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Critically Investigating and Monitoring the Sanitation and Solid Waste Management under Swachh Bharat Mission: A case Study of Ballia, Varanasi and Chandausi, Uttar Pradesh

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Abstract

The global pandemic in the form of COVID-19 has killed many hundred thousand throughout the world and hit hard to the global liberal economic structure resulting from the lockdown of all the major economic activities to counter the spread of the virus. However, there is an flip side of the pandemic also, which is being talked about and that is the positive side of pandemic leading to the restoration of the ozone layer, cleaning of rivers and improvement of air quality to name a few. The restoration of nature has been appreciated but with the opening of economic activities throughout the world, the resurgence of the problem of polluting the environment and ecological imbalance will again take place. Looking at the kind of health problems in the form of EBOLA, SAARS, H1N1 and COVID, restoring the nature is This is mainly because the problem of sanitation and waste management system has not been developed and the planning that has been made has hardly been implemented. The present paper will look into the sanitation and waste management system in India in general and take the case study of Chandausi to examine the implementation of the system and its loopholes. The proposed study has identified the problem at implementation level and also the problem persisting at the level of common public and their attitude towards sanitation and solid waste management.

Keywords: Sanitation, Solid waste management, global pandemic, liberalism, ecology, nature.

1. Introduction

We can think of sanitation as the prevention of human contact with wastes, or as the provision of facilities and services for the safe disposal of human faeces and urine. More formally, the World Health Organization defines sanitation as, "The provision of facilities and services for the safe disposal of human urine and faeces, the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal." By 'facilities', we mean the structures that are used to provide sanitation. This ranges toilets, the system for collecting the excreta from toilets, through to sewage treatment systems. By 'services' we mean the whole scheme for providing sanitation; providing facilities, maintaining them, treating the wastes from them and organising finance and payments. The WHO goes on to state that, "Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities".

Waste management is defined in the European Union's Waste Framework Directive as, "The collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker." The two terms – sanitation and waste management – both refer to waste, but sanitation is primarily concerned with liquid waste and waste management is primarily concerned with solid waste. Liquid wastes are any wastes in a liquid form such as wastewater and sewage. Faeces and the contents of pit latrines and septic tanks are also classed as liquid wastes. Solid wastes are anything in solid form that is discarded as unwanted. In practice, sanitation and waste management are used in ways that overlap and some organisations include solid waste management as part of sanitation.

Hence we can understand the difference between sanitation and waste management as- Sanitation means preventing people from coming into contact with wastes by providing facilities and services for the treatment and disposal of human excreta and other liquid wastes produced in homes, workplaces and public buildings. On the other hand, waste management is the collection, treatment and disposal of solid wastes produced in the home, workplace and public buildings.

Although sanitation and waste management address different issues using different techniques, they have a number of features in common. For example, they both deal with wastes and are concerned with safeguarding human health and preventing disease. It cause major problems if not done correctly and help to reduce environmental pollution (introduction into the environment of substances liable to cause harm). They need to be paid for by the users, the city authorities or the government

Therefore, as per the definition of Sanitation it can be concluded that it has the following components which are as under –

- Access to toilets
- Sewerage
- Drainage
- Water Supply

2. REVIEW OF LITERATURE:

Status of Municipal Solid Waste Management (MSWM) in Various Cities

C. R. Mohanty et al. (2014), in their study *"Municipal Solid Waste Management in Bhubaneswar, India – A Review"*, published in the *International Journal of Latest Trends in Engineering and Technology*, examined the current state of MSWM in Bhubaneswar. The objective was to identify the key obstacles to achieving effective waste management in the city. The study found that the existing system was highly inefficient, with local authorities primarily handling only the collection, transportation, and open dumping of waste. The authors attributed the inefficiencies to rapid urbanization, population growth, a shortage of financial and human resources, poor technological choices, and a lack of strategic planning. They emphasized the urgent need for adopting a new solid waste management framework to improve living standards and prevent further environmental degradation.

Gajendra Mohan Dev Sarma et al. (2015) studied the MSWM practices in Nagaon, a town in Assam. The researchers collected both primary and secondary data through questionnaires administered to households, ragpickers, commercial establishments, hospitals, and the local

municipal board. Their findings revealed that waste management practices were inadequate at every stage—from collection to disposal. Major issues included low collection efficiency and a lack of community participation. There was no regular door-to-door collection or segregation, and the municipal board lacked basic waste treatment infrastructure such as composting units, sanitary landfills, or incineration facilities. A key challenge identified was the unavailability of land for waste disposal. The study recommended the use of color-coded bins for source segregation and suggested adopting composting and vermi-composting technologies for managing organic waste.

Sharholy and Ahmad (2007) presented a comprehensive review of MSWM practices in Indian cities. Their report covered the qualitative and quantitative aspects of waste generation, including waste characteristics, storage, collection, transportation, and disposal methods. The study concluded with practical suggestions for policymakers and researchers aimed at improving the MSWM system in urban areas.

Vikash and Shreekrishnan (2008) analyzed the MSWM situation in Delhi, the most densely populated and urbanized city in India. Delhi generates approximately 7,000 tonnes of MSW per day, with projections suggesting a rise to 17,000–25,000 tonnes/day by 2021. The study highlighted that despite the enormous waste generation, MSWM remained one of the most neglected areas in the city's municipal system. Only 70–80% of the waste was collected, while the remaining waste accumulated on streets and in open areas. Of the collected waste, merely 9% was treated (mostly via composting), and the rest was disposed of in unregulated landfills on the city's outskirts. The study also summarized the policies and initiatives undertaken by the Government of Delhi and the Municipal Corporation of Delhi to address these challenges.

Hazra and Goel (2009) reviewed solid waste management practices in Kolkata. They reported that the city generates over 2,920 tonnes of waste daily, of which only 60–70% is collected—hampered by inadequate manpower and vehicle resources. The authors identified several issues, including a lack of proper infrastructure, underestimation of waste generation, poor management and technical skills, inefficient bin collection, and flawed route planning. The study concluded that these systemic deficiencies were responsible for the poor state of MSWM in Kolkata and called for strategic interventions to address them.

3. Research Questions

This study explores the current state of sanitation and solid waste management (SWM) in Chandausi, a small town in Uttar Pradesh, where uncollected garbage is often seen on the roads. It seeks to evaluate the functioning and effectiveness of sanitation services provided by the **Nagar Palika Parishad (NPP)**.

The research addresses the following questions:

1. Does India possess the necessary technology for effective solid waste management?
2. What policies, rules, and regulations currently guide solid waste management in India?
3. Despite having several laws and schemes, why is India still struggling with cleanliness and considered among the dirtiest countries?
4. What are the key gaps contributing to these conditions?
5. How effectively are SWM systems utilized across various Indian states, cities, and small towns?
6. What is the current situation of sanitation and SWM in Chandausi?
7. What initiatives has the Nagar Palika Parishad taken to maintain sanitation in Chandausi?
8. Does the NPP have any policies or schemes in place for effective waste regulation?
9. How efficient is the NPP in implementing these services?
10. Are the actions of the NPP producing any visible improvements in the town?
11. The NPP claims that Chandausi ranked first in cleanliness within Sambhal district in 2018. How relevant and accurate is this claim in the present context?

4. Hypothesis:

The **Swachh Bharat Mission** has contributed to notable improvements in sanitation and solid waste management systems in India. However, the success of such initiatives is heavily dependent on **both administrative efforts and public participation**.

"When 'I' is replaced with 'WE', even illness becomes wellness."

This quote highlights the importance of collective responsibility. Based on data collected from the Nagar Palika Parishad, field surveys, and interviews, it is evident that **there is a clear gap between the functioning of the NPP and the attitude of the public** towards sanitation and waste management.

For example, during a field survey in Ward No. 2, a resident named Pratap Singh reported that there is no designated place for household waste disposal and that NPP sweepers do not collect waste regularly. This concern was echoed by many other residents across the town. While NPP has provided dustbins, they are often ignored, and garbage is dumped openly.

This reveals a dual issue:

- **Administrative inefficiency** in establishing proper waste disposal systems (e.g., lack of land for waste treatment).
- **Public apathy** and lack of awareness, as residents continue to dispose of waste improperly despite the availability of community services.

Despite these issues, some areas have shown progress:

- **Water Supply**: Most residents reported satisfaction with the quality of water provided.
- **Toilet Access**: Under the Swachh Bharat Mission, both community and individual toilets have been constructed. However, despite this, many people still defecate in the open, which highlights behavioral resistance.

In contrast:

- **Sewerage**: There is no sewage treatment plant in Chandausi, and this area has been largely neglected.
- **Drainage**: Most drains are open and frequently used for garbage disposal due to the absence of proper alternatives.

These observations indicate that **solid waste management and drainage conditions are interlinked**, and that both government actions and community behavior play critical roles in their success.

People want change, but they are often unwilling to be the change.

Some residents living below the poverty line (BPL) stated that without proper shelter or resources, they find it difficult to contribute to maintaining public sanitation.

Thus, the study concludes that while **NPP is making efforts**, its impact will remain limited unless **the public actively participates and behavioral attitudes change**.

5. Scope of the Study:

The scope of this study extends to evaluating the challenges and opportunities in improving **solid waste management and sanitation** in small towns of India, using **Chandausi** as a representative case.

