

Initiatives taken under Swachh Bharat Abhiyan

Indore Municipal Corporation



**SWACHH
SURVEKSHAN
2020**



Challenges in Indore prior to SBM (U)



Lack of public confidence in the Corporation and administration



Lack of sanitation and waste management infrastructure



Community and public toilets not maintained/ unusable



Issues with unions and lack of discipline among municipal staff



Inefficient supervision and monitoring



Manual attendance system & High absenteeism of staff



Manual attendance system & High absenteeism of staff



Changing the Swachhata Landscape of Indore



Two-pronged strategy:

Sanitation & SWM infrastructure; and reaching out to citizens for awareness

Confidence building activities

Onboarding mayor, president, MLAs and corporators

Setting up infrastructure i.e. D2D comparted vehicles, transfer Stations, MRF center, compost plant etc.

Multiple waste collection system: Silt/Sweeping waste, horticulture, C&D Collection, BWG, Biomedical, Meat

100% segregation through community participation

Special focus on setting up IHHL/CT/PT & Urinal Infrastructure



Intensive IEC activities to create large scale awareness

Bin free city/ towns & elimination of GVP points

Citizen involvement for three bin system (Wet, Dry and Domestic hazardous waste)

Targeted community involvement at various levels i.e., RWAs, Commercial Establishments, Social Organizations,

NGOs mobilized for large scale awareness campaigns on SWM Components

Key Initiatives



Solid Waste Management

- Led by Municipal Commissioner, Municipal Team visited field daily at 6-6.30 AM
- Bin Free, Dust free, litter free city
- Mechanized Road Sweeping
- Training and capacity building of Safaimitra
- Welfare measures for Safaimitra/ Ragpickers
- Active communication with Safaimitra unions
- Active involvement of corporators in D2D collection
- Ensuring Sustainability – **“Waste to Wealth”** (CNG – Public transport, Royalty – processing)



Sanitation

- Making Indore Open Defecations Free
- Morning field visits by all officials/ staffs of municipals corporations and councils
- Construction of CT/PT/ IHHL & standalone Urinal
- Restoration & maintenance of defunct CT/PT
- River rejuvenation - Kanh & Saraswati river



Community Engagement

- ‘Dabba’ Gangs & ‘Seete’ Gangs (120) of young brigade to prevent open defecation
- CSR initiatives: Established San-mart for citizens to procure bins, bags, and other items related to SWM at subsidized rate
- ‘Indore 311’ Mayor Helpline for citizen grievance redressal & in other associated ULBs Swachhata App & intensive monitoring

