



CE 404

Capstone Project

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Level- 4, Term- I



Redevelopment of the Secondary Transfer Station at Lalbagh (DSCC Ward 20) with integrated compaction and waste transport facility



SURVEY DATA



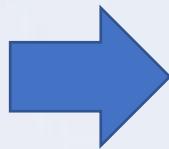
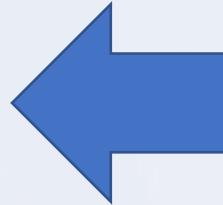
Secondary Transfer Station at Lalbagh, Dhaka





Information of Container and trucks

- Number-7
- Volume- 5 tons
- Dimension- 10'x5.5'x6'



- Number-2(One container at a time)
- Time: 11:30 PM- 12:00 AM
- Transferred to Jatrabari



Information of Van

- Number-20
- Volume- 1500 kg
- Dimension- 2m x1m x 2m
- Collection points: Chawkbazar,
Lalbagh, Azimpur Colony
- Type of source: Residential,
Bank, Shop
- 2 trips per day per van
- Vans are kept at station at night





Leachate and sanitation management

- One underdeveloped basin with pump for drinking and washing purpose
- All kind of leachate are shifted to drain
- Station is washed at the end of day





Station Overview

- Dimension- 60'x45'x27'
- Lighting- 4 lights at 4 corners
- Storage time- 9 AM to 11:30 PM
- Type of waste- Wet and biodegradable, plastics and polyethenes
- No of workers- 30-35





