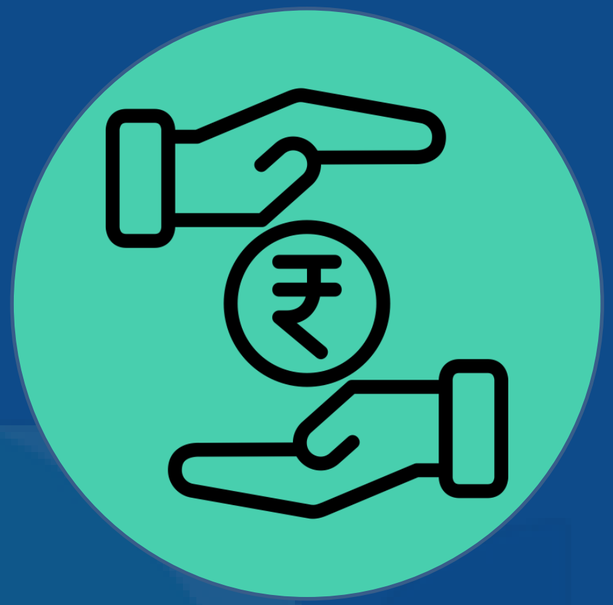


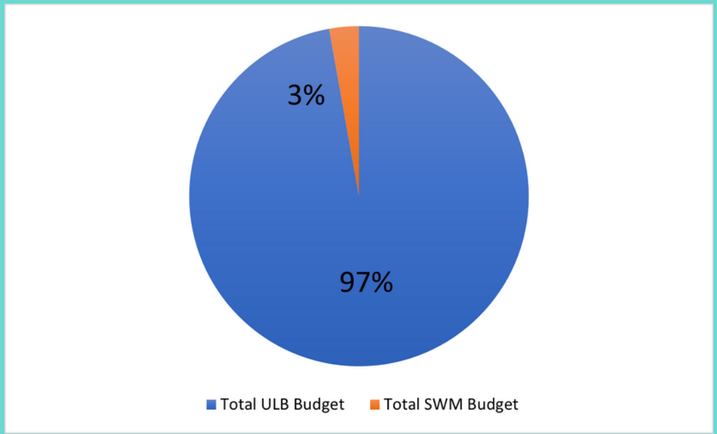
UNDERSTANDING THE ECONOMY OF SWM

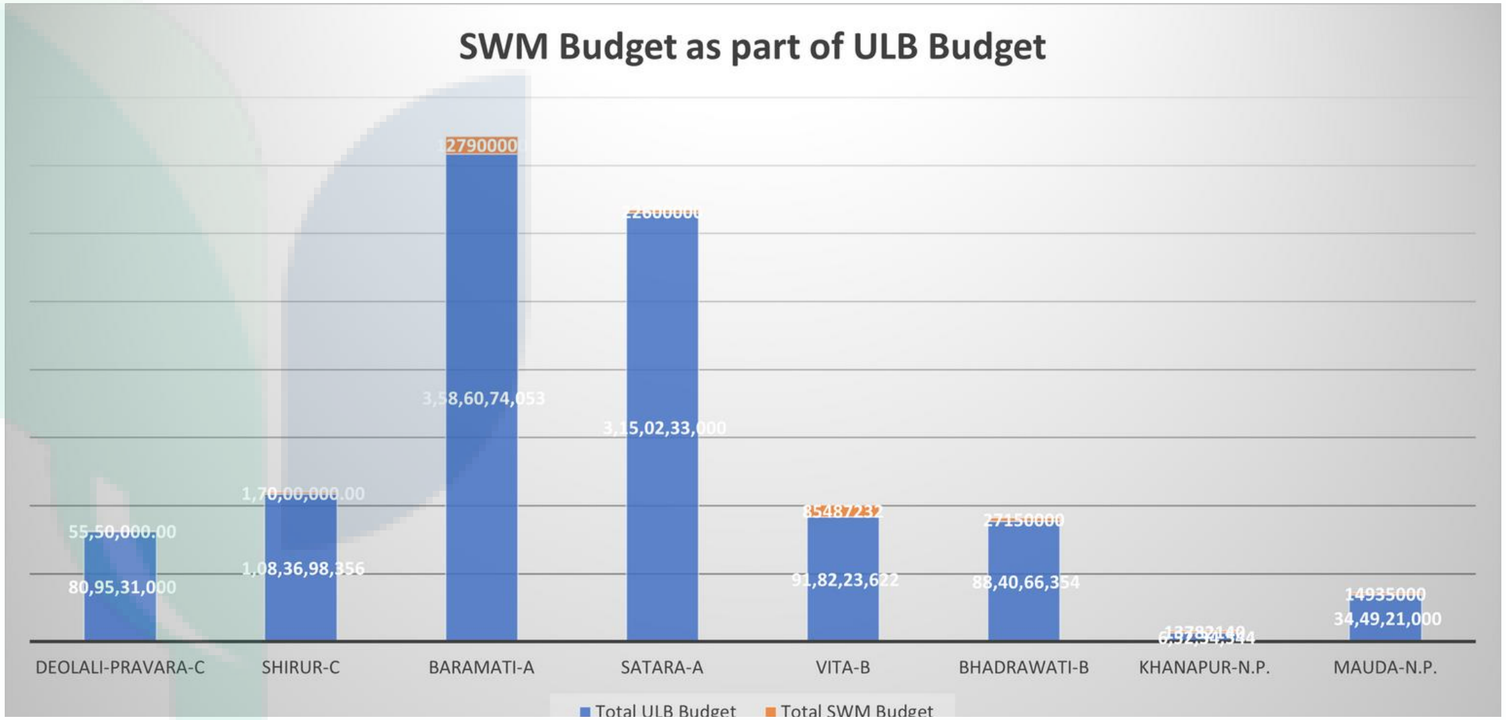
Contents

ULB Budget

SWM Budget as part of ULB Budget

1. ULB Annual budgets are allocated for SWM works.
2. Current direct allocation varies from **1 %** to **10 %** with an average of **3%** per ULB
3. This is not considering the salaries of the staff and other administrative costs associated