India has significant potential to improve its waste management systems, but the ground reality presents numerous obstacles. Unlike countries like **China** and the **United States**, where the public actively cooperates with government and private agencies in recycling and waste disposal, in India, public apathy and lack of awareness are major issues. Many citizens believe that waste management is solely the government's responsibility.

This study not only sheds light on the limitations within Chandausi's Nagar Palika Parishad but also offers insights for **other small towns to assess and improve their sanitation efforts**. It aims to help local governing bodies recognize gaps in their functioning and initiate targeted reforms, especially in:

- Infrastructure for waste treatment and disposal
- Community education and awareness
- Efficient resource allocation
- Behavioral change programs

Ultimately, this research contributes to the larger goal of making **Swachh Bharat** a sustainable and participatory movement, rather than just a government campaign.

"Don't trash our future."
A clean India is possible—but only when both institutions and individuals play their part.

6. Data Analysis:

This section presents an analysis of the sanitation and solid waste management system in Chandausi, Uttar Pradesh. The analysis is organized under the following sub-headings:

1. Solid Waste Management
2. Access to Toilets
3. Sewerage
4. Drainage
5. Water Supply

6.1. Solid Waste Management

Solid Waste Management (SWM) is a mandatory function of the **Chandausi Nagar Palika Parishad**. However, this function is inadequately performed, leading to concerns related to public health, sanitation, and environmental degradation. The major challenges observed in the current SWM system include:

- Shortage of sanitary workers
- Low collection efficiency
- Use of outdated or inappropriate technology
- Absence of designated landfill or processing sites
- Inadequate skilled manpower
- Poor public participation and lack of awareness

Existing Solid Waste Management System:

Solid waste is primarily generated by **residential households, hotels, restaurants, marketplaces, hospitals, and dispensaries**. The city generates approximately **44 metric tonnes (MT)** of solid waste daily, with a per capita waste generation rate of **350 grams/day**.

The Nagar Palika Parishad is currently able to collect and transport only **80–90%** of this waste using its available workforce and vehicle fleet. However, only about **60% of the total municipal solid waste (MSW)** is actually being collected and transported in practice.

Types of Waste Generated:

a) Domestic Waste

Generated primarily from households, domestic waste comprises mostly biodegradable items such as vegetable peels, paper, cloth, and other organic matter. Chandausi, with a population of **114,383**, generates approximately **44 MT** of household waste daily. A small proportion includes non-biodegradable materials like plastic and metals.

b) Commercial Waste

Includes waste from hotels, restaurants, shops, and street vendors. This waste primarily consists of inorganic materials such as paper, plastic, and packaging materials, which are generally mixed with domestic waste during disposal.

c) Hazardous Waste

Primarily **biomedical waste** generated by hospitals, clinics, and laboratories. The components include:

- Human anatomical waste (tissues, organs, etc.)
- Animal waste
- Microbiology lab cultures and pathogens
- Sharp objects (needles, blades, etc.)
- Expired medicines and cytotoxic drugs
- Blood-soiled materials (bandages, cotton, etc.)
- Chemical and infectious liquid waste

There is no specialized treatment facility for biomedical waste in Chandausi, posing serious health and environmental risks.

Collection and Transportation:

Primary Collection

Door-to-door collection is not universally implemented across the city. Most residents dispose of their waste outside their homes. Waste is collected manually using wheelbarrows and carts and transported to temporary collection centers, which are often **masonry-type structures**.

Secondary Collection & Transportation

Chandausi has about **75 waste collection points** and approximately **250 dustbins** spread across different wards. Waste is transported between **10:00 AM and 3:00 PM** daily to secondary collection points using various vehicles under the supervision of the Executive Officer of the Nagar Palika Parishad. The staff includes in the Table number 1.

S. No.	Description	Numbers
1.	Sanitary Inspector	3
2.	Total Sweepers	244
3.	Private Contractor	117
4.	Number of Dustbin	250
5.	Collection Point	75
6.	Land Fill Site (existing)	Nil

Table 1: Details of Manpower and Infrastructure for Secondary Waste Collection and Transportation in Chandausi

Despite these provisions, a large portion of the waste is **transported in open vehicles**, contributing to littering and visual pollution along the roads.

Vehicle Fleet for Waste Collection:

To facilitate the daily transportation of municipal solid waste from collection points to secondary disposal sites, the Nagar Palika Parishad, Chandausi, employs a range of vehicles. These include tractors, JCBs, Magic vans, lorries, and mechanized refuse collectors. Despite the use of such a fleet, a significant portion of the waste continues to be transported in open vehicles, contributing to spillage and road-side littering. The details of the vehicle fleet, along with the number of trips made daily, are presented in Table 2.

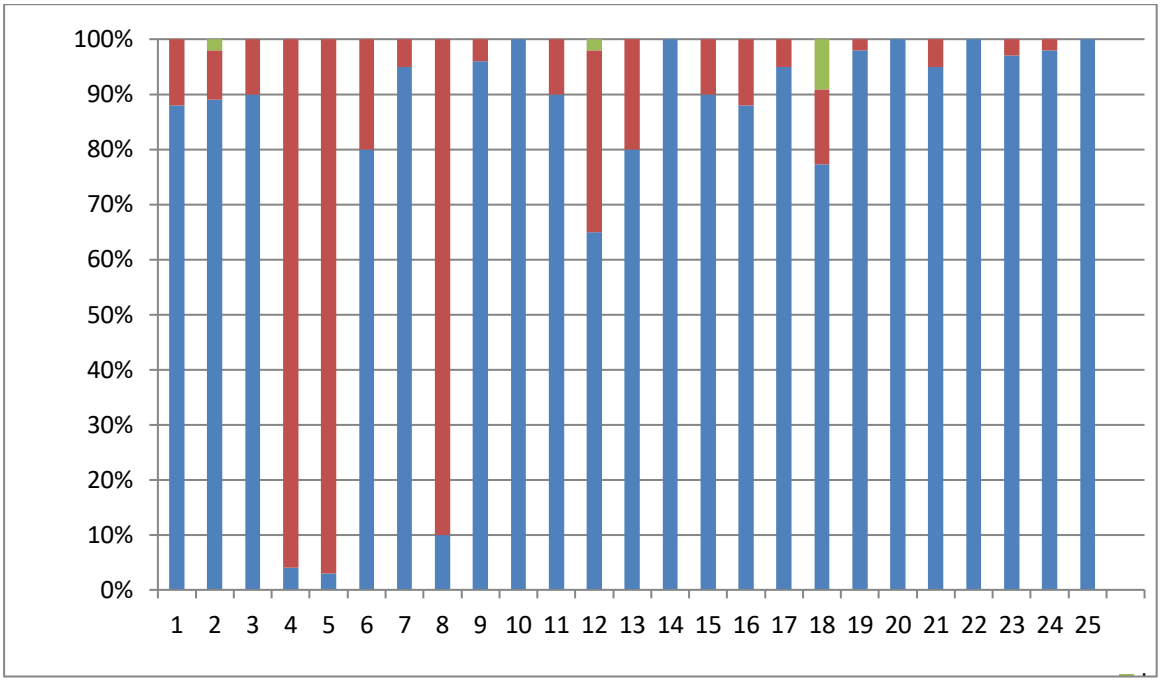
S. No.	Category of Vehicles	Number of vehicles	Trips
1.	Tracker	6	3
2.	Tracker (Small)	2	3
3.	JCB (Large)	1	
4.	JCB (Small)	1	
5.	Magic	1	3
6.	Lorries (Dumper)	1	3
7.	Refuse Collector (RC)	1	12.16 box
8.	RC backer attached	1	6.8 box
	TOTAL	14	

Table 2: Composition and Daily Utilization of Vehicle Fleet for Waste Transportation in Chandausi

Methods of Solid Waste Disposal (Ward-wise):

In Chandausi, **open dumping** is the most common method of waste disposal, violating the **Municipal Solid Waste (MSW) Rules, 2000**. Only a few wards are equipped with waste containers. Most of the collected waste is dumped in **low-lying areas** without any treatment or cover, posing a serious threat to the environment and public health.

