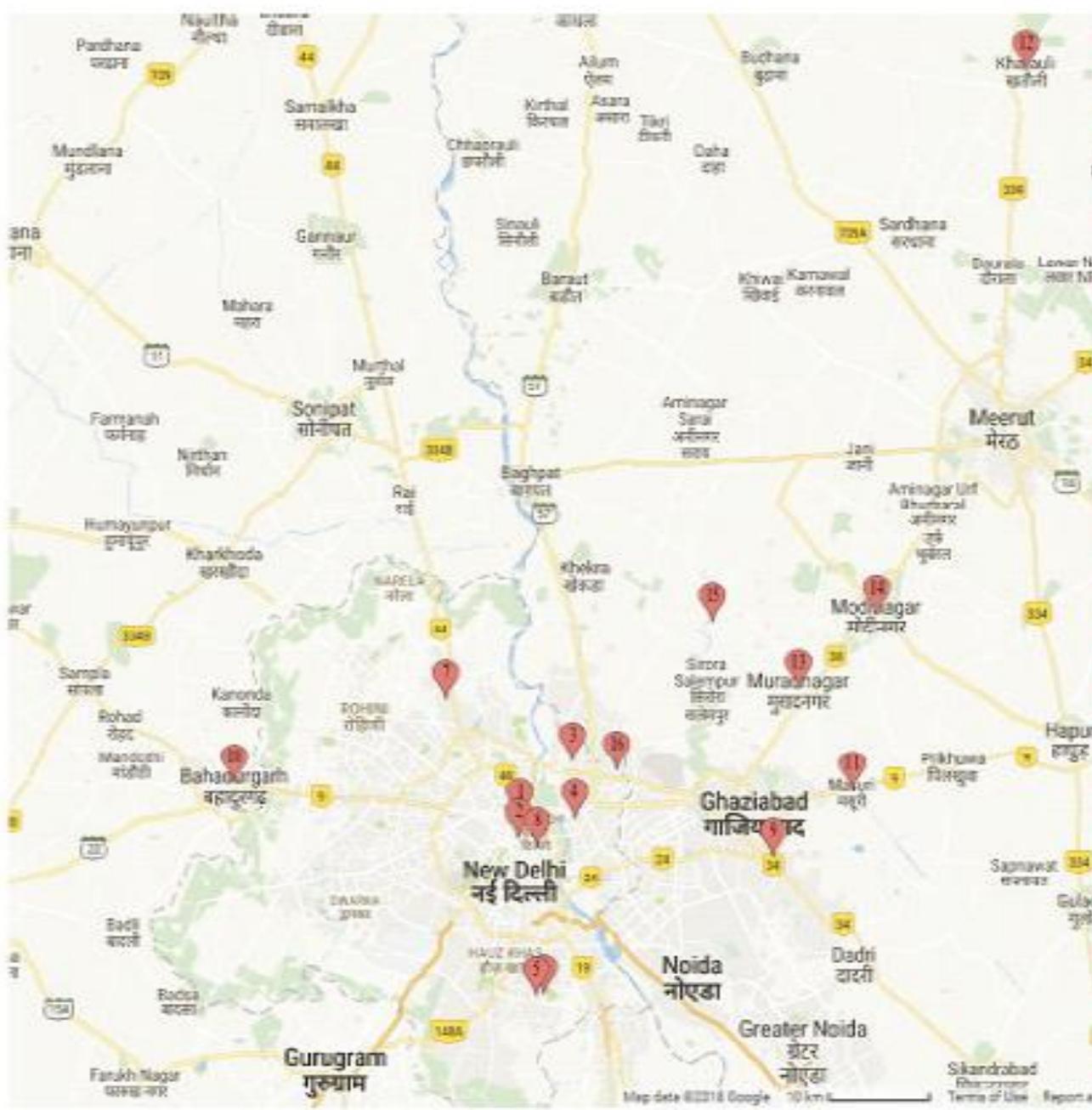






Delhi





- 1 Tis Hazari, New Delhi, Delhi, India
- 2 Paharganj, New Delhi, Delhi, India
- 3 New Mustafabad, New Delhi, Delhi 110094, India
- 4 Seelampur, Shahdara, Delhi, India
- 5 Madangir, New Delhi, Delhi 110062, India
- 6 Dakshinpuri, New Delhi, Delhi 110062, India
- 7 Siraspur, New Delhi, Delhi 110042, India
- 8 Turkman Gate, Chandni Chowk, New Delhi, Delhi, India
- 9 Lal Kuan, Ghaziabad, Uttar Pradesh, India
- 10 Bahadurgarh, Haryana 124507, India
- 11 Masuni, Uttar Pradesh 201015, India
- 12 Khatauli, Uttar Pradesh 251201, India
- 13 Muradnagar, Uttar Pradesh 201206, India
- 14 Modinagar, Uttar Pradesh, India
- 15 Nekpur, Uttar Pradesh, India
- 16 Village Mandoli, Delhi, India

Made using <https://www.mapcustomizer.com/#bulkEntryModal>

Informal recycling chain

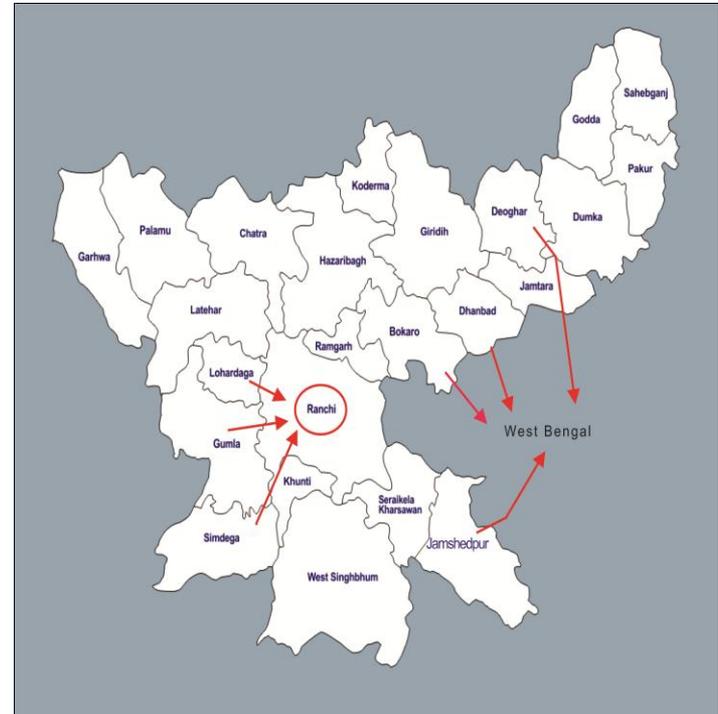
- From Delhi and its neighbouring areas, a large volume of the ULABs reach the informal recycling units located on the outskirts of the city
- Small and large-scale recyclers on the outskirts of Delhi-mostly informal, take batteries of different types, lead scrap and lead dust
- Some factories located in industrial areas also send lead in the form of lead dust and huge bricks to these units
- These units are either involved in dismantling and separation of the battery components or smelting recovered lead or both.



Jharkhand

Material flow

- Ranchi is the hotspot of collection and recycling of ULABs coming from small cities/towns in Jharkhand like khunti, Simdega, Gumla, Lohardaga and others
- Dhanbad, Jamshedpur, Bokaro and Deoghar, on the other hand, send their batteries to Kolkata
- 3 recycling units found to be operational -only one unit claimed to be authorized- not willing to show the relevant documents
- All the three units were found to be dealing with large quantities of used lead batteries ranging between 24 and 68tonnes per month



