

# Municipal Services for City Governments



# User Manual on **Municipal Services for City Governments**

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This user manual is authored by Dr. Dachepally Sudhakar, Retd. Executive Engineer, Greater Hyderabad Municipal Corporation (GHMC) along with Amar Deep Singh, Senior Programme Officer and George Cheriyan, Director, CUTS International as part of the project entitled 'Improving City Governance Through Enhancing Knowledge of Urban Local Bodies in Rajasthan' supported by the Australian High Commission under the Direct Aid Programme (DAP).

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## About the Project

Today, over half of the world's population lives in urbanised areas. India is urbanising rapidly, with the urban population rising much faster than its total population. The level of urbanisation has increased from 17 per cent in 1951 to 31 per cent in 2011. The urban population in India, which was nearly 377 million in 2011, is poised to grow to 600 million by 2031. Urban areas contribute 62-63 percent of India's gross domestic product (GDP), estimated to reach 75 per cent by 2030.

Such a rise in urban population implies increased demand for goods and services and efficient urban planning, management, and governance systems. Therefore, addressing urban development and transformation, urban inequalities and bringing in suitable reformation within the urban governance system to address these changes is undoubtedly India's most important political and intellectual challenge

Urban Local Bodies (ULBs) in Rajasthan also heavily depend on state and central government funds. These local bodies also have limited capacity to raise resources through their sources of revenue and taxes and are all working under severe financial constraints. Every year during the budget presentation, the state government announces several schemes and policies for uplifting and developing urban infrastructure. But often, the Audit report shows that most of these schemes are stuck midway due to a lack of adequate funding. (Refer to CAG Report No.3 of 2020 - State Finances, Government of Rajasthan). The inability of ULBs to raise resources has limited the growth of municipal income.

Strengthening urban local governments through capacity building and better financial management and enlightening the officials of instruments like municipal bonds that can come to their aid to raise resources for long-term financing projects such as infrastructure development is a must. Besides, it is vital to support them with training workshops and conferences related to urban issues like effective management of water supply, solid waste management, public transportation systems, and marginalised social and economic groups.

CUTS is working towards improving urban governance in Rajasthan through various interventions such as MyCity for citizen engagement; Rajasthan City Mayors Learning Platform (RCMLP) for Mayors' sharing and learning; Knowledge Enhancement workshops for City Managers' training and various studies across the state on urban governance. CUTS also has an MoU with the Department of Local Self-Government, Rajasthan, for capacity building of elected representatives and officials of ULBs since 2016.

In this series of initiatives, CUTS is implementing a project '**Improving City Governance through Enhancing Knowledge of Urban Local Bodies in Rajasthan**, ' supported by the Australian High Commission, New Delhi. Under the project, capacity-building workshops will be conducted in four selected municipal corporations (Jaipur, Jodhpur, Kota and Bharatpur) on various topics in consultation with relevant departments.

### Objective

- The directional objective of the project is to “foster knowledge, information and capacity building about issues like solid waste management, urban public transportation system, water supply and financial instruments within ULBs in Rajasthan”.
- The development objective is to “enhance a knowledge about vital topics related to urban governance in selected cities within the project State and to ensure effective functioning of these bodies”.



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# Sanitation

Sanitation is an arrangement to prevent human contact with waste and sewage wastewater hazards. It is a method of preparation for protecting and promoting health.

## **PUBLIC HEALTH IMPORTANCE**

Sanitation systems aim to protect human health by providing a clean environment that will stop disease transmission, primarily through the faecal-oral route. Human excreta are a source of infection and a significant cause of environmental pollution.

**HEALTH HAZARDS** – typhoid, paratyphoid, dysentery, diarrhoea, cholera, hookworm disease, ascariasis, viral hepatitis.

**ENVIRONMENT** – soil pollution, water pollution, contamination of food, propagation of flies and vectors.

**Poor sanitation** – It reduces human well-being and social and economic development due to impacts such as anxiety, risk of sexual assault, and lost opportunities for education and work.

It is linked to the transmission of diarrhoeal diseases such as cholera and dysentery, typhoid, intestinal worm infections and polio. It exacerbates stunting and contributes to the spread of antimicrobial resistance.

## **Poor sanitation example**

When people who live in a particular setting do not have access to safe water and a good sewage system, live in a dirty environment, and more importantly, lack access to a proper latrine.

## **Causes for poor sanitation**

As the population increases, more pressure is put on the capacity of urban cities to provide services to residents. High housing, transport, health care, and sanitation costs have led to the growth of slums and informal settlements. Thus, leading to acute drainage and sanitation problems.

## **Effects of poor sanitation**

Environmental impacts of poor sanitation and waste management at a local level include pollution of land and watercourses, the visual impact of litter, and foul odour.

## **Problems faced in sanitation**

Sanitation workers face health and safety risks, financial challenges and stigma due to the nature of their work and caste-based and gender-based discrimination. The COVID-19 pandemic has further added to their vulnerabilities.



### **Benefits of improving sanitation**

The benefits of improved sanitation extend well beyond reducing the risk of diarrhoea. These include:

- Reducing the spread of intestinal worms, schistosomiasis and trachoma are neglected tropical diseases that cause suffering for millions.
- Reducing the severity and impact of malnutrition
- Promoting dignity and boosting safety, particularly among women and girls
- Promoting school attendance: girls' school attendance is mainly boosted by the provision of separate sanitary facilities
- Reducing the spread of antimicrobial resistance
- Potential recovery of water, renewable energy and nutrients from faecal waste
- Potential to mitigate water scarcity through the safe use of wastewater for irrigation, especially in areas most affected by climate change.

### **Types of Sanitation**

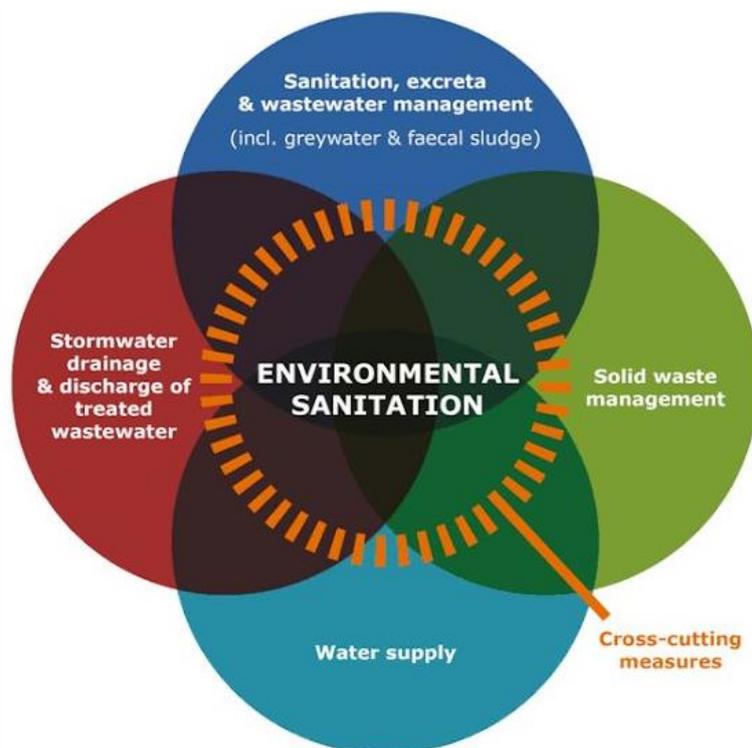
- **Cleaning** - Physically removing all visible signs of dirt and organic matter such as faeces, blood, hair, etc. and Street Sweeping.
- **Disinfecting** - Destroying most microorganisms on nonliving things by physical or chemical means.
- **Sterilising** - Destroying all microorganisms and viruses on an object using chemicals and/or heat.
- **Antiseptics** - Solutions that destroy microorganisms or inhibit their growth in living tissue.
- **Food sanitation** - Refers to hygienic measures for ensuring food safety.
- **Environmental sanitation** - The control of environmental factors that form links in disease transmission. Subsets of this category are solid waste management, water and wastewater treatment, industrial waste treatment and noise and pollution control.

Cont...



**Community-Led Total Sanitation (CLTS)** is an approach to achieve behaviour change in mainly rural people by the process of “triggering”, leading to spontaneous ...