The **graph below** provides a **ward-wise representation of waste disposal practices**, highlighting the methods used in Ward No. 25:



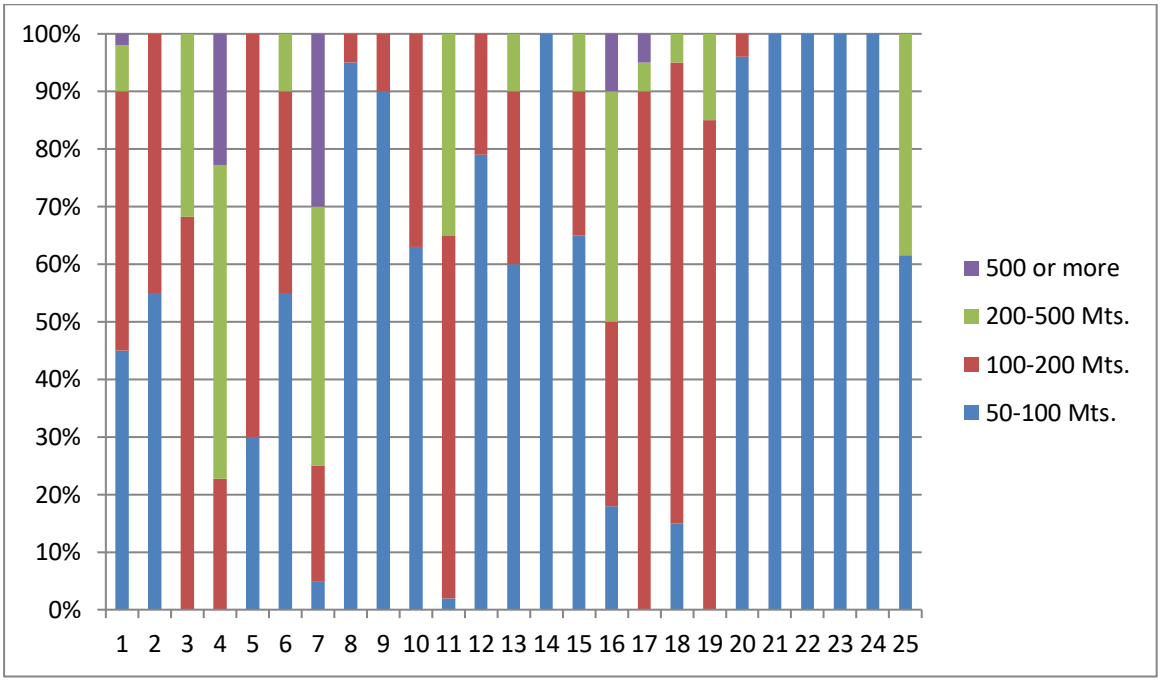
Graph 1: Ward-wise Distribution of Solid Waste Disposal Methods in Ward No. 25

- Blue denotes for Waste Containers
- Red denotes for In the open
- Green denotes for In the drain

DISTANCE OF WASTE DISPOSAL SITE (WARD WISE):

Most of the respondents reported to have the location of the waste disposal site is within the 50-100 metres of the resident area. Some of them reported to have within 200 metres of residents.

The **visual representation below** illustrates the ward-wise distance of waste disposal sites from residential areas in **Ward No. 25**.

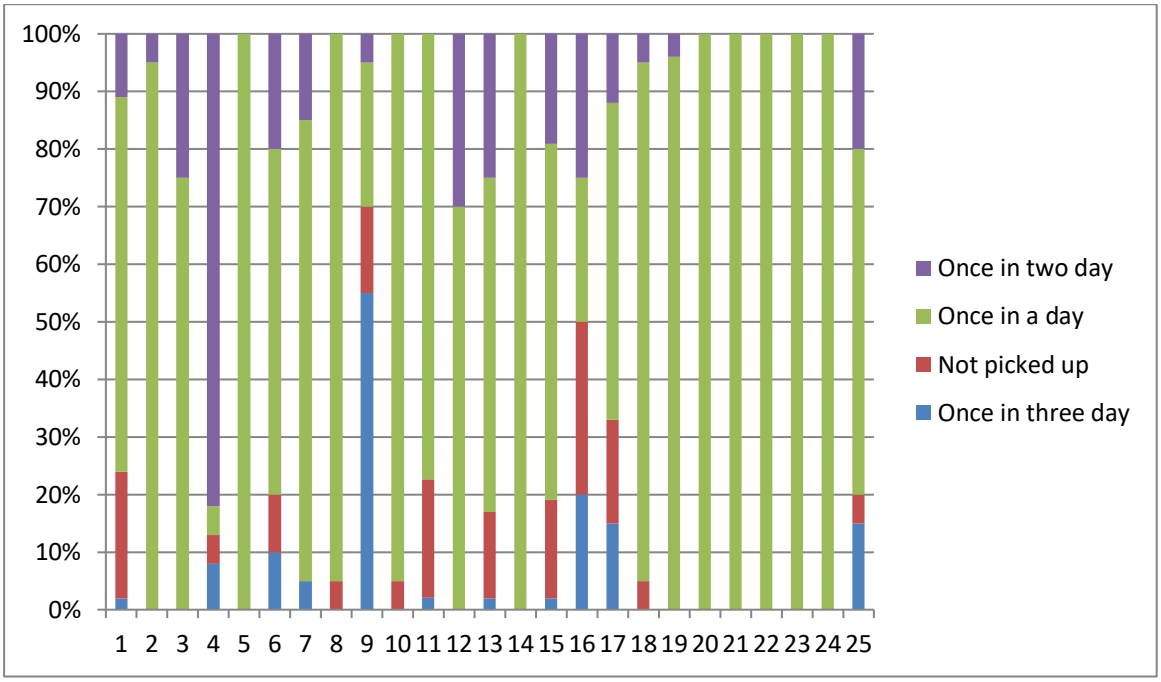


Graph 2: Distance of Waste Disposal Sites from Residential Areas in Ward No. 25

FREQUENCY OF WASTE COLLECTION (WARD WISE):

In the residential areas, most of the respondents reported that solid waste not picked up at all. Some of the respondents reported that solid waste not picked up at all. Some of the respondents reported that solid waste collects once in a day, once in two days and once in three days.

The **graph below** presents the ward-wise data on the frequency of waste collection reported in **Ward No. 25**.



Graph 3: Reported Frequency of Solid Waste Collection in Ward No. 25

TREATMENT AND DISPOSAL:

Chandausi town does not have landfill site for the disposal but due to lack of proper and insufficient number of equipment and lack of solid collection system, and public awareness and the waste is disposed randomly in low lying areas or local pond areas.

GAP ANALYSIS:

- Requirement of Bins
- Door to Door Collection system
- Segregation of solid waste
- Requirement of staff

SWOT ISSUES AND PRIORITIES:

The current state of Solid Waste Management (SWM) in Chandausi Nagar Palika reveals several pressing issues and opportunities. Service delivery is significantly below the Service Level Benchmark (SLB) norms, with inefficient collection systems and widespread open dumping. Public awareness and participation are lacking, and responsibilities for SWM are dispersed among multiple departments, leading to poor coordination and accountability.

Approximately 40–50% of households dispose of waste in open lands or roads due to irregular secondary collection. This attracts stray animals, leading to waste scattering, unsanitary conditions, and reluctance among residents to use the provided dustbins.

A structured **SWOT analysis** (Strengths, Weaknesses, Opportunities, and Threats) is presented below to identify key strategic priorities for improvement:

STRENGTHS	**WEAKNESSES**
• Compact city; amenable to city wide PPP initiatives.	• 0% coverage, negligible levels of door to door collection • Dumping of waste in water bodies and neighbourhoods • Low frequency of collection • Inadequate machinery and staff leading to weak accountability. • No processing and landfill facilities.
OPPORTUNITIES	**THREATS**
• Exposure to modern waste management practices • Scope for generating revenue from processing • Scope for PPP interventions in secondary transfer and processing	• Health hazards • Filling of water bodies by wastes. • Mixing of Solid waste with waste water leading to choking of existing line network.

Conceptual Basis and Best Practices in Solid Waste Management:

Municipal Solid Waste Management (MSWM) is a **comprehensive process** that involves the generation, segregation, collection, transportation, treatment, and disposal of waste. Each component is interdependent, and the **efficiency of the overall system** depends on how well these elements are integrated.

Sanitation and Waste Processing Infrastructure:

According to the Municipal Solid Waste Management (MSWM) Rules, 2016, source-level segregation of waste is mandatory for all households and institutions. Waste must be separated into biodegradable, recyclable, and hazardous categories. In situations where sorting at the source is not feasible, community-level sorting or segregation at processing facilities may be used temporarily. However, pre-sorting remains essential to ensure that the final output, such as compost, complies with quality standards.

Waste sorting in Chandausi is currently carried out through a combination of manual, semi-mechanized, and mechanized approaches. Manual sorting typically involves spreading the waste out and handpicking recyclable materials, while semi-mechanized methods include the use of basic machinery like conveyor belts and crushers, supported by manual labor. Fully mechanized systems rely on automated processes such as shredding, magnetic separation, and compacting, and require minimal human intervention.

Door-to-door waste collection is practiced in the city using containerized handcarts, tricycles, and motorized vehicles that alert residents with unique sound signals. Waste is stored in designated containers, which include metal dumpers and plastic bins placed in residential and commercial areas. For safety and ergonomic considerations, the weight of waste collected manually is restricted to a maximum of 30 kilograms. In localities where the landfill or processing site is located more than 20 kilometers away, transfer stations are used to facilitate efficient transportation.

Waste treatment in Chandausi includes both biological and thermal methods. Biological treatment methods such as aerobic composting convert organic waste into compost through oxygen-driven decomposition, while anaerobic digestion processes organic waste in the absence of oxygen, generating methane that can be used as an energy source. Non-biodegradable and hazardous waste is often subjected to thermal treatment like incineration to reduce volume and eliminate pathogens.

For residual waste that cannot be treated, sanitary landfilling is employed. This involves scientifically managed disposal methods where waste is compacted and covered with layers of earth, minimizing odor, discouraging pests, and preventing environmental contamination.

Recommendations for Improvement in Solid Waste Management:

To strengthen solid waste management (SWM) in Chandausi, it is recommended that ongoing and proposed projects—especially Detailed Project Reports (DPRs)—be prioritized and effectively implemented. Enhancing public accountability and participation is critical, along with improving interdepartmental coordination between the health and engineering wings. Establishing a dedicated SWM unit within the Nagar Palika Parishad would further streamline operations.