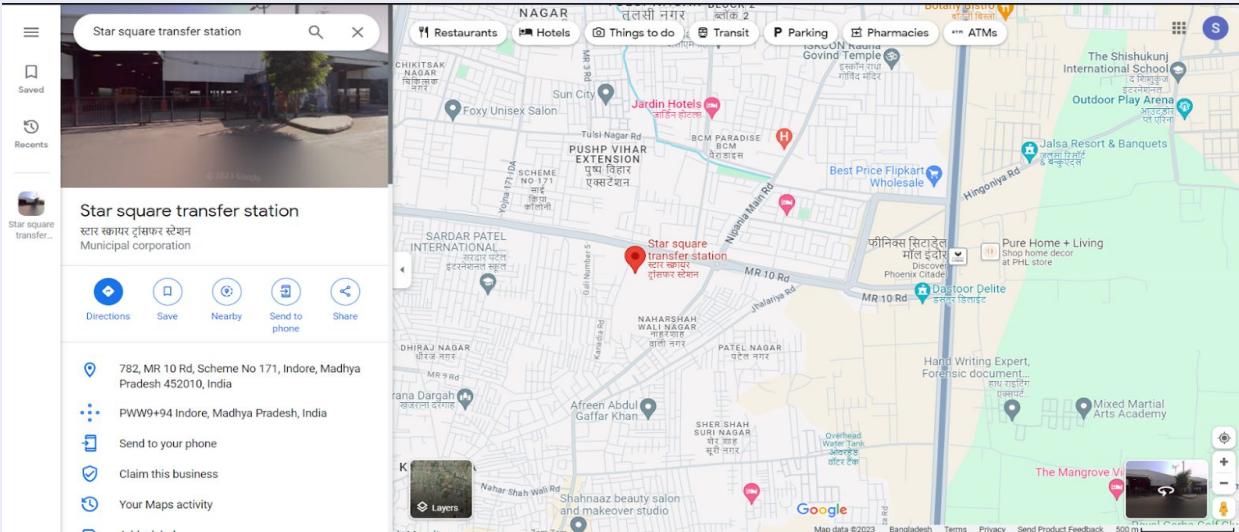
Case Study-1

Star Square Ultra-Modern Mechanized Garbage Transfer Station, Indore

Location



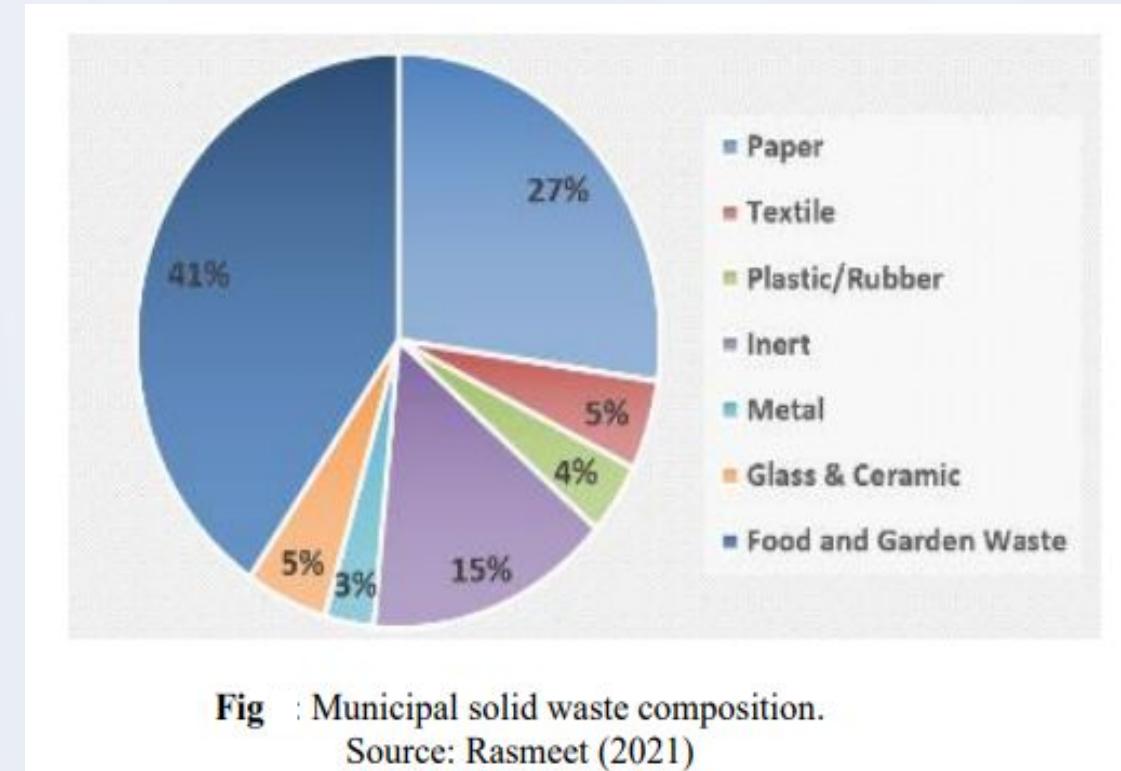