Environmental Sanitation



### Components of Environmental Sanitation

- WATER SANITATION
- FOOD AND MILK SANITATION
- EXCRETA DISPOSAL
- SEWAGE DISPOSAL
- REFUSE DISPOSAL
- VECTOR AND VERMIN CONTROL
- HOUSING
- AIR SANITATION

### Types of Sustainable Sanitation



### Importance of Sanitation



## Total Sanitation



## Sanitation Problems and Solutions

Some specific solutions include

- Implementation of open defecation game plan.
- Strategic public-private partnerships to move populations up the sanitation ladder.
- Ending high-risk hygiene practices.
- Mainstreaming menstrual health and hygiene (MHH) in schools.
- Improving urban sanitation systems and services.

India has made rapid progress in ending open defecation across the country. The number of people defecating in the open in India has reduced significantly by an estimated 450 million people. However, we all need to ensure the sustained use of toilets and hygiene practices.

### How do we manage sanitation problems?

Traditionally, managing poor sanitation, particularly open defecation and improper waste disposal practices, has been done using hardware solutions in the form of provision and use of infrastructures such as toilets, drainage, dustbins and dumpsite

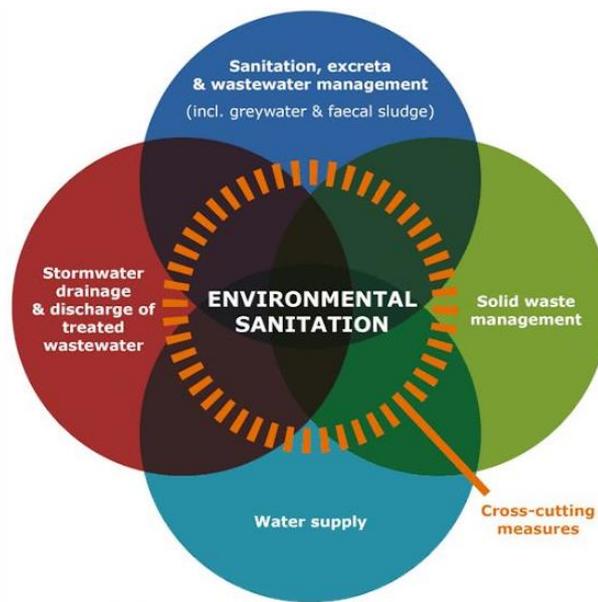
### How can we improve sanitation?

Improve sanitation facilities by providing toilets and latrines that flush into a sewer or safe enclosure. Promote good hygiene habits through education. Proper hand washing with soap and water can reduce diarrhoea cases by up to 35 percent.

### What is the conclusion of sanitation?

Good personal hygiene is one of the best ways to protect oneself from illnesses. Maintaining good personal hygiene will also help prevent diseases from spreading to other people. Good hygiene lowers a person's risk for infections and diseases commonly spread through viruses and bacteria.

### Sanitation important in the present scenario



### MSW Rules 2016

#### Major Highlights of the New SWM Rules, 2016

- Segregation at the source
- Collection and disposal of sanitary waste
- Collect Back scheme for packaging waste
- User fees for collection
- Waste processing and treatment
- Promoting the use of compost
- Promotion of waste to energy

## **Salient Features of the MSW Act 2016**

No person should throw, burn, or bury the solid waste generated by him/her on streets, open public spaces outside his premises, in the drain, or in water bodies. The generator will have to pay 'User Fee' to the waste collector and for 'Spot Fine' for Littering and Non-segregation

Rules are now applicable beyond Municipal areas and extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbases, port and harbour, defence establishments, special economic zones (SEZs), State and Central government organisations, places of pilgrims, religious & historical importance.

The source segregation of waste has been mandated to channel the waste to wealth by recovery, reuse and recycling.

Responsibilities of generators have been introduced to segregate waste into three streams, wet (biodegradable), dry (plastic, paper, metal, wood, etc.) and domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.) and handover segregated wastes to authorised ragpickers or waste collectors or local bodies.

Integration of waste pickers/rag pickers and waste dealers/Kabadiwalas in the formal system should be done by State Governments and Self-Help Groups or any other group to be formed.

Used sanitary waste like diapers and sanitary pads should be wrapped securely in pouches provided by manufacturers or brand owners of these products or in a suitable wrapping material and shall place the same in the bin meant for dry waste/non-bio-degradable waste.

The concept of partnership in Swachh Bharat has been introduced. Bulk and institutional generators, market associations, event organisers and hotels and restaurants have been made directly responsible for segregation and sorting the waste and management in partnership with local bodies.

All hotels and restaurants should segregate biodegradable waste and set up a collection system or follow the collection system set up by local bodies to ensure that such food waste is utilised for composting/bio-methanation.

All resident welfare and market associations, gated communities, and institutions with an area >5,000 sq. m should segregate waste at source- into valuable dry waste like plastic, tin, glass, paper, etc. and handover recyclable material to either the authorised waste pickers or the authorised recyclers, or the urban local body.

The bio-degradable waste should be processed, treated, and disposed of through composting or bio-methanation within the premises as far as possible. The residual waste shall be given to the waste collectors or agency as directed by the local authority.

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New townships and group housing societies have been responsible for developing in-house waste handling and processing arrangements for bio-degradable waste.

Every street vendor should keep suitable containers for waste generated during his activity, such as food waste, disposable plates, cups, cans, wrappers, coconut shells, leftover food, vegetables, fruits etc. They should deposit such waste at a waste storage depot, container, or vehicle as notified by the local authority.

The developers of SEZs, industrial estates and parks are to earmark at least five percent of the plot's total area or a minimum of five plots/sheds for recovery and recycling facility.

All manufacturers of disposable products such as tin, glass, plastic packaging etc. or brand owners who introduce such products in the market shall provide necessary financial assistance to local authorities to establish a waste management system.

All such brand owners who sell or market their products in such packaging materials which are non-biodegradable should put in place a system to collect back the packaging waste generated due to their production.

Manufacturers, Brand Owners, or marketing companies of sanitary napkins and diapers should explore the possibility of using all recyclable materials in their products or provide a pouch or wrapper for disposal of each napkin or diaper along with the packet of their sanitary products.

All such manufacturers, brand owners or marketing companies should educate the masses about wrapping and disposal of their products.

All industrial units using fuel and located within 100 km of a solid waste-based RDF plant shall make arrangements within six months from the date of notification of these rules to replace at least five percent of their fuel requirement by RDF so produced.

Non-recyclable waste having a calorific value of 1500 K/cal/kg or more shall not be disposed of in landfills. It shall only be utilised for generating energy either through refuse-derived fuel or by giving away as feedstock for preparing refuse-derived fuel.

High calorific waste shall be used for co-processing in cement or thermal power plants.

Construction and demolition waste should be stored and separately disposed off, as per the Construction and Demolition Waste Management Rules, 2016

Horticulture waste and garden waste generated from his premises should be disposed as per the directions of the local authority.

An event or gathering organiser of more than 100 persons at any licensed/ unlicensed place should ensure the segregation of waste at the source and handing over segregated waste to a waste collector or agency, as specified by the local authority.

Special provision for the management of solid waste in hilly areas:- Construction of landfill on the hill shall be avoided. A transfer station at a suitable enclosed location shall be set up to collect residual and inert waste from the processing facility. Suitable land shall be identified in the plain areas, down the hill, within 25 kilometres of setting up a sanitary landfill. The residual waste from the transfer station shall be disposed off at this sanitary landfill.

In case of non-availability of such land, efforts shall be made to set up a regional sanitary landfill for the inert and residual waste.

#### **MSW Rules 2016 (Amended)**

- The Environment Ministry has revised Solid Waste Management Rules after 16 years.
- These Rules are now applicable beyond municipal areas and will extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbases, ports and harbours, defence establishments, SEZs, State and Central government organisations, places of pilgrims, religious & historical importance.
- The responsibility of generators has been introduced to segregate waste into three categories: wet, dry and hazardous waste.
- The generator will have to pay 'User Fee' to the waste collector and a 'Spot Fine' for littering and non-segregation, the quantum of which will be decided by the local bodies.

- The integration of ragpickers from the informal sector into the formal sector has been introduced
- In the case of hilly areas, land for the construction of sanitary landfills in the hilly areas will be identified in the plain areas within 25 kilometres.

