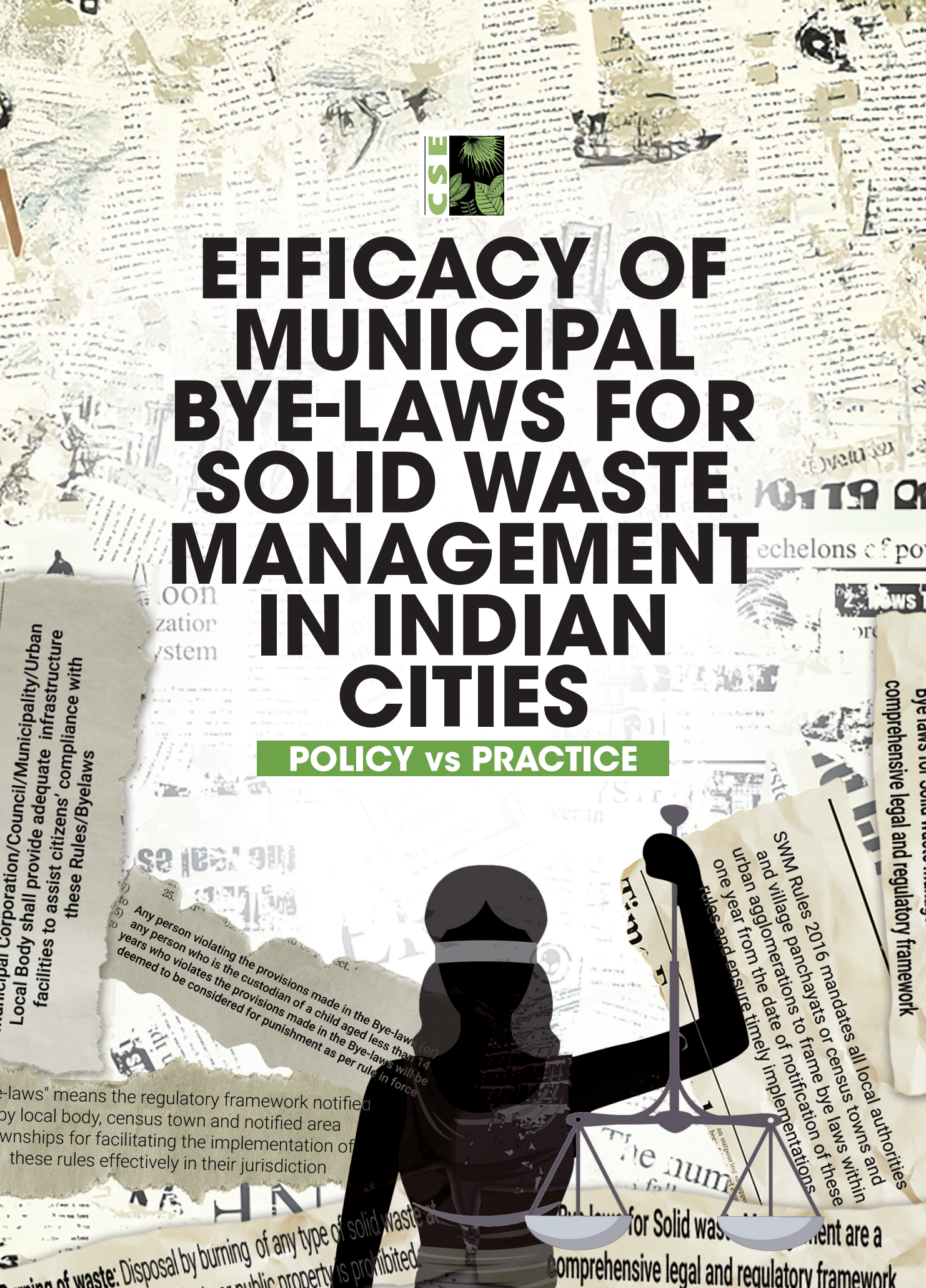
EFFICACY OF MUNICIPAL BYE-LAWS FOR SOLID WASTE MANAGEMENT IN INDIAN CITIES

POLICY vs PRACTICE



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POLICY vs PRACTICE

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CONTENTS

SUMMARY OF KEY FINDINGS BYE-LAWS AS POLICY

- √ 100% of the sample bye-laws have retained the provision of waste segregation at source, door-to-door collection, penal provision against littering, open burning of waste, and collection of user charges from waste generators for waste management services.
- √ 97% of the total bye-laws have the provision of bulk waste generators and waste processing as a mandate.
- √ 97.30 % of the cities have mentioned safe disposal of residue waste into a sanitary landfill in their bye-laws.
- √ 65 % of the cities have mentioned decentralized waste management in their bye-law.
- √ 64.86 % of the bye-laws talk about incentivizing law-abiding citizen.
- √ 59.46 % of the cities have mentioned provision of safety gears for sanitary workers.
- √ 43.24% of the bye-laws mandate the integration of informal sectors into the mainstream waste management system.
- √ Only 35.14% of the studied bye-laws include a provision for a grievance management mechanism.

SUMMARY OF KEY FINDINGS BYE-LAWS IN PRACTICE

- √ Only 32% citizens think that source segregation is taking place.
- √ All of the cities studied are reportedly providing door-to-door waste collection services.
- √ 43% citizens think that bulk waste generators are complying with the official waste mandates.
- √ 43% of citizens reported that they have observed penalties being enforced for littering and open burning.
- √ Only 42% citizens think that user fees for SWM is being collected.
- √ Only 36.36% of the cities reported that they are disposing of their unprocessed inert waste in sanitary landfills, as specified in the SWM Rules, 2016.
- √ 86.36 % of the cities have claimed that they provide safety gears to their sanitary workers.
- √ 28% of citizens reported that their grievances have been resolved by the city administration, while 73% of the cities in question stated that they have a grievance redressal mechanism in place.

ABBREVIATIONS

BWGs	Bulk Waste Generators
CAA	Constitutional Amendment Act
CPCB	Central Pollution Control Board
C&D	Construction and Demolition
EPA	Environment Protection Act
IEC	Information Education Communication
MCC	Micro composting Centre
MoHUA	Ministry of Housing and Urban Affairs
MSW	Municipal Solid Waste
MRF	Material Recovery Facility
PMC	Pune Municipal Corporation
RWA	Residential Welfare Association
SLRM	Solid Liquid Resource Management
SPCB	State Pollution Control Board
SWM	Solid Waste Management
TPD	Tonnes per day
ULB	Urban Local Body

FOREWORD

Solid waste management is one of the most pressing challenges faced by urban India today. With over 31 per cent of the country's population living in cities, as per Census 2011, the demand for robust waste management systems has grown exponentially. The Solid Waste Management (SWM) Rules, 2016, represent a significant step forward in addressing this challenge. However, the efficacy of these rules depends heavily on their localization and implementation through municipal bye-laws.

This study sheds light on the critical role municipal bye-laws play in translating national policies into actionable practices. By analyzing bye-laws from 37 cities across India, it explores the alignment between policy mandates and their implementation on the ground. The findings reveal significant achievements, such as 100 per cent of the sampled bye-laws incorporating mandates for waste segregation, door-to-door collection, and penalties for non-compliance. Yet, the study also uncovers stark gaps, particularly in citizen participation and enforcement. For instance, while 97 per cent of bye-laws include provisions for bulk waste generators (BWGs), only 43 per cent of citizens observed compliance with these mandates. Similarly, though 86 per cent of cities reported providing safety gear to sanitation workers, only 28 per cent of citizens confirmed the existence of effective grievance redressal mechanisms.

The insights presented in this report not only highlight the potential of municipal bye-laws have in revolutionizing waste management, but also emphasize the urgent need for enhanced enforcement and citizen engagement. It is our hope that this study serves as a guiding document for policymakers, urban local bodies, and community stakeholders in creating a cleaner, healthier, and more sustainable urban India.

1

INTRODUCTION

The 73rd and 74th Amendments of the Indian Constitution empowered local governance by establishing elected Municipalities under the 74th Amendment.

Municipal bye-laws, derived from the 74th Amendment and local Municipal Acts, grant municipalities the authority to enact and enforce laws specific to their cities.

The Solid Waste Management Rules 2016, revised from the MSW (M&H) Rules 2000, represent a shift towards waste segregation, minimization, and a comprehensive waste management approach, with landfills being considered a last resort.

India drafted its first documented law for the protection of the environment only after Independence. During the colonial rule, environment laws in India served the interests of the British government and were formulated largely for revenue purposes. Even in post-Independent India, policies were largely attuned towards economic development or poverty alleviation, and environmental issues weren't centre-staged. As a result of the Stockholm Declaration in 1972, India started undertaking legislative measures towards environmental protection, and a separate department for the environment was established.

The Indian Constitution provides a broad framework of powers and functions in relation with the maintenance of a safe and healthy environment for people and other living beings. **The 42nd Amendment of the Indian Constitution in 1974** states that it is the responsibility of the state government to protect and improve the environment and to safeguard forests and wildlife. Thus, it becomes the fundamental duty of every citizen to protect and improve the natural environment, including forests, lakes, rivers, wildlife, and to have compassion for all living creatures.[1]

1.1 EMERGENCE OF ENVIRONMENT PROTECTION ACT, 1986 AND 74TH CONSTITUTIONAL AMENDMENT ACT

The Constitution of India, under Part II, guarantees fundamental rights that are essential for the development of every individual and to which every person is inherently entitled by virtue of being human alone. The right to environment is also a right without which the development of an individual and the realization of her/his full potential is not possible.[2]

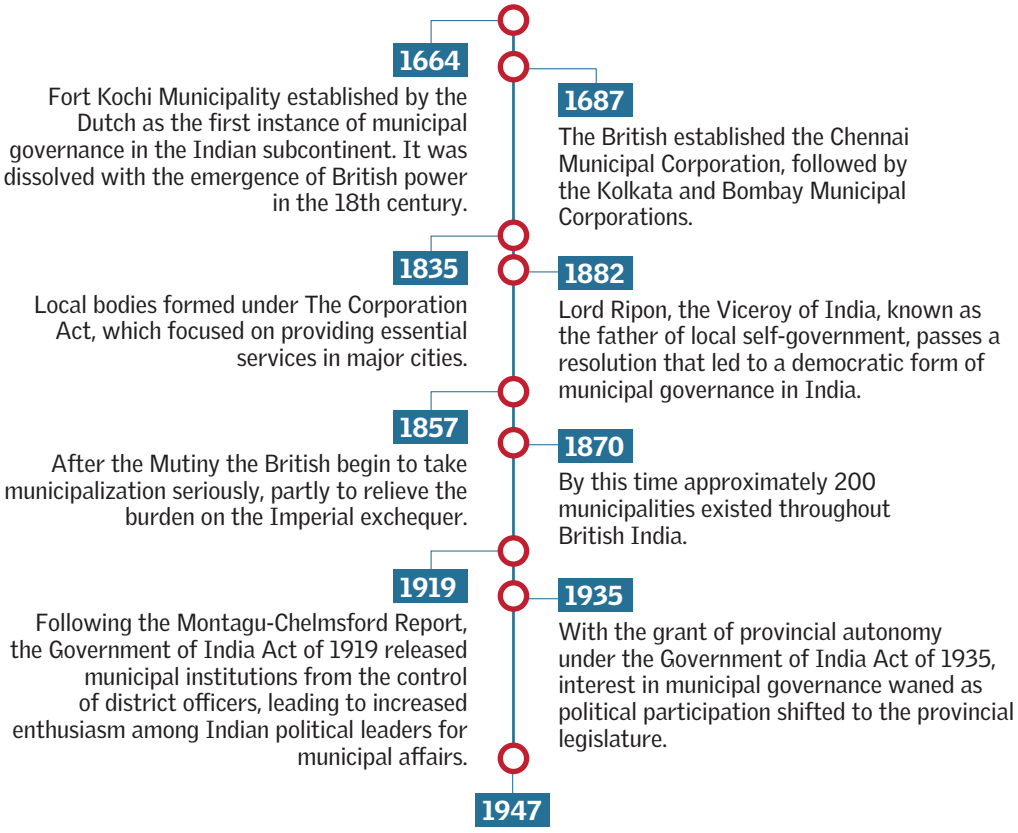
Despite fragmented and indirect mentions of environmental protection in the Indian Constitution, India did not have a direct law for the protection of the environment until the Bhopal Gas tragedy in 1984. The Environment Protection Act (EPA) was passed in 1986 by the Indian Government for the protection of the environment against water, air, land and noise pollution.[3]

India is a federal republic with three tiers of government: central, state and local. Local government refers to the authority below the state level. The 73rd and 74th Amendments to the Indian Constitution recognized and protected local governments, granting them the right to establish their own legislatures. The 73rd Amendment, enacted in 1992, formalized rural self-government through the Panchayati Raj system, while the 74th Amendment established democratically elected local self-governments known as 'Municipalities' in urban areas. Together, these amendments have facilitated the efficient decentralization of power across various levels of government.

FUNCTIONS OF URBAN LOCAL GOVERNMENT ACCORDING TO THE 12TH SCHEDULE (ARTICLE 243W)

* Urban planning, including town planning
* Planning of land use and the construction of buildings
* Planning for economic and social development
* planning and construction of roads and bridges
* Water supply for domestic, industrial and commercial purposes
* Public health, sanitation conservancy and solid waste management
* Fire services
* Urban forestry, protection of the environment and promotion of ecological aspects
* Safeguarding the interests of the weaker section of the society including the handicapped and mentally disabled
* Slum improvement and upgradation
* Urban poverty alleviation
* Provision of urban amenities and facilities such as parks, gardens, playgrounds
* Promotion of cultural, educational and aesthetic aspects
* Burials and burial grounds; cremations, cremation grounds and electric crematorium
* Cattle pounds, prevention of cruelty to animals
* Vital statistics including registration of births and deaths
* Public amenities including street lightings, parking lots, bus stops and public conveniences
* Regulation of slaughterhouse and tanneries

Figure 1: A brief history of Municipal Corporations in India



HIGHLIGHTS

Politically, municipal institutions remained significant from **1919** to **1935.**

In the first four and a half decades after independence, municipal institutions were overshadowed by the rise of statism until **1992**, when two constitutional amendments granted constitutional validity to local governments under a liberalized economic regime.

It was only with the 74th Amendment of the Indian Constitution in 1992, which came into effect in June 1993, that municipal or local governments gained constitutional validity and derived their authority from the individual state governments. Through this amendment, the 12th Schedule of the Indian Constitution (Article 243 W) was added which provides an illustrative list of 18 functions that may be entrusted to the municipalities. It specifies the powers, authority and responsibility of the municipalities to carry out

functions that are relevant to solid waste management, public health, sanitation, the protection of the environment, safeguarding the interests of weaker sections, and poverty alleviation.

The introduction of this Act has subsequently enhanced public participation in local governance and established uniformity in legislation for various urban government bodies.

1.2 URBAN LOCAL BODIES: ORGANIZATIONAL STRUCTURE AND ADMINISTRATION

DEFINITION OF URBAN AREA

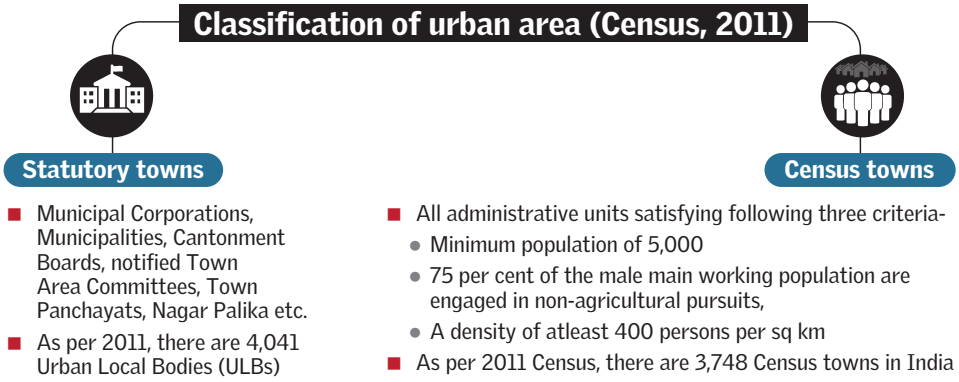
In India, the Census classifies settlements into rural and urban. State governments are entrusted with the responsibility of granting municipal status to urban centers. The rural-urban distribution in local governance is based on the fact that rural and urban areas differ significantly in terms of socio-economic and demographic characteristics. The 1961 Census however, applied the following criteria for urban settlements:

- Places that have urban bodies (Municipal Corporations, Municipality, Notified Area Committee and so on)
- Places with a population of not less than 5,000 per square kilometer
- 74 per cent of the workforce employed in the non-agricultural sector
- The Director of Census Operations, in consultation with state governments and the Census Commissioner of India, has the power to declare a settlement urban.
- In the 1981 Census, two significant changes were adopted—only 75 per cent of male members of the workforce who were engaged in non-agricultural activities were considered, and workers in livestock, forestry, fishing, hunting, plantations, orchards, and allied activities were excluded, making the definition of 'urban' more industrially biased and gendered.

TOWNS IN URBAN AREAS

The definition of 'urban' in India includes both administrative and demographic criteria according to the Census. It identifies two types of towns: Municipal (or statutory) towns and Census (or non-municipal) towns. Census towns are primarily agricultural and do not have municipal status; they are typically governed by the Gram Panchayat.

Figure 2: Classification of urban area (Census, 2011)



Source: CSE, 2023

The declaration of a statutory status is a state prerogative, supposedly dependent upon the level of economic development, financial health and perceived level of urbanization. While, the criteria identifying non-Municipal and Census towns are well defined by the Census, the criteria for declaring a statutory town is yet to evolve.[6]

URBAN LOCAL BODIES

Urban Local Bodies (ULB) are local-level governments in India. It is also known as Municipality, Municipal Council, Municipal Committee and Municipal Corporation depending on the population and administrative area. They are also locally known as Mahanagar Palika, Nagar Nigam, Nagar Palika etc.

There are 7,933 urban entities in India, of which 1,772 Municipalities, 2,023 Nagar Panchayats, 149 Municipal Corporations, and 97 Cantonment Boards. The rest are Census towns (as per Census of India, 2011). However, there are 4,372 cities which have been recognised by Ministry of Housing and Urban Affairs (MoHUA).

