BUSINESS AS USUAL

Informal E-waste Recycling

Manjusha Mukherjee
In the world of e-waste

20% (8.9 Mt) of e-waste is documented to be collected and properly recycled

44.7 Mt of e-waste generated in 2016

80% (35.8 Mt) of e-waste is not documented

- 4% (1.7 Mt) of e-waste in the higher income countries is thrown into the residual waste
- The fate of 76% (34.1 Mt) of e-waste is unknown; this is likely dumped, traded, or recycled under inferior conditions

- The Global E-waste Monitor 2017
INCREDIBLE REACH

but

CRUDE, INEFFICIENT, DAMAGING TO ENVIRONMENT & HEALTH

BACKBONE OF E-WASTE RECYCLING

THE INFORMAL SECTOR IN INDIA
Unfolding 2 years of E-waste (Management) Rules 2016

Impact in the largest informal e-waste recycling hub of India: Delhi

**Mapping**
Re-mapping the areas of informal WEEE units in Delhi and document their current practices

**Tracking**
Documenting the flow of WEEE to the informal sector.

**Assessing**
Examining changes in the informal WEEE market

**Evaluating**
Relook at the processes of dismantling and recycling
The Processing Hotspots of Delhi
Tracked 15 areas

Local estimate: 3400 units, 12300 workers

Our own assessment: 5000 units, 50000+ workers

Collection, international, national and regional trading, dismantling, segregation of components, repairing, refurbishing, metal recovery
## The Informal E-waste Hotspots of Delhi

<table>
<thead>
<tr>
<th>Area of operation</th>
<th>Land use</th>
<th>No. of units (apprx.)</th>
<th>No. of workers (Apprx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behta Hazipur</td>
<td>Residential</td>
<td>250-300</td>
<td>2000-2500 (10% female workers)</td>
</tr>
<tr>
<td>Brijpuri</td>
<td>Residential &amp; commercial mixed</td>
<td>6-7</td>
<td>15-20 (100% female workers)</td>
</tr>
<tr>
<td>Dariya Ganj</td>
<td>Commercial</td>
<td>40-50</td>
<td>200-250 (20% female employee mainly in front office)</td>
</tr>
<tr>
<td>Loni</td>
<td>Unauthorized residential settlements on agricultural lands where commercial activities are also undertaken</td>
<td>300-350</td>
<td>1000-1200 (30-40% female workers)</td>
</tr>
<tr>
<td>Mandoli</td>
<td>Residential colonies &amp; unauthorized settlements on agricultural land</td>
<td>12-15 operating now out of 80 units (closed due to SDM inspection &amp; demolition)</td>
<td>35-40 (25% female workers)</td>
</tr>
<tr>
<td>Mata Sundari Road</td>
<td>Majorly slums with some commercial units</td>
<td>10-12 (dismantling units are closed now as was carried out in Govt. land &amp; is demolished now)</td>
<td>40-50 (no female workers)</td>
</tr>
<tr>
<td>Slum Area</td>
<td>Type of Area</td>
<td>Size of Activity in Units</td>
<td>Number of Female Workers</td>
</tr>
<tr>
<td>-------------------</td>
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<td>---------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Mustafabad</td>
<td>Residential, mixed commercial</td>
<td>400-500</td>
<td>1500-2000 (2-3% female)</td>
</tr>
<tr>
<td>Maya Puri, Junk Market</td>
<td>Residential, industrial &amp; commercial mixed</td>
<td>20-25</td>
<td>85-110 (5% female)</td>
</tr>
<tr>
<td>New Seelampur</td>
<td>Residential (predominantly)</td>
<td>Big units (warehouses): 50-60 Small units within households: 1500</td>
<td>3000-4000 with 10-13% female</td>
</tr>
<tr>
<td>Old Seelampur</td>
<td>Residential &amp; commercial mixed</td>
<td>300-350</td>
<td>1200-1500; majorly male workers</td>
</tr>
<tr>
<td>Saeed Nagar</td>
<td>Residential</td>
<td>15-20</td>
<td>50-60 (no female workers)</td>
</tr>
<tr>
<td>Seema Puri (op. Bus depot)</td>
<td>Roadside slum settlements with shops</td>
<td>8</td>
<td>25-30 (no female workers)</td>
</tr>
<tr>
<td>Shastri Park</td>
<td>Residential</td>
<td>40-50 (small scale)</td>
<td>150-200 (no female workers)</td>
</tr>
<tr>
<td>Turkman Gate</td>
<td>Residential &amp; commercial mixed</td>
<td>80-100</td>
<td>250-300 (no female workers)</td>
</tr>
<tr>
<td>Zafrabad</td>
<td>Residential</td>
<td>10-12 (2 dismantlers &amp; rest refurbishers)</td>
<td>40-50 (2-4% female workers)</td>
</tr>
</tbody>
</table>
# INFORMAL E-WASTE OPERATIONS AT A GLANCE