#### **Salient Features of MSW Rules 2016 (Amended)**

- All hotels and restaurants should segregate biodegradable waste and set up a system of collection or follow the system of collection set up by local body to ensure that such food waste is utilised for composting/bio-methanation.
- All Resident Welfare and market Associations, Gated communities and institutions with an area sq. m should segregate waste at source into valuable dry waste like plastic, tin, glass, paper, etc. and handover recyclable material to either the authorised waste pickers or the authorised recyclers, or to the urban local body.
- The bio-degradable waste should be processed, treated, and disposed of through composting or bio-methanation within the premises as far as possible.
- The residual waste shall be given to the waste collectors or agency as directed by the local authority.

#### **Solid Waste Management (Amendment) Rules, 2019**

April 11, 2019 | by TeamLease RegTech Legal Research Team, EHS Central

The Ministry of Environment, Forest and Climate Change (MoEF and CC) on April 10, 2019, published Solid Waste Management (Amendment) Rules, 2019, to further amend the Solid Waste Management Rules, 2016.

The amendment in Rule 15 of Solid Waste Management Rules, 2016, which specifies the duties and responsibilities of local authorities and village Panchayats of census towns and urban agglomerations, is as under:

Under Clause (h), for the word "white" the word "blue" has been substituted:

Amended Clause (h):

Setup material recovery facilities or secondary storage facilities with sufficient space for sorting recyclable materials to enable informal or authorised waste pickers and waste collectors to separate recyclables from the waste and provide easy access to waste pickers and recyclers for collection of segregated recyclable waste such as paper, plastic, metal, glass, textile from the source of generation or material recovery facilities; Bins for storage of bio-degradable wastes shall be painted green, those for storage of recyclable wastes shall be printed blue and those for storage of other wastes shall be printed black. *Notification No. G.S.R. 298(E)*

#### **Solid Waste Management (Amendment) Rules, 2020**

March 23, 2020 | by TeamLease RegTech Legal Research Team, EHS Central

The Ministry of Environment, Forest and Climate Change (MoEF & CC), on March 19, 2020, issued the Solid Waste Management (Amendment) Rules, 2020, to further amend the Solid Waste Management Rules, 2016. It is noted that this Rule shall also apply to villages with a population of more than 3000.

The following are the amendments made under the Solid Waste Management Rules, 2016:-

- For the words "the Ministry of Urban Development", wherever they occur, the words "the Ministry of Housing and Urban Affairs" shall be substituted.
- The local authorities and Panchayats shall submit application for renewal of authorisation at least 60 days before the expiry of the validity of authorisation to collect and transport bio-degradable, non-bio-degradable and domestic hazardous waste from households, including slums and informal settlements, commercial, institutional and other non-residential premises, multi-storey

buildings, large commercial complexes, malls, housing complexes and the like in compartmentalised and covered vehicle to the respective processing facility.

This Notification shall come into force on the date of its publication in the Official Gazette, on March 20, 2020.

#### Garbage Generation and Disposal in Rajasthan

State	Rajasthan
Solid waste generated (TPD)	6987.16
Collected (TPD)	6720.476
Treated (TPD)	1210.46
Landfilled (TOD)	5082.16

#### The 7Rs of Recycling

- 1. RETHINK:** Step back and think about the type of consumer you want to be and what this means for the environment.
- 2. REFUSE:** Think before you buy and be prepared not to buy at all. Green consumers place themselves at the start of the buy-and-use cycle, buying less and buying products that do the least harm to the environment.
- 3. REDUCE:** Buy less, buy products that have little or no packaging and that last a long time, borrow instead of buy, and compost. Items that are no longer needed or used are donated or sold.
- 4. REUSE:** Upcycle instead of throw away. Examples: glass jars can be used to store dry goods, old calendar pages are used as DIY envelopes, old toothbrushes are used to clean hard-to-reach places, and empty toothpaste tubes are used as funnels.
- 5. REPAIR:** Try to fix items before disposing of them. Our current culture has been called a "throwaway society" because more items end up in landfills than needed. This harms the environment and uses more earth resources to make new items. We can help conserve the earth's resources by fixing things and participating in the "Repair Movement".
- 6. REGIFT:** When you regift, you give someone a gift you received from someone else. Do not feel guilty! Passing it on to someone who will enjoy it more than you is good. You need to follow this etiquette: You are certain the gift is something the recipient would enjoy. The gift is brand new and comes in its original box. The gift is not handmade or a family treasure.
- 7. RECYCLE (Compost):** Put things back into the waste stream to be used again for something else. Glass is used for roads, plastics are melted down to make new products, and the organic waste we compost is used to fertilise our gardens.

### Wastewater Management

#### Sources of wastewater

Wastewater comes from ordinary living processes: bathing, toilet flushing, laundry, dishwashing, etc. It comes from residential and domestic sources. Commercial wastewater comes from non-domestic sources, such as beauty salons, taxidermy, furniture refinishing, musical instrument cleaning, or auto body repair shops.

**There are three types of wastewater or sewage:** domestic sewage, industrial sewage, and storm sewage

#### **How is wastewater formed?**

Wastewater is the polluted water generated from rainwater runoff and human activities. It is also called sewage

#### **Why is water waste a problem?**

Depleting reservoirs and groundwater can put water supplies, human health, and the environment at serious risk. Lower water levels can contribute to higher concentrations of natural or human pollutants. Water more efficiently helps maintain supplies at safe levels, protecting human health and the environment.

**Colour of Waste water:** Light brownish-grey color.

**Temperature range** – Typically between 68 and 95 F (20 to 35 C )

**Wastewater management** is an important approach to protecting water resources and it is defined as the collection, treatment, and reuse of wastewater. In wastewater collection networks as one of the important infrastructures, undesirable performance can lead to different problems. Also, wastewater treatment is a process that depends on different physical and chemical issues; therefore, predicting factors in wastewater treatment plants is essential.

On the other hand, urban treated wastewater is a proper resource for allocating to various uses such as agriculture and industry, but it has its limitations. Improper use of these resources can lead to environmental and health risks and, as a result, social dissatisfaction and sometimes economic problems. Appropriate risk-based modelling approaches and prediction tools are required to manage various aspects of wastewater, such as those mentioned earlier. Because of their advantages, Bayesian networks (BNs) have rapidly increased in water and environment modelling and management, considering different sources of uncertainty. Wastewater, environmental engineers, and decision-makers can effectively use this model in prediction and risk assessment applications as a soft computing skill.

#### **Which acid is used in wastewater treatment?**

Hydrochloric acid is a strong pH reducer. It is suitable for lowering the pH and as an emulsion breaker in industrial wastewater treatment. It can also be used for scale removal

#### **Importance of wastewater management**

The main goal of wastewater treatment facilities is to protect humans and the ecosystem from harmful and toxic elements found in wastewater. Water treatment facilities were designed to speed up the natural process of purifying water because the natural process is overloaded. These facilities treat the wastewater in various ways and then send the purified water back into the environment.

#### **Here are five ways to save water and cut down on its wastage**

- Using a shower bucket
- Reusing water used for washing vegetables/cooking
- Creating a rain garden
- Collecting overflowing water from plants
- Reusing excess drinking water

#### **9 Steps in treatment of wastewater?**

- Step 1: Screening and Pumping
- Step 2: Grit Removal
- Step 3: Primary Settling
- Step 4: Aeration / Activated Sludge
- Step 5: Secondary Settling
- Step 6: Filtration

- Step 7: Disinfection
- Step 8: Oxygen Uptake

### **The 3 stages of wastewater treatment?**

Primary, secondary, and Tertiary water treatment

### **What are the methods of wastewater treatment?**

Majorly four methods of sewage water treatment are followed – physical, biological, chemical, and sludge water treatment. Following these methods, the wastewater is disinfected from all the sewage materials and converted into treated water that is safe for both human usage and the environment.

### **What are the effects of wastewater on the environment?**

#### Wastewater Effects on Water Bodies

Waterways are generally most at risk of the harmful effects of wastewater. Toxic compounds in the effluent disrupt aquatic ecosystems. When many biodegradable substances end up in the water, organisms will start to break them down, using a lot of dissolved oxygen.

### **How can we improve the waste water treatment system?**

If you have a septic system, pump it out to remove solids every two to three years. Never dump oils or grease down your drains. Never wash chemicals down your drains; using non-toxic household cleaners will keep more chemicals out of your wastewater.

The five steps outlined below can help water treatment plants to achieve better water efficiency and realise potential cost savings by reducing water waste.

- Conduct a self-assessment
- Evaluate technology
- Perform a pump audit
- Install smart technology
- Review the data

### **How can we make wastewater treatment more efficient?**

Even if your plant is operating at peak efficiency, you might benefit now or in the future from the following suggestions for reducing your plant's carbon footprint.