SWM Expenditure Heads

Collection and Transportation

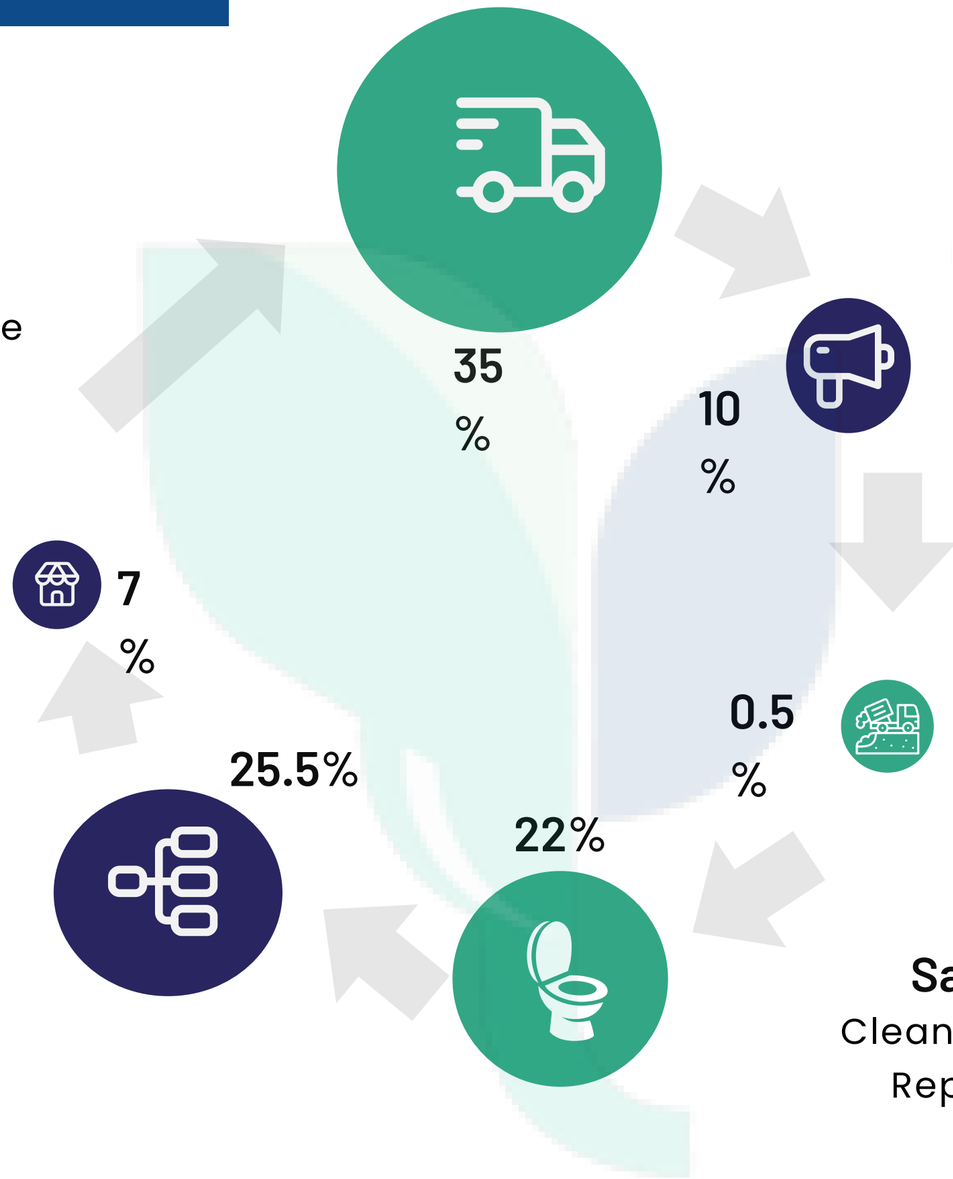
Purchase of Baskets for waste
Swachata equipment purchase
Vehicle purchase and maintenance
Collection by Ghanta gadi
Petrol, diesel and oil
Death animal/ carcass removal

Processing

Biogas

Other

Waste pickers contribution
Uniform purchase
Bacterial medicine purchase



Citizen awareness - IEC

Swach Maharashtra Programme IEC & Various Program expense
Painting of walls
Capacity building