Table 1: Cities with respect to population range

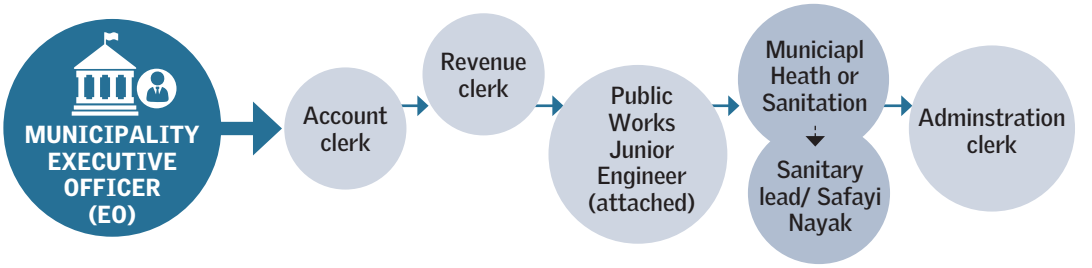
Cities with > 1 lakh population		Cities with < 1 lakh population	
No. of ULBs	Population (in Lakhs)	No of ULBs	Population (in thousand)
9	>40	535	50–1 lakh
40	10–40	989	25–50
99	03–10	1020	15–25
323	01–03	1,357	<15
471		3,901	

Source: Swachh Survekshan 2023 toolkit

ORGANIZATIONAL STRUCTURE OF URBAN LOCAL BODIES

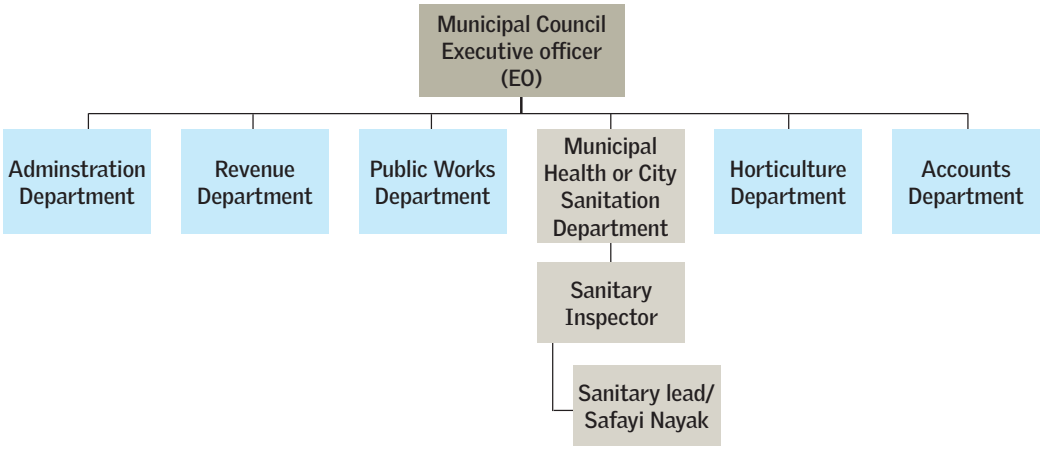
In India, ULBs' organizational structure varies according to the tiers of cities and the population range. The following organogram illustrates the placement of officers and associated employees in Urban Local Bodies (ULBs) with populations below 25,000, specifically for the management of municipal waste at the municipality level.

Figure 3: Organogram of Urban Local Bodies with a population of less than 25,000



Cities that have a population of below one lakh but more than 25,000 follow the following order to manage the municipal waste at the Municipal Council level.

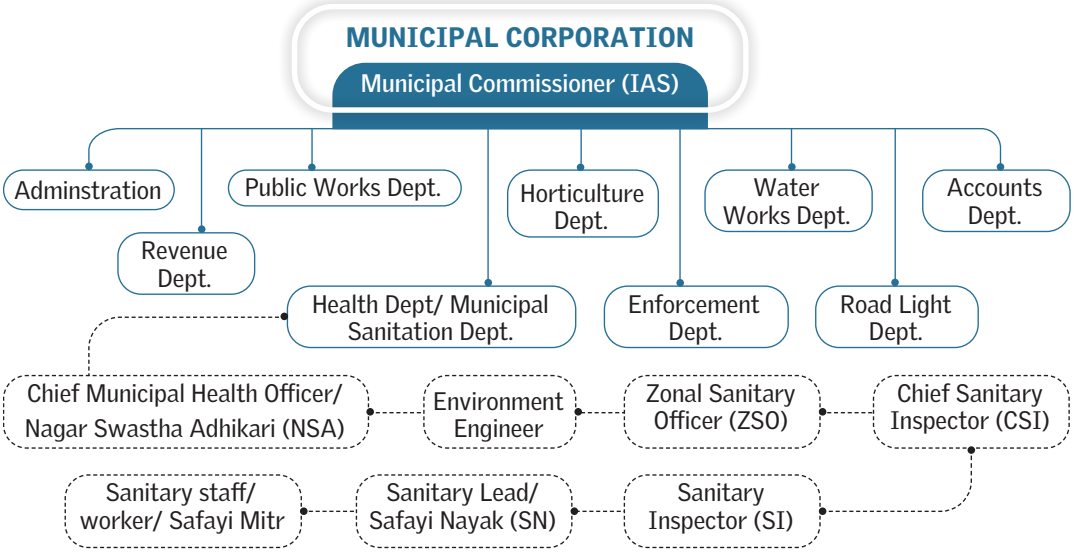
Figure 4: Organogram of Urban Local Bodies with populations between 25,000 and one lakh



Source: CSE 2023

Cities that have a population of above one lakh follow the organization structure as illustrated in the figure below.

Figure 5: Organogram of Urban Local Bodies with a population exceeding one lakh



Based on the population, the city or the municipal area is divided into a certain number of wards. Each ward is represented by an elected representative called the Councilor or Corporator. They are elected for a term of five years or until the next election is held, as per situational requirement.

ADMINISTRATION

A political party that wins more than half of the total seats in an urban local body secures the election. Each seat typically corresponds to one ward, although, in exceptional cases, multiple elected representatives may be elected from a single municipal ward. The winning party elects its leader, usually referred to as the 'Chairman' or 'Mayor,' depending on the type of establishment, area, and population. The 'Chairman' or 'Mayor' serves as the elected head, while the appointed head is responsible for running the government with executive authority. Typically, this administrative head is the Executive Officer, Chief Officer, or Municipal Commissioner (MC), who is appointed by the State Government from the state or central civil service cadre. The administrative head's role includes making critical administrative decisions to implement policies, approve plans, and manage budgets. They are solely accountable for the administration and must report according to the established hierarchy.

Councilors or Corporators are elected by local residents in their constituency through direct voting. Once elected, they are responsible for upholding the law, amending existing laws, and, in some cases, collaborating with the community to update or remove outdated or unnecessary laws.

A Municipal Law Officer heads the cell that provides guidance on legal matters to the Municipal Government. This law officer is also appointed by the Government.

1.3 MUNICIPAL ACTS

State Municipal Acts are legislations enacted by state governments to establish municipal governments, administer them and provide a framework of governance for cities within their jurisdiction. Every state has its own Municipal Act and some states have more than one Municipal Act. These Acts are periodically amended based on the legislation enacted by the Union Government of India.

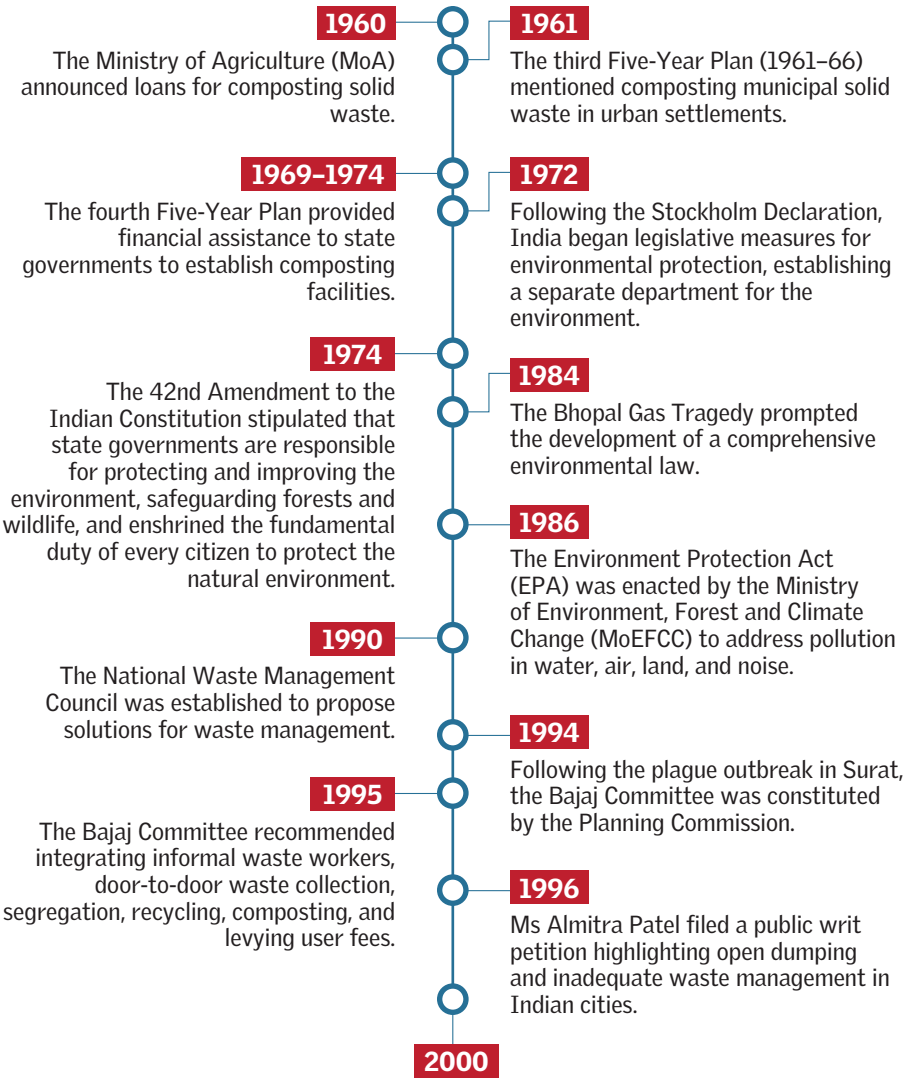
The respective state's Municipal Act is the administering document for municipal governments and it follows the guiding principles of the 74th Constitutional Amendment Act (CAA).[15] These Municipal Acts existed in India before the introduction of the 74th CAA, but the Constitutional Amendment Act introduced them as units of local governance through the principle of subsidiarity. At the same time, the 74th CAA also defined the key responsibilities and functional boundaries of the ULBs along with devolutions of 'fund', 'functions', and 'functionaries'. In summary, the 74th Constitutional Amendment Act, along with the State Municipal Acts, aimed to promote decentralized governance with minimal involvement from higher levels of state administration or the Government of India.

The 74th CAA 1992, not only gave constitutional recognition to local urban governments, but also directed the government to institute mandatory changes, such as setting up State Finance Commissions, and making reservations for women, Scheduled Caste and Scheduled Tribe in Municipal elections and ward committees.

While these changes were brought about through the 74th CAA, it was left to the state legislatures to make state-specific rules[15] through the respective Municipal Acts.

Municipal bye-laws stem from the 74th Constitutional Amendment Act (CAA) and local Municipal Acts which empower municipal governments to create and enforce local laws for their cities based on these existing acts. Municipal laws vary from place to place as

Figure 6: Chronological evolution of environmental regulations in India leading to Municipal Solid Waste (Management and Handling) Rules, 2000



each governing body has to come up with different regulations to cover specific needs of their areas.

1.4 EVOLUTION OF INDIA'S WASTE MANAGEMENT: MUNICIPAL SOLID WASTE RULES, 2000 TO SOLID WASTE MANAGEMENT RULES, 2016

The origin of the present-day Solid Waste Management Rules, 2016 can be traced back to 1996 when a public writ petition was filed against the Union Government of India by Ms Almitra Patel challenging solid waste disposal in five metropolises—Mumbai, Chennai, Kolkata and Delhi and Bangalore. The petitioner claimed that the municipal garbage disposal facilities were inadequate. This has been India's most significant legal litigation involving solid waste. The petitioner demanded an immediate and urgent improvement in current methods of treating Municipal solid waste in India.

The tribunal established to address this issue determined that the situation to be serious, as over one lakh tonnes of raw garbage were being discarded daily just outside the city limits. There was no adequate treatment for this waste, which was left on land, along highways, and in lakes.

The tribunal emphasized the need for converting this waste into a source of electricity and fuel that could be used for the benefit of the society, in accordance with the principles of circular economy. It has also identified this as one of the most significant challenges in recent years.[7]

Thus, the Almitra Patel case was the first of its kind that extensively dealt with the subject at such a level. The Supreme Court issued an order in 1998 through which a committee was formed under the chairmanship of Mr. Asim Barman to look after all aspects of solid waste management. On submission of the committee's report, the Government came up with Municipal Solid Waste (management and Handling) Rules, 2000.[9] Until then, waste management was

viewed as a linear process, from collection to disposal, resulting in significant health and environmental hazards. The responsibility was not placed on waste generators or other stakeholders, the roles of relevant ministries were not clearly defined, and there was no emphasis on the hierarchy of waste management.

Meanwhile, increasing tipping fees, lack of landfills, business opportunities in the sector, environmental concerns, health of the people, all these issues rose after 2010 and called for newer means for managing the specific wastes.

EMERGENCE OF SOLID WASTE MANAGEMENT RULES, 2016

After 16 years, the Municipal Solid Waste (Management and Handling) Rules were revised and renamed as Solid Waste Management Rules, 2016.

On 8 April 2016, The Ministry of Environment, Forest, and Climate Change (MoEFCC) notified the Solid Waste Management Rules (SWM), 2016 to lay a concrete framework for scientific waste management in urban settlements across the country. The other five categories of rules ancillary to it were e-waste, plastics, hazardous, bio-medical, and Construction and Demolition Waste Management Rules, 2016 which have been subsequently amended and revised.

A paradigm shift that has been observed from MSW (M&H) Rules, 2000 to SWM Rules, 2016 is that the focus has shifted from mere collection and disposal to segregation and waste minimization. The focus has shifted from a landfill-centric approach to establishing a comprehensive waste management system, with landfills being considered only as a last resort.[8] For the first time in the history of Indian Environmental Regulations, the onus of solid waste management has equally been placed on the waste generators by explicitly mentioning their roles and responsibilities such as waste minimization, segregation at source, paying user charges etc.

According to these rules, waste generators include:

- Households
- Event organizers
- Street vendors
- RWA and Market Associations
- Gated communities with an area of more than 5,000 sq m and
- Hotels and restaurants

Figure 7: Emergence of Solid Waste Management Rules, 2016, and its ancillary rules

Ancillary Rules

- E-waste Management Rules, 2016, amended latest March, 2024
- Hazardous and Other Wastes (Management and Transboundary Movements) Rules amended latest 2024
- Construction and Demolition Waste Management Rules, 2016, amended latest in 2024
- Bio Medical Waste Management Rules, 2016, amended latest in 2018

Table 2: Stakeholder responsibilities as defined in SWM Rules, 2016

Key responsibilities of the ULBs or Gram Panchayats	Key responsibilities of the waste generators
■ They will arrange for door-to-door collection of segregated solid waste from all households, including slums and informal settlements, commercials, institutional and other non-residential premises, malls, housing complexes etc. ■ They will set up material recovery facilities or secondary storage facilities for non-compostable waste and facilitate sub-segregation, recovery, and recycling of non-biodegradable waste. ■ They will facilitate the formation of self-help groups, provide identity groups, encourage integrated SWM, including door-to-door collection of waste. ■ They will leverage the strength of waste pickers and recyclers to formalize them and provide them with capacity building. ■ They will frame bye-laws that incorporate the provisions of these rules within one year of the date of notification of these rules and ensure timely implementation. ■ They will prescribe user fees from time-to-time as deemed appropriate, and collect the fee from waste generators. ■ They will establish a waste deposition center for domestic hazardous waste and give directions to waste generators to deposit their domestic hazardous waste at the center for safe disposal. ■ They will promote the setting up of decentralized composting or bio methanation plants ■ They will collect waste separately from the sweeping of lane or bye-lanes.	■ All households will segregate the waste into three categories—bio-degradable, non-bio-degradable, and domestic hazardous waste. ■ Bio-degradable waste of all RWAs, gated communities, markets associations and institutions, and hotel restaurants with an area of more than 5,000 sq m will segregate their waste. Bio-degradable waste will be managed and processed through composting and bio-methanation within their premises as much as possible and the recyclables must be given either to authorized waste pickers, recyclers or to the waste collectors deployed by Municipal authorities with the payment of stipulated user charges. ■ Users of sanitary napkins will securely wrap them after use and put them under the category of non-bio-degradable waste. ■ Construction and demolition waste will be stored as far as possible within their premises and shall be disposed as per C&D Waste Management Rules, 2016. ■ Will store garden or horticulture waste within their premises and dispose them off as per the directions provided by the local body. ■ No waste generator shall throw, burn or bury the waste generated by them on streets, open places, outside their premises, or into drains or water bodies. ■ All waste generators shall pay user charges for solid waste management as specified in the bye-laws of local bodies. ■ No person shall organize an event or gathering of more than one hundred people at an unlicensed place without intimating the local body at least three working days in advance, and such a person, or the organizer of such an event, shall ensure the segregation of waste at source and handing over segregated waste to the waste collector or agency as specified by the local body. ■ Every street vendor shall keep suitable containers for storage of the waste generated during the course of his activity, such as food waste, disposable plates, cups, cans, wrappers, coconut shells, leftover food, vegetables, fruits, etc., and shall deposit such waste at the waste storage depot or container or vehicle as notified by the local body.

Source: Solid Waste Management Rules, 2016

- Plastic Waste Management Rules, 2016, amended several times, amended latest was on March, 2024

1.5 SCOPE AND APPLICATION OF SWM RULES, 2016

The term Municipal has been omitted in this new rule as it is now applicable beyond Municipal areas which include urban agglomerations, Census towns, notified areas, industrial townships, areas under the control of Indian Railways, airports, airbases, ports and harbors, defense establishments, state and central government organizations, Special Economic Zones, place of pilgrimage etc.
The key duties of every waste generator has been included. For example, the segregation of waste have been outlined into three categories—bio-degradable, non-bio-degradable and domestic hazardous—before handling it over to authorized waste pickers or waste collectors.

Construction and demolition (C&D) waste needs to be stored separately and disposed of according to the rules of the Construction and Demolition Waste Management Rules, 2016. Similarly, horticulture and garden waste need to be discarded as per the directions provided by the local body.

2

BYE-LAWS

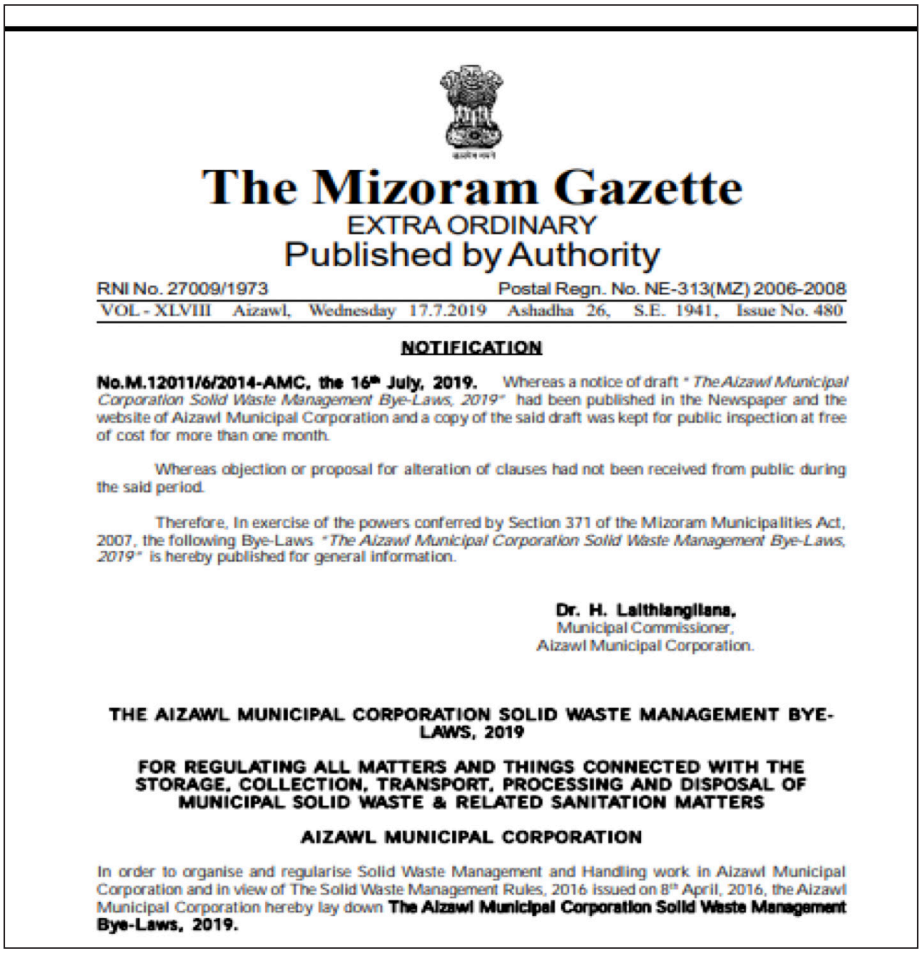
Municipal bye-laws, derived from the SWM Rules 2016, primarily focus on two key aspects. First, they outline the responsibilities of waste generators. Secondly, these laws mandate local governments to ensure the collection, transportation, proper processing, and scientific disposal of waste.

