

INSTITUTIONAL ASPECTS OF SOLID WASTE MANAGEMENT IN INDIA

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ABSTRACT

The issue of solid waste management (SWM) has been neglected in India over the past decades, resulting in highly inadequate and inefficient SWM services. Improving waste management requires promoting a transparent institutional framework with clearly defined roles and responsibilities of different actors. Public authorities and service providers must be held accountable to the public according to the principles of good governance. Moreover, professionalization of the waste management sector and its employees is essential to improve the delivery of such critical services that affect the health, environment and quality of life of city dwellers. This paper describes the current situation of waste management agencies in India and provides a set of guidelines to enhance the capacity of the agencies to implement waste management more efficiently.

INTRODUCTION

In most cases, waste management is the responsibility of local governments. Local governments are therefore responsible for the collection, cleaning, storage, transshipment, treatment and final disposal of waste (Banerjee, 2019). However, in many cases, the delivery of this service is not efficient and the providers are not accountable to the residents and businesses they serve. Another typical problem is that waste management services are dependent on municipal departments that do not have the appropriate know-how. To improve service, SWM needs to be professionalized and the waste department should be managed by personnel trained to use these systems. Local governments need to understand how solid waste affects the environment, health and quality of life and take appropriate steps to improve their systems (Mandal, 2019).

Although in most cases the responsibility for waste management systems rests with local governments, certain tasks are covered by other organizations, such as the private sector, non-governmental organizations (NGOs), community-based organizations (CBOs) and even the informal sector (Ahluwalia & Patel, 2018). Whether or not these tasks are delegated, local governments are ultimately accountable and must manage the functions of the system, in particular the following roles and functions:

- Expenditure of taxes related to the performance of actors in the waste management system.
- Management and protection of environmental and health factors affecting cities and their inhabitants;

Waste management systems are complex and many parties are involved in the process. A clear and well-defined institutional framework in which roles and responsibilities are appropriately assigned to each

task is therefore very important. Authorities should always facilitate the process and establish appropriate bodies to deal with waste management.

DECENTRALIZATION AND DELEGATION OF FUNCTIONS IN THE SWM SYSTEM

By moving decision-making closer to executives and beneficiaries, certain functions can be performed more efficiently. For SWM, it is important to understand which decisions are better handled at each level of management. Some decisions should be made by top management (e.g. planning and monitoring) and other decisions should be made by middle and lower management (e.g. day-to-day activities related to service delivery). In medium- or large-sized cities, efficiencies can be achieved by dividing communities into zones or districts to serve and delegate some of the decision-making authority. This mechanism allows a zone or community to allocate a portion of its available resources according to the specific needs of the zone or community (Singh, 2020). Zone or district delegated authority will ensure more effective monitoring of employees engaged in activities such as street sweeping, door-to-door collection, and secondary waste storage. For example, zone or county officials may handle street cleaning, door-to-door collection, and secondary storage of waste, while the community handles transportation, processing, and disposal.

If functions are decentralized, so should the administrative and financial authority to perform tasks. Communities must provide local governments with all the necessary resources and decision-making authority, while being accountable for the tasks they perform (Sharma & Jain, 2019).

In India, the 74th Amendment to the Indian Constitution mandated the decentralization of government in cities with a population of 300,000 or more. This amendment requires local government commissions to carry out their assigned local government duties (Asnani & Zurbrugg, 2007).

SERVICE PROVISION BY OTHER ACTORS

Governments have ultimate responsibility for service delivery, but some functions may be delegated to the private sector, NGOs, or CBOs for more efficient service.

Non-governmental organizations and the private sector can participate in many areas of waste management such as: Raise public awareness, increase public and community participation (Ohri & Singh, 2010). The private sector may participate in the construction and operation of composting facilities and other treatment and disposal facilities. Contracts with the private sector may also provide for waste transportation, vehicle rental or leasing, or vehicle repair and maintenance.

Waste management services are highly labor intensive and the high wage structure of government and local employees makes such services more expensive over time (Zurbrugg et al., 2014). Moreover, the efficiency of the labor force employed in the urban local bodies (ULBs) is far from satisfactory. The high wage structure and inefficient workforce cause a steep rise in the cost of service; yet the public generally is dissatisfied with the level of service provided by the ULBs. Considering the involvement of other actors might alleviate the burdens on the public sector of managing the service.

When considering private sector participation, municipal authorities need to keep in mind the provisions of the government of India's Contract Labour (Regulation and Abolition) Act 1970, under which the government can prohibit the contracting out of services that are already being provided by the municipal authorities. Therefore, private sector participation should only be considered when the law allows private participation (Adriyanti et al., 2018).