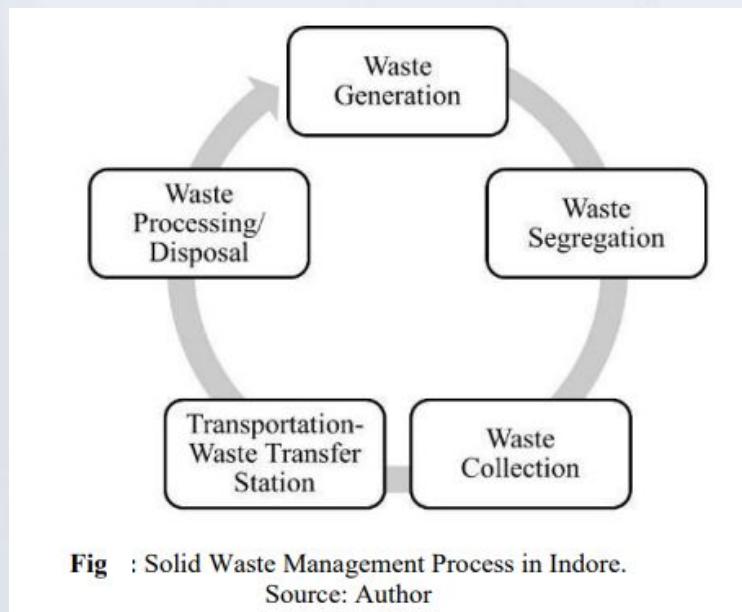
- 782, MR 10 Rd, Indore,
Madhya Pradesh, India
 - 600m away from Star Square
 - Area-1000 square meters