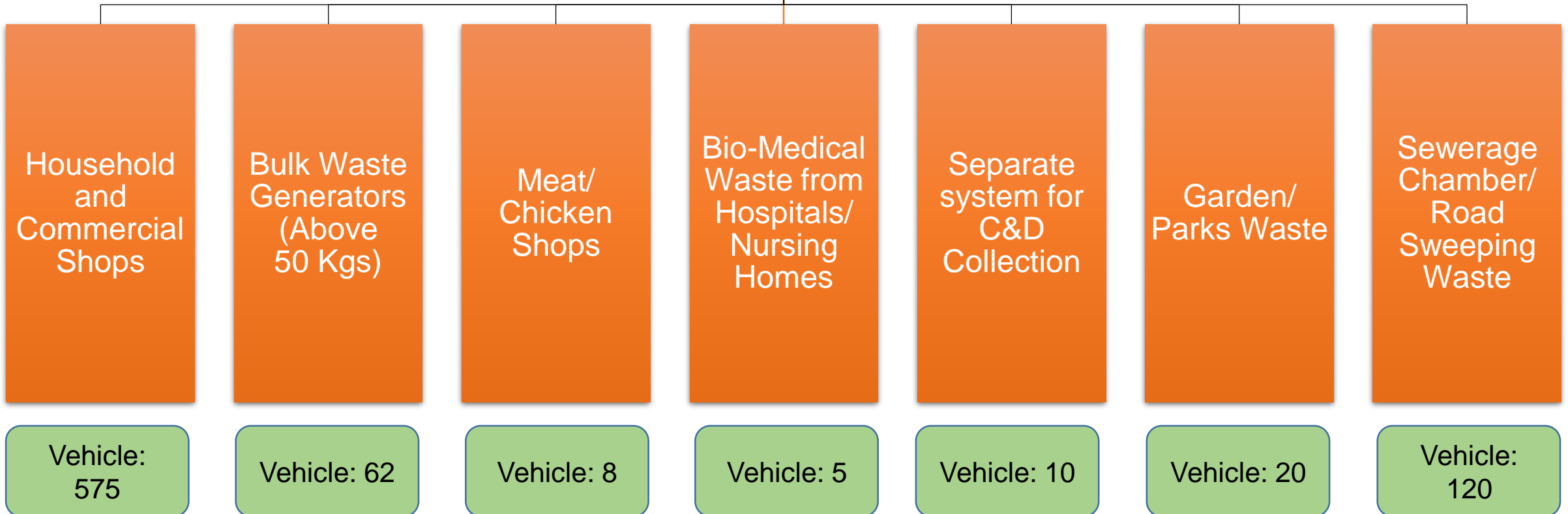


DTDC Collection Systems

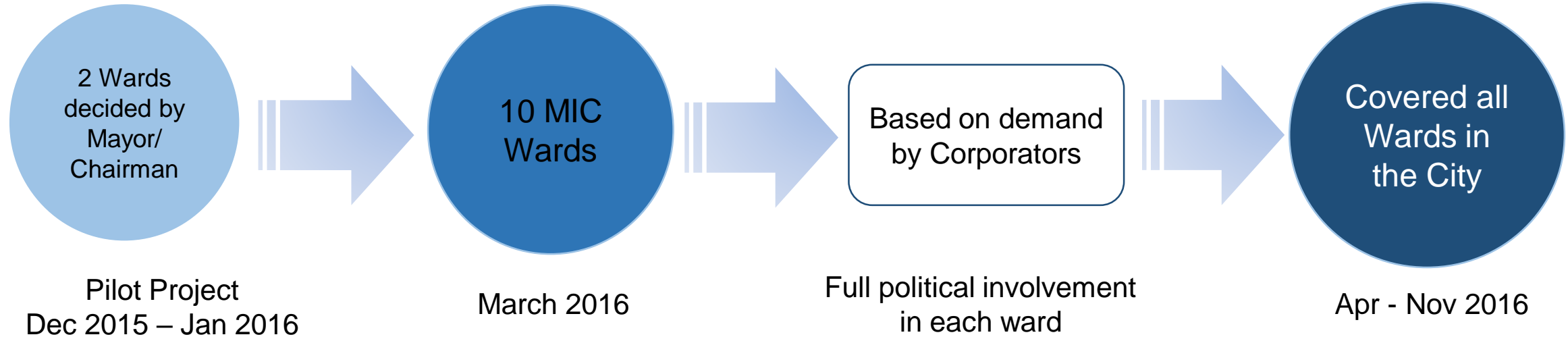


DTDC Collection Systems

Separate and Exhaustive DTDC Collection System at field level:



Scaling up: Door to Door Collection



- ✓ Staff/ Vehicle Deployment
- ✓ Route Plan Maps
- ✓ NGO involvement
- ✓ GPS based vehicle monitoring
- ✓ Spot fine for violations



Ultra Modern Mechanized Transfer Stations



AT SANGAM NAGAR



IT PARK INDORE



STAR SQUARE MR-10



LALBAG INDORE



10

Ultra Modern
Mechanized
Transfer
Stations

Vehicle Tracking & Monitoring System (VTMS)