## WEEE Types
- Cables & wires
- Mobiles & chargers
- Computers & televisions
- Printers & Photocopiers
- Parts of WEEE: circuit boards, motors, hard disk, compressors
- AC, refrigerator, washing machine, microwave
- Audio systems, transformers

## Operation Types
- Collection & segregation
- Trading
- Dismantling
- Refurbishing/repairing
- Recycling/ metal recovery

## Recovery
- Metals (Copper, aluminium, iron, lead, brass)
- dismantled parts of items
- repaired/refurbished items
- CRTs
- Circuit boards
- Plastic

## Destination
- Metal and plastic recycling units in Shahdara and Mandoli
- Dmantlers of other parts of delhi
- TV & Cable manufacturers of Delhi
- Industries using metals
- Other Indian cities & China
Inflow of WEEE to the informal sector

The Source

- 38% Producer
- 15% Formal Dealers
- 14% Bulk consumer
- 12% Individual Consumer
- 5% Scrap Dealer (EEE)
- 12% Kabadiwalas
- 4% Other

The Shift in Volume

- 35% Decrease up to 30%
- 24% Decreased by 30-50%
- 17% Decreased by 50-75%
- 16% Decreased by >75%
- 8% No decrease
Decrease in the Inflow volume for different WEEE

- Refrigerator: 63%
- Washing machine: 75%
- AC: 60%
- Microwave: 75%
- Audio system: 60%
- TV: 50%
- Cathode ray tube (CRT): 95%
- Mobiles: 40%
- Mobile charger: 55%
- Printer and photocopier: 85%
- Hard disk: 50%
Why the flow reduced in the informal market:

- Anecdotal accounts of informal players
- Demonitisation & GST implementation
- Shift in the market, introduction of new technologies, reduced demand
- Import ban on WEEE through E-waste Rules, 2016
Outflow of Waste & Resource from informal sector

**Destination routes**
- Local (WEEE informal): 39%
- Other Hotspots of Delhi NCR (WEEE informal): 18%
- Delhi NCR Industries, (Mandoli Industrial area, etc.): 16%
- Consumer: 13%
- Other states: 7%
- Formal Dealers: 7%

**Waste disposal**
- Dumped in low lying open areas: 56%
- Community bin: 28%
- Carried off by tractor to landfill: 16%
<table>
<thead>
<tr>
<th>Item</th>
<th>Recovered/dismantled materials</th>
<th>Average Profit (Output price – Input price)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cables &amp; wires</td>
<td>Plastic, Copper</td>
<td>INR 45000/ton</td>
</tr>
<tr>
<td>House wiring-thick Cu</td>
<td>Plastic, Aluminium</td>
<td>INR 30000/ton</td>
</tr>
<tr>
<td>Home meter cable - Al</td>
<td>Screen, Circuit board</td>
<td>INR 40000-50000/month for a business volume of 1000 piece/month</td>
</tr>
<tr>
<td>Mobile Phones</td>
<td>CRT (picture tube)</td>
<td>INR 60000/month for a business volume 1000 piece/month</td>
</tr>
<tr>
<td>CRT Monitor</td>
<td>Copper, plastic, used boards for further recycling</td>
<td>INR 25000/month for an average business volume of 2 ton/month</td>
</tr>
<tr>
<td>PCB</td>
<td>Copper, lead, CFL used boards</td>
<td>INR 700 per day per person for an average business volume of 1-1.5 quintal/day/person</td>
</tr>
<tr>
<td>PCB (CFL)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WASTE DUMPED OPEN

File photo: 2010

Study photo: 2018
Foreign buyers in the city's informal market in search of WEEE (mother board)

Photo: 2018
Health & Environment

How will you deliver your product or service?

- Of the units have no health or environmental protection measures: 100%
- Not aware of E-waste (Management) Rules, 2016: 92%

Study photo: 2018

File photo: 2010
Rudimentary & Manual

File photo: 2010

Study photo: 2018
Rudimentary & Manual

File photo: 2010

Study photo: 2018
Rudimentary & Manual

File photo: 2010

Study photo: 2018
Rudimentary & Manual

File photo: 2010

Study photo: 2018
What is in the guideline for Dismantling?

None of them are followed informally

- Dismantling space: minimum of 300 m² for a 1T/day capacity
- Dismantling premise: Water proof roofing & impermeable surfaces, Storage space for disassembled spare parts, Separate containers for storage of batteries, capacitors containing PCBs or PCTs
- Dismantling of fluorescent and other mercury containing lamps, CRT / LCD / Plasma TV not permitted
- Use of dismantling table and de-dusting system with suction hoods, cyclone, bag filter and venting through a chimney of three-meter height above roof level
- Safe removal, storage and transport of Batteries, Printed Circuit Boards (PCBs) of EEE, Toner cartridges, Plastics and External Electrical Cables to recyclers
- Use of PPEs: goggles, masks, gloves, helmet and gumboot etc
Story So far....

- Informal sector in operation
- Receives waste from all sources including formal
- No inclusion in the formal ecosystem
- Inflow reduced but still profitable