Station Overview

- Part of city's decentralized waste management system
- Efficient transfer of waste from smaller vehicles to larger ones
- Wet waste and decentralized processing units





Waste Collection System

- Two types of hoppers used:
Blue- Dry Waste ; Green- Wet Waste
- Containers are compacted with the segregated municipal solid waste
- Containers are lifted through a special hook loader and transported to the disposal site individually
- Dry waste is transported to the Material Recovery Facility
- Wet waste is transferred directly to the Centralized Composting Unit via the hook loader





Waste Transfer System

- Three major parts including compactor, bucket and hook-loader
- Cost: Rs 1.75 crore per station
- Previous Capacity: 30 vehicles per container
- Present Capacity: 45 Vehicles per container
- Collection of more garbage and savings of 20 lakhs per month

Ultra Modern Mechanized Transfer Stations

AT SANGAM NAGAR

IT PARK INDORE

STAR SQUARE MR-10

LALBAG INDORE

10
Ultra Modern Mechanized Transfer Stations



Waste Compaction



Fig: Wet Waste Compaction Processing



Waste Compaction (Continued)



Fig: Wet Waste Compaction Processing



Segregation of Dry Waste



Fig: Dry Waste Segregation Process



Segregation of Dry Waste (Continued)



Fig: Dry Waste Segregation Process



Recycling Waste

Material Recovery Facility (MRF)



Two Material Recovery Facility of 300 TPD and 200 TPD capacity respectively established by IMC

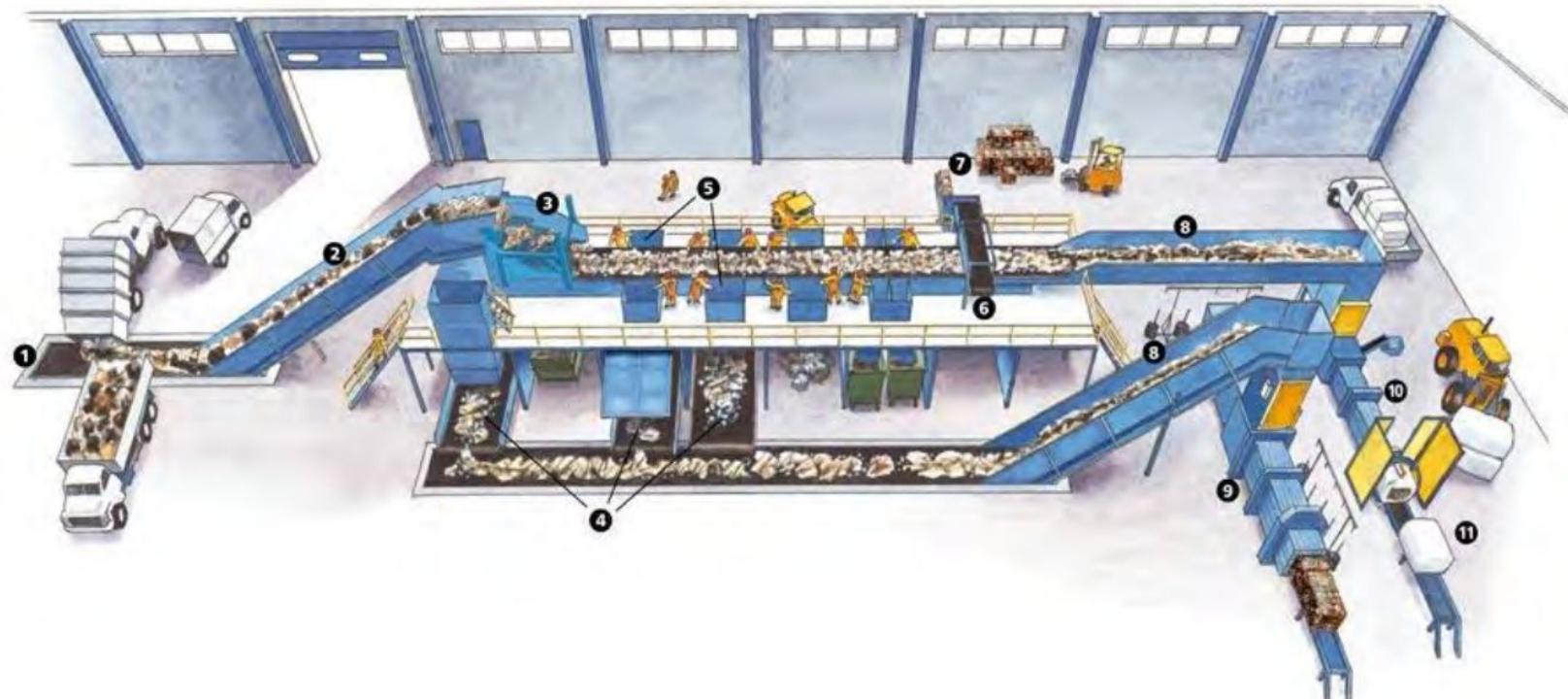
700 Rag pickers will be provided livelihood through IMC, Material Recovery Facility