SWM Rules, 2016 mandate all local authorities, village panchayats, Census towns and urban agglomerations to frame bye-laws incorporating the provisions of the current rules within one year from the date of notification of these rules, and ensure timely implementation.

The flagship Swachh Bharat Mission 2.0 mandates Indian cities to reclaim lost land through biomining of the existing waste dumps and augmenting treatment capacities to divert at least 80 per cent of current generation by 2026 (PCCs) process the applications of all PWPs in their states and UTs, respectively.

The 73rd and 74th CAA have empowered rural and urban local governments to adopt and enforce bye-laws in public interest to improve service delivery, transparency and social justice. A bye-law is a law that is passed by the council of a Municipal Authority to regulate the affairs and services it provides within its jurisdiction.

2.1 MUNICIPAL BYE-LAWS AND BYE-LAWS FOR SOLID WASTE MANAGEMENT



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NOTIFICATION

No.M.12011/6/2014-AMC, the 16th July, 2019. Whereas a notice of draft "*The Aizawl Municipal Corporation Solid Waste Management Bye-Laws, 2019*" had been published in the Newspaper and the website of Aizawl Municipal Corporation and a copy of the said draft was kept for public inspection at free of cost for more than one month.

Whereas objection or proposal for alteration of clauses had not been received from public during the said period.

Therefore, In exercise of the powers conferred by Section 371 of the Mizoram Municipalities Act, 2007, the following Bye-Laws "*The Aizawl Municipal Corporation Solid Waste Management Bye-Laws, 2019*" is hereby published for general information.

Dr. H. Lalthlangliana,
Municipal Commissioner,
Aizawl Municipal Corporation.

THE AIZAWL MUNICIPAL CORPORATION SOLID WASTE MANAGEMENT BYE-LAWS, 2019

FOR REGULATING ALL MATTERS AND THINGS CONNECTED WITH THE STORAGE, COLLECTION, TRANSPORT, PROCESSING AND DISPOSAL OF MUNICIPAL SOLID WASTE & RELATED SANITATION MATTERS

AIZAWL MUNICIPAL CORPORATION

In order to organise and regularise Solid Waste Management and Handling work in Aizawl Municipal Corporation and in view of The Solid Waste Management Rules, 2016 issued on 8th April, 2016, the Aizawl Municipal Corporation hereby lay down **The Aizawl Municipal Corporation Solid Waste Management Bye-Laws, 2019.**

In the context of a solid waste management system, the Solid Waste Management Rules, 2016, recommends a set of local measures to deal with solid waste management issues as part of their responsibilities. To implement these measures, authorities are empowered to create or amend bye-laws for solid waste

management, ensuring the provision of necessary services to citizens efficiently. They can also impose taxes or fines and collect user fees as needed.

SWM Rules, 2016 mandate all local authorities, village panchayats, Census towns and urban agglomerations to frame bye-laws incorporating the provisions of the current rules within one year from the date of notification of these rules, and ensure timely implementation.

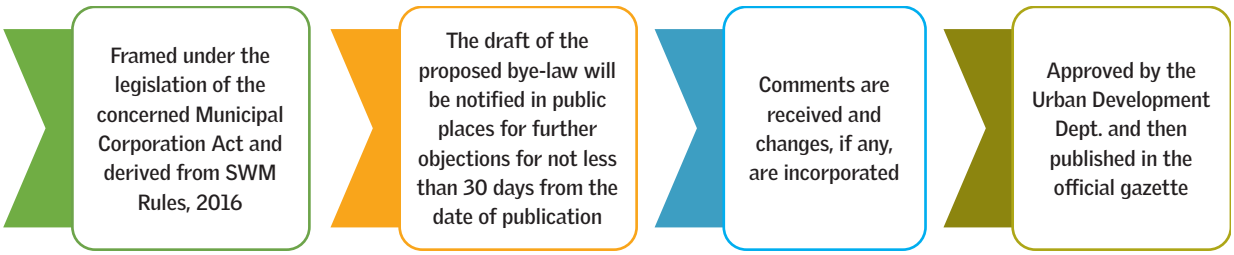
Hence, as per the rule, all local governments are eligible to not only frame, draft/amend or revise, and notify their own bye-laws for solid waste management, but are also responsible for monitoring and facilitating the proper implementation of the same.

Bye-laws for solid waste management are a comprehensive legal and regulatory framework that are put in place by the ULBs as encompassing all aspects of solid waste management, right from its generation to the final disposal. Bye-laws include provisions for the collection, transportation, storage, processing and final disposal of wastes along with monitoring and regulation. Bye-laws are usually in line with the State Act for Municipalities and Solid Waste Management Rule 2016, thus giving the ULBs extra weightage for implementing provisions, including the collection of hefty penalties in case of non-compliance and violations.

2.2 PROCESS OF FORMULATING BYE-LAWS BY LOCAL SELF-GOVERNMENTS

The draft bye-law is created in accordance with the Solid Waste Management Rules, 2016. It is then approved in a specially convened meeting where at least half of the elected representatives (parshads) of the relevant local body are present. Following this, the draft bye-laws are posted in various public locations for a minimum of 30 days to invite objections or comments from citizens. Upon receiving the comments and making the necessary changes, the draft bye-laws are then forwarded to the concerned department dealing with urban affairs under the state authority.

Figure 8: Formulation of bye-laws by local self-governments



Source: CSE 2023

After obtaining their approval, it is finally published in the official gazette and notified by the Municipal body.

The whole process needs to be accomplished by one year of the implementation of the Solid Waste Management Rules, 2016. Sometimes, states make model bye-laws to be implemented and followed by the cities or village panchayats. They can either directly adopt the bye-laws after approval of the body constituting elected representatives, or they can amend it as per local need and context.

2.3 KEY ELEMENTS OF MUNICIPAL BYE-LAWS

Municipal bye-laws, derived from the SWM Rules 2016, primarily focus on two key aspects. First, they outline the responsibilities of waste generators, emphasizing waste minimization, segregation at the source, handing waste over to authorized collectors, prohibiting practices like open burning and littering, promoting home composting, ensuring compliance by bulk waste generators (BWGs), and paying user fees for waste services.

Secondly, these laws mandate local governments to ensure the collection, transportation, proper processing, and scientific disposal of waste. They also include integrating informal waste pickers into formal waste management systems, collecting user charges, enforcing regulations through penalties for non-compliance, and granting discretionary powers or exceptions where necessary.

2.4 BYE-LAWS WITH EXCEPTIONAL PROVISIONS

The analysis of 37 sample municipal bye-laws reveals several special provisions that could enhance sustainable solid waste management (SWM) in cities through effective enforcement:

i) **Publicizing bye-laws (IEC Initiatives):** Many cities mandate publicizing bye-law provisions through various media, ensuring that citizens are well-informed about their responsibilities and available waste management services. For example, Chennai Municipal Corporation uses advertisements, radio, television, and leaflets to spread awareness. Dharamshala, Panaji, Howrah, Ukhlana and Hisar have all featured this initiative of popularizing the components of bye-laws in their respective bye-laws itself.

ii) **Citizens' resource base:** Some cities, like Howrah, Narnaud, Aizawl, and Panaji, have established a citizen's resource base on their websites. This resource provides information on composting and recycling, helping residents access relevant data.

iii) **Waste minimization through reduce-and-reuse:** Cities like Howrah and Bengaluru emphasize waste hierarchy in their bye-laws, promoting waste prevention, reduction, reuse, and recycling as preferred options over disposal. This aims to align citizens' consumption habits with sustainable practices.

iv) **Provision for street vendors:** Bye-laws across cities include specific instructions for street vendors and shopkeepers, requiring them to segregate waste and hand it over to authorized collectors. Non-compliance results in fines, as is the case in Narnaud, Haryana.

v) **Special events on streets:** Organizing public events require an event permit and a caution security deposit to ensure the cleanliness of the venue. The deposit is refunded only if the site is restored to its original condition, for example, as outlined in the bye-laws of Panaji, Goa.

vi) **Efforts to strengthen bye-laws**: Several bye-laws highlight the need for continuous amendments to align with the latest rules from the Ministry of Environment, Forest and Climate Change

(MoEFCC), ensuring up-to-date SWM practices. Examples being, Port Blair, Andaman and Nicobar Island.

vii) **Measures against contravention:** Many bye-laws, including the Municipal Corporation of Gurugram's bye-laws, include strict penalties for non-compliance, with fines levied on the spot. Repeated violations incur daily or monthly fines, and unpaid fines are added to the property tax. The city also publishes monthly reports on violations and fines.

viii) **Provision for markets and slaughterhouses:** Bye-laws require the scientific processing or disposal of waste from slaughterhouses and markets, using methods like composting, bio methanation, or incineration, in compliance with CPCB and SPCB standards.

ix) **Market for RDF:** The Municipal Corporation of Gurugram promotes creating a market for Refuse-Derived Fuel (RDF) and emphasizes routing recyclables through appropriate vendors. Non-recyclable materials are directed to waste-to-energy plants or for co-processing.

x) **Responsibilities of manufacturers and brand owners:** Bye-laws, such as those of the South Delhi Municipal Corporation, require manufacturers and brand owners of disposable products to support waste management financially and establish systems for collecting packaging waste. They also mandate the use of recyclable materials and public education on proper disposal.

xi) **Monitoring cell for bulk waste generators (BWGs):** Cities like Ukhlana, Narnaud, and Howrah have proposed setting up a monitoring cell within the Urban Local Body (ULB) to oversee BWGs, headed by the commissioner or a chief officer. Hisar, Narnaud, Hansi and Ukhlana have provisions to establish separate BWG monitoring cells. Gurugram, Indore, Panaji have reduced the BWG definition from 100 kg to 25 kg and 50 kg.

3

ENFORCEMENT OF MUNICIPAL BYE-LAWS FOR SOLID WASTE MANAGEMENT POLICY vs PRACTICE

Although cities have broadly adopted source segregation policies, only 59% report effective enforcement and transport of segregated waste for treatment. Citizen feedback, however, reveals that actual implementation occurs in only 32% of cities.

Only 43% of the 37 cities studied have some kind of provision in their municipal bye-laws for the integration of the informal sector.

39% of the cities claimed that they were implementing appropriate measures to prevent waste burning and penalize the offenders while citizens of only 27% cities confirmed to have witness any such effort by their cities. Only 26% of the citizens have confirmed that open burning is being strictly prohibited with penalization as a disciplinary action.

As a country advances, it generates a significant amount of goods and services to satisfy its population's needs. However, with these goods comes waste. Waste is considered undesirable, and managing it can be both hazardous and costly. It is an inevitable byproduct of economic activities, created by various participants in the economy.

Currently, countries are grappling with a major crisis in managing escalating waste generation, mainly due to increased consumption and economic growth. As urban occupations have increased and farming and other nature-based jobs have declined, cities have expanded significantly. This growth has led to higher waste generation and more serious health issues for the population.

According to the Census 2011, the urban population of the country constitutes 31.16 per cent of the total population. And the per capita waste generation has increased exponentially in last few decades. According to Central Pollution Control Board (CPCB) report 2020–2021 it is 119. 07 grams per day.

The management of these huge amounts of waste is the responsibility of the government, which includes careful planning, expenditure, and consideration of ecological concerns. The city government bears the final responsibility for the collection, transportation, sorting, processing, and final disposal of this waste. However, due to resource crunch, insufficient infrastructure or strong policy implications, not all the waste is being collected, processed or scientifically disposed, or they are being improperly disposed of, thereby posing serious health hazards to citizens.

It is estimated that 80–90 per cent of municipal waste in India is disposed of in landfills without proper management practices, and often through open burning, resulting in air, water, and soil pollution.[11] Thus, landfill sites pose a potential threat as they emit harmful greenhouse gases, contributing to environmental pollution and groundwater contamination through the formation

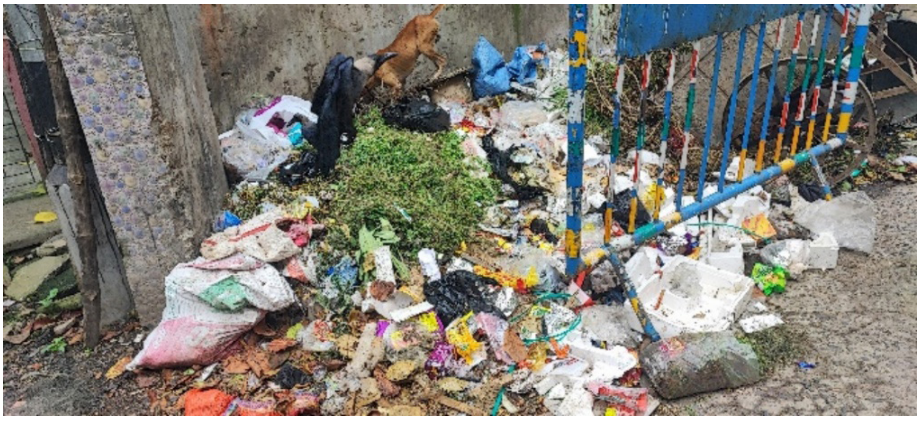
of leachates. Moreover, people stop allowing waste dumping or processing plants in their vicinity, thus making it more challenging for waste handlers to procure new land for dumping.

In cities, the generation of excessive plastic waste leads to clogged drainage systems during the monsoon season, leading to urban flooding. Moreover, micro plastics from these waste materials mix with water, polluting rivers and oceans.[12] The presence of microplastics in aquatic life disrupts the food chain and contributes to global warming.

Waste management issues are compounded by limited public awareness and irresponsible disposal habits among the general public, posing significant obstacles for municipalities. The composition of urban waste varies due to geographical, climatic, social, and economic factors, with densely populated cities typically generating larger quantities of waste. Many Indian cities still practice mixed waste collection and landfill disposal, which hinders the adoption of universally effective waste management strategies. This diversity in waste management practices underscores a broader failure of municipalities to consistently meet desired service standards, largely due to inadequate law enforcement and lack of holistic management approaches across surveyed cities.

The flagship Swachh Bharat Mission 2.0 mandates Indian cities to reclaim lost land through biomining of the existing waste dumps and augmenting treatment capacities to divert at least 80 per cent of current generation by 2026. The current challenges associated with managing municipal solid waste, therefore, continues to be at the epicentre of environmental governance by the urban local bodies.

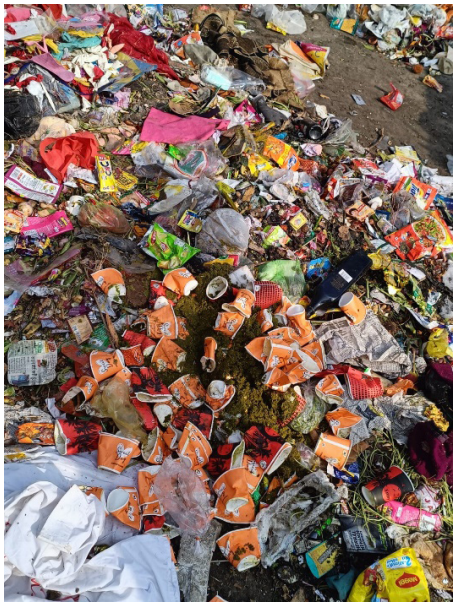
Reducing waste as much as possible and focusing on processing existing waste in a decentralized way emerged are the only solutions to overcoming these challenges.



Mixed waste piled up on the streets of an Indian city

Open waste burning on the streets of an Indian city

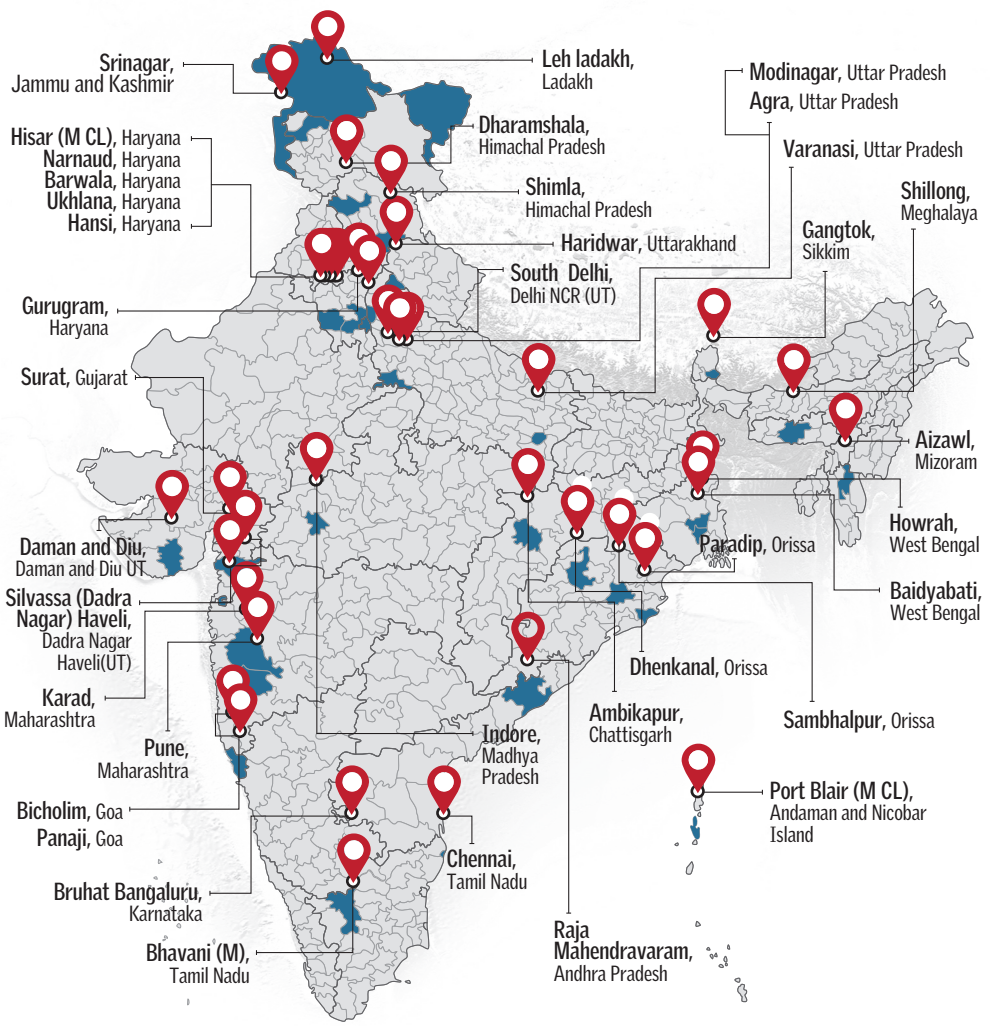
Collection of waste in a mixed manner in an Indian city



Indiscriminate waste dumping in Indian streets

Despite the existence of legal mandates and policies on solid waste management, the current practices in Indian cities reveal a significant gap between policy and on-the-ground implementation. This discrepancy has prompted a comparative analysis to assess the efficacy of the Solid Waste Management Rules, 2016 that are primarily enforced through municipal bye-laws, with urban local bodies serving as the key agents of implementation. The stark contrast between policy and practice emphasizes the need to evaluate the actual impact and efficacy of these regulations.