Installation of GPS receivers in
700+ vehicles



Web based vehicle tracking solution



Dashboard, Live Vehicle Tracking,
Route Replay, Admin module



Reports, Alerts, Integration
requirement



Integration with weight bridge

ISWM

Zone 7 - Schem... All vehicle(s) 04:57 PM 04:00 PM To 11:00 PM CSI Zone 7 7440443427

Map View

Region Boundary Map Indication

Select vehicle

MP09GG362 (55%)

MP09GG404 (7%)

MP09GG704 (11%)

MP09GG7350 (37%)

MP09GG7248 (15%)

Vehicle Tracking & Monitoring System (VTMS)



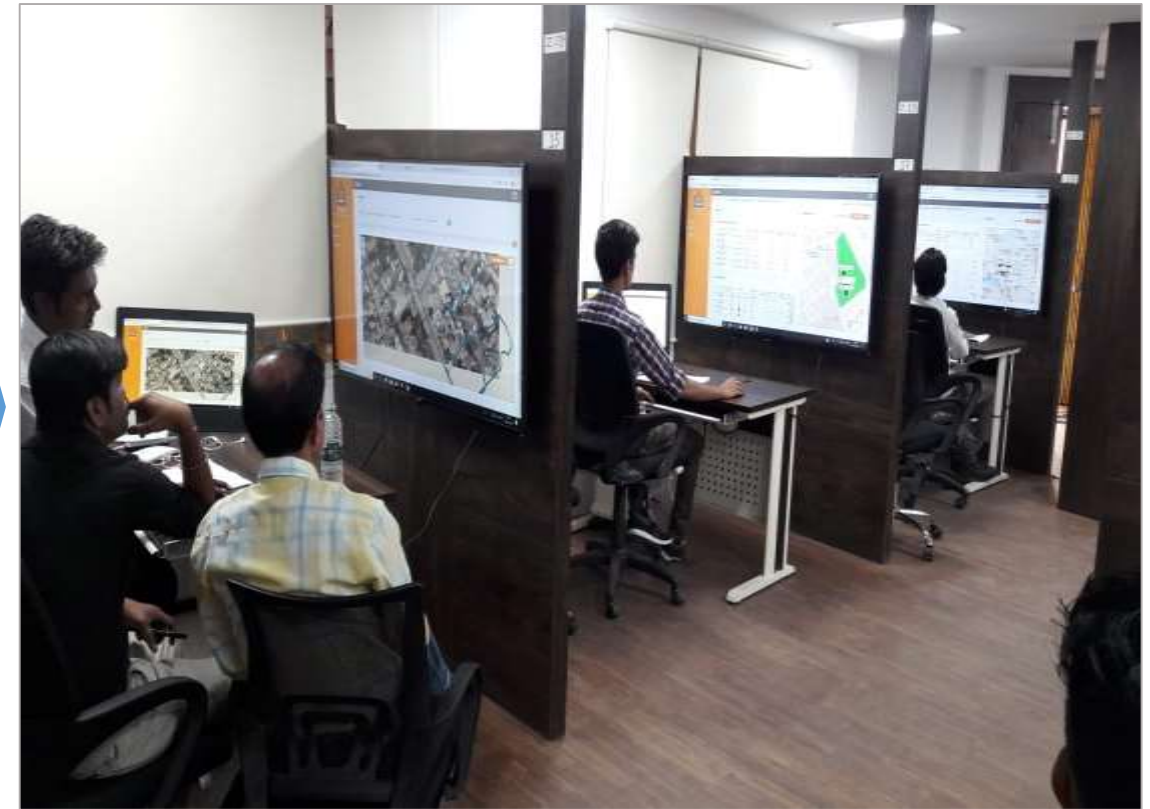
Vehicle on weighbridge at landfill Site



RFID Sticker on Windscreen of Vehicle



Digital Weighing and Recording Mechanism



Sustainability- Integrated Solid Waste Management



IoT based devices & unique weigh bridge mechanism at all GTS

- ▶ Automated **man less** weigh bridges with RFID readers, automated **boom barriers** and **real time data** recording and transfer to control and command center have been installed at all transfer stations and processing facility for temper proof system
- ▶ With the help of this system, Indore has achieved 100% control over the collection and transportation system of