In addition, investments should be made in capacity-building programs and training of the existing workforce to improve efficiency. Municipal by-laws must be updated and strictly enforced to prohibit open littering, ban plastic items below 40 microns, and introduce penalties for non-compliance.

To ensure the sustainability of waste management systems, the introduction of user charges is essential to cover operation and maintenance costs. Furthermore, the city should take advantage of available funding under programs like JNNURM and state-level schemes. A fully privatized door-to-door waste collection system should be adopted, along with the implementation of a two-bin system at the household level to encourage segregation at the source.

6.2. Access to Toilets

Access to toilets is a critical indicator of sanitation infrastructure, particularly in **urbanizing towns** like Chandausi. The rapid rural-to-urban migration—over **20 million people** in the 2001 census decade alone—has exacerbated the demand for sanitation facilities.

Current Scenario in Chandausi:

According to Census 2016, the total population of Chandausi is 114,383, comprising 20,726 households. Among these, 85.8% of households have access to toilets within their premises, while the remaining 14.2% either depend on public toilets or continue to practice open defecation.

Vision:

To provide **equitable and efficient access to public and community toilets**, eliminate open defecation, and foster sanitation consciousness through sustained awareness campaigns.

Progress and Challenges under Swachh Bharat Mission (SBM):

To bridge the sanitation gap in Chandausi, the Nagar Palika Parishad (NPP) has implemented several key interventions under the Swachh Bharat Mission (SBM). These efforts include the construction of 2,267 Individual Household Toilets (IHHL) in underserved areas and the installation of 11 Community and Public Toilets across important zones of the town. While these initiatives have contributed to a reduction in open defecation, several challenges continue to hinder full sanitation coverage. A significant portion of residents still practice open defecation despite having access to toilets, largely due to behavioral resistance. Additionally, the maintenance of community toilets remains inadequate, discouraging regular use. Public awareness also remains a concern, with many citizens yet to fully understand the health and dignity benefits of proper toilet usage. Therefore, while notable progress has been made in infrastructure development, the primary focus going forward must shift toward improving usage, maintenance, and community engagement to achieve lasting sanitation outcomes.

Gap in Toilet Facility Coverage:

The following table presents the current status and remaining need for household toilets in Chandausi:

S. No.	Description	Number
1.	Total No. of Households	20726

2.	No. of households having toilet facility within the premises	17783
3.	No. of households not having toilet facility within the premises	20726 – 17783 = 2943
4.	No. of individual toilets Nagar Palika made under Swachh Bharat Mission in the households where there is no toilet facility	2267
5.	No. of remaining toilets to be made	676

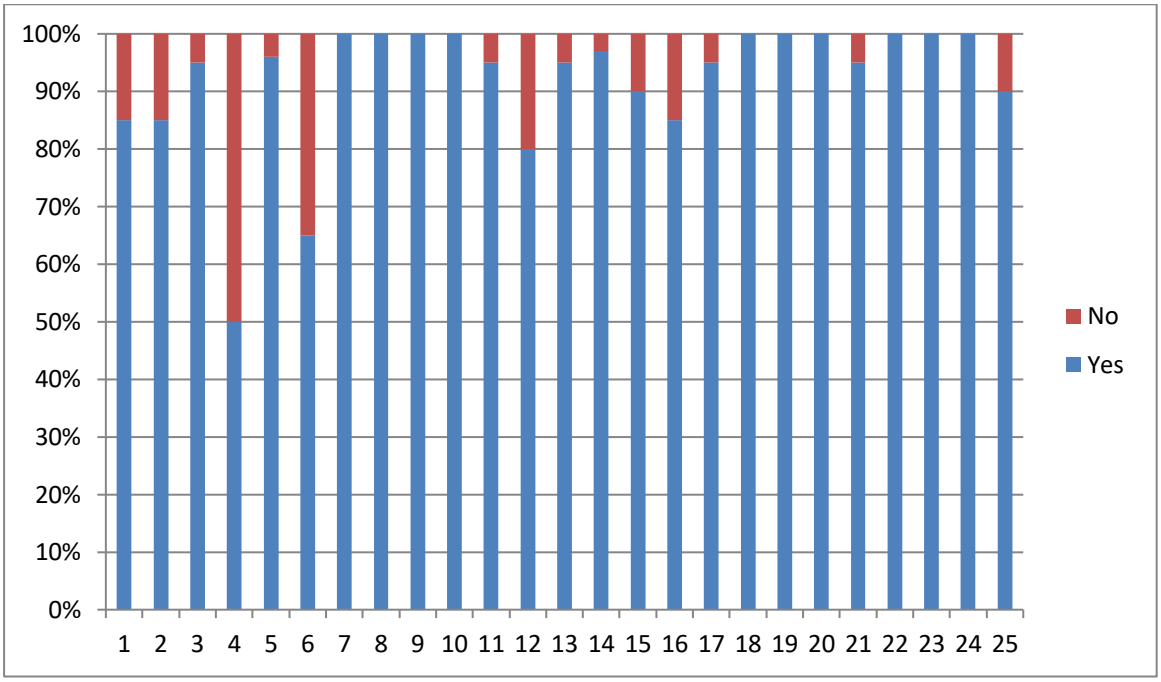
Table 3: Household Toilet Coverage and Gap under Swachh Bharat Mission (Chandausi)

Availability of Toilet Facilities at the Household Level:

Based on field data and community responses, it is evident that a majority of households in Chandausi have access to individual toilets. However, a significant portion of the population, especially in **Wards 4, 6, 12, 16, and 17**, still lacks in-house sanitation facilities. In these wards, residents either share toilets with neighbors or resort to **open defecation**, which undermines the efforts made under the **Swachh Bharat Mission (SBM)**.

According to the sanitation survey conducted, an additional **676 individual household toilets** need to be constructed to achieve **universal toilet coverage** across the town. This shortfall highlights a pressing need for further infrastructural investment and targeted intervention in low-coverage areas.

As illustrated in the **graph below** (**Graph 4**), the disparity in toilet access is clearly visible, with some wards lagging significantly behind others. The issue is not solely one of infrastructure, but also of **awareness, maintenance, and community engagement**. While the Nagar Palika Parishad (NPP) has made commendable progress, especially in constructing over 2,267 toilets to date, the **last-mile challenge** remains crucial for achieving full sanitation coverage.



Graph 4: Ward-wise Availability of Household Toilet Facilities in Chandausi

Type of Toilet Facility (Ward-wise Analysis):

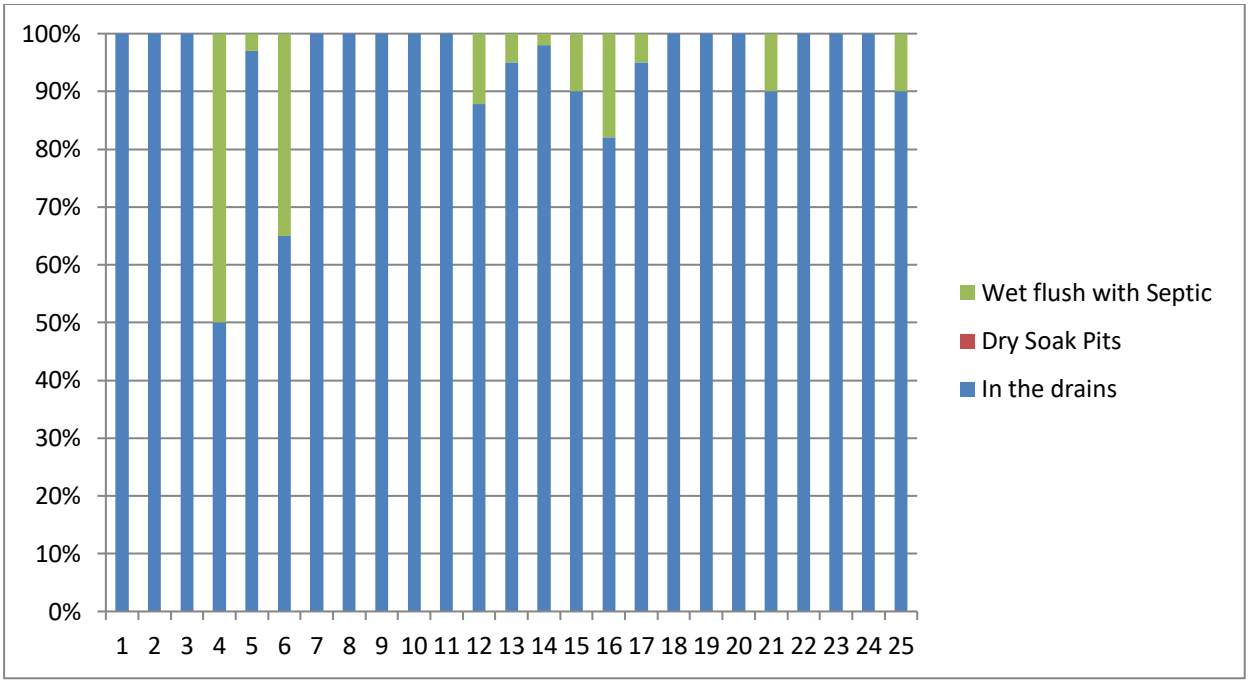
A majority of respondents in Chandausi reported the use of **wet flush toilets (Indian-style)** within their homes, reflecting a **positive trend toward improved sanitation infrastructure**. This indicates successful adoption of better hygiene practices in many parts of the city.