Map 1: Cities surveyed for the report



3.1 ANALYSIS OF BYE-LAWS FROM INDIAN CITIES

SELECTION OF CITIES AND METHODOLOGY ADOPTED FOR ANALYSIS IN THE STUDY

2016 was a landmark year in the history of Solid Waste Management in India. On 8 April 2016, the Solid Waste Management Rules, 2016 came into force, and all urban local bodies were instructed to draft their bye-laws within one year.

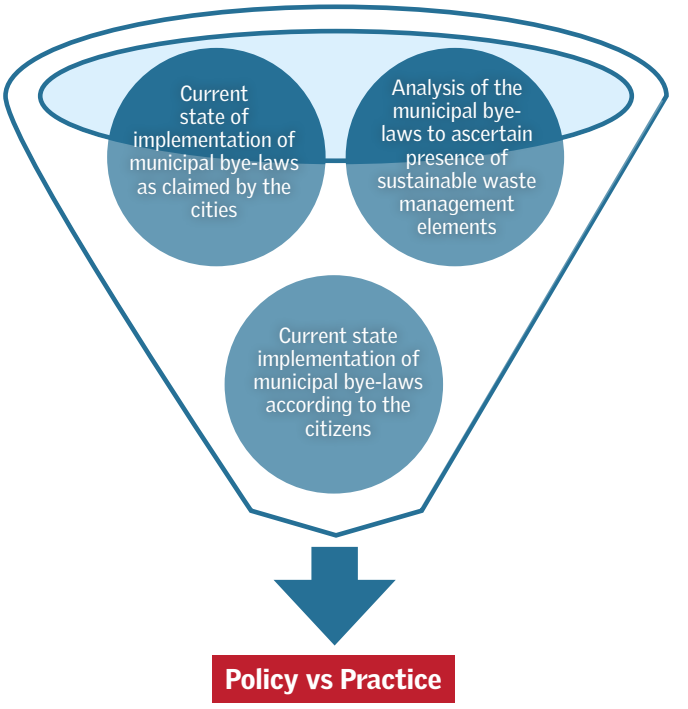
For this study, bye-laws from 37 cities were selected to ensure a balanced representation across five regions of India: North, South, East, West, and Central India. The selection was based on various factors, including population and geographical characteristics (such as Himalayan, coastal, and riverine cities) to capture the diversity in the analysis of the bye-laws. The study intended to cover all types of cities along with a balanced representation from all the five regions in India to make the analysis look more holistic and extrapolatable.

The analysis looked into three different aspects of municipal bye-laws and their implementation on the ground. In order to analyse the current state of municipal bye-laws as a public policy, the methodology considered:

(a) Assessment of a bye-law as a legal and enforceable instrument at the disposal of the urban local bodies.
(b) The cities were asked specific questions on the state of implementation according to their own provisions of the bye-laws. This was further triangulated during field visits and interactions with the stakeholders.
(c) Specific questions were asked to citizens from the same cities to evaluate the state of implementation of various elements of bye-laws according to their observations and experiences as recipients of the services.

Of the bye-laws from 37 cities across India studied here, 36 have either drafted or amended their bye-laws after 2016, therefore

Figure 9: Policy vs Practice

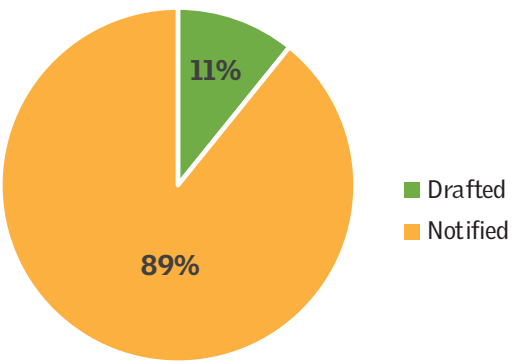


incorporating provisions of the Solid Waste Management Rules, 2016. The only city is Haridwar which is yet to revise their bye-law in accordance with the SWM Rules, 2016. However, Haridwar has issued notices on various Solid Waste Management issues for citizens in accordance with SWM Rules, 2016.

3.2 DRAFTED vs. NOTIFIED BYE-LAWS

As per the rules mentioned above, bye-laws must be notified publicly by cities. Among the 37 cities studied across India, the bye-laws of four cities (11 per cent) are yet to be publicly notified

Distribution of cities in terms of notification of bye-laws after amendment as per SWM Rules, 2016



and 33 (89 per cent) cities have notified their bye-laws. These four cities have issued various orders on solid waste management at different times. Finalizing and notifying bye-laws are imperative to make them more effective and impactful.

Since the bye-laws for Solid Waste Management in India are developed in accordance with the SWM Rules 2016, the fundamental components of all the bye-laws reviewed in this study can also be categorized into two groups: (a) responsibilities of waste generators and (b) mandatory duties of local government. The equal distribution of responsibilities between waste generators is a distinctive feature in the history of environmental regulations in India. This approach fosters greater accountability among citizens and emphasizes that waste management is a collective responsibility.

3.3 COMPONENT ANALYSIS OF BYE-LAWS

The following section examines the municipal bye-laws of all 37 cities through the lens of the solid waste management value chain and related components:

1. Source segregation
2. Door-to-door collection
3. Processing and treatment
4. Recycling
5. Decentralized waste management
6. Compliance of bulk waste generators
7. Home composting
8. Prohibition of open dumping
9. User charge collection
10. Incentivization
11. Penalization
12. Integration of informal sector
13. Safety of sanitary workers
14. Grievance redressal system
15. Scientific disposal of waste
16. Prohibition of open burning

Each component has been analysed on the basis of:

a. A review of the bye-law document to assess the kind of mandate it came up with for the citizens.
b. the manner in which the ULB responded when asked about the status of implementation of the provisions of the bye-law.
c. How the citizens from the same cities have responded to the provisions of the bye-law being implemented.

I. SEGREGATION OF WASTE AT SOURCE

Policy

SWM Rules, 2016 direct all waste generators to segregate and store the waste generated by them in three separate streams namely, bio-degradable, non-bio degradable and domestic hazardous wastes in appropriate colour-coded bins, and handover segregated waste to authorized waste collectors. They have also been directed to wrap and store sanitary waste, construction and demolition (C&D) waste and horticulture waste separately and hand it over to the competent authority, which is the urban local body.

However, the Swachh Bharat Mission 2.0 Urban (SBM 2.0 U) has mandated all waste generators to segregate their waste at source into four categories—wet, dry, sanitary and domestic hazardous waste. They have also directed waste generators to separate C&D waste from other kinds of waste. Waste generators have been specifically instructed not to mix e-waste with other kinds of dry waste and to deposit it to the e-waste collection centre or in any e-waste collection camp organized by the city authority. E-waste

> "It shall be the duty of every generator of Municipal Solid Waste, either owner or occupier of every land or building to collect or cause to be collected from their respective land, premises and building, to segregate waste and to store and deliver the same to the municipal worker/vehicle/waste picker/waste collector deployed by the Municipal Corporation for the purpose."
>
> Source: Bye-laws of the Aizawl Municipal Corporation, Mizoram

must be handed over to the licensed and authorized recyclers certified by the CPCB.

All of the bye-laws reviewed in this study have explicitly mandated waste segregation at the source by all generators. Additionally, they require the separate segregation of bulk garden and horticultural waste, encouraging composting on-site as much as possible. If that cannot be executed, the bulk garden waste must be handed over to the authorized waste collectors within the mentioned days of the week and with stipulated payment stated by the ULB.

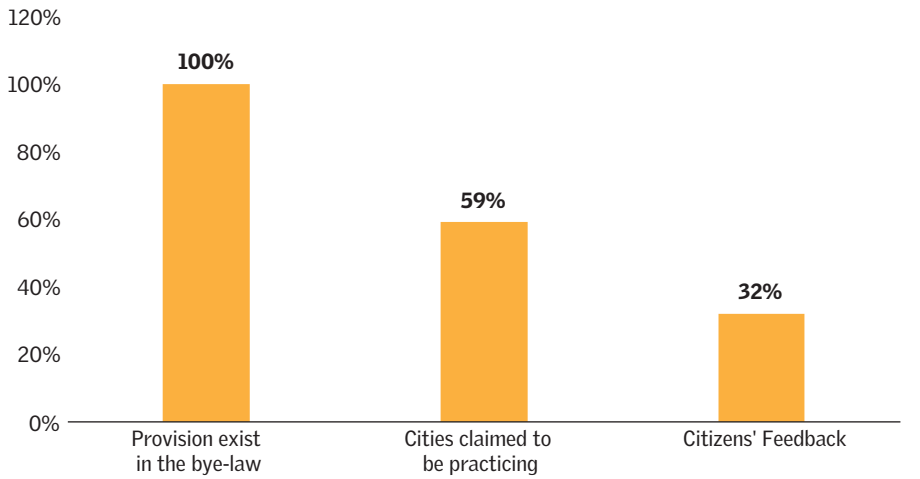
All the bye-laws also mandated segregated storage of construction and demolition waste (C&D), as and when generated, should be segregated, and stored separately within the premise where the waste has been generated and kept separately from Municipal solid waste. C&D waste must not be mixed and handed over with other municipal solid waste; it shall be delivered separately by the waste generator according to the timings and to the location mentioned by the competent authority. Small-scale household construction and demolition (C&D) waste should be managed locally by engaging an authorized agency. Homeowners should inform the local body and arrange for the collection of segregated C&D waste by the vehicle provided, paying the necessary charges as required. The authorized agency are to dispose the waste at the approved disposal site. According to the bye-laws, the policy for domestic hazardous waste is also to segregate and hand over waste separately to waste collectors on a weekly basis, or periodically, as decreed by the local body.

Consistently in line with the SWM Rules, 2016, all 37 bye-laws examined in this research mandate that every waste generator in the city segregate waste into different streams. The number of categories varies significantly, ranging from two to six. Additionally, each bye-law requires the proper storage and/or handover of waste to the municipal corporation or authorized waste pickers.

Practice

While all cities have comprehensively addressed the agenda of source segregation, only 59 per cent reported being able to enforce it effectively and transport segregated waste for further treatment and processing. When citizens were asked about this issue, they indicated that source segregation is actually being implemented in only 32 per cent of the cities. The following graph summarizes the data:

Graph 1: Source segregation in surveyed cities



Source segregation is a non-negotiable criterion in sustainable solid waste management. Unless waste is segregated at the point of generation, meaningful waste processing cannot be achieved, and the value of recyclable materials diminishes when mixed with decomposable organic waste. During our visit to Shillong Municipal Board in the state of Meghalaya, excellent level of source segregation was observed among the citizens. Shillong Municipal Board sends two separate vehicles for the collection of organic and inorganic waste separately. People there would come with two separate bins and wait in a queue for their turn to come and hand over the segregated waste into two separate vehicles individually. This sort of community participation is undoubtedly remarkable for achieving effective and sustainable solid waste management.

Citizens in Shillong are waiting in line to hand over their segregated waste to the city vehicle. In Baidyabati, West Bengal segregated waste is being collected door-to-door.

II. DOOR-TO-DOOR COLLECTION: POLICY vs PRACTICE

Policy

Door-to-door collection is one of the principal components in the solid waste management value chain and ULBs have to reach every doorstep for regular, consistent and timely collection. The Solid Waste Management Rules, 2016 and Swachh Bharat Mission 2.0 strongly mandate setting up a robust system for the collection of segregated waste from all sources or premises, failing which, cities may go through massive littering and deal with a large number of garbage vulnerable points. In addition, timely collection of waste from the doorstep makes a city eligible to ask for user charges. Traditionally, in India, households don't store their waste for more than a day and in the event of the waste not being picked up daily, they would find ways to dispose it off at nearby locations. The cities included in the study came up with a diverse door-to-door collection ecosystem ranging from very sophisticated and mechanised systems to ones that were very basic and non-mechanised.

Places where door-to-door collection is not possible, civil bodies have provisioned community bins where waste generators can deposit their waste in a segregated manner into dry and wet bins separately. The bye-law also mandates that no individual should discard waste in such a way that the waste spills over on the ground and the bins should be covered as well. Cities have also created legal provisions in the bye-laws for the timely clearing of bins and keeping the areas clean.

All the cities covered under the study featured door-to-door collection in their bye-laws in detail under the section 'obligatory duties for the local government.' However, the extent of door-to-door collection in terms of the sources of waste covered in the city varied significantly in many cases.

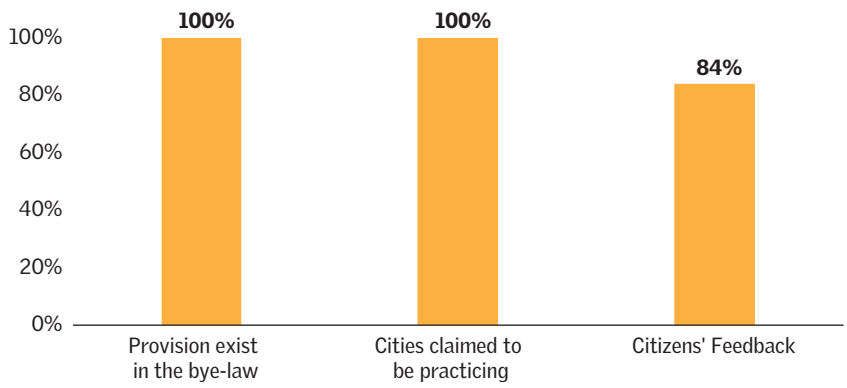
Practice

In terms of implementation, all cities reported having a strong door-to-door collection system. However, citizens indicated that only 84 per cent of this service is effectively in place. They noted that waste is often collected in a mixed manner, and there is a lack of real effort from the city government to promote or enforce source segregation. Additionally, citizens mentioned that in 16 per cent of the cities, door-to-door collection services are inconsistent.

Interestingly, the study revealed a tendency to project door-to-door collection as 100 per cent coverage, despite some sources being excluded from the service. This trend has been driven by the annual Swachh Survekshan, which conducts a nationwide score-based assessment of urban local bodies' sanitation performance. Based on extensive field visits conducted during the study, the following observations can be made regarding the parameter of door-to-door collection:

I. The collection is irregular (once in 2–3 days)
II. Time of collection is inconsistent
III. Not all areas of the city are covered by collection services
IV. The collected quantity is reported as the amount of waste generated

Graph 2: Door-to-door collection in surveyed cities



The city of Baidyabati in West Bengal, with an estimated population of 1,42,000 and 40,000 households, has achieved 100 per cent door-to-door waste collection. The two categories of waste are collected every morning according to a specific route map established by the Municipality. There are 19 dedicated tricycles for the narrow lanes and 25 auto tippers for comparatively wider lanes. The tricycles run at least two trips a day and by 2–3 hours covering 200-250 households in a day for coverage of all the households in a particular ward. At least two community mobilizers are assigned to each ward, with a higher number for larger wards. They accompany the collection vehicles and conduct door-to-door awareness campaigns.

Once the waste is collected from all the wards, they are transferred to the larger fuel-operated Tripper that has different chambers for wet and dry wastes. The waste is then transported to the compost plant (the wet waste) and to the RWMC (the dry waste) for further segregation of dry waste in the MRF, processing, and disposal.

Compartmentalized vehicles for primary and secondary waste collection in Baidyabati

Segregated waste being collected from the citizens in Karad, Maharashtra

III. PROCESSING AND TREATMENT OF WASTE

Policy

Processing is the most critical stage in the solid waste management value chain and is included among the 'obligatory duties of local government'. According to the Solid Waste Management Rules, 2016, and the Swachh Bharat Mission, both wet and dry waste must be processed using various methods and technologies. It is the responsibility of the city government to establish the necessary facilities based on daily waste generation to ensure that collected waste fractions are treated effectively, generating revenue and protecting the environment from potential pollution.

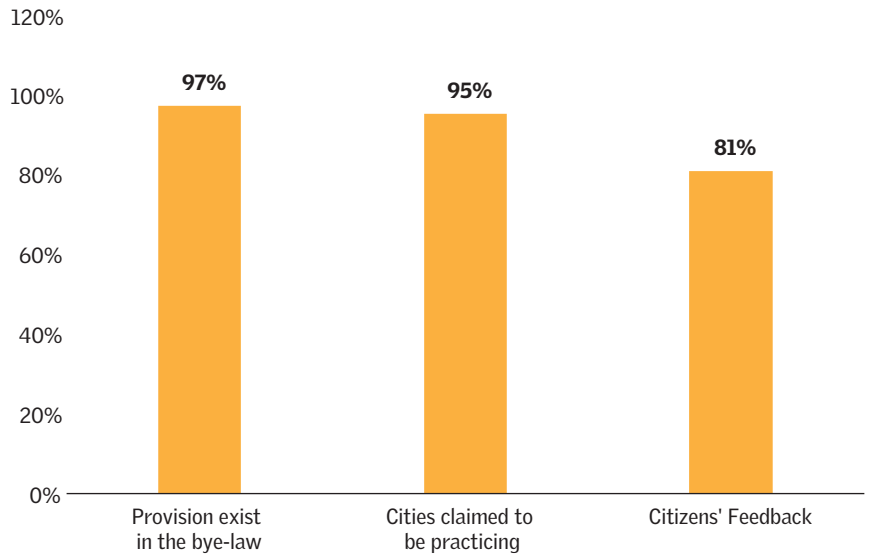
Organic or wet waste is commonly processed through composting or bio methanation, while dry waste is sub segregated in a material recovery facility. Valuable items recovered from the streams of dry waste are sent for recycling, non-recyclables are sorted separately and sent for co-processing, and the inerts are sent to landfills for disposal. It is imperative to understand that in many cases the term *processing* is used as per convenience by the urban local bodies even when cities do not have facilities to treat the waste or lack facilities that are operating at the desired level. In such instances, the entire collected waste is disposed of in a landfill without any treatment or processing. This has been commonly observed in several cities included in the study. Notably, many cities have reported to their administrative hierarchy, as well as in the annual 'Swachh Survekshan,' that they are processing nearly all the waste they generate, which is an overestimation of the actual situation on the ground.

Practice

A review of the bye-laws in all the 37 cities revealed that 97.3 per cent of them had clear provisions for processing waste exactly the way it has been mandated in the SWM Rules or the Swachh Bharat Mission. In terms of implementation, 95.45 per cent of the cities reported that they process their waste after collection in

accordance with their bye-laws. However, citizens indicated that only 81.08 per cent of the cities were actually processing their collected waste in some manner, while the remainder was simply collecting it and dumping it in landfills. Generally, many citizens equate processing with mere landfilling or dumping due to a lack of adequate processing facilities. Thus, those who claim that waste processing is occurring are likely referring to waste collection and dumping.

Graph 3: Waste processing in surveyed cities



According to Swachh Bharat Mission MIS data, about 42 per cent of the Indian cities that were studied are yet to have facilities for dry waste management or they have not reported the availability of dry waste processing capabilities. Similarly, around 45 per cent of Indian cities still lack facilities for processing wet waste, which may also reflect under-reporting. However, the current situation is significantly at odds with what SBM 2.0 outlined in its operational guidelines, where the flagship program explicitly mandated the creation or enhancement of processing facilities with additional central assistance.