Landfill

Levelling of waste heaps
Rent of JCB

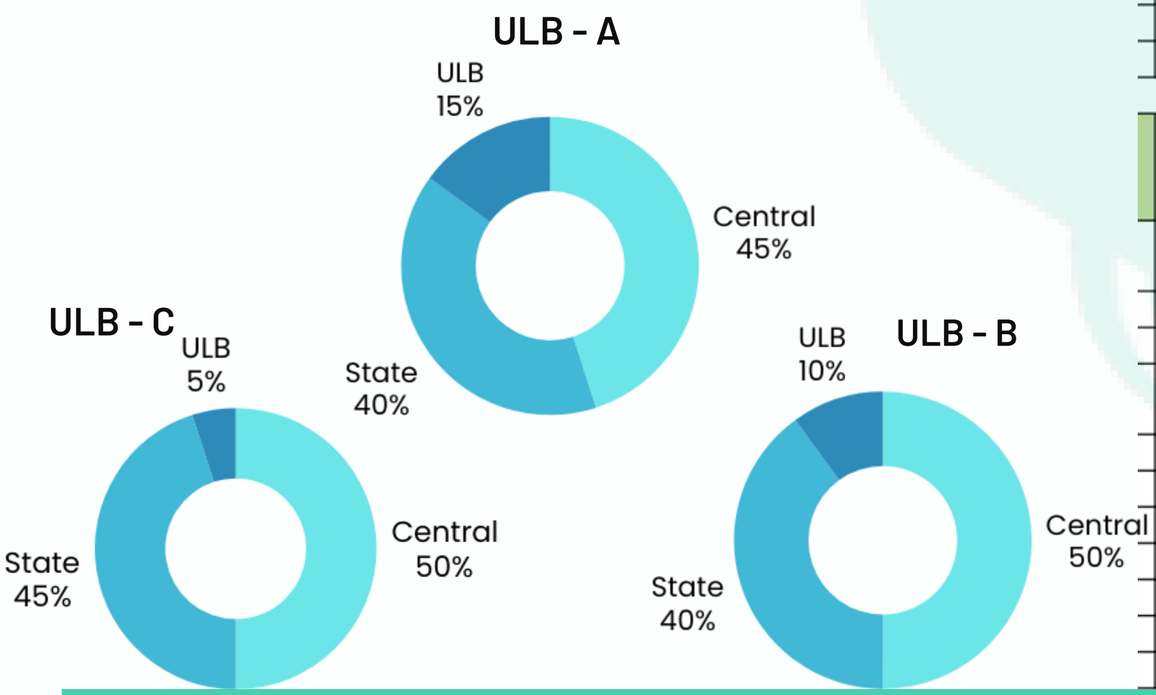
Sanitation

Cleaning of Toilets
Repair of Toilets

Capital Expenditure

SWM DPR from the SWM Funds

1. Civil Works
2. Legacy waste - Biomining
3. MRF and Composting plants
4. Machines and vehicles



Sub -work	Description	Unit	Quantity	Estimated Cost in Rs.(INR)
A	**Procurement, Installation of Machineries**			
1	Wet Waste shredder Machine Capacity Upto 10 TPD (Each)	Nos.	2	1,038,400.00
2	Dry Waste Segreation conveyor belt system for 5 TPD	Nos.	1	920,000.00
3	Electric Smokeless Incinerator with low sulphur fuel of up to 5Kg/Batch capacity along with all accessories including transportation.	Nos.	1	956,500.00
4	25 KVA BIOMASS GASSIFICATION POWER GENERATION PLANT. (5 TPD)	Nos.	1	3,953,000.00
5	Tromell machine with conveyor (5TPD) with installation	Nos.	1	1,600,000.00
6	Horizontal Bailling Machine	Nos.	1	1,000,000.00
	Sub Total (A)			**9,467,900.00**

B	Construction of Civil Work at Solid Waste Management Site			
	Description	**Length**	**Width**	**Estimated Cost in Rs.(INR)**
7	Material Recovery Facility with Shed and covered from all sides with Dry waste storage compartments and	20	10	4,600,000.00
8	Gassification unit shed	10	5	1,150,000.00
9	Wet waste tipping platform	15	7	577,500.00
10	Modifcations in the existing shed (ventilation provision) + Leachate collection system	25	20	350,000.00
11	Windorw shed with platform and leachate collection system	55	20	14,850,000.00
12	Leachate Tank	4	4	
13	Platform for Tromell Machine	11	8	484,000.00
14	compost curring platform	36	7	1,260,000.00
15	Sanitary Landfill Site	24	21	1,764,000.00
	Sub Total (B)			**18,708,000.00**

SWM Operational heads

Full Cost accounting is necessary to calculate the total operational costs for SWM

Front end costs

Land Acquisition
Permits
Building construction

Operating costs

Daily activity - Labor contracts
Cost of repair and refurbishments
Technical support

Contingency Costs

Liability costs - Fire, flood, property damage, personal injury etc.
Remediation costs.

Environmental & Social Costs

Costs involved in mitigating adverse effects on environment
Citizen grievance addressal - Community image
NIMBY attitude
Aesthetic impacts and Quality of life

Back end Costs

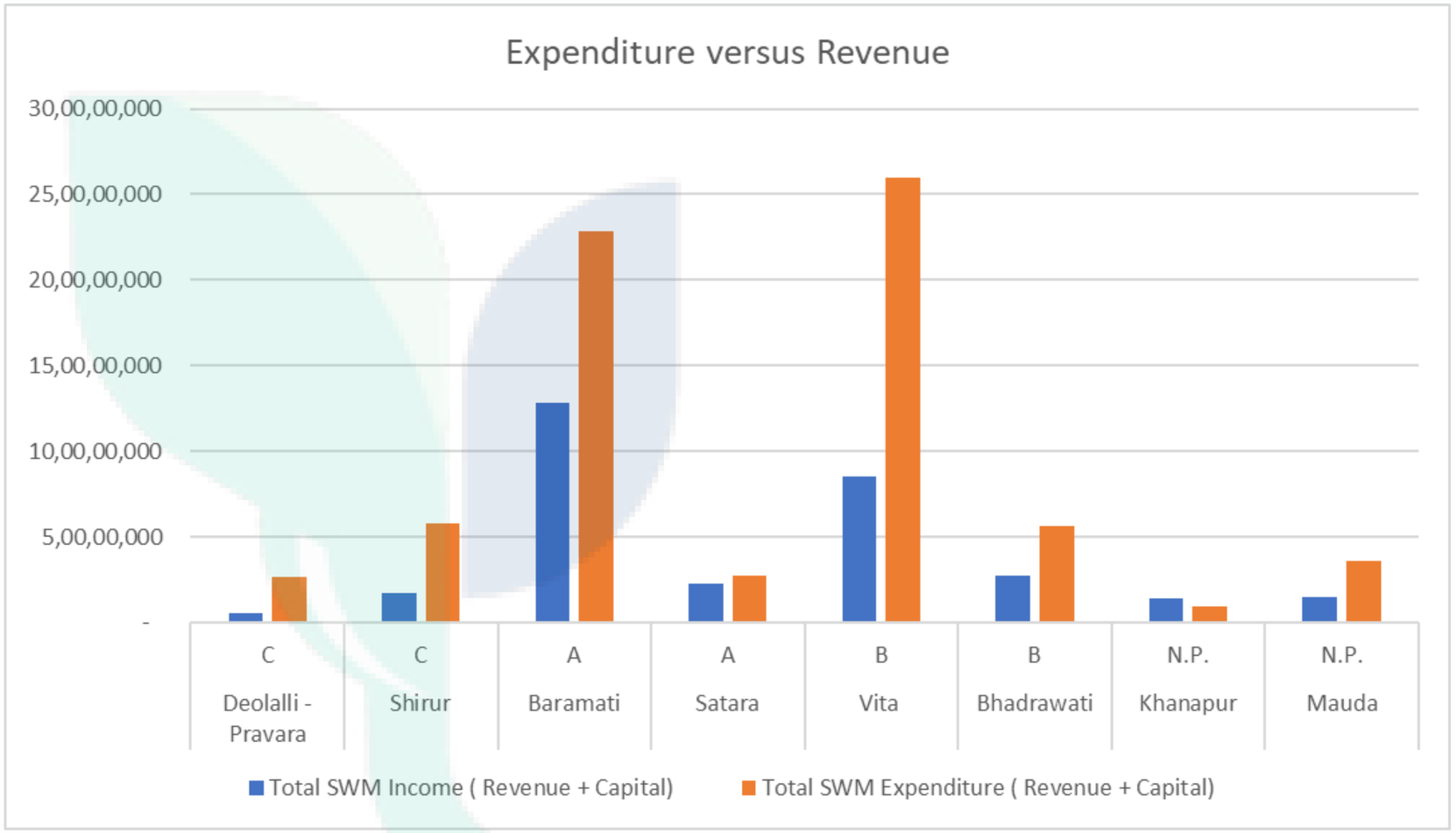
Site closure, demolition
Building equipment decommissioning
Contract handover
Retirement and health benefits for employees