- Upgrade pump stations
- Optimise aeration
- Improve sludge management
- Recover/recycle essential nutrients
- Go light on disinfection

Four common wastewater treatment methods include physical water treatment, biological water treatment, chemical treatment, and sludge treatment.

### **What are the biggest problems in wastewater treatment?**

- **Energy consumption.** Energy consumption is one of the biggest issues confronting wastewater plants
- Staffing shortages
- Environmental footprint

India's largest cities have centralised sewage systems with underground pipes, pumping stations, and treatment plants. However, these systems are expensive to build and operate, requiring uninterrupted power, skilled operators, and extensive maintenance.

### What is wastewater example?

Wastewater is used water and includes substances such as human waste, food scraps, oils, soaps and chemicals. This includes water from sinks, showers, bathtubs, toilets, washing machines and dishwashers in homes.

### The best wastewater treatment system?

The best system on the market is **ClearFox Nature**. This is a non-electric plant, the only non-electric treatment plant in the world that does not require replacement parts or media. So, the best non-electric sewage treatment plant is, without a doubt, the **ClearFox Nature**

### Special Sanitation Drive in GHMC



### Residents leaving garbage on roads



**Residents dumping in lakes at Hyderabad (Alwal)**



**Cleaning of lakes**



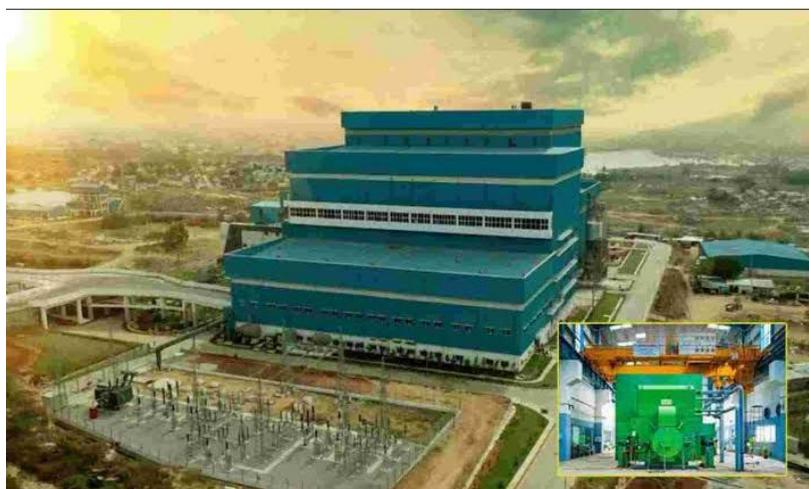
**MAUD Minister flags off new auto tippers in GHMC**



**New garbage trucks in GHMC**



**Waste to Energy Plant in GHMC**



**Secondary collection Transfer Station at KUKATPALY**



# Community Participation

Community participation involves people in a community in projects to solve their problems. People cannot be forced to 'participate' in projects which affect their lives but should be given the opportunity where possible.

## Examples of Community Engagement

- Volunteering at a local food bank, animal shelter or homeless shelter.
- Maintaining a community garden.
- Participating in a local blood drive.
- Helping set up a local farmers market.
- Advocating for others.
- Creating support groups in your community.

## What is the purpose of community participation

Community participation paves the way for self-development and contribution. The sense of contributing, for instance, participation in a project contributing to society, can give you a sense of pleasure and meaningfulness. See the benefits of community participation below: Promotes a sense of belongingness.

## What are the main features of community participation?

Community participation involves the citizens in municipal functions e.g., setting priorities, budgeting provisions, etc. They provide for the participation of citizens in the decision-making process on local issues.

## What are the types of participation?

### 4 Forms of participation

- Nominal
- Instrumental
- Representative
- Transformative

**Passive Participation:** People participate by being told what is going to happen or has already happened through a unilateral announcement by the administration.

**Participation in Information Giving:** People participate by answering questions posted by extractive researchers using questionnaire surveys or similar approaches and do not have the opportunity to influence proceedings.

**Participation by Consultation:** People participate by being consulted, and external people listen to views and may modify these in the light of people's responses but do not involve them in decision-making.

**Participation in Material Incentives:** People participate by providing resources, for example, labour, in return for food, cash, or other material incentives; people have no stake in prolonging activities when the end of the incentive.

**Functional Participation:** People participate by forming groups to meet predetermined objectives related to the project after major decisions have been made.

**Interactive Participation:** People participate in joint analysis, development of action plans, and formation or strengthening of local institutions.

**Self-mobilisation:** People participate by taking initiatives independent of external institutions to change systems. They develop contacts with external institutions for resources and the technical advice they need but retain control over how resources are used. These can also take the form of social movements and bring about social change.

### **Benefits of Community Participation**

- Promotes a sense of belongingness
- Better health and well-being
- Set goals and improve skills
- Gives purpose and a sense of contribution
- Adapt and develop new skills
- Acceptance and recognition
- Increase social networks
- Enhances social support
- Involvement in projects that can benefit the community
- Opportunities for making an income
- Improved skills and lives

### **STRATEGY OF COMMUNITY PARTICIPATION**

The Urban Local Bodies (ULBs) may adopt the following strategy.

- Identification of groups of people to be addressed
- Residential areas

### **Community may be classified into three categories**

1. High Income Group - the affording
2. Middle Income Group - educated, sensitive, less affording
3. Low Income Group – un-affording

None of the above categories of people is an exception in apathy towards SWM. Still, each group's level of awareness and sensitivity is different and needs to be tackled differently.

### **Markets/Commercial Areas/Offices/Banks etc.**

These places may be classified into three broad categories: -

1. Vegetable Markets
2. Shopping areas
3. Offices/Institutional areas

Identification of the Areas in Solid Waste Management Where Community Participation is Essential. Solid Waste Management involves several stages of activities where people's participation is critically required, and the local body has to do the rest of the work.

### **People's Participation is Essential in the Following Areas**

- Reduce, Reuse & Recycle (RRR) waste.
- Not to throw the waste/litter on the streets, drains, open spaces, water bodies, etc.
- Storage of organic/bio-degradable and recyclable waste separately at the source.
- Primary collection of waste
- Community storage/collection of waste in flats, multi-storied buildings, societies, commercial complexes, etc.
- Managing the excreta of pet dogs and cats appropriately.
- Waste processing/disposal at a community level(optional)
- Pay adequately for the services provided.

### **Promote Public Participation in SWM Systems Adopted**

The first and foremost thing that the citizens need to be told and made to understand is that no waste shall be thrown on the streets, drains, water bodies, open spaces, etc. and that they should form the habit of:

- Storage of wet food/bio-degradable waste and dry recyclable waste separately at the source
- Participation in the primary collection of waste
- Handing over recyclable waste materials to rag pickers/waste collectors
- Use of community bins wherever directed/provided.
- Use of litter bins on roads and public places

### **What are the advantages of community participation?**

Community activities in non-segregated spaces would help people learn new skills or brush up on their hobbies. It also allows people to build and improve their confidence, and community participation paves the way for self-development and contribution.

### **What are the disadvantages of participation?**

Key messages. Community disadvantage comes about as a result of the complex interplay between the characteristics of residents living in a community (e.g., unemployment, low income) and the effects of the social and environmental context within the community (e.g., weak social networks, relative lack of opportunities)

### **What are the challenges of community participation?**

#### 5 Principal Challenges of Public Participation

1. Inadequate financial and human resources
2. Lack of skilled facilitator
3. Low efficiency
4. Not interested in participation
5. Language barrier

### **Ways to More Efficiently Increase Community Participation**

- Increase participation with online sign-ups
- Increase participation with online facility booking
- Increase participation with social sharing
- Increase participation with data
- Increase participation with memberships
- Increase participation in email marketing

### **What are examples of community participation?**

- Volunteering at a local food bank, animal shelter or homeless shelter
- Maintaining a community garden
- Participating in a local blood drive
- Helping set up a local farmer's market
- Advocating for others
- Creating support groups in your community

### **What are the steps in community participation?**

#### 6 Steps for Sustaining Community Engagement Year-Round

- Step 1: Pause for a strategic review and reset
- Step 2: Prioritise efforts to improve your focus
- Step 3: Automate your processes
- Step 4: Create a community super user programme
- Step 5: Give people reasons to keep coming back
- Step 6: Interview community members

### **Impact of village uplift programmes**

NGOs play an important role in community participation. NGOs that work with community participation using need-based intervention and microfinance work towards helping the villages be self-sustained. At present, around 16829 NGOs are licenced across India.