IV. RECYCLING WASTE

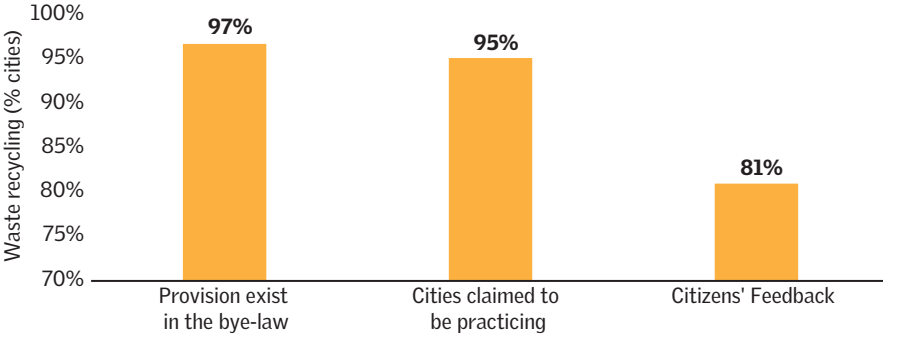
Policy

ULBs are required to recover recyclable waste fractions to manufacture new products from recycled materials. Key dry waste streams, such as plastic, paper, metal, and glass, should be sorted at the material recovery facility (MRF) during secondary segregation. The recovered materials and their quantities are then sent directly to authorized recyclers by the cities, assuming appropriate agreements are in place. Alternatively, the private agency responsible for operating the MRF is supposed to collect, sort and channel the recovered waste streams to the recycling market. This happens to be a major source of revenue that cities are expected to generate from the sale of recyclables. The bye-law acts as the legal instrument to mandate the recovery of waste for recycling, even though recycling is the least preferred option in the waste management hierarchy. Further, secondary segregation is subject to availability of material recovery facility with the city.

Practice

A review of data from the 37 cities covered under the study revealed that 97 per cent of the municipal bye-laws have clear provision for recovering materials for recycling. During the field survey, 97 per cent of the cities reported that they had the resources to recover dry waste fractions, which are subsequently sent to authorized recyclers. 81 per cent of the citizens agreed that they

Graph 4: Waste recycling in surveyed cities



were aware of the recovery and recycling taking place in their cities, substantiating the claims made by the city administrations. However, the average rate of recycling in India is in between 10–12 per cent which does not corroborate the cities' claims.

On average, the city of Ambikapur in Chhattisgarh generates an average of 70 tonnes of waste per day (TPD). In 2015, the city identified the urban poor and vulnerable women, establishing 62 self-help groups (SHGs) comprising around 480 women, of whom 115 were informal waste pickers prior to this initiative. These women are responsible for collecting waste from the doorsteps of 200,000 households and bringing it to 20 SLRM units established for further sorting and processing within the city. They further sub-segregate the recyclable materials into 16 categories and earn an average of INR100,000 per month by selling the meticulously sorted recyclable materials.

Dry waste sorted into different categories in an MRF in Ambikapur, Chattisgarh

V. DECENTRALIZED WASTE MANAGEMENT

Policy

Section 15(V) of the Solid Waste Management Rules, 2016 mandates prioritizing decentralized waste processing to reduce transportation costs and environmental impact. The core concept of decentralized waste management involves dividing the area managed by a local government into smaller sections based on municipal wards or clusters of wards. Each cluster should have a decentralized facility for processing both dry and wet waste. Decentralized facilities are designed to treat wet waste through micro-composting or the bio methanation process and dry waste through secondary segregation to recover recyclable and non-recyclable fractions. The three biggest advantages of decentralized systems are: (a) it requires very little land, infrastructure, capital and human power compared to the existing centralized facilities, (b) maximum waste is treated or processed and that way diverted from landfills; (c) it creates livelihoods for local waste pickers, self-help groups and civil societies. Shifting to decentralized systems has many known benefits, both in terms of economy and environment. A decentralized system can reduce the cost of transportation by up to 70 per cent which occupies the highest share of municipal budgets in solid waste management.

Despite having so many benefits, decentralized systems are not adopted or implemented by urban local bodies despite there being several good examples. Municipal bye-laws can enforce the implementation of a decentralized system wherever relevant and implementable.

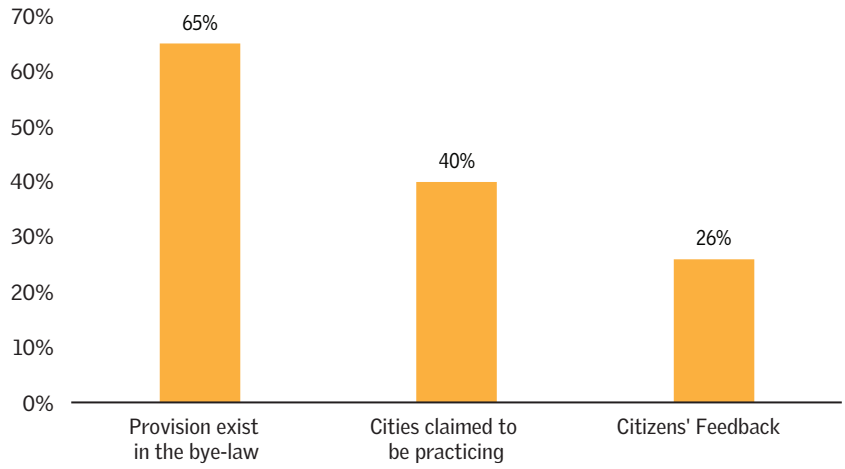
'The Ward Sanitation Committee will promote home composting, bio-gas generation, decentralized waste processing at the community level subject to control of odour, and maintenance of hygiene around the facility.'

Source: Bye-laws of Dhenkanal, Odisha

Practice

65 per cent of the 37 cities covered under the study has provisions for promoting decentralized systems in their municipal bye-laws. During the field visit, 40 per cent cities claimed that they were practicing decentralized system in certain areas. The citizens from only 26 per cent of the 37 cities confirmed to have seen decentralized systems in operation for waste management.

Graph 5: Decentralized waste management in surveyed cities



SHG-run decentralized compost unit at Dhenkanal, Orissa

The entire state of Odisha has moved to a decentralized system in 2019. All the 114 ULBs in the state are now decentralized systems. All their Micro Composting Centres (MCC) and Material Recovery Facilities (MRF) are within the design capacity of five tonnes per day that exempts them from any environmental clearances. There are cities like Ambikapur (Chhattisgarh, Alappuzha (Kerala), Taliparamba (Kerala), Vijaywada (Andhra Pradesh) are known for being good models of decentralized waste management systems.

VI. BULK WASTE GENERATORS

Policy

Managing bulk waste generators (BWGs) is a critical element of the sustainable solid waste management ecosystem. The Central Public Health and Environmental Engineering Organization (CPHEEO) estimates that up to 40 per cent of all municipal solid waste is contributed by the BWGs. The Solid Waste Management Rules, 2016 defines the bulk waste generators as 'buildings occupied by the Central government departments or undertakings, State government departments or undertakings, local bodies, public sector undertakings or private companies, hospitals, nursing homes, schools, colleges, universities, other educational institutions, hostels, hotels, commercial establishments, markets, places of worship, stadia and sports complexes having an average waste generation rate exceeding 100kg per day'.

According to the rules, every BWG is obligated to treat their wet waste in-situ and get their dry waste collected internally at their own cost and then hand over the entire quantity to the authorized collector. However, under the 74th Constitutional Amendment Act of 1992, urban local bodies have the power and authority to redefine bulk waste generators (BWGs) to include any entity that generates more than 100 kg of waste per day, if necessary. There are many examples where urban local bodies have used their discretionary power to change the definition and brought the criteria further down from 100 kg per day.

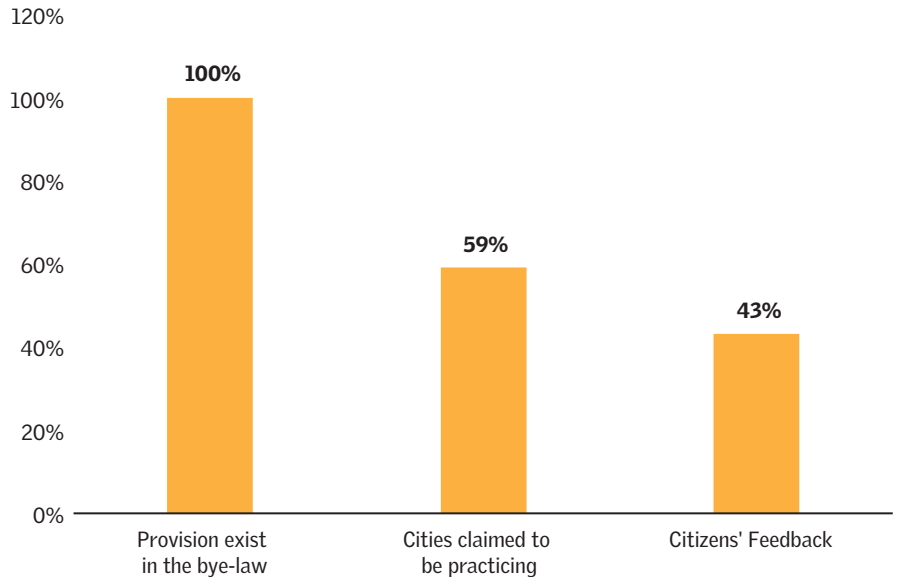
In the context of the current solid waste management ecosystem, there are multiple benefits to strengthening waste management by the BWGs. They are:

i) It ensures the source segregation to the sources of bulk waste,
ii) it substantially reduces the burden of collecting and treating the wet waste by the urban Local Bodies
iii) It makes the collection of dry waste a lot easier
iv) It diverts a considerable amount of waste from going to the landfill

Practice

Our study revealed that the ULBs of all 37 cities have clear provisions for waste management by the BWGs in their municipal bye-laws. Our field visit revealed that only 59 per cent of the cities claimed that they were managing the BWGs in accordance with the rules, while 43 per cent of the citizens agreed with the claims made by their cities, confirming that waste management by bulk waste generators (BWGs) is effectively governed by the city administration.

Graph 6: Bulk waste generators in surveyed cities



In Gurugram, any entity from the above-mentioned category who generates 50 kgs or more waste per day is a bulk waste generator. In 2022, during a study on the solid waste management practices by bulk waste generators in Gurugram, CSE found that there were 681 identified BWGs in the city and of them, 205 were complying with the rules. This means that they were segregating waste at source and managing their organic waste within their premises by composting or bio methanation. One of the recommendations of this study is to revamp the survey, considering that this figure may be an underestimation for a millennium city like Gurugram. In late 2023 and early 2024, the city undertook a complete overhaul of the system following another round of surveys. This included revitalizing the Citizens' Monitoring Committee, which was renamed the Citizens' Supervisory Committee, establishing a dedicated MIS portal for monitoring bulk waste generators (BWGs), and, importantly, publishing the bye-laws for public notification, which had been in draft form since 2018. Now the city has a new list with 1681 BWGs and sent individual notice to all for compliance.

VII. HOME COMPOSTING

Policy

The waste management hierarchy prioritizes the golden principle of reduce-reuse-recycle, with 'reduce' as the most favoured option and 'recycle' as the least preferred. Home composting plays a vital role in minimizing waste at its source, making it a top priority for urban local governments. Section 15(t) of the Solid Waste Management Rules, 2016 categorically mandates urban local bodies to promote home composting at the community level as a measure to reduce waste at source. In India, more than 50 per cent of all wastes is bio-degradable. If home composting is promoted and incentivized through municipal bye-laws for sources like households, institutions, commercial establishments etc, it can treat nearly half of the waste at source which will not only be instrumental in reducing the waste collection burden borne the urban local bodies but also divert biodegradable waste from landfills, thereby reducing large scale pollution and the emission of greenhouse gases. Home composting can be encouraged in schools and colleges, which can then be extended to households and communities. To effectively promote home composting, support

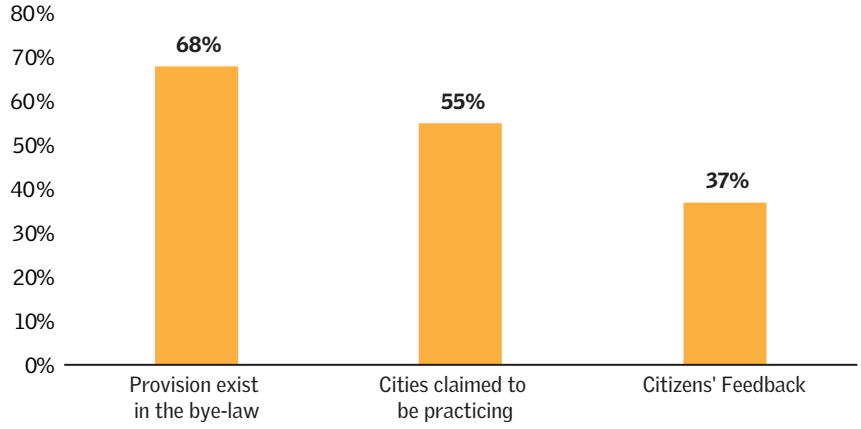
from urban local bodies is essential, along with the engagement of civil societies and other stakeholders. This collaboration will help build the capacity of waste generators and foster demand for composting through tailored behaviour change communication strategies.

Municipal bye-laws are the best legal instruments to incentivize home composting through tax rebates for municipal services. Such initiatives have been very successfully implemented by many Indian cities.

Practice

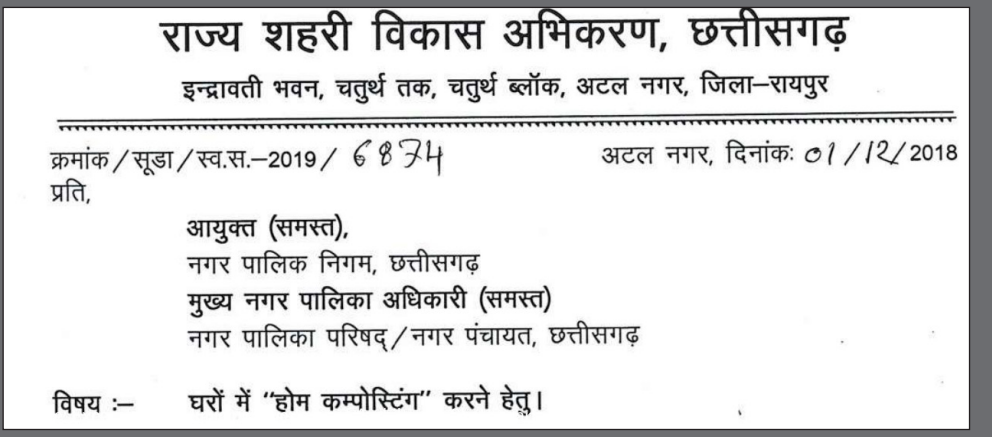
The study examined whether cities are promoting home composting by establishing specific provisions in municipal bye-laws and addressing capacity building and technical requirements through suitable institutional arrangements. Findings from the 37 cities covered under the study found that 68 per cent municipal bye-laws have clear provisions for promoting home composting. During field visits and interactions with the ULB officials, 55 per cent of the cities claimed that they were promoting home composting through appropriate institutional arrangements. Only 37 per cent of citizens in the surveyed cities confirmed that they are practicing home composting or have received specific communication and support for it.

Graph 7: Home composting in surveyed cities



In Indore, over 50,000 households are actively practicing home composting, significantly diverting organic waste from landfills. The Indore Municipal Corporation supports these efforts by providing a 50 per cent subsidy to households for purchasing compost kits, such as buckets and pots. Additionally, the city government offers on-site training for enthusiastic citizens upon request. These initiatives are encouraging greater interest in home composting among residents.

Ambikapur has launched a dedicated initiative to encourage citizens to practice home composting for the organic waste they generate. In 2018, the city issued a notice that included guidelines and procedures for home composting. As part of this initiative, 10 per cent of the interested households were selected to participate and received training. These families were instructed to start home composting right away, and their data was recorded in the city's management information system (MIS) portal.



राज्य शहरी विकास अभिकरण, छत्तीसगढ़

इन्द्रावती भवन, चतुर्थ तक, चतुर्थ ब्लॉक, अटल नगर, जिला–रायपुर

क्रमांक/सूडा/स्व.स.–2019/ 6874 अटल नगर, दिनांकः 01/12/2018

प्रति,

आयुक्त (समस्त),
नगर पालिक निगम, छत्तीसगढ़
मुख्य नगर पालिका अधिकारी (समस्त)
नगर पालिका परिषद्/नगर पंचायत, छत्तीसगढ़

विषय :– घरों में "होम कम्पोस्टिंग" करने हेतु।

VIII. PROHIBITION OF OPEN DUMPING

Policy

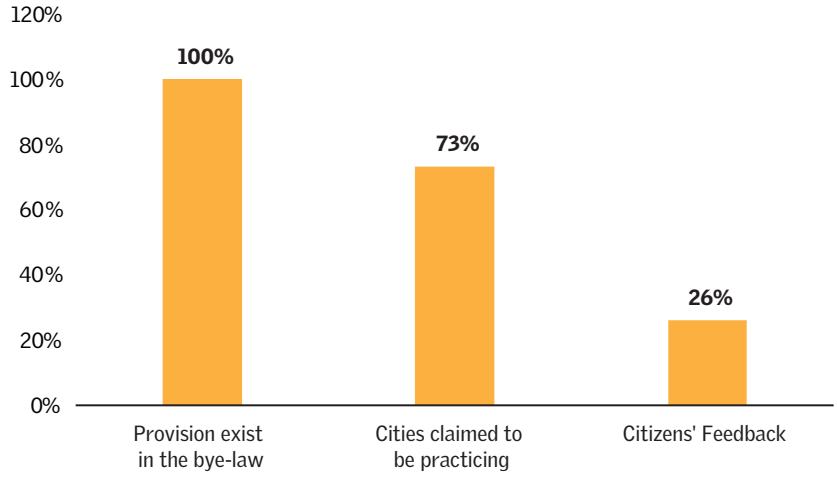
Informal and open dumping of solid waste is very common across all the cities in India. Often open and uncontrolled dumping of waste is said to be an offshoot of limited door-to-door collection. Traditionally, Indian households prefer not to store their waste for more than a day and if the waste is not collected from the doorstep,

people find the easiest options to dump the waste wherever they can. Most commonly, vacant land, vegetation, embankments in waterbodies are found to be hotspots for open dumping of waste. The Solid Waste Management Rules, 2016 has specific provisions to prohibit the practice of open dumping in Section 15(g). However, implementing the rules requires penal provisions that must be included in the municipal bye-law before it is notified. The agenda of open dumping got to an extent when specific measures needed to be initiated to eliminate 'garbage vulnerable points' and later on included in the annual Swachh Survekshan assessment framework with assigned scores and criteria.

Practice

The study examined the use of municipal bye-laws to combat open waste dumping across 37 Indian cities. It found that all the cities had clear provisions against open dumping, including penalties. During field visits, 73 per cent of the cities reported that they were enforcing these bye-laws and penalizing offenders, including recovering penalty amounts. However, only 26 per cent of the citizens agreed with this assessment. Many citizens pointed out that their cities still had numerous hotspots for waste dumping, indicating that the enforcement of bye-laws had minimal or no impact on actual implementation.