SWM Budget Heads

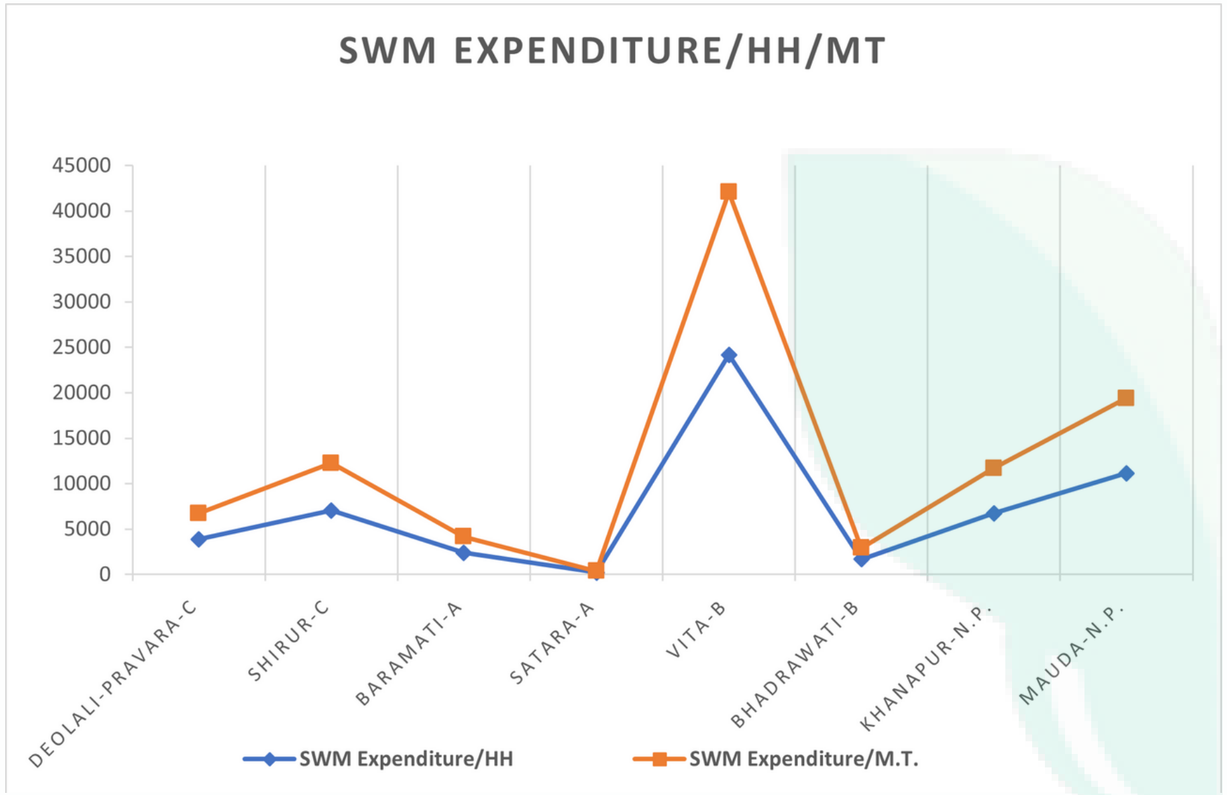
A	**Staff**	C	**Citizen Awareness**		E	**Processing**	G	**Other**
	Management staff		Interpersonal			Composting plant operations		Administrative
	Sanitary Inspector		Mid media			MRF operations		Technical support
	Mukadam		Mass media			Biogas Operations		Wastepicker integration
						Other processing plant operations		Innovative projects
B	**Sweeping**	D	**Collection and Transportation**			Security at processing plant		
	Staff - Sweepers		Vehicles purchase			C&D waste collection and processing		
	Equipment for sweeping		Vehicle Operations					
	Uniforms & PPE		Vehicle Maintenance		F	**Sanitary Landfill**		
	Sweeping vehicles		Collection staff			Operations		
	Litter bin purchase and repair		Vehicle GPS tracking system					
			Weighbridge					

Expenditure/ Revenue

1. SWM expenditure is several times higher than the revenue collected or received specifically for SWM
2. Revenue from grants is for capital expenditure
3. Revenue was **10%** to **80%** of the expenditure



Benchmarking



1. The average spend by ULBs per HHs per year is Rs. **2743.00*** for SWM
2. The average spend per MT per ULB per year is Rs. **4772.00***

** Certain outlier removed.*

Conventional Revenue Source

1. Local Taxes

Property Tax
Conservancy Tax
Development Fee

2. Central Government Grants

Swachh Bharat Mission
15th Finance Commission
Amrut grants
NCAP Funds

3. State Government Grants

SWM DPR
State FInance Commission grants

4. Fines and penalties

Dumping of waste
Use of Plastic
Littering

Revenue Sources

Exploring and adapting to new means and instruments of financing SWM is essential for appropriate processing of waste.