23-Ultra Modern Mechanized Road Sweeping Machines

- ▶ Road Sweeping machines *Broadson* was introduced for daily sweeping of major roads such as Bypass & Super corridor & bridges. It was introduced to cover Highways in shorter time span with 20 MPH speed.
- ▶ Compact Road Sweeping machines (Citynet & Nilfisk) was introduced for daily sweeping of narrow roads & footpaths
- ▶ 15 High pressure jet machines – Washing monuments, footpaths and Squares etc.

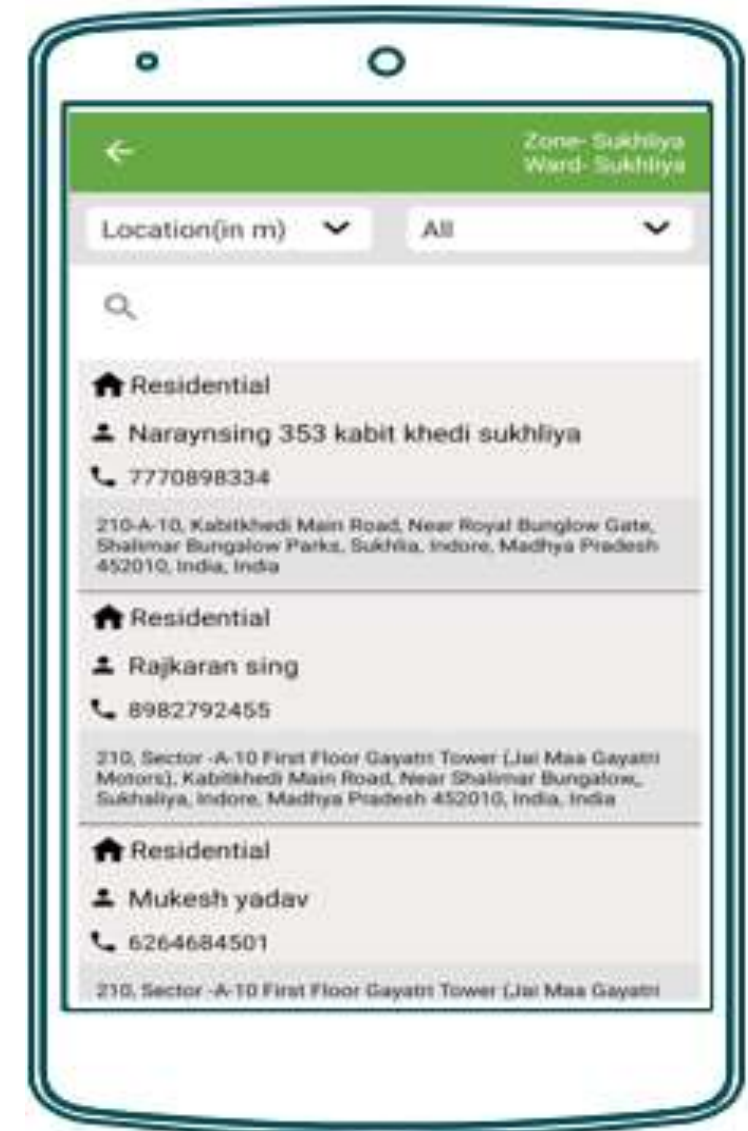


Sustainability – Integrated Solid Waste Management



Collection and Transportation App

- ▶ Waste Collection Route and Gate monitoring to ensure 100% waste generators are covered through D2D system
- ▶ Data Digitization Platform to manage 100% data in digital form including all registers such as GTS/ processing plant/ Citizen feedback registers/ CT/PT maintenance and feedback registers etc.
- ▶ The mock surveys/ thematic ranking are conducted using this App



Sustainability – Integrated Solid Waste Management



ICT Monitoring with Google toilet Locator

Monitoring of CT/PT & Urinals with received feedback by various means such as QR code/ Google maps/ Swachhata App (Indore 311) is implemented along with BSNL feedback devices, ensures suitability of Sanitation services.