However, certain wards—**Ward 4, Ward 6, Ward 12, and Ward 16**—still present serious concerns. In these areas, a segment of the population continues to **dispose of waste directly into open drains**, a practice that significantly compromises public health and environmental safety. It contributes to water contamination, foul odors, and the spread of vector-borne diseases.

To address this, a dual approach is needed:

- **Targeted awareness campaigns** to inform residents about the health hazards of improper waste disposal.
- **Infrastructure upgrades** to facilitate the adoption of hygienic, closed sanitation systems.

As shown in the **chart below (Graph 5)**, the variation in toilet facility types across wards highlights the need for **focused interventions** in underperforming areas.

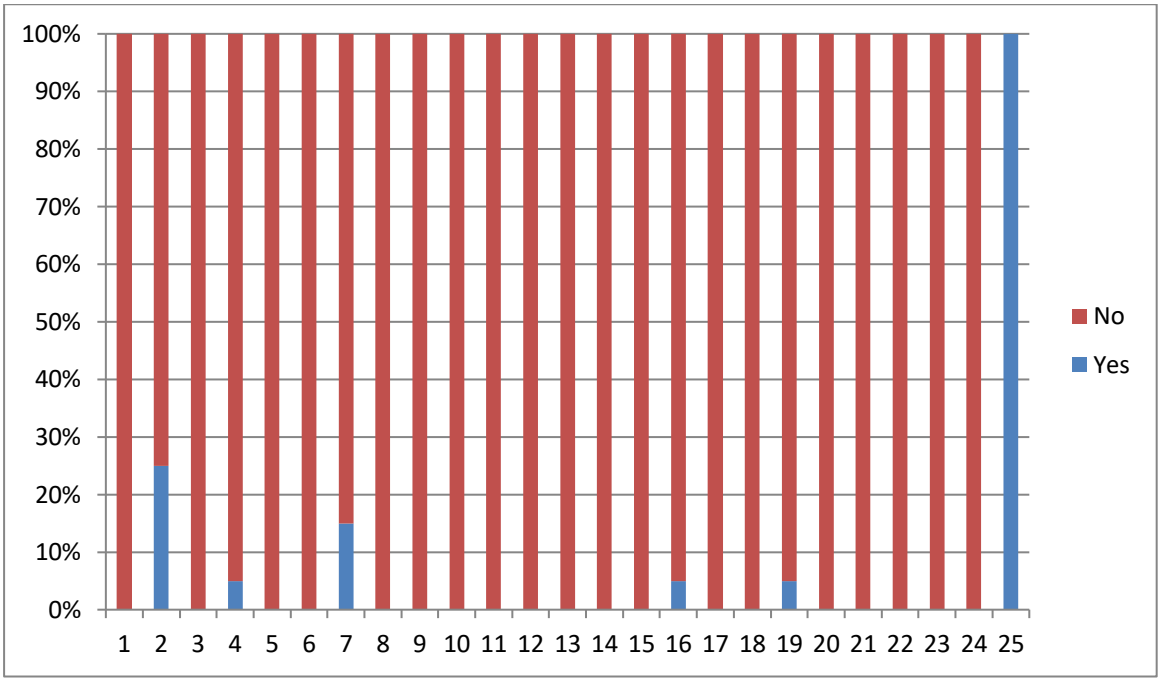


Graph 5: Ward-wise Distribution of Toilet Facility Types in Chandausi

Willingness to Contribute to Operation and Maintenance (O&M) of Toilets (Ward-wise Analysis):

In the residential areas of Chandausi city, the willingness of residents to contribute towards the operation and maintenance (O&M) of toilet facilities varies across wards. However, overall, **most respondents across all wards expressed reluctance or unwillingness to contribute financially or otherwise towards the upkeep of toilet facilities**.

This reluctance may reflect a lack of awareness about the importance of sustainable sanitation services, economic constraints, or limited trust in local authorities managing these resources. Addressing these concerns through community engagement and education could improve participation and ensure better maintenance of sanitation infrastructure.



Graph 6: Ward-wise Willingness to Contribute to Toilet O&M in Chandausi

SWOT Analysis for Access to Toilets within Nagar Palika Parishad, Chandausi:

Access to toilets is a crucial element of urban sanitation and public health. The Nagar Palika Parishad (NPP) of Chandausi has made notable progress, especially under the Swachh Bharat Mission, but several challenges and opportunities remain. The SWOT analysis below highlights the internal strengths and weaknesses as well as external opportunities and threats affecting toilet access in the city.

STRENGTH	WEAKNESSES
• Good Coverage for Toilet Access under Swachh Bharat Mission. • General awareness on sanitation hygiene is good. • People themselves want change in the city.	• Open Urination particularly in commercial areas.
OPPORTUNITIES	**THREATS**
• Open defecation is limited to selected low-income pockets	• No willingness to pay for construction of Community Toilets

• People desire individual house toilet • Limited identifiable areas with no toilet.	and its O&M • Open urination would create health hazards.

Table 4: SWOT Analysis of Toilet Access in Nagar Palika Parishad, Chandausi

Key Issues Related to Access to Toilets:

Open defecation, although relatively rare, still persists in some low-income pockets within Chandausi. This situation is compounded by widespread open urination, particularly in congested commercial areas and public spaces. Addressing these challenges requires prioritizing the construction and maintenance of public toilets, with clear accountability assigned to the Nagar Palika Parishad to ensure consistent service delivery.

Conceptual Basis and Best Practices:

While individual household toilets remain the preferred sanitation solution, shared toilets—such as community and public toilets—are essential in certain contexts. These include slum areas and high-traffic urban locations like commercial centers and transit points where individual facilities may not be feasible. Sustainable financing and management of these community toilets continue to be a challenge, necessitating extensive stakeholder consultation and detailed analysis. Under the Swachh Bharat Mission, significant emphasis has been placed on sanitation awareness and hygiene promotion, and Chandausi has made commendable progress in this regard.

Options for Improving Service Delivery:

Innovative approaches can enhance the sustainability and effectiveness of toilet facilities. For example, selling advertising rights in toilet complexes can generate revenue, helping to make maintenance commercially viable. It is also important to assess local demand carefully before constructing new toilet blocks to ensure that they will be profitable and that user charges, if any, will be feasible. Strengthening monitoring and accountability is critical; this can be achieved by enforcing contracts rigorously, engaging media and consumer feedback mechanisms, and clearly defining service level parameters with penalties for non-compliance. Additionally, increasing lease periods for toilet operations can support long-term cost recovery and maintenance, provided that these leases include performance penalties to ensure high service standards.

Financial Options:

Broad cost estimates are assessed for capital expenditures related to public toilet complexes and mobile toilets, including suitable wastewater treatment systems.

Component	Total Units	Cost for one unit	Rate
Household Toilets made by Nagar Palika	2267	8000	1,81,36,000
Household Toilets have to be made	667	8000	53,36,000
Community Toilets Complex	10	65000	6,50,000

Total Capital Investment = 53,36,000 + 6,50,000 =59,86,000	59,86,000

Table 5: Financial Options and Capital Cost Estimates for Sanitation Infrastructure in Chandausi

- Nagar Palika has already spent INR 181.36 lakhs on 2,267 toilets.
- Remaining requirement: INR 59.86 lakhs for 667 toilets and community complexes.

Cost Recovery Options:

One of the key challenges in sustaining sanitation infrastructure is establishing a rate structure that adequately covers capital investment, operational expenses, maintenance, and regulatory costs. Revenue to support these functions can be sourced through tax levies on property owners, user charges, and other municipal revenues. Additionally, adopting advanced technology within the water supply system can enhance both revenue collection and operational efficiency, contributing to better cost recovery.

Recommendations:

To improve sanitation services and infrastructure, a comprehensive inspection and monitoring protocol should be implemented. This involves making existing toilets fully usable by assigning clear accountability to sanitation officials and engaging local stakeholders in the maintenance and monitoring of shared facilities. Periodic third-party audits and facility reviews can help maintain standards and identify issues early.

Strengthening the legal framework and administrative capacity is equally important. Toilet sizing and specifications should be incorporated into building regulations to ensure adequate facilities in new constructions. Additionally, sanitation bye-laws should be amended to include fines for open defecation and urination, thereby reinforcing behavioral norms and legal compliance.

Behavioral change and awareness campaigns must be prioritized. Slum-level sanitation campaigns can help eliminate open defecation, while trader-support campaigns can target the reduction of open urination in commercial areas. Schools should also be engaged through campaigns focused on civic duties and sanitation awareness. Exploring financial

sustainability models, including outsourcing public toilet management, can further improve service delivery.

Priorities:

Immediate priorities include creating access to public and community toilets to eliminate open defecation and urination in public spaces. Increasing hygiene and health awareness through sustained behavior change initiatives is essential. Strengthening accountability via enforcement and regular monitoring will help maintain service standards. Finally, innovating financing solutions will be crucial to ensuring the long-term sustainability of toilet operations.