A	***User Fee***
B	**Sale of End Products - Compost, RDF, Recyclables**
C	***CSR***
D	***Subsidies from other programs***
E	***PPP Models***
F	***Extended Producer Responsibility***
G	***Carbon Credits***
H	***Other***

User Fee

State Government has defined the User fee in the State SWM Byelaws in 2019.

Part A: User charges

The Rates/User Charges/Fees for collecting garbage from home and establishments for Garbage Collection are fixed as follows :

Sr.No (1)	Categorisation (2)	Municipal Council	
		A and B class (3)	C and D class (4)
1	MSW generation less than 100 kg		
2	Residential/Month	40	30
	Commercial		
3	Shops	60	45
4	Showroom	80	60
5	Godown	80	60
6	Hotels and Restaurants	80	60
7	Hotels having lodging and boarding	100	75
	Hospitals		
8	Less than 50 beds	80	60
9	More than 50 beds	120	90
	Institutions		
10	Educationals institutes	60	45
11	Religious institutitions	60	45
12	Government/Semi Government offices	60	45
13	Marriage halls	200	150
14	Hawkers	120	90

Note :—

The above rates will be increased by at least 5 percent every year.

User Fee/ Tax

A tax is levied as part of a common charge, while a fee is for payment of a specific benefit or service. In this case door to door collection of waste is a service provided to the citizens.

Higher Cost

The cost to process it in a environmentally safe method, is higher than the amount collected from the tax alone.

Polluters Pay Principle

Those responsible for waste generation should pay for its collection and safe disposal. Thus generators that produce more waste should pay for it.

Sale of End Products

Compost

Good quality compost can earn the ULB Rs 3 to 17 per kg. ULB can generate 12% of its waste as compost

Other waste

Paper, Cardboard, Glass, Plastic, can be sold to the aggregators at about Rs.5/kg

Refuse Derived Fuel

The shredded RDF can be sold at an average rate of Rs.200 per MT, depending upon the distance to transport

C&D products

Crushed sand, aggregate can be directly used in ULB construction works, or sold at market rates.

E waste

E waste can sell at an average price of Rs.15- 20 per kg. Depends on the electronic components.

Storage space for segregated storage to achieve required quantities.

Corporate Social Responsibility

Permitted activities under CSR

Eradicating poverty, hunger, and malnutrition, promoting health care which includes sanitation and preventive health care, contributing to the Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water.

Engage with NGOs and Companies for following activities

1. Citizen awareness activities
2. School awareness programs
3. Cleanliness drives
4. Beautification of GVPs
5. Sponsoring jingles and radio spots
6. SHG and waste picker integration programs
7. Capital machinery for waste management

Subsidies from other Ministries

Ministry of New and Renewable energy

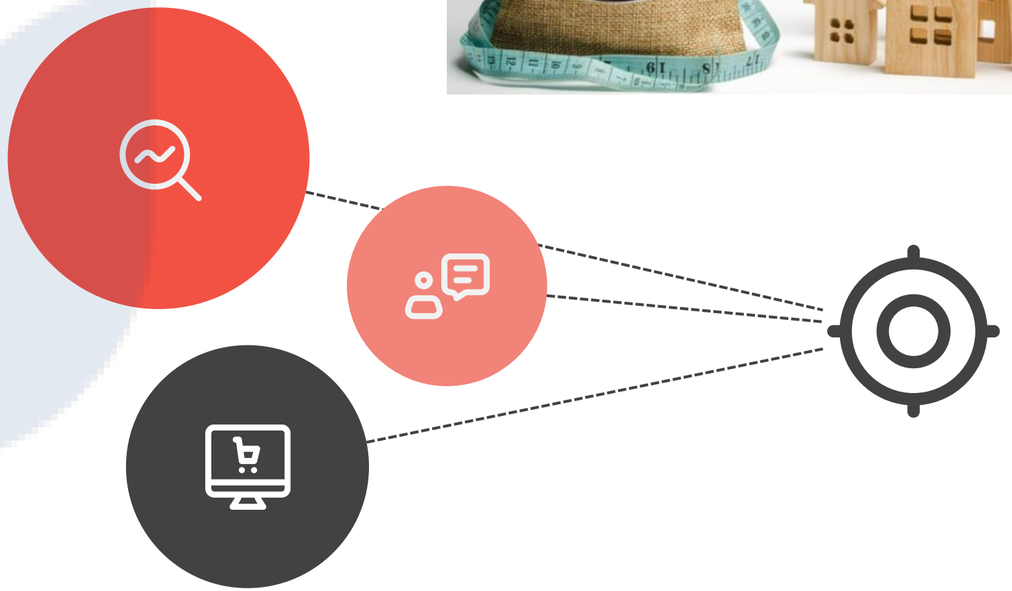
MNRE has been promoting waste to energy projects through subsidies and financial assistance.

MOEFCC

The Ministry of Environment and Forests and Climate Change (MoEFCC) have subsidised compost plants up to 50% of the capital cost.

Ministry of Agriculture

MoA has subsidised compost plants up to 50% of the capital cost. The purpose of the subsidies has been to promote technologies



Public Private Partnership

Public - Land & permissions

Private - Technology, Capex, and Opex

Advantages:

- No Capex and Operation cost
- Possibility of revenue share
- Efficient project mng

Risks:

- The project does not perform as expected.
- Litigation and
- Land is locked.