When most functions are delegated to the private or nongovernmental sectors, the municipal government must monitor service provision and

encourage good services even in areas that might not be profitable or easy to access for the private sector or NGOs. Good service can be encouraged by providing the right incentives and enforcement mechanisms. To this end, an appropriate legal and regulatory framework with appropriate compliance and enforcement mechanisms is required to ensure proper performance of private companies (Joseph et al., 2012). In addition, supportive and coherent legal and regulatory infrastructures such as liability rules, insurance protection, bankruptcy protection, and public contract law form an essential foundation for the development of mixed public-private systems.

INSTITUTIONAL SETUP IN INDIA

In India, the laws are very specific on how solid waste should be treated. Waste management is a state responsibility. However, the central government has the power to enact laws and frameworks for environmental protection. Therefore, the Government of India enacted the Environmental Protection Act (EPA), 1986 to establish regulations for the management and handling of municipal, biomedical and hazardous wastes, etc. as stipulated in this Act. Municipal solid waste management is covered by all state municipal legislation, but not all SWM-related issues are adequately addressed by state legislation. Therefore, the Government of India has established a set of unified regulations, Municipal Solid Waste (Management and Treatment) Regulations 2016 pursuant to the EPA, obliging all municipalities in the country to implement these regulations within a prescribed time frame (Wilson et al., 2015).

Central Government Level

The role of the central government is very limited as waste management issues are entrusted to the provinces and handed over from the provinces to the ULB. The central government's main role is to formulate laws and regulations through the Ministry of Environment and Forests and to provide guidelines, technical assistance, financial support, etc. to be achieved through other ministries such as

the Ministry of Environment and Forests and Urban development and poverty alleviation (Visvanathan & Trankler, 2003).

The Ministry of Urban Development and Poverty Alleviation has already published a national handbook on solid waste management (Ministry of Urban Development and Poverty Alleviation 2000); formed a technical advisory group. It has also published reports on appropriate technical, financial aspects, and training and development needs. It has also facilitated him to allocate a grant of Rs. 25 crore to his ULB from the 12th Finance Committee to improve waste management. The ministry has also supported local government training and capacity development programs. 100 Improving Municipal Solid Waste Management in India (Massoud et al., 2019)

The Central Pollution Control Board (CPCB) is the premier regulatory body in environmental affairs. Its main task is to oversee the implementation of regulations. However, CPCB has taken some positive steps by issuing guidelines and manuals, and also supports several training programs and pilot projects (Liyala, 2011).

The Ministry of Agriculture and the Ministry of New and Renewable Energy also play an active role in promoting and funding his MSW composting and waste-to-energy projects respectively.

State Government Level

The state governments are mainly liable for suitable SWM within the nation. The State Urban Development Department that is liable for searching after city affairs via municipal organizations and nation municipalities, performs a decisive position in directing the municipal government in imposing the guidelines and in giving them monetary and technical assist to facilitate implementation (Singhal & Pandey, 20001).

The State Environment Department commonly performs a position in tracking the implementation via the State Urban Department and State Pollution Control Board (SPCB). State Pollution Control Board are mainly liable for tracking the

implementation of the Municipal Solid Waste Rules 2016 and for taking movements towards defaulters (Chikamane, 2012) The state PCBs also are liable for authorizing the municipal government or operators of the centers to installation remedy and disposal centers with inside the respective states. In addition to regulating neighborhood government, a few nation PCBs take a proactive position in guiding the neighborhood government in implementation of the guidelines.

Urban Local Body Level

The 74th change of the Indian charter creates 3 stages of ULBs:

- Municipal Corporations
- Municipalities
- Transition areas, together with nagar panchayats and metropolis panchayats

The country has 4,378 municipal authorities. These government are responsible— under the respective state guidelines and the Municipal Solid Waste Rules 2016—for dealing with municipal stable waste in the ideal manner (Gupta et al., 2015). They are anticipated to comply with the guidelines given in relevant nation legal guidelines and the 2016guidelines, and that they should adhere to the time-frame prescribed.

URBAN LOCAL BODIES: A KEY PLAYER IN INDIA

In most cities in India, health officers (usually medical professionals) are in charge of the waste management sector. They generally lack a technical background and knowledge of the engineering and environmental aspects of waste management, so they generally focus on preventive health services and food hygiene, and focus on waste management, waste treatment and final disposal (Annepu, 2012). In most cases, responsibility for solid waste disposal falls to sanitary inspectors and supervisors. Few major cities have engineers in charge of waste management systems, but not necessarily environmental engineers with experience in such

systems. Sanitary inspectors have limited technical skills and very specific knowledge of traditional waste collection methods. For example, sweeping roads, taking waste to open dumps, or hauling waste on open trucks. They do not have the technical knowledge to provide a more efficient service, nor do they have the knowledge of waste treatment and disposal. Many small municipalities do not even have a qualified sanitary inspector to run their waste management services and supervise their sanitary staff.