6.3. SEWERAGE SYSTEM

The present condition of the sewerage system reveals that most parts of the city lack an operational sewerage network. The existing old sewer lines are obsolete, with pipe diameters of approximately 6 inches, whereas the minimum required diameter is 2 feet. Currently, the sewerage network extends only 3.5 km and is limited to the AWAS VIKAS COLONY. Additionally, there is no sewage treatment plant in the city.

VISION:

"The vision is to achieve complete collection and treatment of all wastewater to prescribed standards while incorporating recycling and reuse strategies to conserve freshwater resources."

Sewerage Generation:

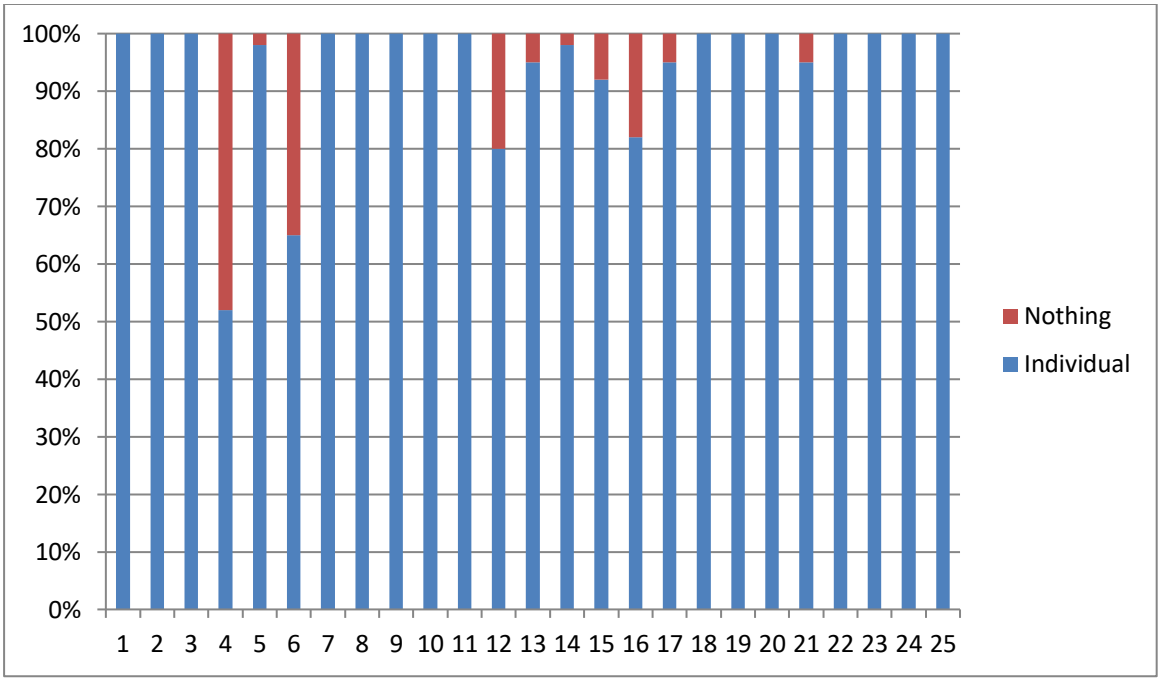
Indicator	Description
Population	114383
Total Water Consumption	15.4 MLD
Waste Water generate	12.32 MLD
Sewerage Network	3.5 km
Sewerage Treatment Plan	Nil

Table 6: Sewerage Generation and Existing Infrastructure Status

- Wastewater estimate based on 80% return factor.
- Actual wastewater may exceed municipal supply due to private submersible use.

Collection and Treatment:

Most households rely on septic tanks for wastewater disposal, while grey water is frequently discharged untreated into open drains. The sewer network remains largely non-functional, causing wastewater from septic tanks to often contaminate both drains and groundwater. The exact extent of septic tank coverage in households and slum areas is currently unknown. Residents either use individual septic tanks or have no wastewater treatment system at all.



Graph 7: Graph illustrating wastewater collection and treatment methods in Chandausi, emphasizing reliance on septic tanks, untreated grey water discharge, and limited sewer network functionality.

Responsibility and Frequency of Septic Tank Maintenance (Ward-wise):

In all wards, residents are individually responsible for the operation and maintenance of their septic tanks. However, no respondents reported any organized or regular cleaning of septic tanks, and it appears that maintenance is managed personally by households. Additionally, there is no available information regarding the frequency of septic tank cleaning, which suggests a risk of wastewater percolating or leaking into nearby drains and groundwater.

Waste Water Management SWOT:

The wastewater management system has several strengths, including the widespread use of septic tanks as the primary sanitation method. However, it faces significant weaknesses such as the absence of a functional sewerage network and sewage treatment plant, mixing of stormwater with sewage, lack of clear accountability and regulation for septic tank monitoring, unorganized sludge removal, and unsafe sludge disposal practices. Opportunities exist to improve the system through awareness campaigns by Nagar Palika to encourage sewer connections, better cost recovery mechanisms, and the introduction of bylaws for onsite sanitation and septage management. Major threats include groundwater pollution due to contamination risks, inadequate treatment monitoring, and the adverse effects of stormwater and sewage mixing on groundwater recharge and water bodies.

STRENGTH	WEAKNESS
• Prevalent use of septic tanks	• Absence of Sewerage Network • Absence of Sewage Treatment Plant. • Mixing of storm water and sewage. • No clear accountability/regulation for monitoring septic tanks (On site sanitation). • Unorganised sludge removal; Weak guidelines/safety practices. • Dumping of sludge in nearby areas; no safe disposal.
OPPORTUNITIES	**THREATS**
• By some initiatives, campaign and awareness program Nagar Palika can gain confidence of people and convince them to access laid network. • There is potential to improve connections / cost recovery in offsite sanitation.	• Major threat is pollution of ground water which can be a major source of water supply. • Potential Ground Water contamination which is currently the most reliable source in the absence of standards and regulations.

• Potential for introducing bye-laws and regulation for onsite sanitation and septage management (frequency of de sludging) for onsite sanitation.	• Mixing of storm water and sewage prevents from the opportunity of ground water recharge and increase in water levels of the existing water bodies. • Absence of Treatment Quality Monitoring in case of people resisting connections.

Table 7: SWOT Analysis of Wastewater Management in Chandausi

The key issues and priorities with respect to waste-water management within NPP are summarized below –

- The city is devoid of sewerage network.
- Flows of grey water and in some cases black water into water bodies going unchecked.

GAP ANALYSIS

Most households do not have a connection to the sewerage network, with only a few areas currently connected. Sewer connections are required for all 20,726 households. Additionally, a Sewage Treatment Plant with a capacity of 13 MLD is also needed to manage the wastewater effectively.

GAP OF SEWERAGE:

Indicators	Existing	Present Gap
Sewerage Line	3.5 km	31 km
Sewerage Connection	0	20726
Sewerage Treatment Plan	0	13 MLD

Table 8: Gap Analysis of Sewerage Infrastructure in Chandausi

Conceptual Basis and Best Practices for Wastewater Management

1. **Fully On-site Sanitation**

   On-site sanitation involves treating and disposing of wastewater at or near its point of generation, typically within the household premises. The main components include septic tanks, which treat wastewater onsite, and soak pits, which allow treated liquid effluent to percolate safely into the ground. Improvements can be made by constructing soak pits for households that currently have septic tanks but lack soak pits, and by providing both septic tanks and soak pits where none exist. Community toilets can also be equipped with septic tanks and soak pits or trenches to manage wastewater effectively. Efficient septage management — the collection and safe disposal of sludge from septic tanks — is critical and should be managed by the Urban Local Body (ULB) or authorized private agencies under regulatory oversight.

2. **Centralized or Decentralized Sewerage Systems**

- *Centralized System:* A large-scale sewer network collects wastewater from across the city and channels it to a centralized sewage treatment plant for processing.
- *Decentralized System:* Smaller, localized treatment plants are distributed across various zones of the city to handle wastewater treatment.

  Planning and implementation of either system require detailed surveys of topography, land availability, and other site-specific factors to ensure feasibility and efficiency.

3. **Combined System**

   This system integrates on-site and off-site sanitation methods. Household sanitation includes septic tanks with soak pits onsite, coupled with periodic septage removal. Where available, sewerage networks are used to convey wastewater to treatment plants. Public toilets can either connect to the sewerage network or use septic tanks with soak pits, depending on infrastructure availability. Effective disposal of septage through organized collection and treatment is critical. Wastewater conveyed via sewerage networks is treated to meet prescribed environmental and health standards before disposal or reuse.

Challenges and Financial Considerations in On-site Sanitation and Sewerage Networks:

The regulation of on-site sanitation faces several challenges, including a lack of dedicated institutional structures and trained personnel for effective septage management. Although existing municipal laws and building regulations include provisions for punitive actions, enforcement remains inconsistent. Key issues contributing to these challenges are insufficient public awareness and involvement, poor system design and selection, inadequate operation and maintenance practices, and weak monitoring mechanisms.

From a financial perspective, capital investments for sewerage network development were concentrated primarily in the initial two years (2016–2018), with subsequent years focusing on incremental improvements and system expansion up to 2024. Effective financial planning must address both upfront capital expenditures and the long-term operation and maintenance costs to ensure sustainability and efficiency of sewerage services.