At MRF, sorting of all type of dry waste such as Paper, plastic, iron, glass, e-waste, polythene, rugs, leather, shoes, pet bottles, rubber etc.



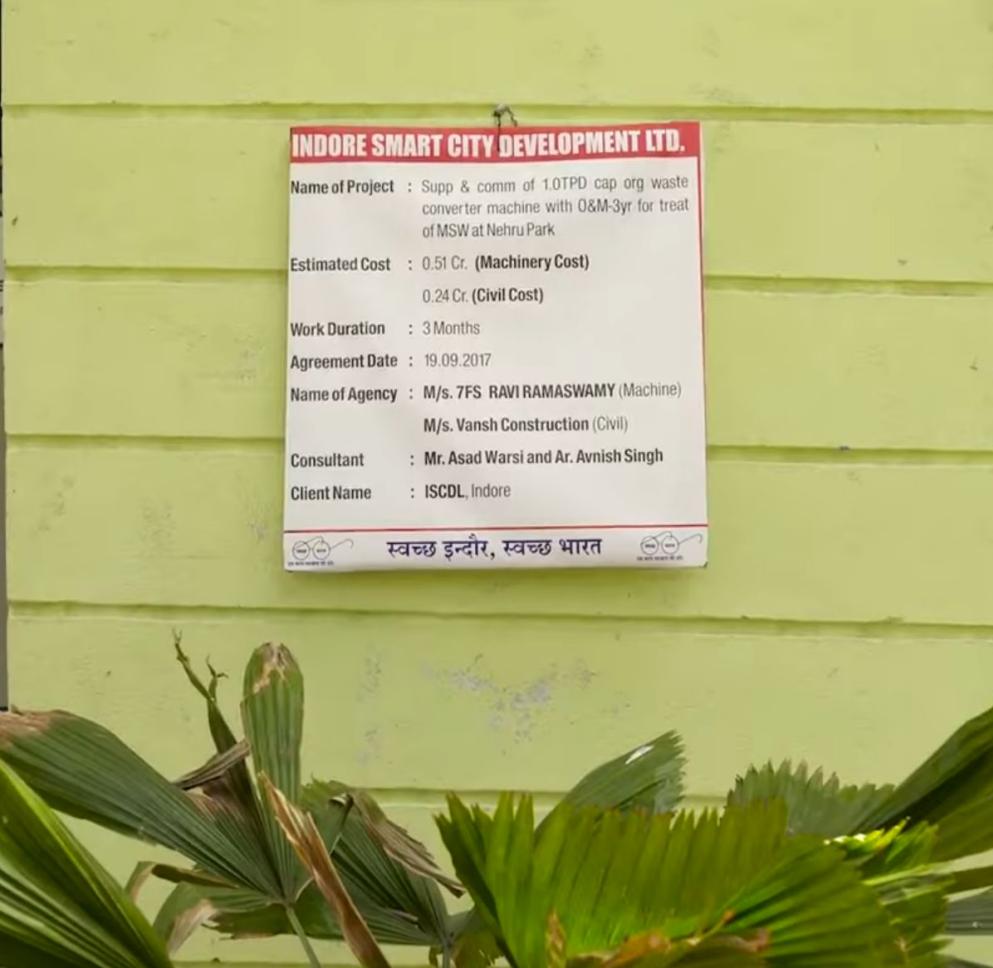
Recycling Waste (Continued)