The **success of PPPs** depends on the three necessary conditions

Regular **monitoring and reviewing** of performance of the private entity against predefined performance criteria by the ULBs is important for the success of PPP projects.

Extended Producer Responsibility

EPR is defined as ‘an environmental policy approach in which a producer's responsibility, physical and/ or financial, for a product is extended to the post-consumer stage of a product's life cycle.

1.Shifting of responsibility upstream towards the producer and away from municipalities.

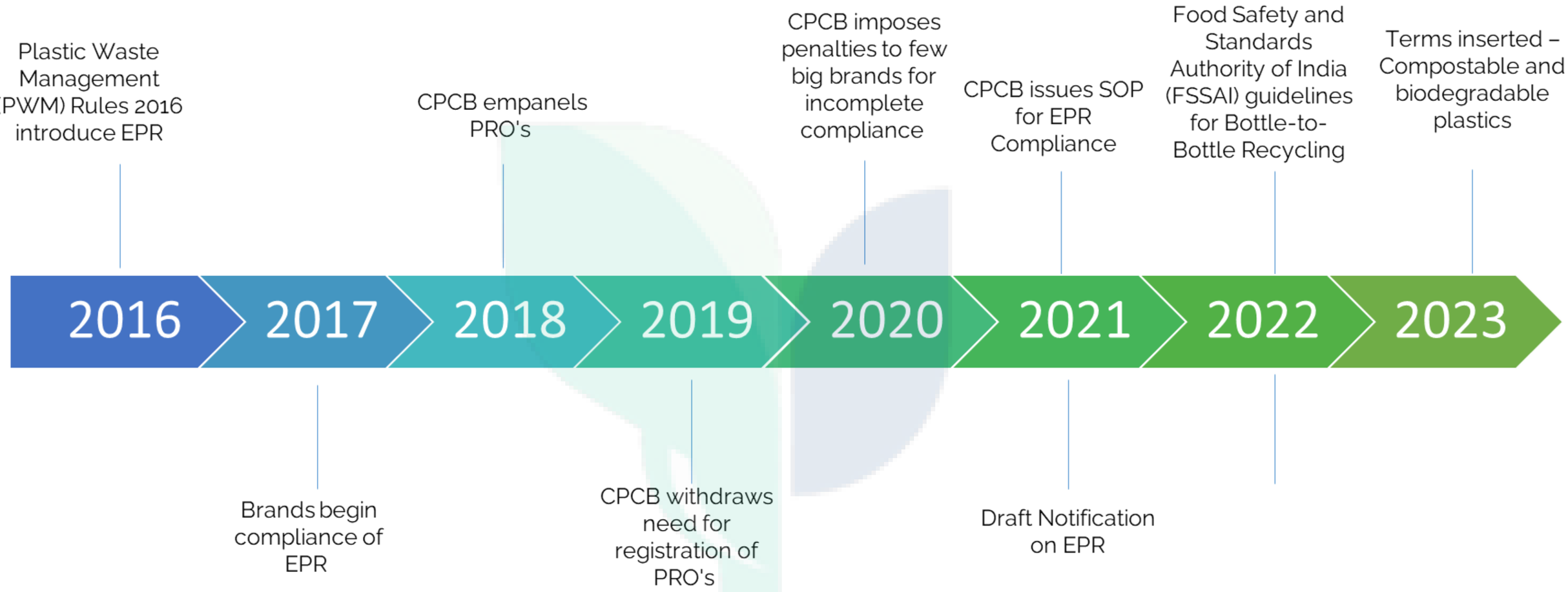
2.Providing of incentives to producers to include environmental considerations in their product design, such as

- Reducing material consumption,
- Using more secondary material,
- Promoting product eco-design (dfe)

Benefits of EPR:

1. Achieve increased collection and recycling rates of plastic waste,
2. Cost-efficiency, value chain optimization,
3. A transparent and well-functioning waste management ecosystem.

EPR Rules


Plastic Waste Management (PWM) Rules 2016 introduce EPR
Brands begin compliance of EPR
CPCB empanels PRO's
CPCB withdraws need for registration of PRO's
CPCB imposes penalties to few big brands for incomplete compliance
CPCB issues SOP for EPR Compliance
Draft Notification on EPR
Food Safety and Standards Authority of India (FSSAI) guidelines for Bottle-to-Bottle Recycling
Terms inserted – Compostable and biodegradable plastics
2016
2017
2018
2019
2020
2021
2022
2023

EPR Framework

Fee-Based Model

- Producers, Importers, and Brand Owners (PIBO) using less plastic for packaging contribute to the EPR corpus fund.
- The fund is managed by a Special Purpose Vehicle (SPV) where various stakeholders can become members.