स्वच्छ भारत
एक कदम स्वच्छता की ओर



स्वच्छ सर्वेक्षण 2020



इन्दौर नगर पालिक निगम, इन्दौर

इन्दौर नगर पालिक निगम
मूत्रालय एवं शौचालय
स्वच्छता एवं गुणवत्ता
नियंत्रण प्रणाली

Powered By


नीचे दिए गए QR कोड को
स्केन करें



Go to Google Maps
and rate



गूगल मैप पर जाएं व रेट करें

Go to 311 App
and rate



इन्दौर 311 एप पर जाएं
व रेट करें

Toilet Code: 802273 P 0007 | **Ward:** 57 - Devi Ahilyabai | **Location:** Court Campus Near Parking

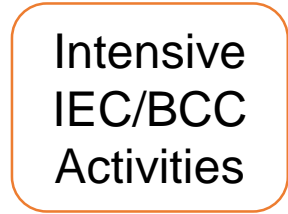
Scaling up: Segregation at Source



Scaling-up: Segregation at Source



Pilot Project
May 2016



Gradual Scaling-Up
June 2016 – Dec 2016



Jan 2017



- Strict checking by Driver/Helper/NGO at source stage
- At Transfer Station
- Spot fine for violations



Sustainable Revenue Model –Dry Waste Processing

- ▶ This 350 and 200 TPD plant capacity will help IMC in generate revenue of (1.41+16) 1.57 cr. Every year.
- ▶ On PPP mode the company has invested 30 cr.
- ▶ This plant will be well linked by Collection and Transportation App of IMC to ensure ICT based record keeping.
- ▶ Sorting all type of dry waste such as Paper, plastic, iron, glass, e-waste, polythene, rugs, leather, shoes, pet bottles, rubber etc.,
- ▶ Integration with Recycling Industries, Cement Plant and Road Construction Agencies

Livelihood Opportunities –Ragpickers

- ▶ This plant will help in ensuring maximum recovery, minimum intervention & better health safety environment.
- ▶ 700 Rag pickers and 14 Kabaadis have been provided sustainable livelihood opportunities
- ▶ Experience rag-pickers are trained by NEPRA to help in quality check and segregation
- ▶ These experienced rag-pickers have been provided sustainable livelihood as well as enhancing the performance of plant



Sustainability | Moving towards Circular Economy – MRF



Plant

- Capacity – 550 TPD
- Managed by Concessionaire
- Area: 8 Acres



Financials

- Capex Cost: Rs. 25 Crs.
- Annual Revenue: Rs. 1.5 Crs.



Operations

- Construction period:
8 Months
- Annual Opex. 72 Lakh



Implemented in
District/M. Corp Level



Waste Processed

- Dry waste Input: 550 TPD
- Processed waste: 440 TPD
- Recycled: 90% plastic &
10% RDF



Benefits

- Help to reduce solid waste
- Ecofriendly Processing



Recycled Product

- Use in road construction
- RDF*



Employment
Generation
250 Pax.