RATE FOR PROPOSED SEWERAGE NETWORK

S. No.	Item	Unit	Rate (Lakh)
1.	Construction cost for sewerage network	1 km	30
2.	Sewerage Treatment Plant	1 MLD	108
3.	De-sludging machine	1	4.5
Total Cost			
1.	Length of Sewage Network NP2 R.C.C.300mm Dia. Pipe	31 kms	930
2.	Sewerage Treatment Plant	12.32 MLD	1330.56
3.	De-sludging machine	5	22.5
TOTAL COST			2283.06

Table 9: Estimated Cost for Proposed Sewerage Network in Chandausi

The approximate cost for implementation of this recommendation is Rs 22.83 Crores.

COST RECOVERY OPTIONS:

Chandausi faces the challenge of developing a sustainable financial model to support its sewerage infrastructure, encompassing capital investments, operations, maintenance, and regulatory compliance. To address this, several cost recovery mechanisms are proposed. First, a property tax levy can be implemented, introducing a dedicated sanitation cess or surcharge on property owners based on property size or water usage, thereby generating steady revenue. Second, user charges for sewerage services should be introduced or rationalized to promote responsible use and cover operation and maintenance costs. Third, a cross-subsidization approach is recommended, where subsidies for low-income households are balanced by higher charges for commercial or high-usage users, ensuring affordability and equity. Finally, the adoption of smart water and wastewater billing systems is essential for accurate consumption tracking and efficient revenue collection.

RECOMMENDATIONS:

To improve wastewater management, it is essential to operationalize the existing sewer network by reactivating and upgrading the current infrastructure to ensure efficient collection and conveyance of sewage. Public awareness campaigns should be conducted to educate citizens on the importance of proper sewage disposal, the benefits of sewer connections, and the health and environmental risks of untreated wastewater discharge. Improving septic tank management through regular cleaning, maintenance, and regulated septage disposal is also critical to prevent contamination. Strengthening institutional capacity by establishing a dedicated sewerage management unit within the Nagar Palika Parishad, staffed with trained personnel, will enhance effective operation and monitoring. Additionally, the phased development and construction of a 13 MLD sewage treatment plant must be planned to accommodate both current and future wastewater volumes.

ACTIONS	RECOMMENDED BODY
Initiate a connection drive to increase penetration of sewerage connections covering	NPP

black and grey water flows.	
Waste- water recycling should be priority; explore further opportunities to meet SLB norms in the medium to long term	NPP/Jal Kal
Action plan for using treated sewage for horticulture, irrigation, industrial & other non-potable use in order to conserve fresh water.	NPP
Efforts to involve PPP in O & M and STP's & other components	NPP/State Govt
Formulate bye-laws / guidelines on septage management and on-site sanitation	NPP
Establish a waste-water quality monitoring protocol in coordination with CPCB	NPP

Table 10: Recommended Actions for Strengthening Wastewater Management in Chandausi

6.4. DRAINAGE

The city's drainage system is currently inadequate and poorly planned, resulting in significant challenges during rainfall. Drainage channels, or water chutes, often lack proper gradients, causing frequent overflow. Main drains are regularly clogged due to garbage dumping by residents, further impeding water flow. Open drains are common throughout the city, many of which are damaged or encroached upon by informal construction. In fact, approximately 70% of the drains suffer from encroachments, severely limiting their capacity. The absence of a comprehensive city drainage master plan further aggravates flooding and water stagnation problems.

Households Connected to Drainage:

Most households discharge their wastewater directly into open drains, which leads to environmental pollution, foul odors, waterlogging, and unsanitary conditions. This open drainage system poses serious health risks to the residents, increasing the likelihood of waterborne diseases and creating a hazardous living environment.

Water logging Areas:

Certain parts of Chandausi experience partial or persistent flooding during the rainy season due to poor drainage. Key areas affected include:

- Station Road
- Sita Road
- Ramswaroop Marg
- Sikari Gate
- Rawwara Chowk

Key Issues:

The lack of proper gradients in the drains causes frequent overflow and waterlogging during rains. Encroachment and dumping of waste in the drains further reduce their capacity, worsening the drainage issues. Additionally, the city does not have a formal drainage master plan, which hampers systematic management and improvement. The prevalence of open

drains contributes to significant environmental pollution and poses serious health hazards to the community.

GAP ANALYSIS

Type of Drainage	Households connection	In %	Remarks
Closed Drainage	6202	26.1	
Open Drainage	14695	70.9	Should covered
No Drainage	729	3.1	GAP
Total			75%

Table 11: Household Connections to Drainage System in Chandausi: Status and Gaps

SWOT ISSUES AND PRACTICES

STRENGTH	WEAKNESSES
• Topography of old town allows several parts to be drained off, other parts, of the town have quite flat.	• Grey and in some cases black water let out into drains • Solid Waste being dumped into drains • Poorly maintained drains
OPPORTUNITIES	THREATS
• Plans under AMRUT scheme	• Health hazards due to poor maintenance and waste clogging.

Table 12: SWOT Analysis of Drainage System Issues and Practices in Chandausi

Nagar Palika Parishad Chandausi does not have any centralised database or map of drainage system available. No cleaning, repair and maintenance of drains is undertaken pre-monsoon and one other time of the year.

FINANCIAL OPTIONS:

COST ESTIMATE FOR DRAINAGE IMPROVEMENT

S.No.	Item	Km	Rate (Lakh/Km)

1.	Cost of Drain (250 mm)	1	32.67
2.	Up gradation of temporary drain	1	12.10
Total			
1.	Cost of Up gradation of Drain	51.75	627.21
TOTAL COST			627.21

Table 13: Financial Cost Estimates for Drainage Improvement in Chandausi

The approximate cost for implementation of this recommendation is Rs. 6.27 Crores.

RECOMMENDATIONS (Drainage)

To improve rainwater management, storm water drainage systems should be constructed under the AMRUT scheme to effectively handle runoff. Strict regulations must be enforced to prevent the dumping of waste into natural drains, safeguarding their flow capacity. Additionally, regular operation and maintenance (O&M) of storm water drains along major roads, streets, and natural watercourses should be ensured to prevent clogging and waterlogging issues.

6.5. WATER SUPPLY

Adequate and safe drinking water supply is crucial for maintaining sanitation, promoting environmental health, and preventing waterborne diseases. Poor water quality and insufficient supply disproportionately impact vulnerable urban populations, exacerbating health risks and social inequalities.

City Level Status (Chandausi)

The city currently has a total of 15,660 water supply connections, which cover 62.46% of the population's water supply needs. All these connections are domestic, unmetered, and serve households exclusively. The total water production capacity stands at 15.2 million liters per day (MLD), sourced entirely from groundwater. Notably, the city lacks surface water sources as well as any treatment facilities for drinking water.

Indicator	Status
Sources of Water	Ground Water

No. of tube wells	16
No. of Over Head Tanks	3
No. of Hand Pumps	650
Water Connections	8083

Table 14: Water Supply Infrastructure and Coverage Status in Chandausi

There are total 8083 water connections in the city which includes households and commercial connections also.

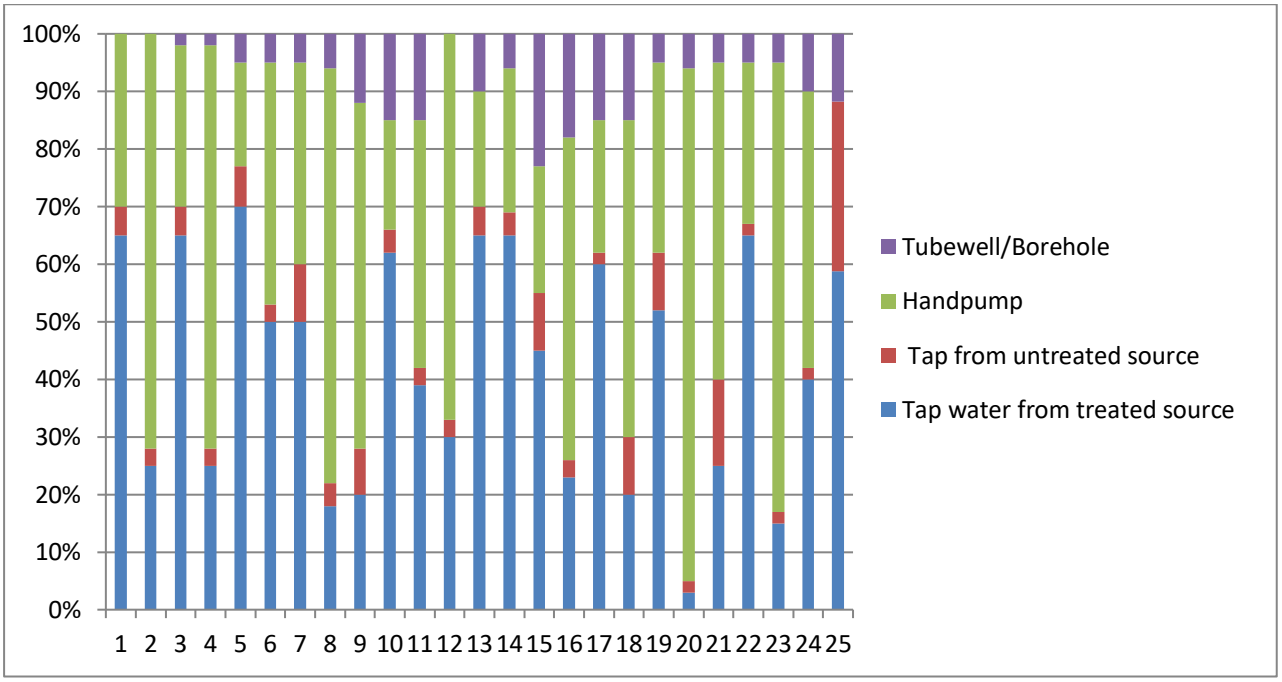
WATER CONNECTIONS OF CITY

S.No.	Types Of Connections	Number
01.	Household service connection	7563
02.	Commercial Connection	520
03.	Duration	11 hours on average