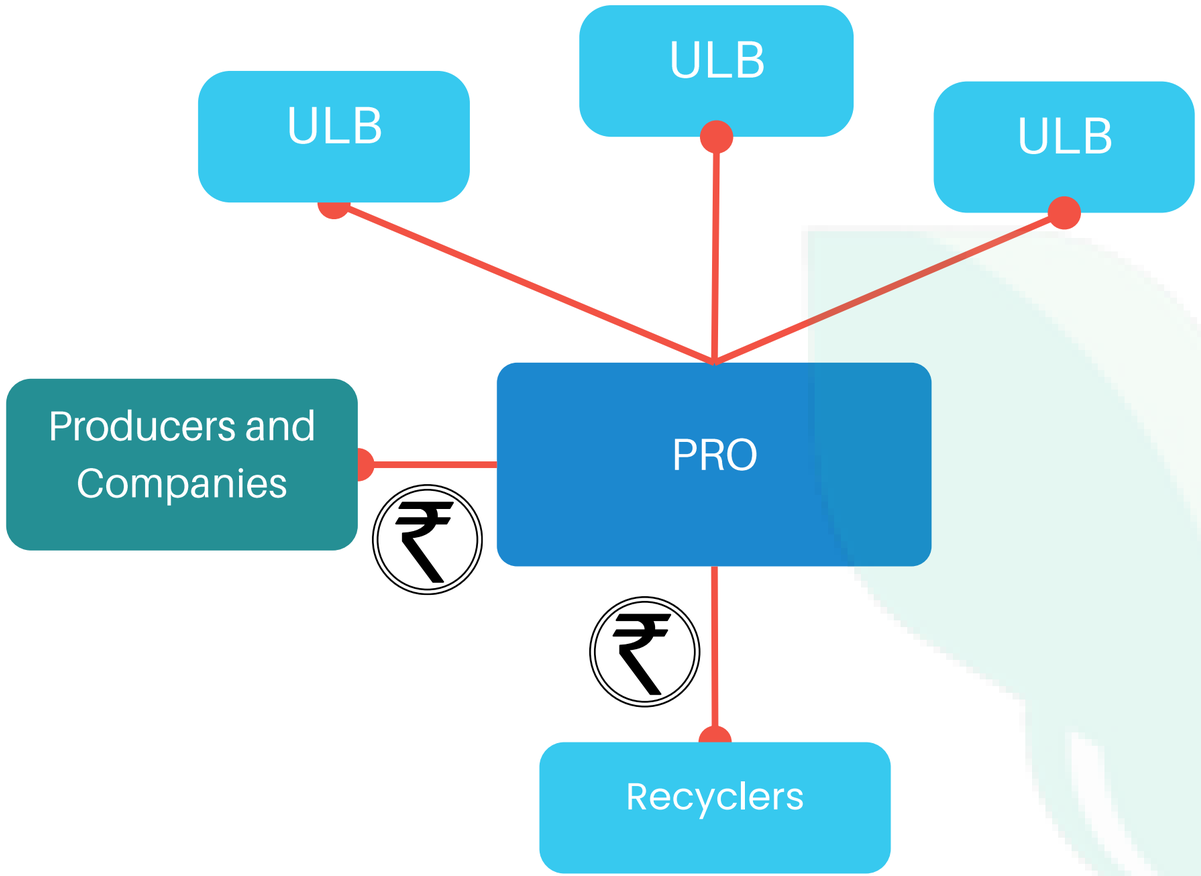
Producer Responsibility Organisation (PRO) Based Model

- PROs discharge national and state legal obligations of producers in an efficient and cost-effective manner.
- They leverage industry experience from successful producer responsibility programs.

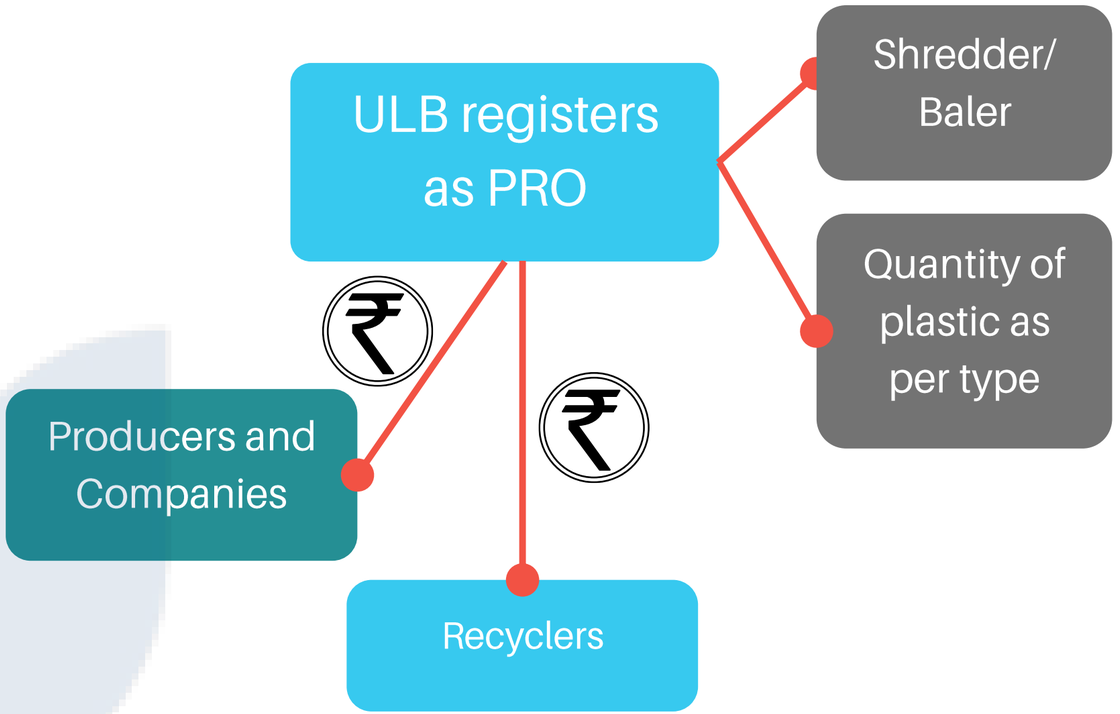
Plastic Credit Model

- Producers ensure an equivalent amount of packaging waste has been recovered & recycled, but not necessarily their own packaging.
- Producers acquire evidence of recycling or recovery from accredited processors.
- Producers and processors may exchange plastic credits for financial transactions.
- Producers have the liberty to establish channels for collecting plastic credits, with or without forming or linking with PROs.