*RDF: Refuse Derived Fuel

Construction and Demolition Waste Plant – Process

Collection and Transportation



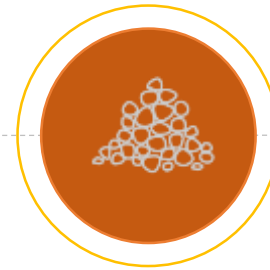
Input in the Feed Hopper



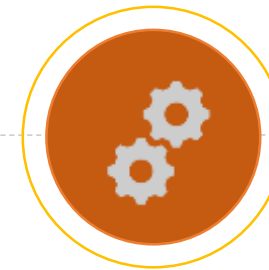
3 Deck Screen Processing Unit



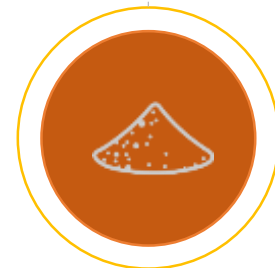
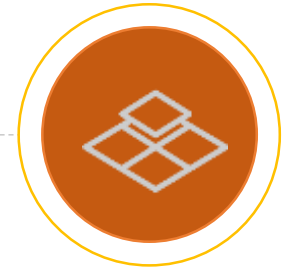
Aggregate of <20mm, >20mm and <10 mm



Paver and Brick molding machine



Pavers and Bricks



Sand Classifier



Sustainability | Construction and Demolition Waste Plant



Plant

- Capacity – 100 TPD
- Managed by Concessionaire
- Area: 217800 Sq. Ft.



Financials

- Variable Revenue Model
- Capex Cost: Rs. 4 Crore
- Annual Revenue: Rs. 3.93 Crs.



Operations

- Construction timeline: 3 Months
- Annual Opex: Rs. 36 Lakhs



Implemented at M. Corp Level



Employment Generation 15 Pax.



Waste Processed

- 100% Recyclable
- Waste Processed – 60 TPD



Benefits

- Reduction in municipal solid waste
- Positive environmental impact

“Recycling C&D waste would lead to minimal mineral extraction”



Recycled Products
1. Paver Blocks
2. Bricks

Sustainability – 3R (Reduce-Reuse-Recycle) Stations



Initiatives

- 8th UN Regional 3R Forum in Asia and Pacific REGION -held at Indore April 2018.
- Indore 3R declaration for clean land, clean water & clean air.
- Zero waste events (**Ashara Mubarak** & IPL)
- Reduction of Waste Generation at source by Decentralized Composting & behavioral change
- Promoting Reuse & Recycling of waste
- 22 Zero Waste Campus/ colonies

Impact

- 5 Zero waste wards initiative out of 150 wards have been selected
- More than 0.52 lakhs of citizens doing home composting
- Reduction in transportation cost per metric tons
- Reduction in use of single use plastic
- **Initiative of 3R already has been taken to reduce the waste:-** *Bartan Bank, Food Bank, Artefacts made out of Waste, Neki Ki Dewar, Leftover food to needy people*

Disposal Free Markets



Secretary MoHUA visit



3R Pledge by Citizens



'Ashara Mubarak'



Jatra (Marathi Festival)



Cricket Match:3R Protocol



Wet Processing

Processing

Centralized Organic Waste Processing



615 TPD Capacity

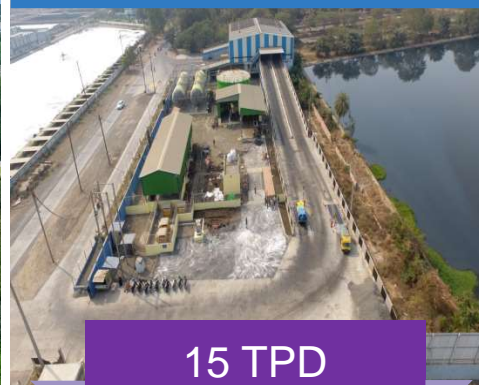
Decentralized Organic Waste Processing

Biomethanation - Choithram Mandi



Onsite Composting
20 TPD
Capacity

Biomethanation Plant -Kabitkhedi



15 TPD Capacity

Mobile decentralized composting unit



5 TPD Capacity
Mobile Composter

Onsite Waste Composting (OWC)



RWAs Bulk Garbage generators - Onsite processing

52,000+
households



Practicing home composting since 2019
and help governance for less expenses

Sustainability: Powering clean and green urban transportation



Plant

- Capacity : 15+20= 35 TPD (Two Plant combined)
- Managed by Concessionaire
- Area: 15 TPD-36,000 Sq. Mt. + 7,500 Sq. Mt.