Fully Automatic Material Recovery Facility (MRF) –
(under construction)





Onsite Compost





Onsite Compost (Continued)





Workers' Safety

Distribution of Personal Protection Gears to all SWM workers

स्वच्छ भारत
एक कदम सफलता की ओर

- IMC distributed Raincoats, Hand gloves, fluorescent jackets and Masks
- Ensuring that every employee uses personal protective safety gears while working in the field.



Success

Bioremediation - Transformational Change



BEFORE



BEFORE



PRESENT



- ▶ 100 % legacy waste remediated
- ▶ 100 acres land worth Rs. 300 cr. Reclaimed
- ▶ Proposed Plan to develop Golf Course/ City Forest



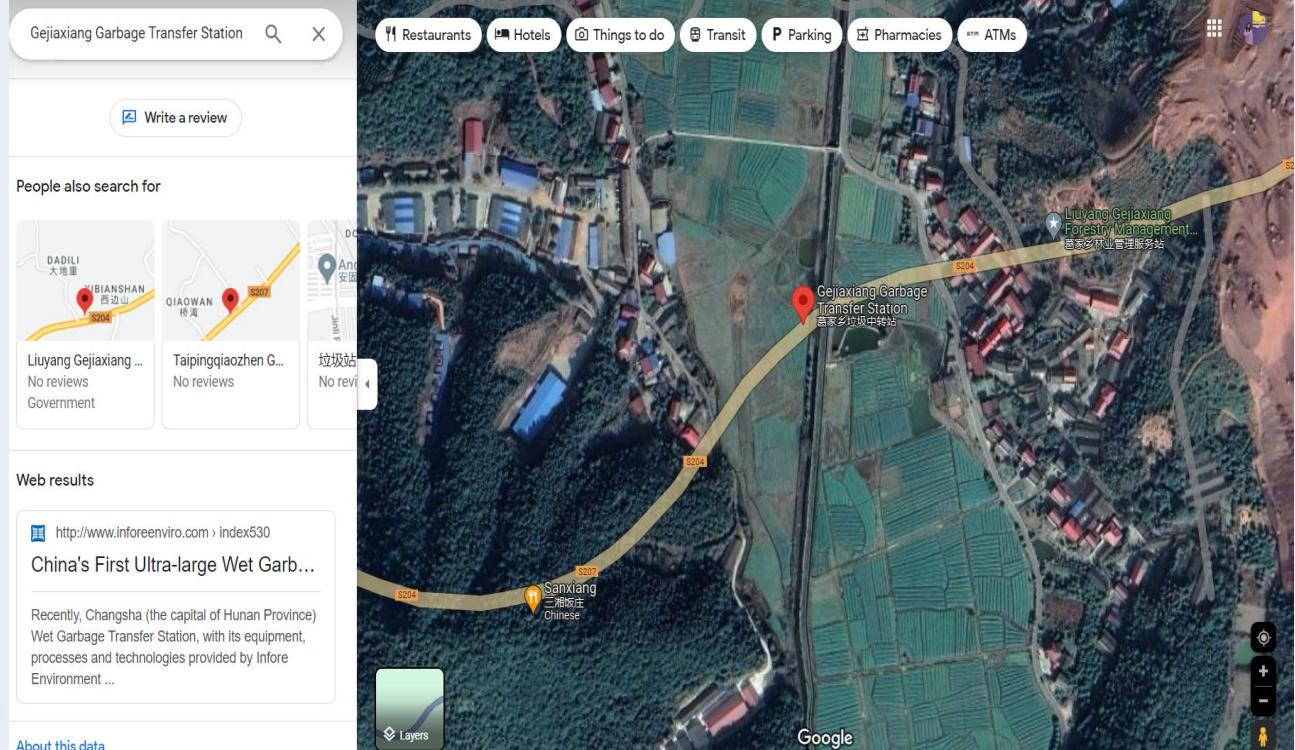
Case Study-2

Jinxiang Wet Garbage Station (Changsha, China)



Location and Equipments

- Garbage bag-breaking machines
- Semi-trailer transfer trucks
- Kitchen residue processing equipment
- Medical residue processing equipment
- Spray deodorization system



- Area-3,900 square meters
- Wet waste- 1,200 tons
- Kitchen waste- 400 tons



Mechanism- Wet waste processing

- High moisture content waste
- Bag breaking technique
- Standard- 15% of dehydration rate



Fig: Household waste compactor



Fig : Wet garbage processing compactor



Mechanism- Kitchen Residue Processing

- Vertical direct-pressure compressor
- Garbage bin positioner
- Garbage bin and removable garbage truck
- “Combining vertical direct-pressure trucks with hook arm trucks“ process is utilized to transfer dehydrated refuse and incinerate



Fig: Vertical compactor for kitchen waste processing



Mechanism- Medical Waste Processing



Fig: Medical Waste Processing



Specialized Facilities- Double Protections to Comprehensively Remove Dust and Odor

- Fully closed sewage collection system
- Single-sided door in vertical waste bin
- negative-pressure wind-drawing dedusting and deodorization system



Fig: Spray Deodorizing System



Fig: Negative Pressure Wind Drawing Dedusting



Specialized Facilities-Intelligent and Efficient Digital Centralized Control

- Waste Compression System
- Traffic Command System
- Intelligent Weighing and Dedusting System