Graph 8: Prohibition of open dumping in surveyed cities



In Bengaluru, there is a dedicated task force under the Bruhat Bengaluru Mahanagara Palike (BBMP) called BBMP Marshals who focus on enforcing solid waste management regulations and maintaining cleanliness in the city. It was introduced in 2019 to monitor waste management practices, penalize violators, and raise awareness among citizens about proper waste segregation and disposal methods within the city. There are 451 marshals and 32 supervisors working with the solid waste department and are tasked with maintaining vigils against littering on footpaths and roadsides. They conduct regular patrols and monitoring activities in their designated areas to ensure compliance with waste management rules. If found guilty, the citizens are penalized. BBMP marshals have collected about Rs 27 crore in fines from the public, residents in apartments and from commercial establishments between September 2019 and January 2023 in Bengaluru for unscientific disposal of garbage.

IX. USER CHARGE COLLECTION

Policy

User charges or the fee that every waste generator is supposed to pay for getting their waste collected from the doorstep is a critical cofactor in ensuring economic sustainability of the services provided by the urban local bodies. The Solid Waste Management Rules, 2016 in Section 4 (duties of waste generators), Para 3 categorically mention that, 'all waste generators shall pay such user fee for solid waste management, as specified in the bye-laws of the local bodies'. This means that for the collection of user charges, the only available legally enforceable instrument is the municipal bye-law. The urban local bodies are supposed to fix the tariffs for user charges depending on local issues like income level, distance travelled by the collection vehicles etc. ULBs have the authority to exempt certain population categories or a specific habitation on the basis of a defined criteria at the discretion of elected representatives of the urban local bodies. Regular

collection of user charges is therefore critical and non-negotiable for economic sustainability of solid waste management services. The implementation of a user charge collection mechanism has traditionally been a challenge in Indian cities, often due to resistance from elected representatives. However, many cities have successfully established a robust system by integrating user charge collection with other municipal services through online payment systems. It's essential to recognize that the willingness of waste generators to pay these charges depends on the availability of regular and consistent door-to-door waste collection services.

'User Charges for Solid Waste Management Services and Trade Refuse Charges: As per the directions of the Ministry of Urban Development, Government of India, the Corporation of Chennai Council in Resolution No.688/2018, Dated 21.08.2018 has resolved that User Charges for solid waste management services be levied and collected from the general public/generators of waste in order to meet out the Operation and Maintenance costs involved in the solid waste management programme as per the Schedule of Solid Waste Management User Charges.'

Source: Bye-laws of the Chennai Municipal Corporation

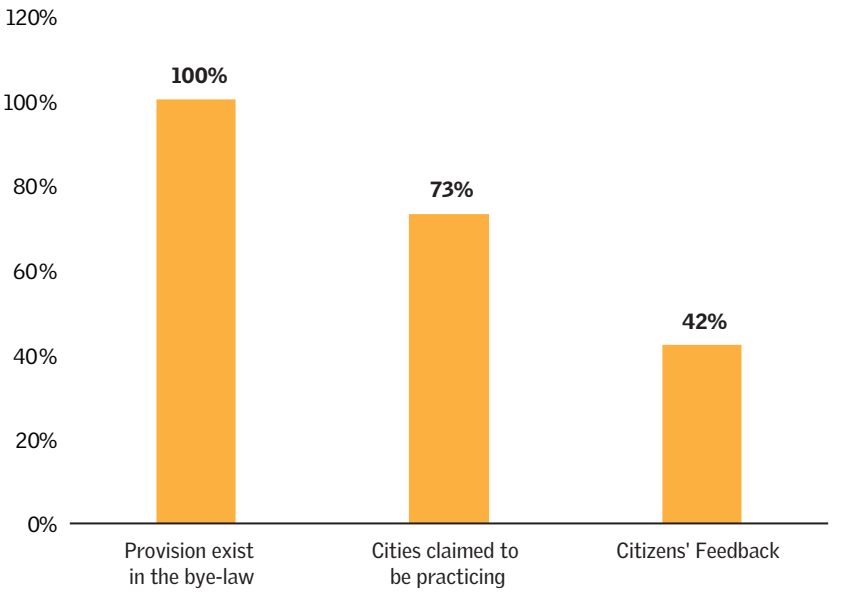
Practice

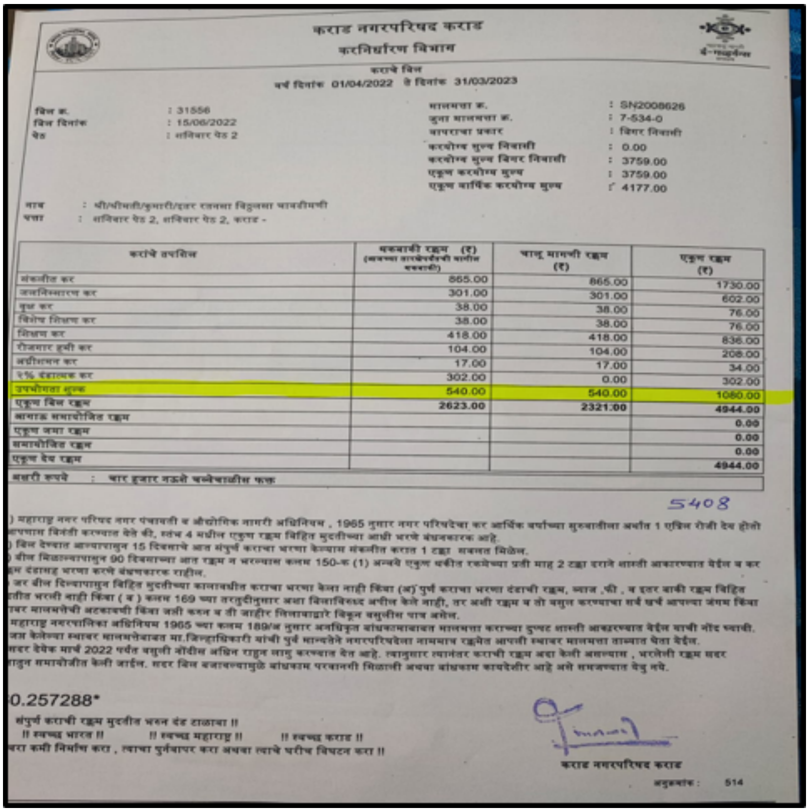
The study thoroughly examined the user charge collection agenda across 37 cities and found that all of them included it in their municipal bye-laws. Additionally, 73per cent of these cities reported having a strong mechanism for collecting user charges. However, the cities did not reveal any specific data so as to substantiate what is the percentage of collection in terms of the number of sources served, the total estimated collection versus actual collection in absolute numbers. The cities however mentioned that data on user charge collection is reported to the national MIS portal managed by the Ministry of Housing and Urban Affairs. The citizens from only 42 per cent of cities have actually corroborated that they were paying user charges for waste collection on a regular basis and the quality of doorstep collection is also decent.

User charge is being collected at the rate of Rs 640 per year during the collection of property tax in Karad Municipality, Maharashtra whereas, Chandigarh collects user charges for solid waste management services along with the water bills. Surat city in Gujarat imposes user charges for garbage collection, Rs 600 per year for residential, Rs 700 for commercial and Rs 1,500 for industrial users. Navi Mumbai charges 60 per month from each household.

However, it was not possible to obtain information on the amount collected in user charges from the cities implementing this provision in their bye-laws. This is primarily because no separate accounting system is maintained to track this data.

Graph 9: User charge collection in surveyed cities





कराड नगरपरिषद कराड

करनिर्धारण विभाग

कराचे बिल

वर्ष दिनांक 01/04/2022 ते दिनांक 31/03/2023

बिल क्र.	: 31556		मालमत्ता क्र.	: SN2008626
बिल दिनांक	: 15/06/2022		जुना मालमत्ता क्र.	: 7-534-0
पेठ	: शनिवार पेठ 2		वापराचा प्रकार	: बिगर निवासी
			करयोग्य मुल्य निवासी	: 0.00
			करयोग्य मुल्य बिगर निवासी	: 3759.00
			एकुण करयोग्य मुल्य	: 3759.00
			एकुण वार्षिक करयोग्य मुल्य	: 4177.00

नाव : श्री/श्रीमती/कुमारी/इतर रतनसा विठ्ठलसा चावडीमणी

पत्ता : शनिवार पेठ 2, शनिवार पेठ 2, कराड -

कराचे तपशिल	थकबाकी रक्कम (₹)	चालू मागणी रक्कम (₹)	एकुण रक्कम (₹)
संकलीत कर	865.00	865.00	1730.00
जलनिस्सारण कर	301.00	301.00	602.00
वृक्ष कर	38.00	38.00	76.00
विशेष शिक्षण कर	38.00	38.00	76.00
शिक्षण कर	418.00	418.00	836.00
रोजगार हमी कर	104.00	104.00	208.00
अग्निशमन कर	17.00	17.00	34.00
२% दंडात्मक कर	302.00	0.00	302.00
उपभोगता शुल्क	540.00	540.00	1080.00
एकुण बिल रक्कम	2623.00	2321.00	4944.00
आगाऊ समायोजित रक्कम			0.00
एकुण जमा रक्कम			0.00
समायोजित रक्कम			0.00
एकुण देय रक्कम			4944.00

अक्षरी रुपये : चार हजार नऊशे चव्वेचाळीस फक्त

5408

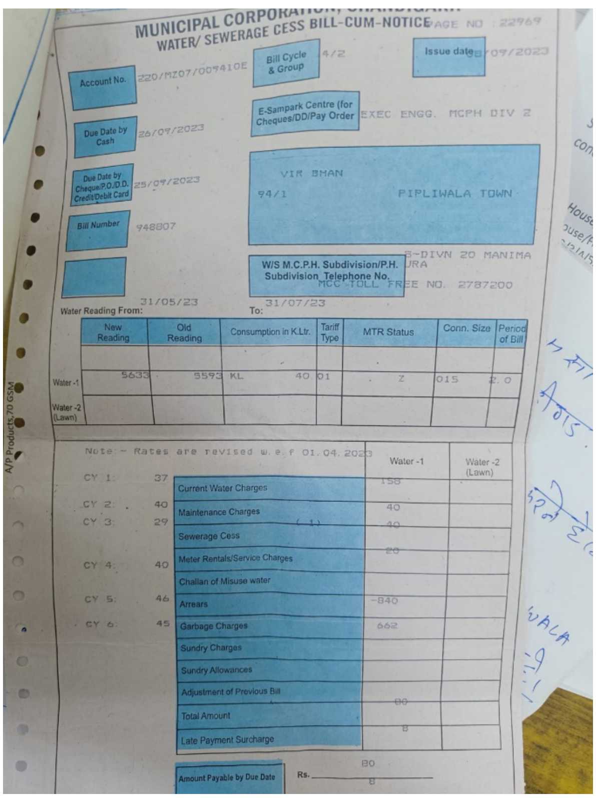
0.257288*

!! स्वच्छ भारत !! !! स्वच्छ महाराष्ट्र !! !! स्वच्छ कराड !!

कराड नगरपरिषद कराड

अनुक्रमांक : 514

Top: User charge is being collected along with the property tax in Karad Municipality, Maharashtra



MUNICIPAL CORPORATION, CHANDIGARH
WATER/ SEWERAGE CESS BILL-CUM-NOTICE

Account No. 220/MZ07/0074106
Bill Cycle & Group 4/2
Issue date 09/07/2023
Due Date by Cash 26/07/2023
E-Sampark Centre (for Cheques/DD/Pay Order) EXEC ENGG. MCPH DIV 2
Due Date by Cheque/P.O./D.D. Credit/Debit Card 25/07/2023
Bill Number 948807
VIR BHAN
94/1 PIPLIWALA TOWN
W/S M.C.P.H. Subdivision/P.H. Subdivision Telephone No.
Water Reading From: 31/05/23 To: 31/07/23

	New Reading	Old Reading	Consumption in K.Ltr.	Tariff Type	MTR Status	Conn. Size	Period of Bill
Water -1	5633	5593	KL 40	01	Z	015	2.0
Water -2 (Lawn)							

Note – Rates are revised w.e.f 01.04.2023

	Water -1	Water -2 (Lawn)
Current Water Charges	158	
Maintenance Charges	40	
Sewerage Cess	40	
Meter Rentals/Service Charges	20	
Challan of Misuse water		
Arrears	-840	
Garbage Charges	662	
Sundry Charges		
Sundry Allowances		
Adjustment of Previous Bill		
Total Amount	80	
Late Payment Surcharge	8	

Amount Payable by Due Date Rs. 80

Bottom: User fees collected under 'garbage charges' along with the water bill in Chandigarh

X. INCENTIVIZATION

Policy

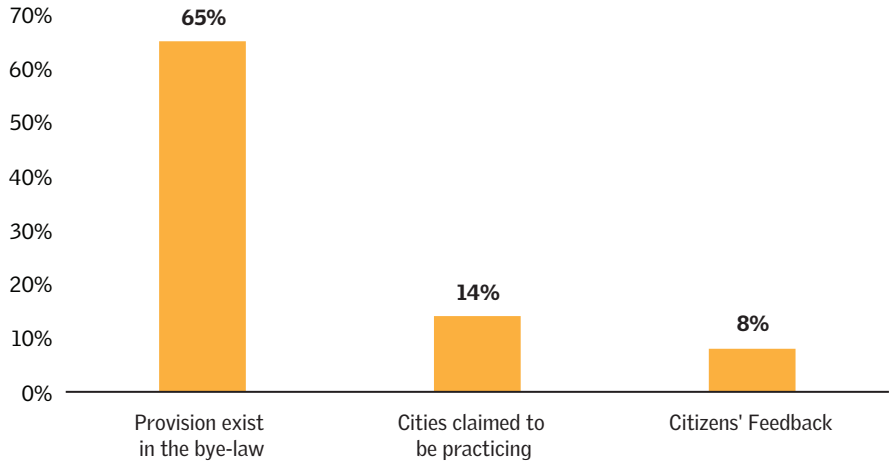
The 74th Constitutional Amendment Act, 1992 empowers urban local bodies to take appropriate decisions to foster economic development and social justice, and use municipal bye-laws as a tool for implementation. In a sustainable solid waste management value chain, there are many critical issues connected to human behaviour when it comes to waste handling and disposal. Issues like segregation of waste at source, composting of wet waste at home or institution, reducing open burning or dumping of waste by certain urban areas etc. requires some kind of rewarding mechanism. The urban local bodies can always create provisions for incentivizing good behaviour to facilitate habit formation by the citizens. Such incentives come in different forms like rebate in property or water tax or any other form of financial discount. Sometime, municipal wards are rewarded by public felicitation for being a good neighbourhood which always helps to create an enabling environment to promote and sustain good practices.

There are many cities in India who have used municipal bye-laws to best effect to create provisions for promoting sustainable behaviour to waste through appropriate incentive schemes. In many cases, such measures have proven to be extremely effective to create an enabling mechanism.

Practice

Data from the 37 cities covered under the study revealed that 65 per cent municipal bye-laws have provisions to incentivize sustainable practices. During interactions with the ULB officials, only 14 per cent cities claimed that they have used the provision of the municipal bye-laws at some point of time in the past or in some cases, such incentives are still being implemented. However, citizens from only 8 per cent cities have validated that they have witnessed any incentive scheme implemented by the local city government.

Graph 10: Incentivization in surveyed cities



Surat Municipal Corporation (SMC) has initiated a scheme to incentivize its norm-abiding citizens in SWM from 2012, called the Anudan Scheme. Here, payments are made to residential and non-residential societies at the rate of 60 paise and 65 paise per sq mt respectively for maintaining cleanliness. The minimum amount payable to the society is INR 1,200 per month. Payments to the societies are done by the SMC based on production of a completion certificate, duly signed by the president of the society on a monthly basis. The societies are required to make an agreement with the SMC to provide regular waste management services in their designated areas. Until now, more than 600 societies have benefited under this scheme.

In Navi Mumbai there is a practice of incentivizing residential socieities for waste segregation and composting (Vermi and bio composting). The annual incentives will range from INR 10,000 to 25,000 per category for two years. The categories are-Flats per society:

Up to 50= INR10,000
50–199 = INR15,000
200–499 = INR 20,000
500 = INR 25,000

The Pimpri-Chinchwad Municipal Corporation (PCMC) in Maharashtra will provide 20 to 50 per cent tax exemption on cleaning tax, if housing societies initiate solid-operating zero waste concepts, sewage systems, waste management or composting systems.

XI. PENALIZATION

Policy

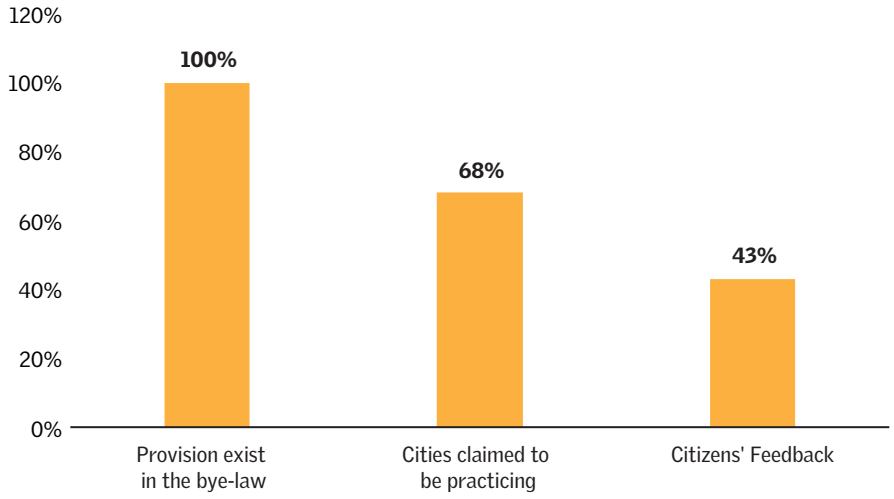
The Solid Waste Management Rules, 2016 has very clear and strong provisions for those found violating the provisions of the law. According to the rules, fine is a 'penalty imposed on waste generators or the operators of waste processing and disposal facilities under the bye-laws for non-compliance of the directions contained in these rules and/or bye-laws'. Therefore, inclusion of penal provision with the amount of penalty for specific types of violations is a must for every municipal bye-law. It's important to note that without a provision established in the bye-law and publicly notified, urban local bodies cannot enforce penalties against violators. The enforcement of such penalties often creates a ripple effect, alerting others who may have committed similar violations to refrain from prohibited practices, even if they haven't yet faced penalties.

There are many Indian cities who have used the penal provisions very effectively in the municipal bye-laws to hold the offenders responsible on certain prohibited practices. Apart from having the provision in the bye-law, it is also critical to have a surveillance mechanism in place to collect information about violation of the solid waste management rules in order to penalize the violators.

Practice

The data collected from the cities included in the study showed that all of them have incorporated penal provisions in their bye-laws. However, only 68 per cent could claim to have implemented these provisions to some extent, with a significant portion of penalties recovered from violators. Nevertheless, only 43 per cent of citizens reported having observed the enforcement of these penal provisions in their cities.

Graph 11 : Penalization in surveyed cities



In Navi Mumbai, in adherence to the Solid Waste Management and Cleanliness and Sanitation Bye-laws 2020, the civic department has begun levying a fine of INR 250 multiplied by the number of housing units in the society. A twelve storied building in Sector 19, Nerul was penalized with a sum of INR 3,000 because they did not adhere to the rules despite multiple notices and even verbal instructions to provide segregated waste.

The Pune Municipal Council (PMC) has recently (May, 2024) increased the minimum fine amount from INR 180–500.