The activities of NGOs include but are not limited to environmental, social, advocacy and human rights works. They can work to promote social or political change on a broader scale very locally. NGOs play a crucial role in developing society, improving communities, and promoting citizen participation.

### **Example**

**Exnora**- An environmental-based NGO is working towards achieving zero waste in Chennai by implementing community participation. It highlights the various activities and projects of the NGO on managing solid waste in Chennai and its success in achieving its goals.

### **Conclusion on community participation**

There is no one right way to engage with your community. Community engagement requires identifying a goal, considering what you know about your residents and city, and acting on that knowledge to inform your city's engagement plan.



**Basthi Dawakhana in Kishanbagh, Hyderabad**



**Officials and Mayor of GHMC in bin free programme**



**Door-to-door survey in slums of Hyderabad**



**Volunteers with kids in schools**



**Schoolchildren involved in the clean Hyderabad programme**



**GHMC Mayor felicitating the hard work of associations**



**GHMC pools Residential Welfare Associations in community participation**



**College students participated in water usage and control over wastewater in Hyderabad**



Senior citizens in KAPRA circle GHMC participated in swatch cleaning and awarded



# Municipal Finance

## URBAN SCENARIO in India

- **Urban Population as per 2001 (Census): 286 million (27.8%)**
- **Urban Population as per 2011 (Census): 387 million (31%)**
- **Urban Population estimates by 2030: 600 million (40%)**

HPEC estimates: **Rs.39.2** Lakh crore in the next 20 years

## Resources

1. Internal Resources
2. External Resources
3. Improvement of Property Tax
4. Public Private Partnerships (PPP)
5. Corporate Social Responsibility (CSR)

## Internal Resources

### 1. Property Tax - Assessment

- A. Mapping
- B. Collect the mobile no. of the owners/occupiers of the property
- C. Penalty is levied and collected from un-authorized constructions
- D. Identify Central, State Government, other Undertakings
- E. Conduct special drives for assessment/re-assessment of buildings

### 2. Property Tax - Collection

- A. Serve demand notice/bill in May/November
- B. Demand notice/bill placed on the website
- C. Educate the public on the need for payment of tax
- D. Collect the mobile no. of taxpayers
- E. Announce and popularise the rebate (benefit taxpayers)
- F. Provide an opportunity to pay online, through cheque and educate
- G. Fix up a target for ULB Staff
- H. Special drives, Incentives
- I. Defaulters – Highest taxpayers
- J. Action against defaulters (private and public)
- K. Monitoring

### 3. Property Tax on Vacant Lands

- A. Identify and collect the names of the owners of the vacant lands or layout plots for collection of VLT by obtaining the names of the Property Owners from the concerned Sub-Registrars.
- B. Adopt the capital value of the lands fixed by the Registration Department for registration.
- C. If the Vacant Land is purchased at a higher price than the Market Value fixed by the Registration Department, the value mentioned in the registered document shall be adopted.
- D. Also, assess the excess vacant lands adjacent to the buildings to VLT, as per Act.

### 3a. Introducing self-assessment scheme

#### 4. Advertisement Tax

The respective Municipal Councils/Corporations may, by resolution, levy tax on advertisements, per the procedure prescribed by local Municipal Legislations. It is suggested that the town/city may be divided into three categories based on the roads' importance, as shown here, to achieve the full potential of advertisement revenue.

**Category – A** Places adjacent to the Right of way of National Highways, Outer Ring Roads pass through the town/city and major commercial roads.

**Category – B** Places adjacent to the Right of way of State Highways, Inner Ring Roads and Roads with 60 feet width and above passing through the town/city and other commercial roads not included in category A.

**Category – C** Places adjacent to other roads/streets within Municipal limits are not covered under categories A and B.

It is suggested that rates of advertisement tax may be fixed based on the following factors:

- i. Importance of the road/category of the road
- ii. Type of hoarding
- iii. Size of the hoarding

The types of Advertisements may be categorised as follows:

- a. Uni poles/unstructured
- b. Hoardings- ground level and rooftop
- c. On buses, taxis, bus shelters
- d. Glow sign boards
- e. On floating balloons
- f. Shops and establishments display advertisements of any kind, excluding the name of the shop/establishment/products
- g. Advertisement displayed in the form of slide shows and trailer films
- h. On screens in Cinema Halls
- i. Advertisements along with street furniture such as bus shelters,
- j. Public toilets, benches, informative kiosks, hawing/vending

Ensure that a survey is conducted on all existing advertisements in the municipal limits and verification is made whether permission has been obtained and advertisement tax paid.

In respect of advertisements where permission has not been obtained, an action shall be taken to issue a notice to the party/advertising agency in respect of permissible advertisements to pay advertisement tax with a penalty of 25% of tax within two weeks from the date of service of notice and obtain permission.

If the tax is not paid as per the notice, the advertisement shall be removed and the tax due thereon and the cost of removal shall be recovered as arrears of property tax.

Regarding advertisements where permission has not been obtained and granted as per Rules, an action shall be taken to issue a notice to the party to remove the advertisement within a specified time. In case of failure, the advertisement shall be removed departmentally and the cost of removal shall be collected from the concerned party.

## **Water Charges**

The ULBs realise only 40 percent of operation & maintenance costs are from water charges. There is an immediate need to fix up water charges in such a manner to enable ULBs to realise the operation & maintenance cost in full, duly following the procedure in vogue.

The municipal councils are competent to make by-laws for all matters relating to the water supply. Such water supply by-laws provide, among others, the rate of water charges for various users.

Ensure that the unauthorised tap connections are detected by conducting a survey and regularise the tap connections immediately.

Ensure that the bills for payment of water charges are issued by the end of April for the first half-year and by the end of October for the second half-year in respect of connections on a tap rate basis.

Ensure that the bills must be issued every month by the 10th of the succeeding month regarding connections on a metred basis.

## **Sewerage Charges**

1. Municipal councils can fix and levy underground drainage charges (sewerage charges).
2. Wherever such facility is provided by the ULB, the same may be collected along with the monthly water charges, at a fixed percentage on the monthly water charges, to be decided by the Council.
3. A provision for a levy of interest may be made in the by-laws. It is suggested that the interest may be charged as in the case of Property Tax.

## **Trade Licence Fee**

Ensure that the Trade Licenses are issued under the relevant provisions of the Act duly categorising the Trades as follows:-

- a. Eating establishments.
- b. Medical Establishments.
- c. Non-eating & non-medical establishments.
- d. Flammable Establishments.
- e. Veterinary Trades.
- f. Small Scale Industries / Small & Medium factories

The procedure for issuing of Trade License may be simplified. E-seva may be given access for the submission of new applications and for renewal.

On submission of applications for new trades, renewal of existing trades, and payment of fees, a provisional licence may be issued to the Traders across the Counter. The same is valid for three months from the date of issue.

After that, field inspection may be taken up by the competent authority and recommended for the issue of licence, along with the difference of amount, if any, to be paid by the trader.

## **Others**

- Fee from markets and slaughterhouses
- Parking fee
- Municipal shopping complex
- Municipal grounds

- Entertainment tax
- Professional tax
- Surcharge on stamp duty

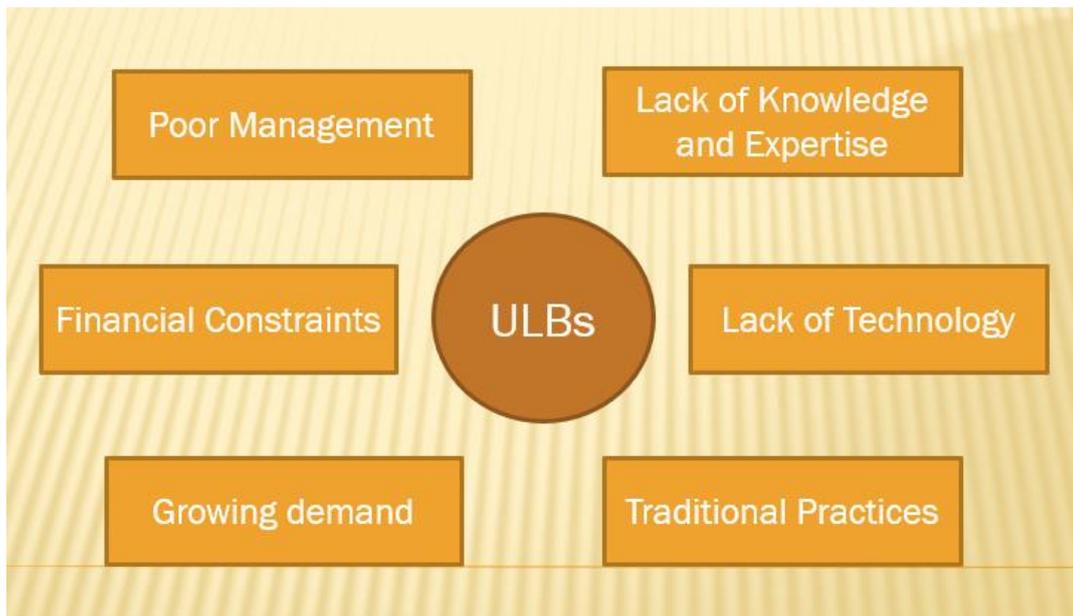
### Public Private Partnership (PPP)

PPP is an arrangement where private parties participate in or provide support for infrastructure provision.