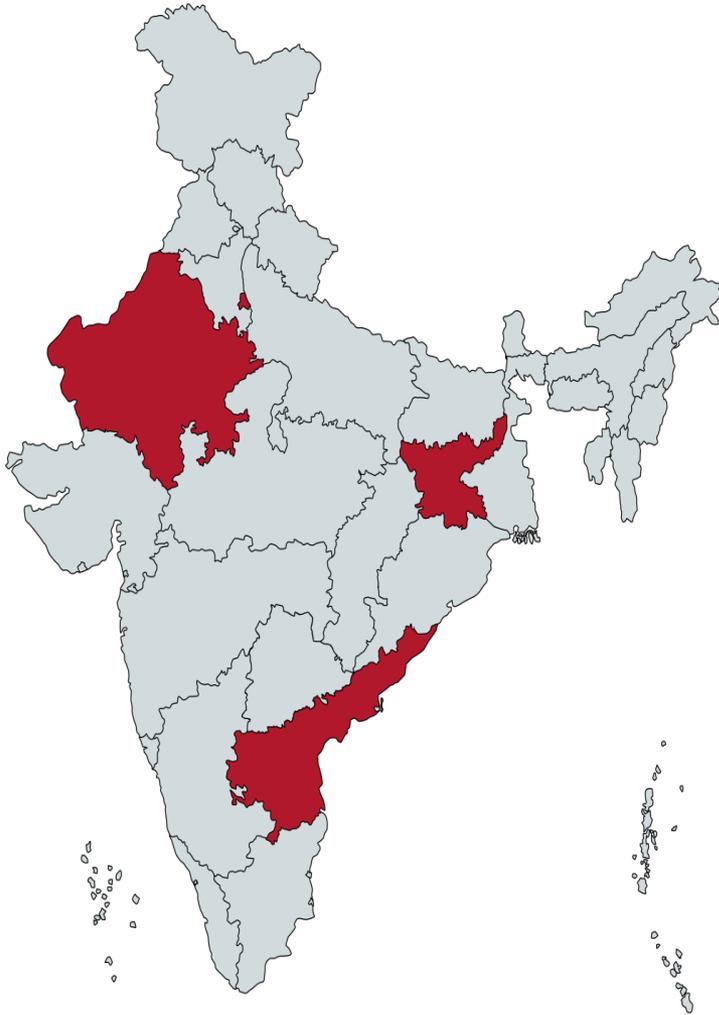


Rajasthan



Material Flow

- In Jaipur, Moti Dungari, Chandpole, Sansar Chand Road and Sitapura Industrial areas were identified as the prime areas of collection of ULABs in and around Jaipur.
- Network of traders who deal with huge quantities of ULABs
- The informal recycling units are concentrated in Bagru, Mangalam and Jaitpura Industrial areas along with Kaladera, Manda Harsoli and Sarna Doongari in Jaipur and Reengas in Sikar.
- The formal recycling units are also located in many of these areas like Sanganer on Jaipur-Phagi Road, Kaladera and Sarana Dungari
- The ULABs not only come to these recycling units in Jaipur from other parts of Rajasthan, they come from other states too.