XII. INTEGRATION OF INFORMAL SECTOR

Policy

Section 11(c) of the Solid Waste Management Rules, 2016 defines the role of the Secretary-in-Charge, Urban Development in the states and Union Territories as an entity who shall ensure that 'state policies and strategies should acknowledge the primary role played by the informal sector of waste pickers, waste collectors and recycling industry in reducing waste and providing broad guidelines regarding the integration of waste pickers or

informal waste collectors in the waste management system'. It is an established fact that the larger share of recyclable waste is collected and channelized by informal waste pickers and/or their agglomerations. Despite the legal provisions for the integration of the informal sector in the waste value chain, there is limited evidence of that happening in India where initiatives have been taken to identify, recognize, and utilize their services for efficient management of solid waste in the cities.

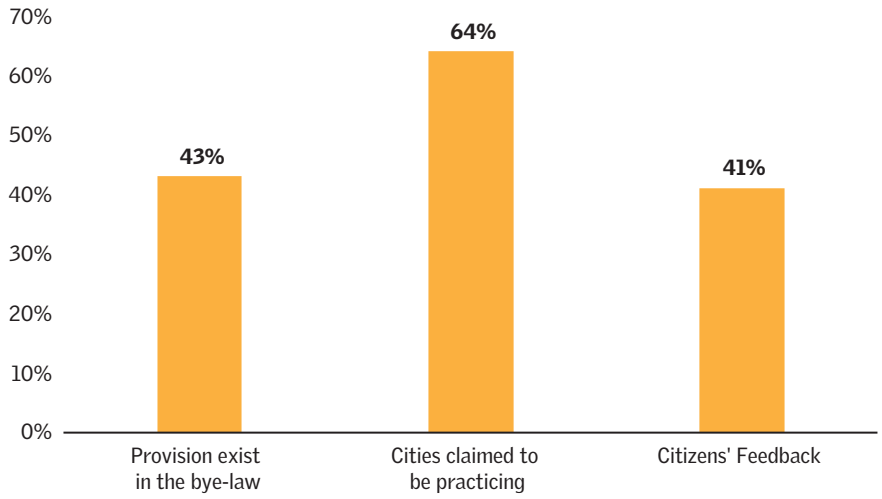
The municipal bye-law is the best instrument where duties of urban local bodies can create clear provisions to identify places and opportunities for the engagement of waste pickers. Apart from creating such provisions, it is equally important to get the same reflected in the implementation practice. It is even more critical to understand the actual meaning of 'integration,' which is often misunderstood as offering them wage-based employment.

There are many Indian cities where very good working models of integration have been established and some of them stand out as examples. The successful integration of waste pickers has two core benefits in both reducing the cost of waste management and ensuring maximum recovery of for recycling and repurposing.

Practice

The study revealed that only 43 per cent of the 37 cities studied have some kind of provision in their municipal bye-laws for the integration of the informal sector. In most of the cases, such integration is wage-based employment, in other cases, cities have provided identity cards to the waste pickers so that they can freely roam around the neighbourhood to collect waste. During a field visit, 64 per cent of the cities claimed to have done some form of integration of the informal sector in the waste value chain while citizens from 41 per cent of the cities confirmed the claims made in terms of integration.

Graph 12: Integration of the informal sector in surveyed cities



In Pune, Maharashtra, the Pune Municipal Corporation has integrated around 4,500 waste pickers into the mainstream solid waste management system through the SWaCH cooperative. These waste pickers collect waste from the door steps of more than nine lakh properties every day. They have been authorized to collect user fees from citizens and they also have access to recyclables which they can sell and earn some extra money. PMC has a tripartite agreement with the SWaCH cooperative and these waste pickers. The corporation has provided them with manual push cart for primary collection and other necessary safety gears, whereas, the city saves more than 100 crores a year of their primary collection costs with the help of them.

In Pune, where a comprehensive cooperative model of integration of informal sector is in place, Pune claims that 35 per cent of the city's household dry waste is being recovered by the waste pickers for recycling and 37 per cent of the plastic is recovered by them for recycling.13 Whereas the nation wise average for plastic recycling by informal waste pickers is 20 per cent.[14]

The engagement of informal waste pickers in the solid waste management ecosystem in our country has enormous social, economic, and environmental impact.

XIII. SAFETY OF SANITATION WORKERS

Policy

Section 15(zd) of the Solid Waste Management Rules, 2016 mandated urban local bodies to 'ensure that the operator of a facility provides personal protection equipment, including uniform, fluorescent jacket, hand gloves, raincoats, appropriate footwear and masks to all workers handling solid waste and the same are used by the workforce'. This is mandatory along with periodic health monitoring of workers to ensure the safety of sanitary workers at the workplace. Municipal solid waste largely comprises four major fractions i.e. biodegradable waste, non-biodegradable waste, domestic hazardous waste and sanitary waste. Of these four fractions, domestic hazardous waste and sanitary waste come under the hazardous category and pose greater health risks to sanitary workers due to continuous exposure. This is a critical component of the 'duties and responsibilities to be fulfilled by urban local bodies'.

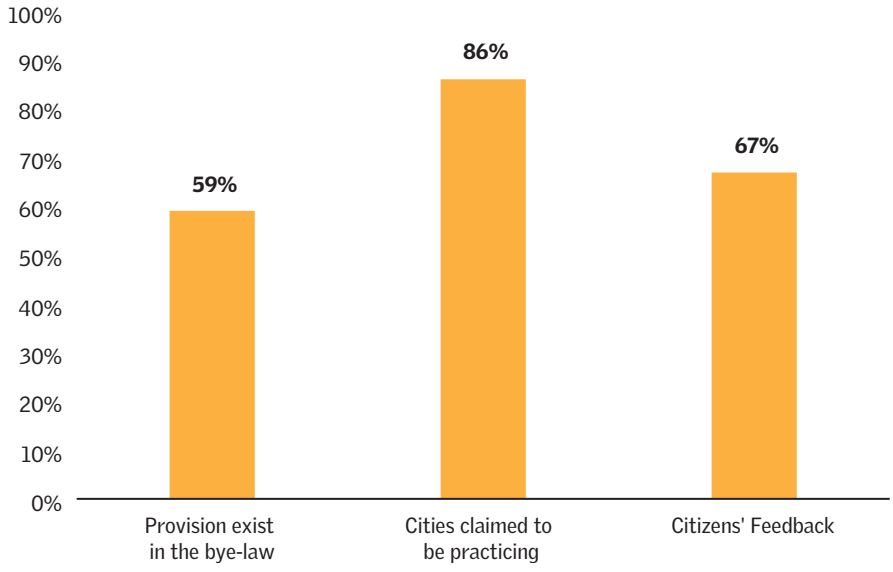
In reality, this is an area which is largely ignored by the city governments and sanitary workers have been found to be working with minimum safety equipment. Sometimes, the safety equipment being used are in dilapidated conditions. Very little awareness has been observed among sanitary workers about the potential health hazards from their occupations. The frequency of health check-up arrangement for the sanitary workers have also been found to be inadequate.

Practice

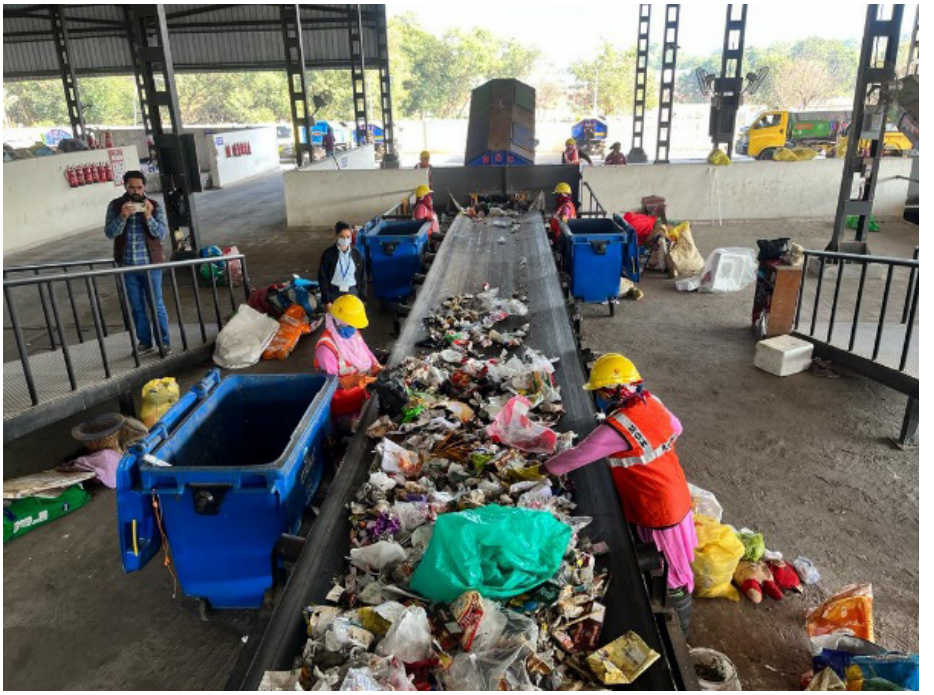
The study revealed that only 59 per cent of municipal bye-laws consider the safety of sanitation workers. Meanwhile, 86 per cent of cities reported that they regularly address these concerns, even including those that have not incorporated such provisions into their bye-laws. Citizens from 67 per cent of the cities confirmed to have seen the sanitation workers operating with safety equipment. However, they were unable to comment whether their health condition was being monitored by the city government. Field

level observation also suggests that in most of the cases, sanitary workers used mere plastic gloves and a florescent jacket. The gloves were insufficient for the type of work and frequently tore. PPE kits and other safety equipment have not been updated for a long time, highlighting a disregard for worker safety.

Graph 13: Safety of sanitation workers in surveyed cities



Pune Municipal Corporation (PMC) pays an annual health premium of INR 5,000 to informal waste pickers whom they have integrated into the solid waste management system. Shillong Municipal Board has linked informal waste pickers who work in the Martem Dumpsite with the government hospitals for free health check-ups and yearly medical insurance. Similarly, around 40 women sanitary workers who serve at the pink MRF in Chandigarh city are having the facility of health and accidental benefit, received safety gears from the city.



Women waste pickers are working in pink MRF protected with safety gear in Chandigarh city

Job identity card handed over to informal waste pickers who have been integrated into the solid waste management system in Karad, Maharashtra

XIV. GRIEVANCE REDRESSAL MECHANISM

Policy

In order to monitor the quality of solid waste management services offered by the municipal government, having a mechanism to address grievances of the citizens is an integral part. While the monitoring mechanism is meant to look into the operational aspects of the services, that largely include source segregation, guaranteed on-time collection, vehicle movement, daily attendance of the sanitary workers, drivers etc. waste treatment and processing in respective facilities, waste received at the landfill etc. The essence of having a grievance redressal mechanism is critical so that the gaps in the services is brought to the attention of the municipal government and those are addressed for improving the quality of services and also holding concerned officials responsible for any lapses in discharging their duties. Majority of the grievances are received in connection with timely and regular collection of waste, behaviours of the authorized waste collectors, mixing of segregated waste into one compartments (when the vehicles are not designed to receive and transport segregated waste), detouring of vehicles from designated routes, collected of waste from unauthorized sources, unauthorized absenteeism, collection of user fees and charges for personal benefits etc.

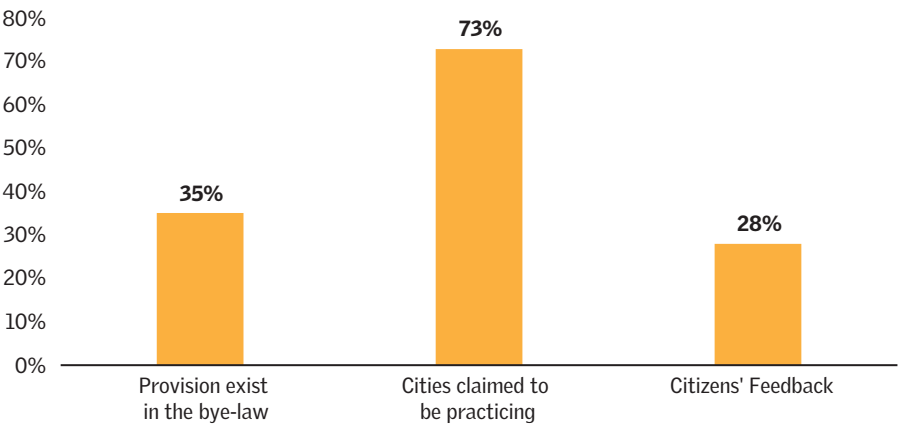
Many Indian cities have got a strong grievance management mechanism in place which always acts as a catalyst to build and environment of trust between the citizens and the municipal government. In many cases, the grievance management mechanism has been kept independent of the operational monitoring of waste management systems which is the most preferred option.

There is no direct mandate for setting up a grievance management mechanism from the Solid Waste Management Rules 2016 but with the power and authority delegated to the urban local bodies by virtue of the 74th Constitutional Amendment Act 1992, they are empowered to introduce such mechanism as a measure to ensure transparency and accountability in municipal services.

Practice

The study found that of the 37 cities covered, only 35 per cent have provisions for managing grievance in the municipal bye-law while 73 per cent of the cities claimed to be implementing similar mechanism in some form or the other. In many cities, a mobile number or a WhatsApp number is circulated among the citizens and the same is also featuring in the web portal of the local bodies to inform the citizens. In many cases, it has been observed that the institutional arrangement to address the grievances raised by the citizens are either very weak or does not exist. Citizens of only 28 per cent cities have confirmed to have seen the presence of some kind of grievance management mechanism in their cities. Majority of the citizens have opined that the grievance management mechanism is dismal and dissatisfactory.

Graph 14: Grievance redressal in surveyed cities



Indore's 311 Mobile app, launched in 2016, offers citizens a single platform to access public service information and report civic issues with photos. The complaint is immediately sent to the relevant officer, with a 24-hour resolution timeline. Once resolved, the officer uploads a proof picture, and a feedback call is made to the complainant. The complaint is closed after receiving satisfactory feedback.

XV. DISPOSAL OF WASTE INTO SANITARY LANDFILL

Policy

The Solid Waste Management Rules 2016 in its section 15(zi) clearly mandates to "allow only the non-usable, non-recyclable, non-biodegradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities to go to sanitary landfill and the sanitary landfill sites shall meet the specifications as given in Schedule–I, however, every effort shall be made to recycle or reuse the rejects to achieve the desired objective of zero waste going to landfill". Despite the mandate, collection of mixed waste (which is also prohibited by the rules 2016) which includes all types of municipal solids (wet, dry, hazardous and sanitary, is still being practiced by majority of Indian cities. This is a practice which clearly violates the provision of the law. Landfilling of waste happens to be the easiest option to the municipal bodies. In many cases, the ULBs are yet to setup facilities for treatment and processing of waste which leaves them with landfilling as the only option to dispose of the waste. This way, while the cities are looking cleaner, we have grown more than 3100 dumpsites in India. Biominig of the manmade garbage mountains is one of the big mandate under the ongoing Swachh Bharat Mission 2.0. Needless to mention that biomining operation is very expensive and the cities are practically spending twice for the same waste (a) for collection and transportation and (b) cleaning the garbage mountain to reclaim the land. Such practice has added the economic burden on the cities despite some central assistance to share the cost. In addition, the garbage mountains are pollution hubs that is causing water, air and soil pollution and affecting human health, the nearly human settlements in particular.

The SWM Rules, specifies that local body having a population of 0.5 million people or more to set up a common sanitary landfill for disposal of only residual waste from the processing facilities as well as untreatable inert waste. A sanitary landfill is scientifically engineered landfill to contain, control and manage waste. A sanitary landfill includes advance engineering strategies such as gas

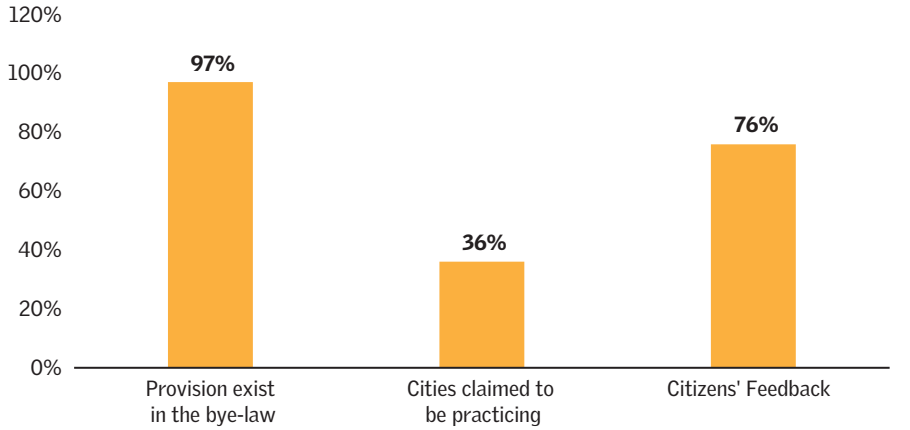
extraction and collection system, leachate management system, ground water monitoring program, dust suppression measures and vegetation covers for erosion control. The SWM Rules, 2016 also suggest that the landfill site should be 100 metres away from river, 200 metres from a pond, 200 meters from highways, habitations and parks and water supply wells, and 20 km away from air ports or air base

The municipal bye-law could be a great instrument to put an end to this practice by adopting measures like ban on dumping of food waste and combustible waste and also by levying landfill tax for incoming waste which is in practice by the cities in global south and north.

Practice

The study emerged with the findings that says 97 per cent of the 37 cities covered are having the provisions in their bye-laws that is synonymous with the provisions of the rules 2016 which mandates minimum disposal and maximum processing. Only 36 cities could claim that they had measures in place to prevent treatable and recyclable waste from getting into the landfills. In reality, less than one per cent of Indian dumping ground is scientific landfill. 76 per cent of the citizens from the sample cities have claimed that their waste is being taken to dumpsites but they did not confirm it as scientific landfill compared to the claim made by 36 per cent cities.

Graph 15: Disposal of waste into sanitary lanfills



The city of Chandrapur in Maharashtra generates 11 tonnes of waste per day. Since 2016, in alignment with India's flagship program Swachh Bharat Mission, the city is sending only the non-recyclable, non-compostable, non-combustible, and non-hazardous inert for landfilling as per the mandate and thus achieving the zero landfill status.

The city has secured 85 per cent source segregation into three main categories: bio degradable, non-biodegradable and domestic hazardous. They have an integrated processing unit within the landfill area and around 95 per cent of the waste is either recycled, processed or recovered. There is one vermicomposting and one windrow composting unit existing within the facility for the biodegradable waste.

Around 800 households also have started doing home composting. This has reduced the burden on the landfill. There is a separate storage for domestic hazardous waste which will later be handed over to the authorized processors as per the norms.