Fig: Digital Centralized Control

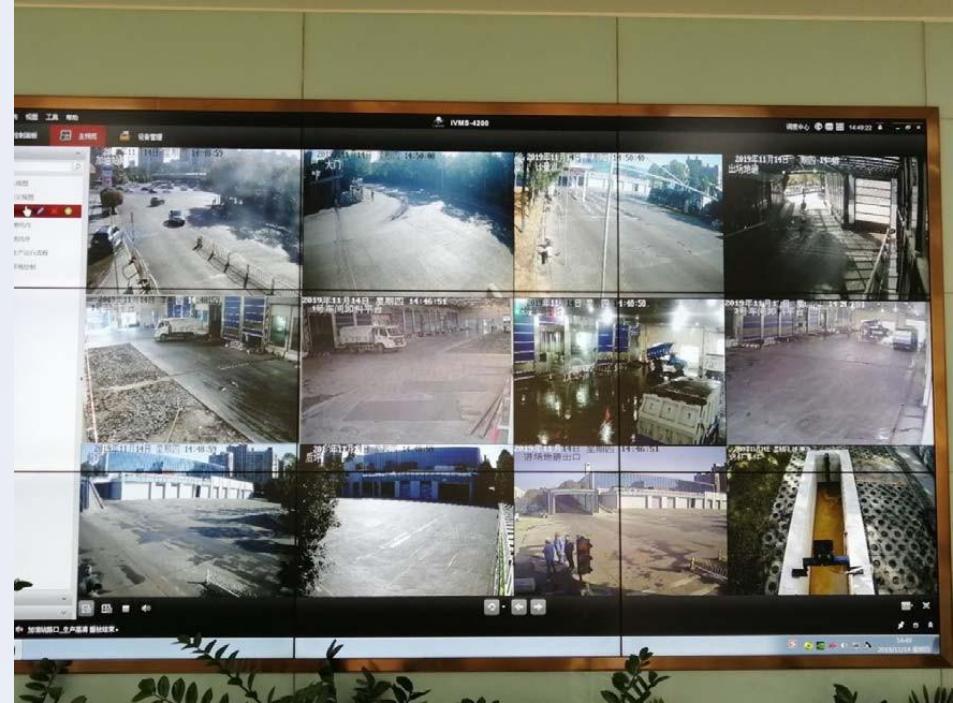


Fig: Digital Monitoring



Success

- Comprehensive waste classification system
- Categorization of Rubbish
- Progress in transferring and processing wet garbage
- departure from traditional waste management methods
- Handling of 96 tons of trash daily
- Main construction site with a total capacity of 45 million cubic meters of solid waste.
- Part of 22 pollution treatment projects in the Xiangjiang river valley.



Case Study-3

Modern Scientific Waste Compacting Station (Kolkata, India)



Location: Kolkata

- 4500 MT OF Municipal Solid Waste (MSW) per day generated in Kolkata
- Clean City Initiative by KMC
- Two to Five compactors in a compactor station
- 119 Compactors & 95 Mobile Compactors



Fig: MSWCS



Previous Condition



Fig: Previously used Vat in KMC areas presently substituted by MSWCS



Type of Compactors

- Automatic Compacting Receptacles (ACR'S) e.g. Smart Packs
- Regular or indoor Trash Compactors
- Outdoor Trash Compactors e.g. Stationary, Dumpster type, Vertical outdoor