Status

Four States- Delhi (NCR),
Rajasthan, Jharkhand, Andhra
Pradesh

Process

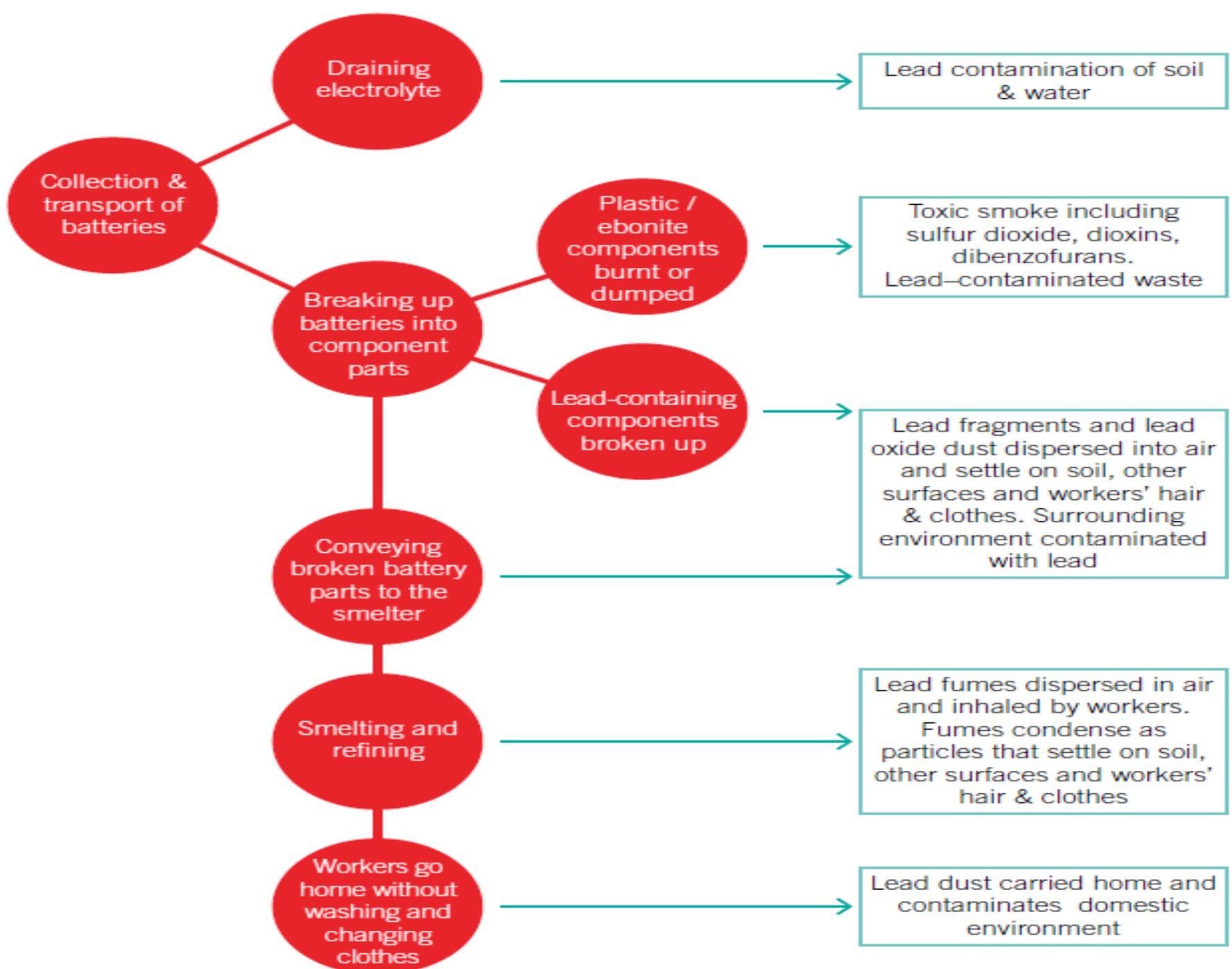
- In both small and large-scale units, dismantlers break open the batteries using hammers. Plastic casing, separators and lead grids are separated
- Plastic casings and the separator are processed to make pellets -melted and remoulded
- Acid drained out on land or in drains –usually by scrap collectors to decrease the weight and help transportation
- Lead grids melted in *bhattis*
- Recyclers receive lead in the form of lead dust and huge bricks -dipped in a small pond to turn it into dust.
- Dust is dried and heated at 600-700 degree in an open heating chamber or *bhatti* using coal.
- The purified lead is taken out of the chamber poured into casting moulds











Environmental Concerns

- Kabadiwallas and workshops- to maximise monetary gains pour out the acid at the site of receipt- on soil or in drains.
- Although the sulphuric acid in LABS is diluted, it usually contains dissolved and dispersed lead which on repeated dumping on the same spot may pollute the groundwater and even other water bodies where the drain water finally reaches.
- Dismantlers, while breaking open the batteries, expose the surrounding air, soil and water to lead dust, leading to severe contamination
- The separators retrieved from batteries, made of plastic or paper, are often dumped on the ground

Environmental Concerns

- Unorganised smelting units often leave this raw material out in the open, exposed to the wind and rains. As a result, the air around smelting units is often laden with lead dust
- Lead bricks -dipped in a pond for some time for softening- contamination of the ground water and those areas where the dirty water from the pond (heavily concentrated with lead) is dumped periodically.
- Smelting operations are mostly carried out in the open in *bhattis- huge exposure risk*
- *Even in units where closed chambers are used, basic pollution control equipment like filters were found to be missing to collect ash(containing lead) from the exhaust pipe.*



Occupational hazard

- Basic health and safety standards missing
- Many workers were seen to have been covered in the silver metal from head to toe.
- No use of PPE in most units
- Many involved in the collection and recycling of used batteries are exposed to the acid and lead regularly
- kabadiwallas and workers in dealers' shops confessed to having suffered from accidents like acid spills from ULABs
- Almost 60 percent of the workers in recycling units suffered from molten lead spills and injuries due to heavy batteries falling on their feet during loading and offloading- cases where the batteries fell on their limbs and caused fractures.
- Some of them also suffer from skin diseases due to acid spills

Occupational hazard

- The acid sometimes even splashes on their faces.
- The workers were found to suffer from nausea and respiratory issues while working.
- Workers also expressed concern over exposure to lead causing impotence.
- Heightened irritability was also mentioned by workers as one of the impacts
- In absence of separated mess areas, they are forced to eat and drink in the open in the highly contaminated factory area.