EPR Framework



- Disadvantage: Do not get the share of EPR
- Advantage: Even small quanities are picked up



- Advantage: Direct funds of EPR with ULB
- Disadvantage: Have to ensure sustained source of good quality plastic
- Conduct a Brand Audit - For larger companies for 10 tons of plastic

Carbon Credits

What is Carbon Credits

- Measurement of GHG Emission Reduction **(1 Carbon Credit = 1 Tonne of CO2e emission)**
- Certificates issued to Entities in developing countries that reduce their GHG emissions

Process to get Carbon Credits

- There are multiple Carbon credit Mechanisms - VCS, CDM, GCC etc.
- Project has to be registered and validated
- Auditors verify the process
- The operations are monitored
- Trading process begins

Indore Model

- Registered its Composting and Biomethanation plants and earned Rs. **69 lakhs in 2017-2019,**
- Same project - **July 2019 to 31 Dec 2020 Earned - Rs. 8.34 CR**

Challenges

- High Project registration charges - $10000
- Complex process requires team
- No open trading platform
- Fluctuating Carbon Credit Markets

Next steps

Green Credit Program (GCP): Incentivizing Environmental Actions

Other Approaches

Renting of space for MRFs – Bhopal

Space for storing, and sorting of material at decentralised level. ULB can collect rent by floating a RFP.

Reclaimed land to be used Public urpose

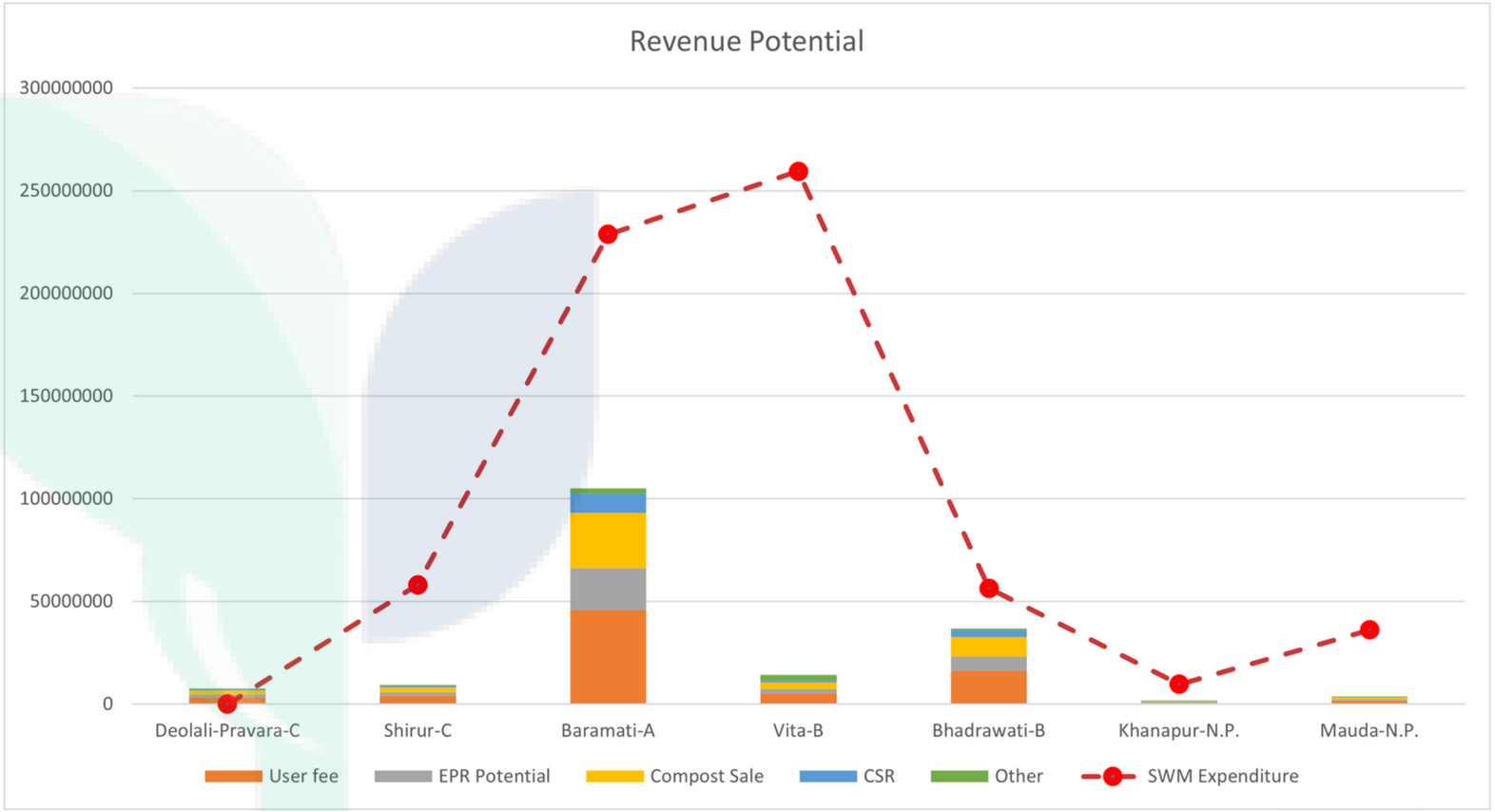
Reuse the reclaimed land for horticulture, or bus service, other use and earn a income from leasing it.

Plastic vending machine

Install vending machines to collect plastic waste and pay for use.

Expenditure/ Revenue - Potential

- Percentage revenue versus expenditure ranged from **5% to 65%**
- Actual revenues ranged from **Rs. 16 Lakhs to Rs. 10.5 Crores.**



Case study - Shrivardhan

Population estimated in 2024	19659
Waste Quantity	6.8 TPD

		Annual	Assumption
Expediture budgeted in 23-24		**136.25**	
Revenue potential	User fee	20.97	Rs. 40 average for all households
	EPR for Plastic	9.28	Rs. 3000/MT of plastic average cost
	Compost	12.38	12 % of Total waste as quantity selling @ Rs. 5 per kg
	CSR	5.00	Average Rs. 100 per HHS.
	Other	5.00	Fines, E waste, RDF, etc.
	Total	**52.63**	
Percentage of Expenditure		39%	

SWM Budget allocation

To improve segregation we have to increase funds for Citizen awareness in the short term.

This will improve the Processing potential

Earn revenues and improve solid waste management