Fig: Mobile Compactor



Figure 3. Compactor Station



Process Flow Chart

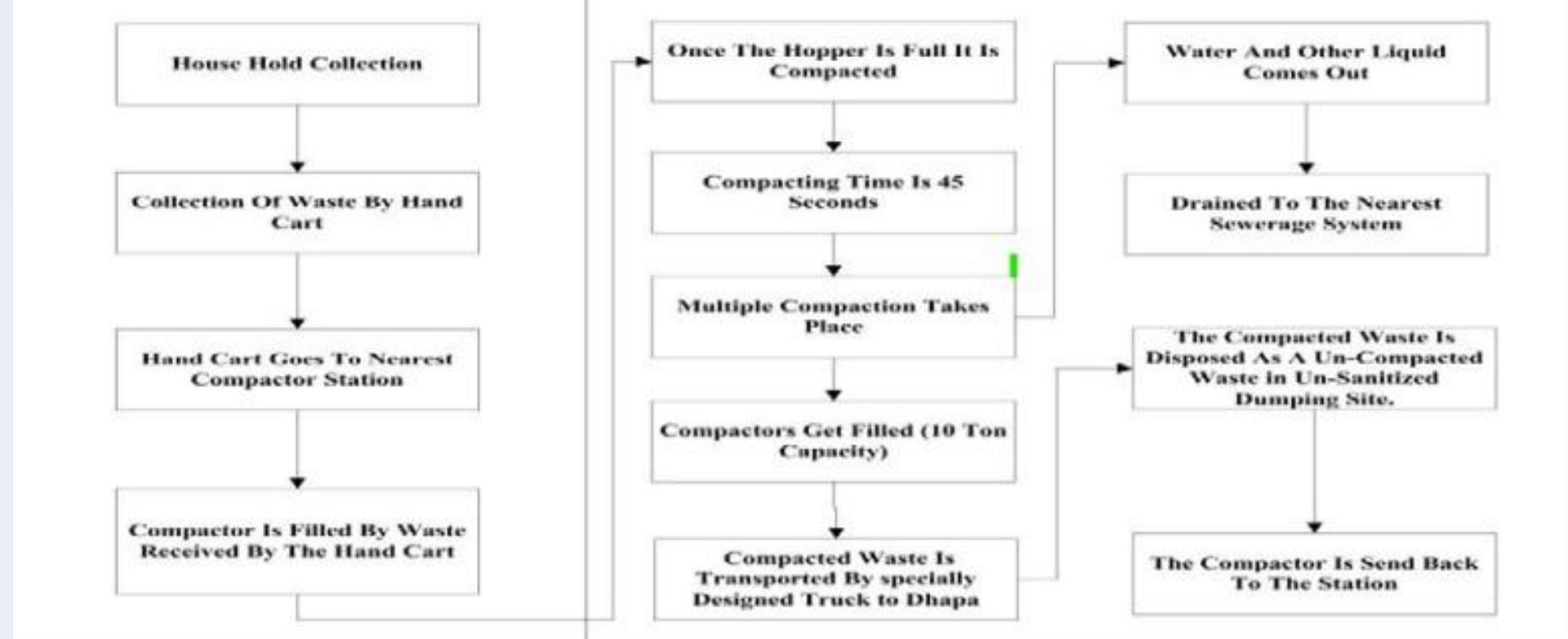


Fig: Process flow chart from the point of waste collection to dumping site



Waste Compaction Management System



Figure.4. Feeding MSW from households in Compactor Station

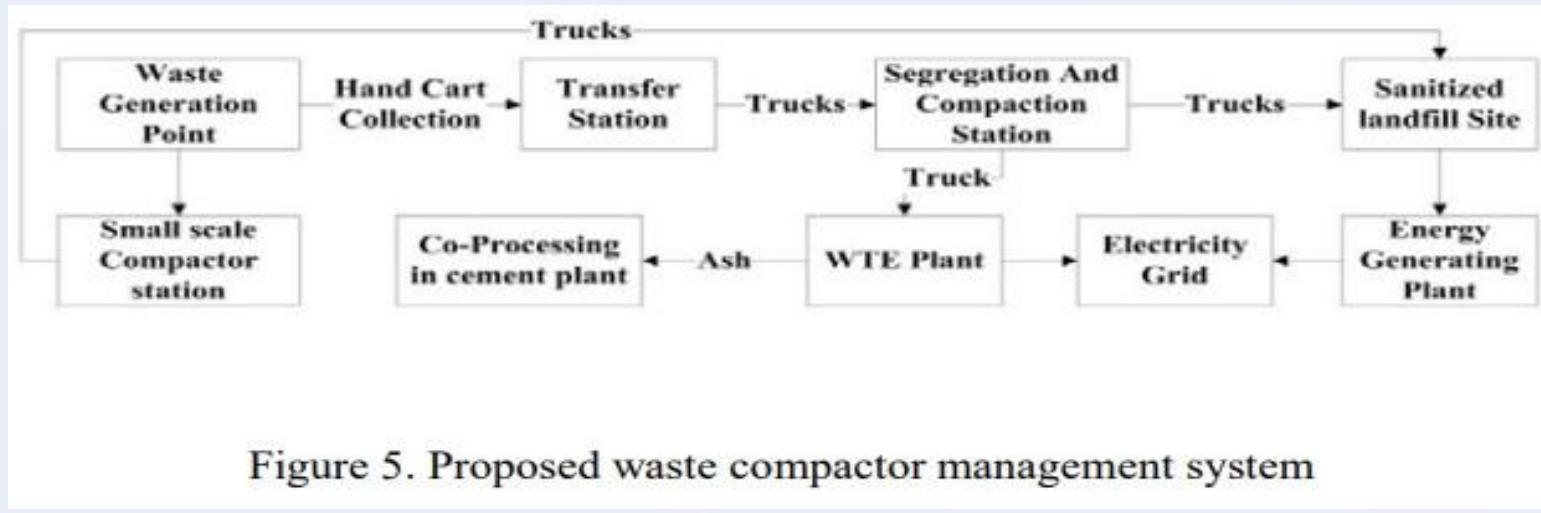


Figure 5. Proposed waste compactor management system



Waste Collection and Transfer



Fig: Waste Collection from households via carts and transfer the waste into compactor



Compaction and Leachate Management



Fig: Waste getting into compressor portion from collection portion



Fig: Produced leachate poured into sewerage system



Transportation of waste from MSWCS to Landfill



Fig: waste transfer for compactors to truck



Fig: Dumping of waste in the landfill



Drawing