XVI. PROHIBITION OF OPEN BURNING OF WASTE

Policy

Section 4 of the solid waste management rules 2016 speaks about duties of the waste generators. Subsection 4(2) clearly mandates "No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies". Burning of waste is a traditional challenge being faced by the municipal government

across the nation. In most of the cases, the combustible wastes are collected into heaps and burnt to get rid of the responsibility to manage them in a scientific manner. Burning of waste is more prevalent during early morning and late evening even by the human settlements which are least serviced by the municipal authorities. Such practice causes massive air pollution and paves the way serious health hazards among the dwellers. Despite having clear legal provisions to penalise such practice by fines or otherwise, it is least implemented across the country. Besides, there has been very

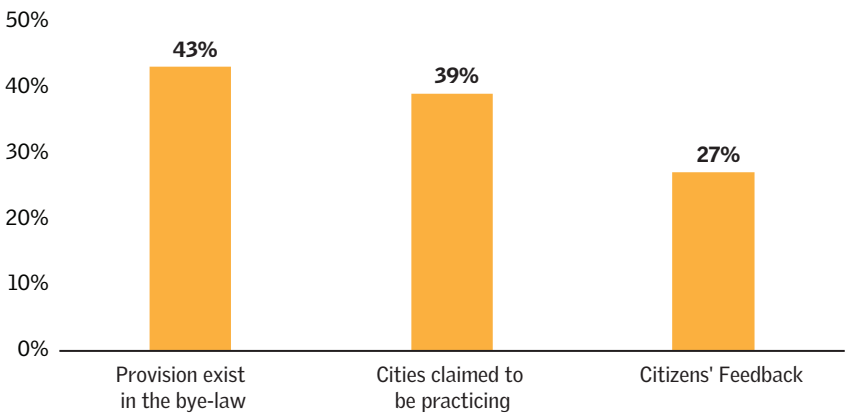
limited efforts by the municipal administration to raise awareness among the citizens to inform them about the detrimental effects of waste burning and creating a surveillance mechanism with the help of the citizens so that such practices could be brought to the attention of the city authorities for appropriate countermeasures. It is an established fact that burning of waste is an offshoot of limited and timely collection by the ULBs. During winter, the frequency and scale of burning goes up manifold to deal with the cold wave.

The cities must use and factor specific penal provision to address the waste burning practice in their municipal bye laws and also create a monitoring mechanism with the help the citizens, institutions and law enforcement agencies to deal with it.

Practice

The study found that only 43 per cent of the 37 cities covered were having specific provisions to prevent waste burning in their bye-laws. 39 per cent of the cities claimed that they were implementing appropriate measures to prevent waste burning and penalize the offenders while citizens of only 27 per cent cities confirmed to have witness any such effort by their cities.

Graph 16: Prohibition of waste burning



In between November 2023 to February 2024, The Brihanmumbai Municipal Corporation (BMC) has registered 142 cases of open waste burning and a sum of INR 61, 900 was collected as penalty for such violation. The city has recently launched a new feature in its toll free number where citizens can complain against cases of waste burning openly. And because of this feature, such strike in the cases against waste burning have been registered.

The Pune Municipal Corporation (PMC) has recently (May, 2024) increased the fine for open burning from INR 500–5,000

4

KEY FINDINGS AND RECOMMENDATIONS

The formulation, adoption, and notification of bye-laws involve a rigorous process, with elected representatives (Parshads) from each ward playing a critical role. To strengthen by-laws as effective tools for sustainable sanitation, prioritizing capacity building for these representatives on by-law efficacy and their responsibilities is essential.

Despite strong municipal by-laws on solid waste management, Urban Local Bodies (ULBs) face challenges in enforcement and meeting mandates aligned with circular economy principles. Strengthening by-law enforcement is essential for building a robust, sustainable waste management ecosystem.

The study covered 37 cities and reviewed the status and extent of notification of municipal bye-law for solid waste management and found out that 11% bye-laws have never been notified.

The purpose of the bye-law is to empower local governments in line with the principle of subsidiarity. It also provides a legal basis for planning the collection, storage, transportation, processing and disposal of municipal waste for the ULBs. The bye-law also requires ULBs, within their boundaries, to manage the waste for resource recovery and recycling, imposition and collection of fees, and establish certain rights for the ULBs. The bye-laws also delegates power and authorities to the ULB to implement the bye-law through a City Sanitation Society, providing remedies, prescribing penalties, and making repeals whenever needed.

One of the objectives of introducing these bye-laws is to create an enabling environment for sustainable solid waste management with active participation of the waste generators. The bye-law is meant to be used to incentivize or penalize erring citizens as well as erring staff when it comes to solid waste management so that waste can be managed in an effective manner. The ULB intends to convey the importance of sanitation to all its citizens and it acknowledges the role of people and their participation in effective governance. Active citizen groups, NGOs and Resident Welfare Associations can make valuable contribution in effective implementation of the bye-laws.

Following a thorough analysis of the bye-laws across various states and cities, as well as an assessment of the implementation status of their provisions, the key findings are as follows. Despite the presence of a robust legal framework through Municipal Bye-laws on Solid Waste Management, the capacity of urban local bodies to utilize these laws for enforcement and to effectively fulfill their mandates in managing solid waste in line with the circular economy principle has been significantly constrained. In summary, ensuring the effective enforcement of the municipal bye-law to establish a robust solid waste management ecosystem will require significant attention in the future. The larger policies of solid waste management, especially the Solid Waste

Management Rules, 2016 provides a basic legal framework and functional domain. Municipal bye-laws are supposed to use the national law as the premise and provide operational details of the nuances for clarity of understanding and enforcement. Further the bye-law must be drafted and adopted to address local needs and challenges. These challenges and local needs like area, population density, demography, livelihoods, economy and income level, road condition, terrain, presence of bulk waste generators etc. drastically varies from one place to the other. It is therefore critical to frame the bye-law within the ambit of the national policies so that local needs and issues can be addressed.

The following section summarizes the key learnings that emerged from the study and recommendations for improving the scenario.

CAPACITY BUILDING OF ELECTED REPRESENTATIVES

The study involved 37 different cities from north, south, east and western India. It therefore involves an extensive review of a wide variety of bye-laws. One common agenda that was identified is the limited role of elected representatives in adopting and enforcing the bye-laws. The process of bye-law formulation, adoption and notification goes through a rigorous process involving critical role of the elected representatives (*Parshads*) from their respective wards. The elected representatives are supposed to play a critical role to sensitize their constituencies once the bye-law is notified. The role of the elected representatives in implementation and enforcement of the bye-law have been found to be very limited across the country. If bye-law has to be used as a strong legal instrument to institute to sustainable sanitation, their capacity building around the efficacy of bye-law and their role must be one of the top priorities going forward.

FRAMING OF BYE-LAWS BY THE LOCAL GOVERNMENT

The entire premise of the 74th Constitutional Amendment Act (CAA) revolves around delegating more power, authorities and

resources at the disposal of the municipal authorities to enable them to function as units of local governments. The inherent philosophy is based on the principle of subsidiarity. The study found that more than 20 per cent of the bye-laws are framed by the respective state authorities which have later been adopted and notified by the municipal governments. Such practice is not in line with the principles of the 74th CAA. The process of formulation of bye-laws must be based on the local economy, population density, livelihoods and other factors so that local priorities are reflected in the scope. The Solid Waste Management Rules therefore must provision formulation of the bye-laws at the local government level following due diligence with involvement of the district and state administration during the process of ratification and enforcement. The process must explore institutionalizing participation of the citizen's representatives from all municipal wards, key institutions, commercial establishments, resident welfare association etc. to ensure inclusive governance and the time of implementation and enforcement.

INCLUSION OF ENFORCEMENT OF BYE-LAW IN THE AMBIT OF SWACHH SURVEKSHAN ASSESSMENT FRAMEWORK

Since 2016, Swachh Survekshan provides the assessment data to policy makers to assess performance of the municipal governments in matters related to sustainable sanitation. Currently, the Swachh Survekshan assessment framework includes elements of the bye-law, such as user charge collection, but it does not cover aspects like the process of creating, notifying, enforcing, or the status of implementation. The citizens' feedback section of the assessment also misses questions about municipal bye-law and the city's performance. As a matter of strategy, the components of municipal bye-law, including the subsets like 'duties of waste generators,' and 'duties of the urban local bodies,' must be brought under the ambit of the Swachh Survekshan Assessment Framework going forward. Once the agenda of bye-law is included in the score-based assessment, its importance to the municipal governments will increase manifold which eventually result in improved enforcement.

INCLUSIVE APPROACH TO NOTIFY THE BYE-LAW

The study covered 37 cities and reviewed the status and extent of notification of municipal bye-laws for solid waste management and found out that 11 per cent of the bye-laws have never been notified. The remaining 89 per cent, even though notified, had very limited impact on the ground in terms of enforcement and compliance. The process and instrument of notifications are usually limited to a newspaper advertisement, notice in the office of the municipal government etc. As a result, the notification process fails to reach a wide audience or achieve the necessary scale. The process must include a rigorous drive for communicating the waste generators (individual, institutional, commercial) using channels like social media (whatsapp, facebook etc.), text messages using the property tax database preferably in the local language and in simpler words. Such a process must be followed whenever the bye-law is revised. Such effort by the municipal government will foster inclusive governance and participation of the citizens resulting in much higher compliance.

CLEAR PROVISIONS OR INCENTIVES AND PENALTY

Considering the current state of waste management and challenges associated with collection of user charges, source segregation, composting of organic waste at home, littering, burning, burying of waste, the bye-law is supposed to have clear provision for incentivizing good practice and penalizing offenders to promote sustainable and environment-friendly behaviour among the citizens. There are great examples of cities where the bye-laws have been instrumental in promoting sustainable behaviour. Despite majority of the bye-laws examined for the study (65 per cent with provisions for incentives, 100 per cent with penalty provision) had these provisions, the implementations have been very limited. Citizens of only eight per cent of the surveyed cities have received incentives for good practices and 43 per cent of the citizens have witnessed the enforcement of penal provisions for offenders and polluters. Therefore, having provisions in the bye-law definitely provides a legal instrument to the municipal governments but strategic enforcement of the bye-law with mandatory provisions for incentives and penal provisions continues to be a challenge. Policy makers must identify elements that are critical to

instituting a sustainable sanitation ecosystem and revising the rules accordingly. Simultaneously, monitoring the enforcement and implementation of these bye-laws is also critical for periodical review of the performance of the cities.

INTRODUCING STRENGTHENING DUTIES AND RESPONSIBILITIES OF THE MUNICIPAL GOVERNMENTS

The municipal bye-law can be seen from two different perspectives —'duties and responsibilities of the waste generators,' and 'duties and responsibilities of the urban local bodies'. During the course of the study and interaction with stakeholders, it was evident that the municipal government was unable to enforce the provisions of the bye-laws primarily because they were unable to fulfil the duties and responsibilities themselves. For instance, if citizens are required to segregate their waste at source, as stipulated in the waste generator bye-law, the waste management system must be adequately equipped to collect, transport, and process the segregated waste streams. This should be done according to the specific waste fractions and with the appropriate technology, enabling Urban Local Bodies to effectively fulfill their responsibilities. While interacting with the ULB officials and citizens during the study, it was quite evident that the relationship of trust between the citizen and the local government got affected because in many cases, the ULBs could not fulfil their responsibilities as envisaged in the bye-law. The study found that issues such as segregation (32 per cent), prohibition of open dumping (26 per cent), prohibition of waste burning (27 per cent), user charge collection (42 per cent) are some of the areas where duties and responsibilities of the urban local bodies were major concerns. The feedback from the citizens plays a very critical role to gauge the efficacy of the bye-law towards sustainable solid waste management practices. Even the mechanism for grievance management were found to be implemented in 28 per cent cities only. Therefore, an institutional mechanism for collecting feedback on enforcement and implementation of the provisions of the bye-law is the need of the hour. Solid waste management is a service that the municipal government offers to the citizens, where fulfilment of the mandate by the ULBs is extremely critical for enforcement.

IMPLEMENTING DETERRENTS IN THE BYE-LAW TO DISCOURAGE WASTE DUMPING

The practice of collecting and dumping waste with minimum or no treatment is a traditional and prevalent practice in many cities. Solid waste management has transitioned from, 'cleanliness of the cities,' to 'waste to wealth,' and currently being viewed as a potential source for revenue which calls for a diversion of waste from getting to the dumpsite through treatment and processing. None of the 37 bye-laws reviewed for the study have been found to have any element that disincentivizes the practice of dumping. The bye-law must include mandatory provisions for a sustainable procurement practice to move away from a tipping fee for collection of mixed waste to contracts that are designed to pay for segregated collection, transportation and treatment. Such practices must be embedded into the standard operating procedure for a bidding process and feature in the terms of reference in the bid documents. In addition, there must be a legal ban on dumping organic and combustible waste that can act like a deterrent to waste dumping without any treatment. The other measures could be introducing a landfill tax depending on the quantity of waste brought to dumpsites to promote waste segregation, segregated collection and transportation, treatment and processing. These measures are the need of the hour if the dream of waste-to-wealth has to be a reality in line with the principles of circular economy. Since the Solid Waste Management Rules, 2016 clearly mandated landfilling of only non-reactive and non-hazardous waste, these measures are extremely critical to make the older bye-laws more relevant in the current context of waste management. The Government of India and state governments must take these recommendations into consideration and provide clear directions to municipal governments to revise their existing bye-laws accordingly and notify them subsequently.

CLEAR PROVISION FOR INTEGRATION OF INFORMAL SECTOR FOR LIVELIHOODS AND WASTE PROCESSING

Informal waste pickers play a crucial role in fostering a circular economy within the solid waste management system by promoting recycling, reducing collection and transportation costs for city administrations, and working at various source points, including households, to segregate and recover waste. These workers, skilled in segregation, also operate at Dry Waste Collection Centres (DWCC), helping cities save at least 50 lakhs annually.[18] The study found that 41 per cent of the cities surveyed show some form of informal sector integration. However, the modalities and approach vary significantly from one city to another due to the absence of comprehensive guidelines or policies, and the integration remains inconsistent.

Waste pickers still constitute the most labour-intensive yet least paid and unrecognized workforce in waste management. They work under hazardous conditions, are exposed to toxic waste without health or social security, leading to serious health risks like pneumonia, skin cancer, bronchitis, and infections. Despite their crucial role, they lack basic protection and face fatal health consequences due to unsafe working environments. The Solid Waste Management (SWM) Rules, 2016, directed Urban Development Departments of States and Union Territories to develop a policy and strategy for integrating informal waste pickers. This should be done in consultation with relevant stakeholders, including waste pickers and self-help groups, aligning with national policies. The strategy was expected to be developed within one year of the rule's notification, but implementation remains limited.

Despite 43.24 per cent of cities including informal waste picker integration in their bye-laws as part of their obligations, it remains a guideline rather than a legal mandate. As a result, cities are hesitant to fully adopt this responsibility. The integration of informal workers into the solid waste management system is still in its early stages.

To ensure effective integration of informal waste pickers into the solid waste management system, municipal bye-laws should be amended to provide a clear legal mandate for their inclusion. These bye-laws should not only recognize the role of informal waste pickers but also formalize their engagement in various waste management activities, such as door-to-door collection, segregation at source, and operations in Material Recovery Facilities (MRFs). Additionally, the bye-laws must guarantee fair wages, access to health and social security benefits, and safe working conditions. This legal framework should be aligned with national policies, ensuring that municipalities adopt these provisions as part of their obligatory duties, rather than optional guidelines, to create a consistent and equitable system across all cities.

REVISION IN USER FEES IS THE NEED OF THE HOUR

User charges provide the civic body with a major revenue stream to partially bear the cost of waste management and provide the required services. Fixing tariff for the waste generator is therefore an integral part of bye-law formulation. User charges can be different for various income groups and the quantity of waste generated. The poorest or citizens belonging to lower income groups can be completely exempted from the user charges while the others should be made to pay an appropriate tariff for doorstep collection of waste every day. The study found out the absence of a mechanism to determine the tariff after careful assessment of the cost incurred for managing the value chain. In many cases, the age old tariffs are still being continued knowing that the cost has increased manifold in terms of cost of living. For example, it was found that Haridwar has the same user charges between big bungalows and a slum dweller, fixed in a bye-law that was notified back in 2011 and thereafter never revised again. This is a classic example of why finalizing user charges must be done locally after careful assessment of the population and sources belonging to different income groups. The property tax amount should also be

taken as a basis to determine user charges, especially for the urban poor. Need-based surveys are also required to be undertaken before determining the user charges. A mechanism must be devised to collect user charges online, along with other type of taxes that are already within the scope of Swachh Survekshan. There should be specific directive from the policy makers to determine user charges and collection mechanism using bye-law as the instrument.

REVIEW OF BYE-LAWS IN REGULAR INTERVAL

Whether the bye-laws need any amendment or modification should be an annual exercise by the municipal governments in line with all the policy amendmends or new policies under supervision of the Urban Development Department of the concerned states. The effective implementation of the provisions of bye-laws should be reviewed for the existing provisions by the responsible city officials at least bi-yearly where the targets and its achievements should be evaluated for necessary course corrections. Except a few, no other cities under the study have been found to be reviewing their bye laws to identify areas that were required to be amended to be compliant with the concurrent policy landscape. The bye-laws drafted by the cities under the study found to have very minor variations over the years. Some mandate source segregation into two categories, while others are asking for three or six different categories. User charges and penalties differ across cities, with places like Panaji, Daman and Diu, and Aizawl emphasizing the importance of establishing citizen resource bases, maintaining transparent data on the quantum of waste received in landfills, and implementing mechanisms for proactive disclosure of their data on city websites. Despite these differences, all the bye-laws are aligned with the Solid Waste Management Rules, 2016. It is therefore strongly recommended to provide clear directive for periodical review of the bye-law by the state and local government authorities to make the bye-laws more concurrent, relevant and useful for enforcement and sustainability.

CAPACITY BUILDING ULB OFFICIALS AND OTHER STAKEHOLDERS FOR IDENTIFICATION OF ISSUES AND PRIORITIES IN THE BYE-LAWS

The study's findings concluded that the enforcement and implementation of municipal bye-laws are hindered by a combination of limited political attention from elected representatives and the lack of capacity among ULB officials to fully understand the importance and complexities of the bye-laws, which are crucial for establishing a sustainable solid waste management system. A comprehensive bye-law should include specific guidelines for stakeholder mapping and an annual plan for capacity building. The study found very limited evidence of capacity-building efforts for ULB officials and other stakeholders. Therefore, it is essential to establish a clear mandate to create a mechanism for capacity building and support for municipal governments, with a specific focus on prioritizing the elements of municipal bye-laws to enhance implementation and accountability.

CONCLUSION

In the spirit of the 74th CAA, empowerment of the city government is absolutely important through financial devolution, greater autonomy in mobilising resources, levying user charges to cover costs, reform in governance and building their capacity in planning and implementation. [11]

It is reasonable to assert that the components of the bye-laws are appropriate and sufficient for the current context, provided they are regularly reviewed to adapt to changing circumstances. However, enforcement remains a significant challenge nationwide. For effective implementation of municipal by-laws, there must be alignment and cohesion between policy and practice.

Urban Local Bodies in Indian cities, along with relevant departments, must take urgent action to address gaps in the implementation of by-laws derived from the Solid Waste Management Rules. .

This requires stakeholder consultations to ensure source segregation, regular door-to-door waste collection, creating source-wise inventory of waste generators, capacity building for officials and the public, behaviour change initiatives, adequate infrastructure for waste processing through decentralized or centralized approach, and stronger public-private partnerships. Additionally, integrating the informal sector into the waste management value chain and establishing robust monitoring systems are essential for effective solid waste management and environmental protection.

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Efficacy of Municipal Bye-Laws for Solid Waste Management in Indian Cities: Policy vs Practice **delves into the complex interplay between regulations and on-ground implementation of solid waste management practices across India. This comprehensive analysis evaluates municipal bye-laws derived from the SWM Rules, 2016, spanning 37 cities. Through comparative insights, it highlights successes, gaps, and citizen perceptions, offering a critical examination of enforcement challenges and innovative strategies. The report is an essential resource for policymakers, urban planners, and sustainability advocates aiming to bridge the policy-practice divide and foster effective urban waste management systems.**

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