And here we have not even come to real impacts of lead exposure!!

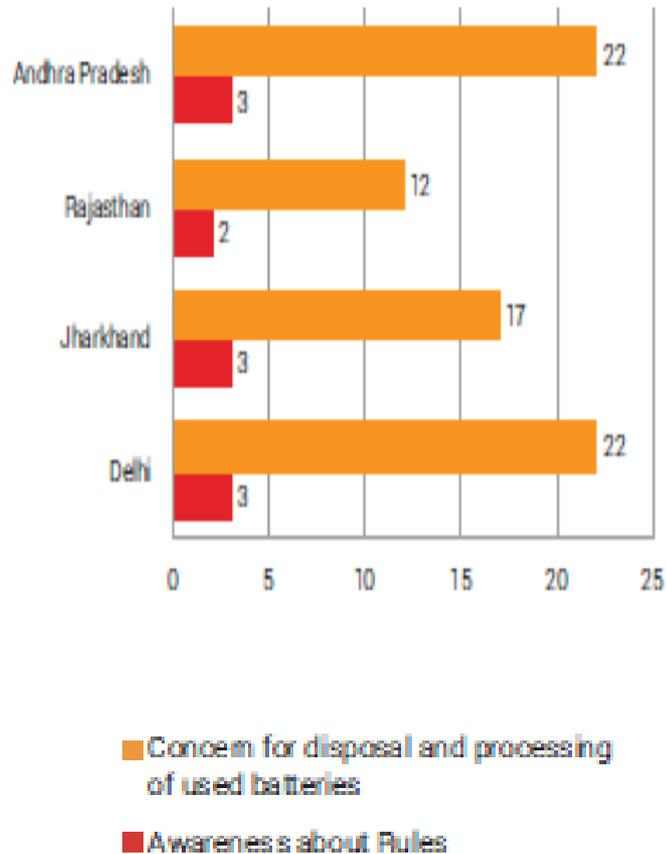
Occupational health

- Patliputra Nursing home, in Samaypur Badli, Delhi situated near an industrial area and specializes in treating patients with lead poisoning.
- Patients are generally workers (including women), in the in the age group of 20 -40 years, from battery or paint industries-mostly from the surrounding areas but patients also come from Punjab, Haryana and Uttar Pradesh.
- Blood Lead level observed among the workers: 150 to 300 $\mu\text{g}/\text{dL}$, the highest recorded has been 700 $\mu\text{g}/\text{dL}$. Workers who have been working in these units for 3-4 months report around 100 $\mu\text{g}/\text{dL}$ blood lead level.
- There are some patients who have been working in the battery recycling units for the last 10 -20 years





Awareness amongst Customers (%)



Consumer Awareness

No effort from industry or government bodies to educate consumers

Accountability?

| Period | Data submitted by number of SPCB/PCCs | MT of new batteries sold by Manufacturers, assemblers, Importers, Dealer and Re-conditioners | MT of used batteries sent to Registered recyclers |
|---------|---------------------------------------|--|---|
| 2013-14 | 14 | 18,018 | 48,727 |
| 2014-15 | 16 | 136,933 | 27,757 |
| 2015-16 | 22 | 296,510 | 79,362 |
| 2016-17 | 17 | 198,250 | 102,198 |

Key Concerns

- **Failure of Battery Rules**
- Most battery manufacturers have takeback system- no information available on the % of battery collected or recycled
- Dealers key players in the value chain and often decide waste flows in formal or informal chain- convenience and price factors
- Large quanta of used lead acid batteries are still recycled in the informal sector
- Conditions in the informal units are deplorable, with huge risk of lead pollution.
- In recycling units the smelting activities are carried out in open *bhattis*
- Lack of awareness among consumers
- **SPCBs not accountable**

- More accountability under EPR
- Fiscal benefits
- Improved monitoring

Rules

- Public campaigns
- Informal sector training
- Transparent system

Awareness

- Recycling targets
- Monitoring of facilities
- Closing down of informal operations
- Worker safety

Recycling

- Collection targets
- Robust collection network
- Bulk consumer accountability

Collection