Financials

- Capex Cost: Rs. 9 + 9 =18 Crs.
- **Annual Revenue: Rs. 3.4 Crs.**
- Per Unit cost:
Bio Gas: Rs. 66/Kg



Operations

- Construction timeline:
18 Months



Implemented in
District/M. Corp Level



Employment
Generation
18-22 Pax.



Waste Processed

- Processed waste: 35 TPD
- Recycled: 600 KG/ Day
+ 800 KG/ Day



Benefits

- Reduce dependence on fossil fuel
- Biogas Generation Reduces Soil and Water Pollution

Generated Bio-CNG
Fuels City Buses
covering over 3,500
km/day



Recycled Products
Bio-CNG

Sustainable Revenue Model - 550 TPD Bio CNG plant



- After the successful implementation of the two unique and innovative models at Choithram Mandi (20TPD) and Kabitkhedi (15TPD), IMC has now decided to install a plant of 550 TPD. Work for the same is in progress.
- Initially the project was taken up for 50 TPD but after analyzing the future requirement of processing of organic waste and its cost benefits, then finally IMC proposed the project of 550 TPD capacity organic waste
- The Biomethanation plant is anaerobic digestion process, which takes place in a closed airtight digester where organic raw materials are converted into biogas and digested as products.
- This biogas project provides a greener fuel with zero discharge.
- The obtained Bio CNG gas specifications are as per latest Indian Standard Norms and the gas is suitable to fill in the gas cylinders as per PESO Gas Cylinder Regulations.
- **On PPP mode the company is investing 30 cr & this 550 TPD plant will help IMC in generate revenue of 1.01 cr. Every year.**



Proposed Biogas plant image

Advantages:

1. With installation of this plant IMC could manage to operate all the city busses running within the city.
2. In addition to that, IMC would also receive 40 TPD high quality compost from this plant.
3. Bio-Methanation process is successful only if segregated waste is provided to the plant. As Indore has 100 % source segregation the committed gas generation through this plant is achievable thus making the project feasible.

Decentralized Processing



Decentralized Organic Waste Processing

Sr. No.	Parameters	Minimum Requirements
1	Plant Capacity	20 MT per day
2	Bio-Gas Specification	Biogas specification for auto CNG
3	Biogas production capacity	1600 cu.m/day
4	Bio-CNG production capacity//day	700 kg/day
5	Plant Area	150M X50M
6	Mechanical Shredder/Grinder	4 Tonnes / Hour
7	Water recirculation and Feed Pump	5 Hp - 2 No.
8	Anaerobic Digester with conveyor feeding system	<ul style="list-style-type: none"> □ Pre-digester Volume : 150 cu.m □ Digester volume: 1200 Cu. m. □ Slurry storage tank volume: 200 Cu. m. □ Feeding conveyor capacity: 3 tonnes / Hour
9	Bio-CNG purification Plant	150 Cu.m/hr capacity, Gas quality: As per BIS and Gas Cylinder rule 2016.
10	Dispensing Station for CNG Vehicle filling	Minimum 1 No OR may be more as per the need
11	Cascade cylinder for distribution	Min. 1500 Kg Bio CNG gas storage cascade
12	Captive Power backup Generator	1 No., 125 KVA Gas Generator Set
13	Scrubber moisture	2 No.
14	Scrubber hydrogen sulphide	2 No.
15	Gas Compression	High pressure CNG Compressor of min. 60 Cu. m. / Hour capacity for automatic compression and storage of Bio CNG cascade cylinders
16	Gas Storage Vessel	10 Cu. m. gas storage
17	Dewatering System	1 No. to separate solid manure from the digested slurry
18	Remote Monitoring System	Online Dashboard (Analyzers)
19	Flaring System	1 No. to automatically flare the excess gas
20	Biogas balloons	500 Cu. m. capacity