### PPP in India

- The history of PPP in India can be traced back to 1853 and The Great Indian Peninsular Railway Company
- Roads, transportation and urban development projects comprise the vast majority (73 percent)
- Growing since 1998 and significant acceleration since 2006, both as a result of legislative, regulatory and increased political will

### Why PPP?



### Private sector brings in



## PPP Models

Option	Asset Ownership	O&M	Investment	Comm. Risk	Duration
<b>Service Contract</b>	<b>Public</b>	<b>Both</b>	<b>Public</b>	<b>Public</b>	<b>1-2 yrs</b>
<b>Management Contract</b>	<b>Public</b>	<b>Private</b>	<b>Public</b>	<b>Public</b>	<b>3-5 yrs</b>
<b>Lease</b>	<b>Public</b>	<b>Private</b>	<b>Shared</b>	<b>Shared</b>	<b>8-15 yrs</b>
<b>BOT/BOO</b>	<b>Public/ Private</b>	<b>Private</b>	<b>Private</b>	<b>Private</b>	<b>20-35 yrs</b>
<b>Annuity</b>	<b>Private</b>	<b>Private</b>	<b>Private</b>	<b>Public</b>	<b>10-15 yrs</b>

## Areas of PPP

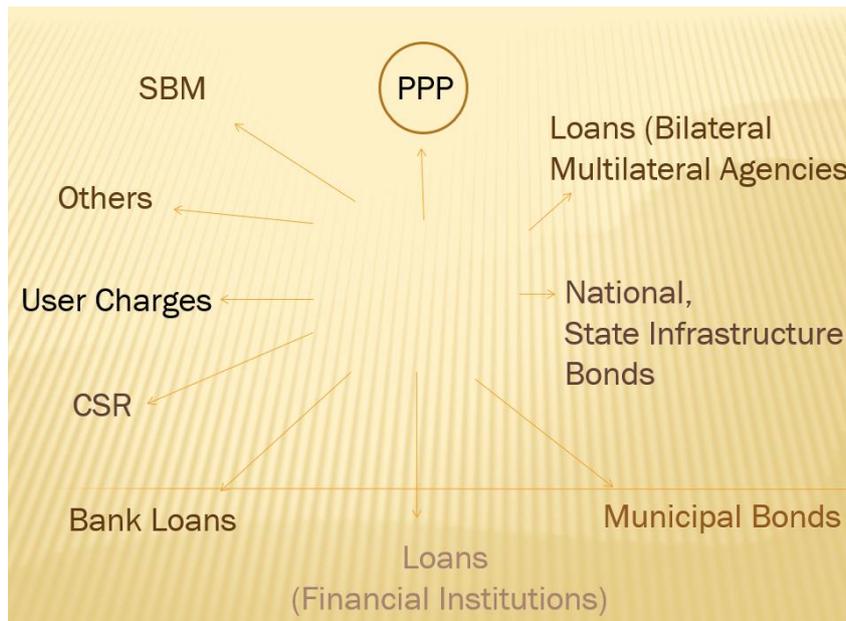
- Water supply & distribution systems
- Urban transport systems – rail or bus based
- Urban roads – upgradation & maintenance
- Development of parks and amusement parks
- Bus terminals & parking facilities
- Bus shelters & civic amenities
- Solid waste management – collection & transportation, treatment & disposal facilities

## PPP - Advantages

- Promotes competition in the service/infrastructure provision leading to better management and beating monopoly
- Offers efficient provision of a service
- Maximises profits by reducing costs
- Enables innovations - technical as well as managerial
- Optimisation of human resource utilisation

## Limitations

- Policy and regulatory gaps
- Inadequate availability of long-term finance
- Inadequate capacity of public institutions and officials to manage PPP processes
- Inadequate capacity in the private sector—both in the form of developer/investor and technical manpower
- Inadequate shelf of bankable infrastructure projects that can be bid out to the private sector
- Inadequate advocacy to create greater acceptance of PPPs by the public.



Under External resources, ULBs may avail of phase 2 of Swachh Bharat Mission funds

Municipalities can take up the following components as specified in SBM 2nd phase

1. ODF Plus activities under Phase II of the Swachh Bharat Mission (Grameen) will reinforce ODF behaviours and focus on providing interventions for the safe management of solid and liquid waste in villages.
2. Phase2 is being implemented between 2020-21 and 2024-25 to help cement the work of phase1
3. The Centre launched the second phase of the Swachh Bharat Mission (Grameen) - SBM(G) Phase-II on March 04, 2020. It will be implemented from 2020-2021 to 2024-2025 in a mission mode with an outlay of Rs **1,40,881** crore.
4. Phase 2 of the Swachh Bharat Mission to focus on waste segregation at the source
5. The second phase of the SBM, announced in the Union Budget, will be responsible for sewage management in all cities with less than 1 lakh population.

### **CSR (Corporate Social Responsibility)**

Corporate Social Responsibility (CSR) is the continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce, their families, the local community, and society at large.

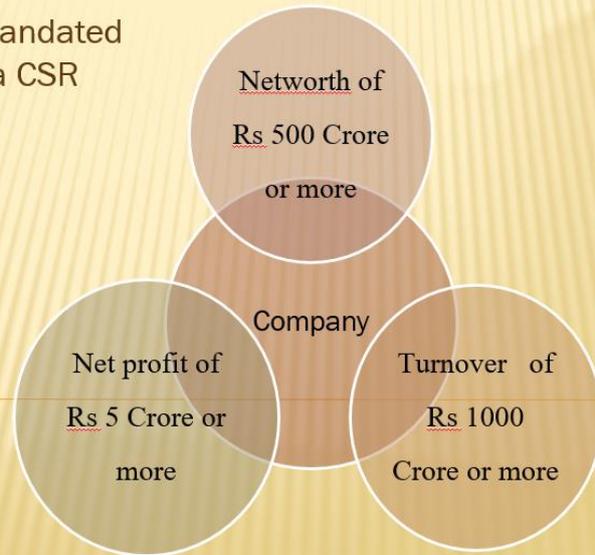
*-Lord Holme and Richard watts*

CSR encompasses what companies do with their profits and how they make them. It goes beyond philanthropy and compliance and addresses how companies manage their economic, social, and environmental impacts, as well as their relationships in all key spheres of influence: the workplace, the marketplace, the supply chain, the community, and the public policy realm.

*-Harvard University*

## CSR: Companies Act 2013 – Section 135

Companies Mandated  
to constitute a CSR  
Committee



### CSR Committee to have

- Three or more directors
- At least one is to be an independent director
- Board's Report shall disclose the constitution of the CSR Committee

### CSR Committee will

- Formulate CSR policy and recommend to board indicating the activities to be undertaken as specified in schedule vii
- Recommend the amount of expenditure to be incurred
- Monitor CSR Policy from time to time

### Areas of CSR

- Water supply & distribution systems
- Urban transport systems – rail or bus based
- Urban roads – upgradation & maintenance
- Development of parks
- Bus terminals & parking facilities
- Bus shelters & civic amenities
- Solid waste management – collection & transportation, treatment & disposal facilities
- Beautification of lakes
- Auditoriums

### CSR – Case Study of GHMC Hyderabad

- Development of graveyards
- Development of lakes
- Development of parks
- Plantation programme
- Development of SWM initiatives

## Crematorium executed under CSR at Hyderabad



### How to start a CSR Unit in ULB?

- Establish a Unit with Commissioner and at least two other officers
- Develop a strategy, objectives, milestones and action plan
- Develop proposals
- Share the proposals with CSRs
- Sought support from CSR
- Implement the projects
- Document the success and challenges

12 A and 8G  
Certificates

### What is a municipal bond?

Municipal securities, or "Munis," are bonds issued by states, cities, counties, and other governmental entities to raise money to build roads, schools, and a host of other projects for the public good. Go to the Bond Section of FINRA. Market Data Center for real-time

### What are municipal bonds examples?

Governments use Munis bonds to raise funds for projects that will benefit the public. Common examples include Roads, highways, bridges, and other infrastructure.