SWM INSTITUTIONS AND FUNCTIONS

Following table shows the SWM institutions and their roles and responsibilities:

Responsible institution Roles and responsibilities in SWM

Central Government	Make laws and rules; frame policies; prepare guidelines, manuals, and technical assistance; provide financial support; monitor implementation of laws and rules
State government	State government Make state-level laws and rules; frame policies; prepare guidelines, manuals, and technical assistance; provide financial support; monitor implementation of laws and rules.
Municipal authorities and state government	Plan for SWM treatment facilities.
Municipal authorities	Collect, transport, treat, and dispose of waste
Municipal authorities with the approval of	Frame bylaws; levy and

state governments collect fees.

Municipal authorities and. state and central governments Finance SWM systems

PROFESSIONALIZATION OF SOLID WASTE MANAGEMENT

One step needed to improve India's waste management system is to improve the occupations of those who handle waste. For the most part, this profession is neglected and viewed as very low status, ignoring the importance that such an important job can bring to the well-being of the people. It means building workers' skills to work more effectively and efficiently in conditions (Joshi & Ahmed, 2016) .It also means that employees perform their work in a safe environment and under healthy conditions. Training, motivation, incentives for excellence and incentives for underperformers are essential for talent development.

Local governments should make concerted efforts to indoctrinate them Raise the pride and motivation of officers and employees toward their work we will do our best to improve the service level of the city and the image of the municipality management. Supreme Court's Waste Experts Panel Recommends Stop Follow municipal service experts to manage municipalities scientifically Solid Waste (Supreme Court 1999):

One superintending engineer (public health or environmental engineering) per 2 million population

One executive engineer (public health or environmental engineering) per 1 million population

One assistant executive engineer (public health or environmental engineering) per 500,000 population

One assistant engineer per 250,000 population

One qualified diplomate chief sanitary inspector per 100,000 population

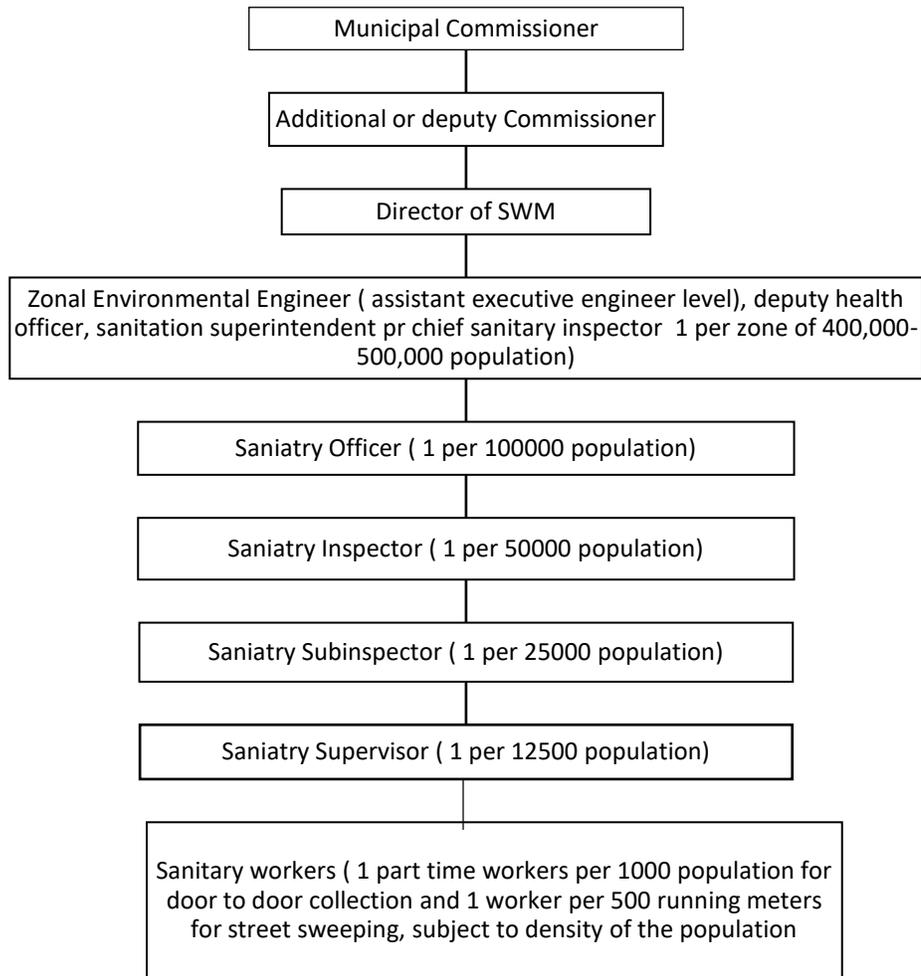
One qualified diplomate sanitary inspector per 50,000 population or part thereof