20 TPD

Biomethanation Plant at Choithram Mandi



Onsite Composting at Choithram Mandi

Decentralized Processing



Decentralized Organic Waste Processing

Sr. No.	Parameters
1	Plant Capacity 15 MT per day
2	Bio-Gas Specification Biogas specification for auto CNG
3	Biogas production capacity 1100-1200 cu.m/day
4	Bio-CNG production capacity//day 500 kg/day minimum
5	Plant Area 90M X 40M
6	Mechanical Shredder/Grinder 2 Tonnes / Hour
7	Water recirculation and Feed Pump 5 Hp - 2 No.
8	Anaerobic Digester with conveyor feeding system Pre-digester Volume : 100 cu.m □ Digester volume: 900 Cu. m. Slurry storage tank volume: 150 Cu. m. Feeding conveyor capacity: 2 tonnes / Hour
9	Bio-CNG purification Plant Gas quality: As per BIS and Gas Cylinder rule 2016.
10	Dispensing Station for CNG Vehicle filling Minimum 1 No OR may be more as per the need
11	Cascade cylinder for distribution Min. 1000 Kg Bio CNG gas storage cascade
12	Captive Power backup Generator 1 No., 125 KVA Gas Generator Set
13	Scrubber moisture 2 No.
14	Scrubber hydrogen sulphide 2 No.
15	Gas Compression High pressure CNG Compressor of min. 60 Cu. m. / Hour capacity
16	Gas Storage Vessel 10 Cu. m. gas storage
17	Dewatering System 1 No. to separate solid manure from the digested slurry
18	Flaring System 1 No. to automatically flare the excess gas

15 TPD

Bio-methanation Plant at Kabitkhedi



Bio-methanation Plant at Kabitkhedi

Linkage of SWM to Public Transport



Bio-CNG
gas is
used as a
fuel to
operate 15
city buses

Plastic
Bottle
Crusher

Bio-Remediation



PHASE I:
GREEN BELT
DEVELOPED ON BIO-
REMIEDIATED LAND
[50,000 MT]



PHASE II:
GREEN BELT
DEVELOPED ON BIO-
REMIEDIATED LAND
[1,00,000 MT]



Bio-Remediation - Transformational Change



BEFORE



AFTER

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



PRESENT



Result and Impact



ODF & WATER SUSTAINABILITY

- ✓ Sustainable ODF City since 2015 and 1st ODF++ City in India
- ✓ 100% Fecal Sludge treated at STP
- ✓ Action Plan for reuse of treated waste water is formalized.
- ✓ 100% IHHL constructed as per requirement
- ✓ Self sustainable CT/PT to cater to the population of Indore

SWM

- ✓ State-of Art Infrastructure encompassing the entire waste value chain from collection to scientific disposal of waste
- ✓ Dumpsite remediated and 100 Acre land reclaimed
- ✓ Efficient C&D Waste Plan
- ✓ Sustainable Revenue Model established of Dry Waste Processing
- ✓ 4R (Refuse-Reduce-Reuse-Recycle) principal implementation with citizens

IEC

- ✓ 100% DTDC and 100% Source segregation achieved at all wards
- ✓ 100% processing of Dry and Wet Waste achieved and the city is in process of achieving 'Zero Landfill Model'
- ✓ Across all parameters, IEC activities now focus on sustenance of the systems and processes in place

Way Forward (Waste Projects 2020)



100 TPD Sludge Hygiene-nation Project in Collaboration with BARC

500 TPD Bio-Methanation Plant

10 TPD x 4 Dry waste processing plants with Material recovery facility

Zero Waste Wards

399 Urinal upgradation

500 TPD NTPC Dry Reject to Bio Char/ Coal



Swachh Survekshan
Award 2017



Swachh Survekshan
Award 2018



Swachh Survekshan
Award 2019



Swachh Survekshan
Award 2020



Thank You