### Are municipal bonds a good investment?

Investing in municipal bonds is an excellent way to preserve capital while generating interest. Most are exempt from federal taxes, and some are tax-free at the state and local levels. 1 Municipal bond, also called "Munis," helps build infrastructure in your area.

### What are the advantages of municipal bonds?

A major benefit of municipal bonds, or "Munis," is that the interest they pay is generally exempt from federal income taxes. They are also usually exempt from state income taxes if the issuer is from the investor's home state.

Although municipal bonds may have lower interest rates than riskier investments like corporate bonds or stocks, they offer stability for your capital with low default rates. Interest from Munis is also federally tax-exempt, making it an attractive investment.

## GHMC BUDGET GOES BIG?

Budget proposals	2017-18 (revised)	2018-19 (in ₹ crore)
Total budget proposed	<b>7,661</b>	<b>13,150</b>
Revenue Income	<b>2,905</b>	<b>3,325</b>
Revenue Expenditure	<b>2,509</b>	<b>2,675</b>
Revenue Surplus	<b>396</b>	<b>650</b>
Capital Receipts	<b>5,151</b>	<b>10,475</b>
Capital Expenditure	<b>5,151</b>	<b>10,475</b>



**GHMC plans to spend ₹8,000 crore, including ₹6,317 crore for 2-BHK housing**



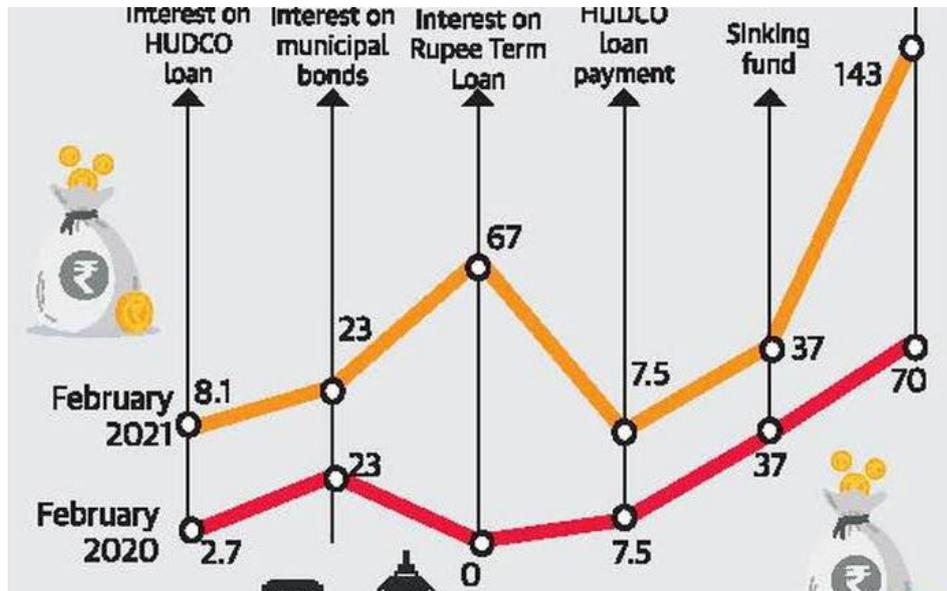
### TAKING MEASURES

Cases prosecuted	<b>340</b>
Fines imposed by GHMC	<b>₹19.59 L</b>
Fines imposed by court	<b>₹5.3 L</b>



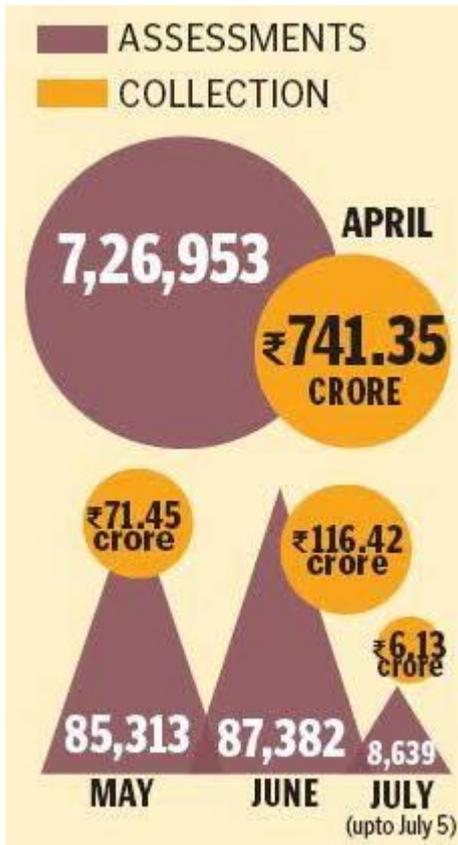
Number of animals slaughtered in GHMC slaughterhouses		
Amberpet	<b>148,124</b>	<b>Total sheep &amp; goat slaughtered</b> <b>2,40,551</b>
New Bhoiguda	<b>154,929</b>	
Ramnasthapura	<b>80,368</b>	<b>Total cattle slaughtered</b> <b>1,42,870</b>

Debt burden and lack of new resources hit GHMC



Property Tax windfall for GHMC

Online Tax collection



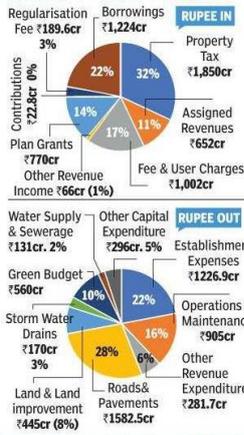
Your Transaction Completed Successfully with Following Details

PTIN : ██████████  
 Amount : 3417  
 Transaction Status : SUCCESS  
 GHMC Transaction id : M112995848520 ██████████ 652  
 Bank Transaction id : OL60273390 ██████████ 2  
 Tax Amount Status : CLEARED

Greater Hyderabad Municipal Corporation Property Tax Receipt Details	
PTIN	██████████
Owner Name	SRI. VINAY VANGALA
Amount (Excluding PG Charges) Paid	Rs/- 3417 /-
Transactionid	OL60273 ██████████ 82
Transaction Date & Time	129-04-2020 23:38:14
Mode Of Pay	Online
Transaction Status	Your Transaction is completed successfully
***** Please Print this receipt for further reference *****	
* It is a computerized Receipt, signature is not required.	

GHMC budget focusses on roads and health

GENERATING REVENUE



**GHMC 2021-22 BUDGET (REVENUE + CAPITAL EXPENDITURE) : ₹5,600CR**

- Revenue income (property tax, building fee): ₹3,571cr
- Revenue expenditure (salaries, maintenance, interest for loans): ₹2,414cr
- Revenue surplus (revenue income minus revenue expenditure): ₹1,157 crore
- Capital receipts (loans from banks, bonds, revenue transfer for city development works): ₹3,186 crore
- Capital expenditure (green budget, roads): ₹3,186cr

**CAPITAL EXPENDITURE: PROPOSED SPENDING: ₹3,186CR**

- Roads & pavements: ₹1,582cr
- Bridges, flyovers, subways: ₹81.9cr
- Green budget (urban forestry and horticulture): ₹560 crore
- Buildings (markets, shopping complexes, halls): ₹87 crore
- Capital receipts (grants, loans from banks, bonds, revenue transfer for city development works): ₹3,186cr
- Land and land improvement (acquisition, playground, traffic islands): ₹445cr
- Storm water drains: ₹170cr

**IN NUMBERS**

GHMC BUDGET 2022-23

Budget: ₹6,150cr

Revenue: ₹2,800cr

Borrowings: ₹1,302cr

**BREAK UP**

Property tax | ₹1,700cr

Town planning | ₹1,200cr

Trade license | ₹63cr

Pattana Pragathi (garbage collection) | ₹354cr

Other receipts | ₹117cr

**HIGH PRIORITY ALLOCATIONS**

Road infrastructure | ₹1,500cr (SRDP gets | ₹714cr, CRMP | ₹248cr)

Health & sanitation | ₹1,140cr

Land acquisition | ₹750cr

Nalas | ₹540 (SNDP gets | ₹340cr)

### GHMC received its share of stamp duty



#### Stamp duty share received by GHMC (in cr)

2018-19	₹342
2019-20	₹498

#### Share from mutation fees (in cr)



Assigned revenues and surcharge on the transfer of immovable properties are accounted for during the year only upon actual receipt

# Sustainable Transportation

Sustainable transportation refers to any means of transportation that is 'green' and has a low environmental impact. Sustainable transportation is also about balancing our current and future needs. Sustainable transportation includes walking, cycling, transit, carpooling, car sharing, and green vehicles.