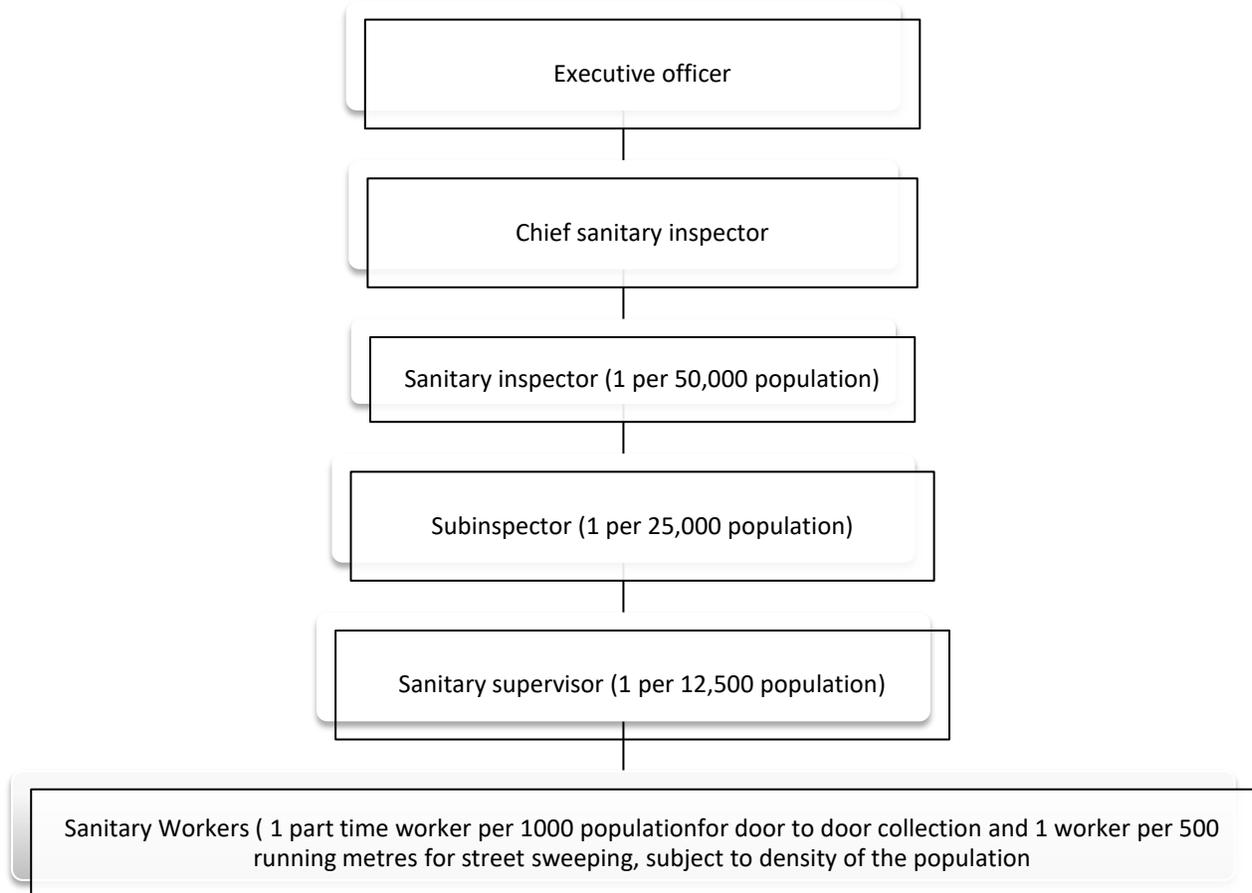
One qualified diplomate sanitary subinspector per 25,000 population or part thereof

One sanitary supervisor (mukadam, who can read, write, and report) per 12,500 population or part thereof

The Manual on Solid Waste Management (Ministry of Urban Development and Poverty Alleviation 2000), which was developed by the Central Public Health and Environmental Engineering Organization (CPHEEO), recommends the following deployment of human resources in India

Large Municipal Corporation:



Municipality:**CONCLUSION**

The chapter describes the institutional structure and hierarchy of solid waste management at national, state and local levels. It is concluded that institutions play a vital role in improving SWM practices and services. Decentralization and delegation of power further soothes the process of SWM in the country. Institutions are a catalyst to SWM systems and procedures. Poor institutional framework reveals SWM failures, poor coordination of stakeholders, delayed collection frequencies and poor cost recovery mechanisms. Therefore the study demands

institutional strengthening and capacity building to make SWM services more efficient.

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