## Importance of sustainable transportation?

**Creates Less Congestion:** With fewer private vehicles on the road, fewer traffic jams will occur. This means people can get to where they need to be faster, even in dense urban areas. Also, we can better preserve our natural habitat with more open roads and spaces.

## What is the most Sustainable Transport?

### Cycling and Walking

It is no surprise that bicycles and walking are the most sustainable transportation methods. Not only do they produce 0 carbon emissions at every stage, but they are also enjoyable for us.

## Characteristics of sustainable transportation?

A sustainable transportation system is “one in which fuel consumption, vehicle emissions, safety, congestion, and social and economic access are of such levels that they can be sustained into the indefinite future without causing great or irreparable harm to future generations of people throughout the world.”

## How can we support sustainable transportation?

These are some of the top strategies

- Make public transport more cost-effective
- Make active transport more seamless at your facilities
- Provide discounted bike-share or car-share memberships
- Advocate for sustainable transport infrastructure in your neighbourhood
- Foster carpooling
- Disincentivise driving

## How does transportation affect sustainability?

A reduction of the environmental impacts of transportation is a likely strategy for sustainability. Transportation contributes to harmful emissions, noise, and climate change. About 15% of the total greenhouse gases and 22 percent CO<sub>2</sub> emissions are attributed to transportation.

- How can we improve transportation?
- 4 Ways to Improve Public Transport (With Input from the Public)
- Improve bus frequency. First and foremost, riders want buses to arrive more frequently.
- Improve bus ticketing systems.
- Increase passenger comfort and safety.
- Reduce bus emissions and GHGs.

### **How do transport systems impact the environment in cities?**

The environmental effects of transport are significant because transport is a primary user of energy and burns most of the world's petroleum. This creates air pollution, including nitrous oxides and particulates, and is a significant contributor to global warming through the emission of carbon dioxide.

### **Transportation challenges**

- Traffic movement and congestion
- Public transport crowding
- Off-peak inadequacy of public transport
- Difficulties for pedestrians
- Parking difficulties
- Environmental impact
- Atmospheric pollution

### **Main Benefits of Sustainable Transportation**

- Creates jobs
- Provides safer transportation
- Emits less pollution
- Promotes health
- Decreases congestion
- Saves energy
- Conserves land
- Saves money

Sustainable transport can improve your health. Sustainable transport systems can protect and promote health by reducing risks from vehicular air pollution, physical inactivity, and traffic injuries and providing climate and environmental benefits for urban areas.

### **Why should people be concerned about sustainable transportation?**

Sustainable transportation should become the top priority to slow climate change and environmental pollution and halt global warming.

### **How does sustainable transportation reduce climate change?**

#### **Less Pollution and Clearer Skies**

Compared with driving alone, taking public transportation reduces CO2 emissions by 45%, decreasing pollutants in the atmosphere and improving air quality.

### **What are the most important elements of a sustainable transportation system?**

Fuel efficiency, occupancy, electrification, pedal power, and urbanisation are our five pillars of sustainable transportation.

### **Advantages of sustainable transport packaging**

The main advantage of using sustainable transport packaging is reducing environmental impact.

### **Potential cost savings of sustainable transport packaging include:**

- Reduced raw material and waste disposal costs
- Reduced handling and storage
- Reduced costs of complying with the packaging waste regulations

### Disadvantages of sustainable transport packaging

- The main disadvantage of sustainable or reusable transport packaging systems is cost.
- The initial purchase of reusable containers
- Modifications to handling and transport facilities
- Additional costs of the tracking system, e.g. software packages, bar code labelling/reading equipment, electronic chips and detectors

### The challenges of sustainable transportation?

- Current mass transport systems present significant and growing challenges (not to say problems) for:
- Their impact on the environment.
- How they affect human health (mental and physical)
- Ownership and cost management.

### What are examples of sustainable transportation?

Sustainable transportation refers to any means that are 'green' and have a low environmental impact. Sustainable transportation is also about balancing our current and future needs. Sustainable transportation includes walking, cycling, transit, carpooling, car sharing, and green vehicles.

### What are the most important elements of a sustainable transportation system?

Fuel efficiency, occupancy, electrification, pedal power, and urbanisation are our five pillars of sustainable transportation.

### Green Transportation – Cycle Track

As per IRC-11-1962 design layout of the cycle track



1. The 2-way cycle track width of 2.5 meters in India but 3 meters wide at least
2. Length 130 to 500 meters
3. It should be made with Asphalt
4. Speed 10 to 15 km/hour on footpaths
5. 25KM/hour on shared paths
6. Marked a solid white lane
7. Surface to be coloured RED/GREEN

## Cycling Rules in India

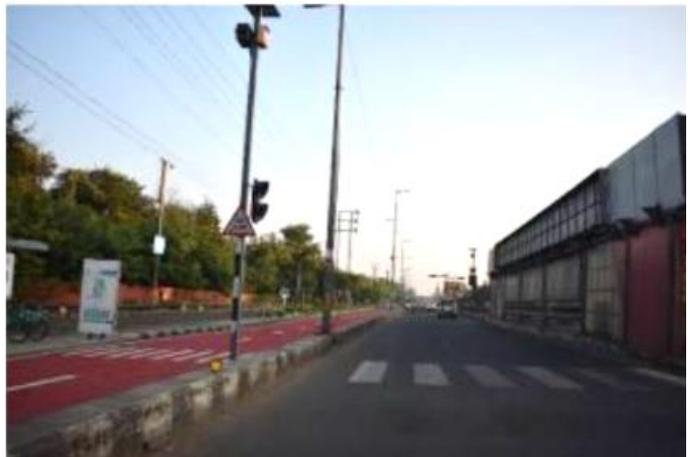
1. Do not overload
2. Move to the left side
3. Avoid overtaking
4. Put both hands on the handlebar
5. Use reflective tapes

## Various cycling tracks built across India

### WARANGAL Municipality



### Bhopal Municipality



## Telangana, under smart city funds

**HYDERABAD:** The city's longest cycle track (23KM) along the side of the service road of Outer Ring Road



### Kalyan Municipality



### Bangalore Metro



**New Delhi 11 kms**



**Chandigarh 30 kms**



**Gurgram Metro**



**Mumbai Metro**



### **What is the National Urban Transport Policy 2006?**

The National Urban Transportation Policy (NUTP), launched in 2006, aims to provide better mobility and sustainability by focusing on people and not vehicle mobility.

### **What are the salient features of national urban transport policy?**

This policy aims to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and other needs within our cities.

The **National Urban Transport Policy 2014** recognises the huge deficit in the quality and quantity of urban transport services and infrastructure. The use of desirable modes of transport -- walking, bicycle, and public transport -- is declining and the use of undesirable modes, i.e. cars and two-wheelers, is growing.

### **Cities won the most sustainable transportation in India**

1. Surat
2. Kochi
3. Tamilnadu
4. Mumbai
5. Calcutta

### **Cities won the most sustainable transportation in the World**

1. Hongkong
2. Singapore
3. Seoul
4. Europe
5. London
6. New York
7. Few other states in the USA

Finally, one can think about how to Reduce CO<sub>2</sub> footprint without increasing costs. Carbon-neutral manufacturing is green public transport vehicles, including electric trains, trams and electric buses, combining the advantages of green vehicles with those of sustainable transport choices. Other transport choices with very low environmental impact are cycling, human-powered vehicles, and animal-powered transport.

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