Table 15: Types and Number of Water Connections in Chandausi City

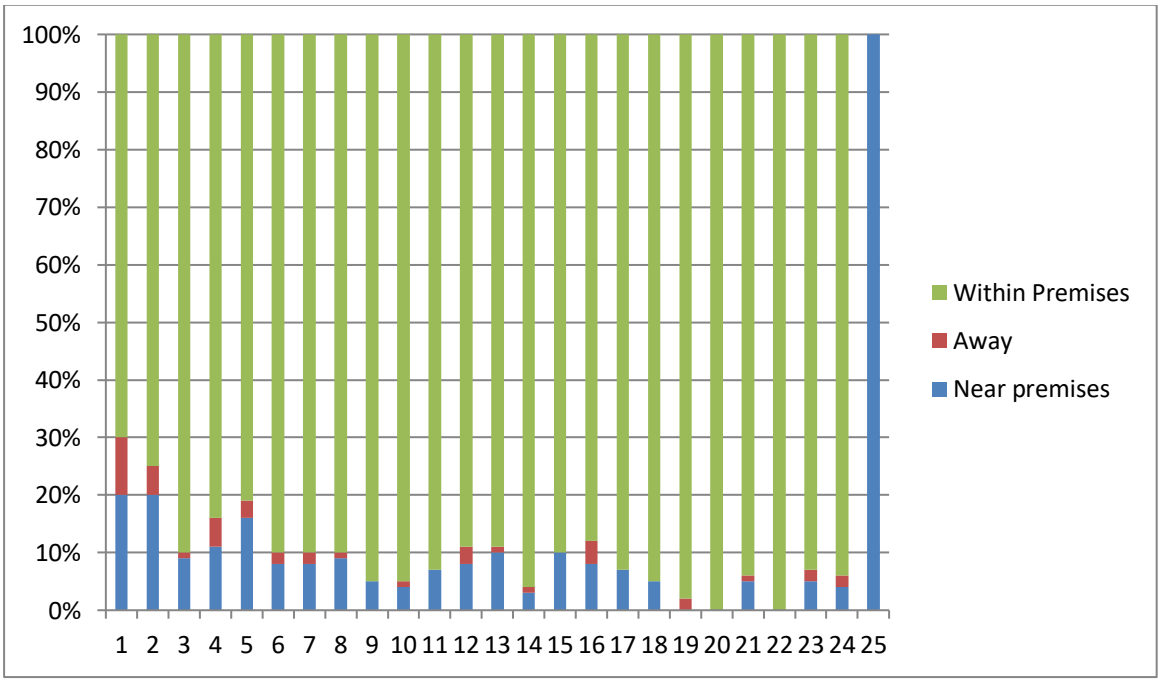
SOURCE OF WATER:

Chandausi's total water consumption stands at 15 million litres per day (MLD), supplied through 8,083 water connections. The city's water supply is sourced primarily from 16 tube wells and supplemented by 402 hand pumps distributed across various municipal areas. However, approximately 20% of the total water produced is lost due to leakages in the system. As a result, the effective water supply available to the public is around 11 MLD, which is mainly distributed to households.



Graph 8: Graph showing the sources, distribution, and losses in Chandausi's water supply system, highlighting total consumption, number of connections, and effective water availability after leakages.

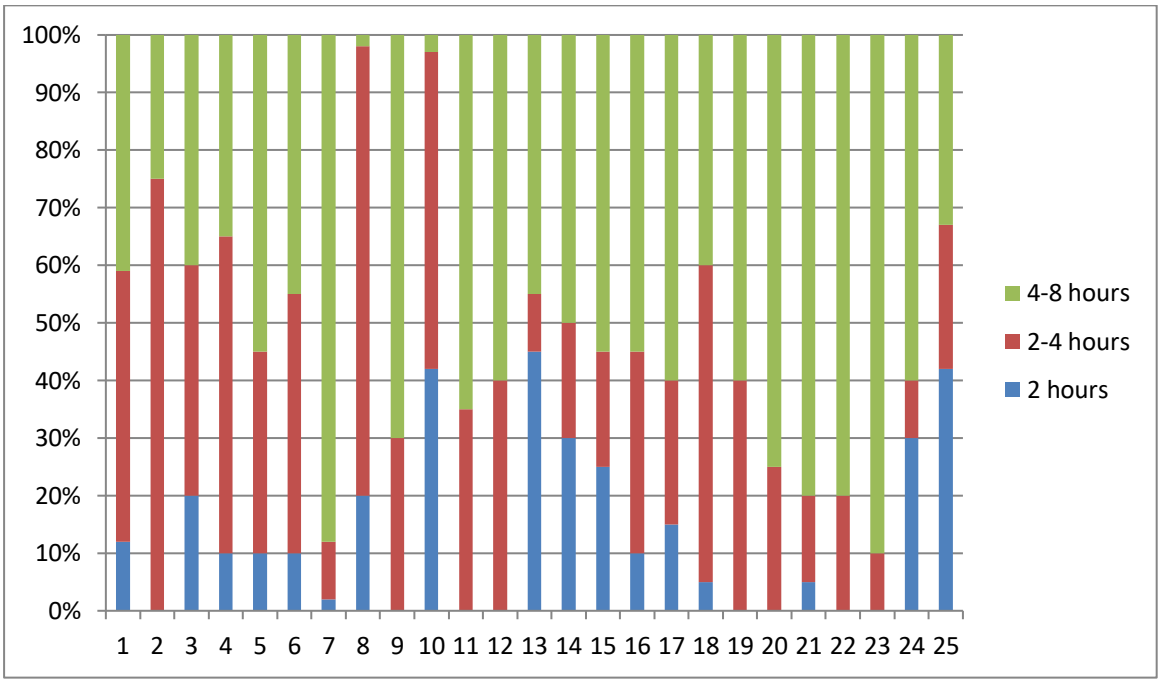
LOCATION OF DRINKING WATER



Graph 9: Map showing the locations of drinking water sources and supply points across Chandausi.

FREQUENCY OF WATER SUPPLY

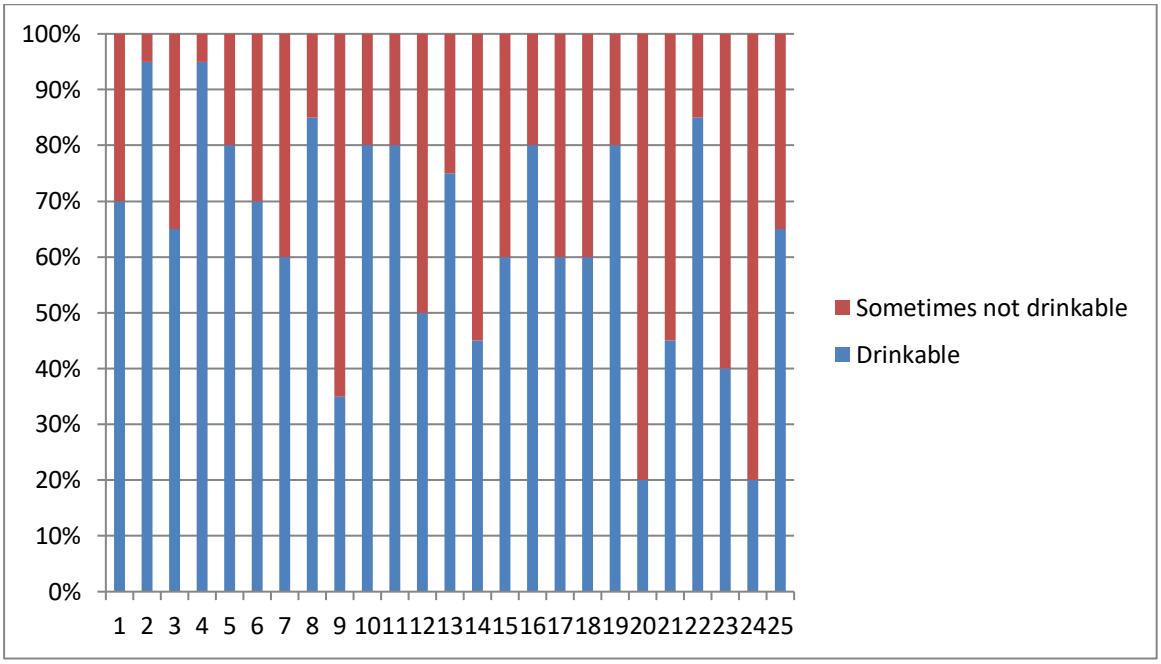
The water from Municipal comes only for 2 hours and respondent shaving bore well get 4-8 hours water supply.



Graph 10: Graph showing the frequency and duration of water supply from municipal sources and bore wells in Chandausi

QUALITY OF WATER

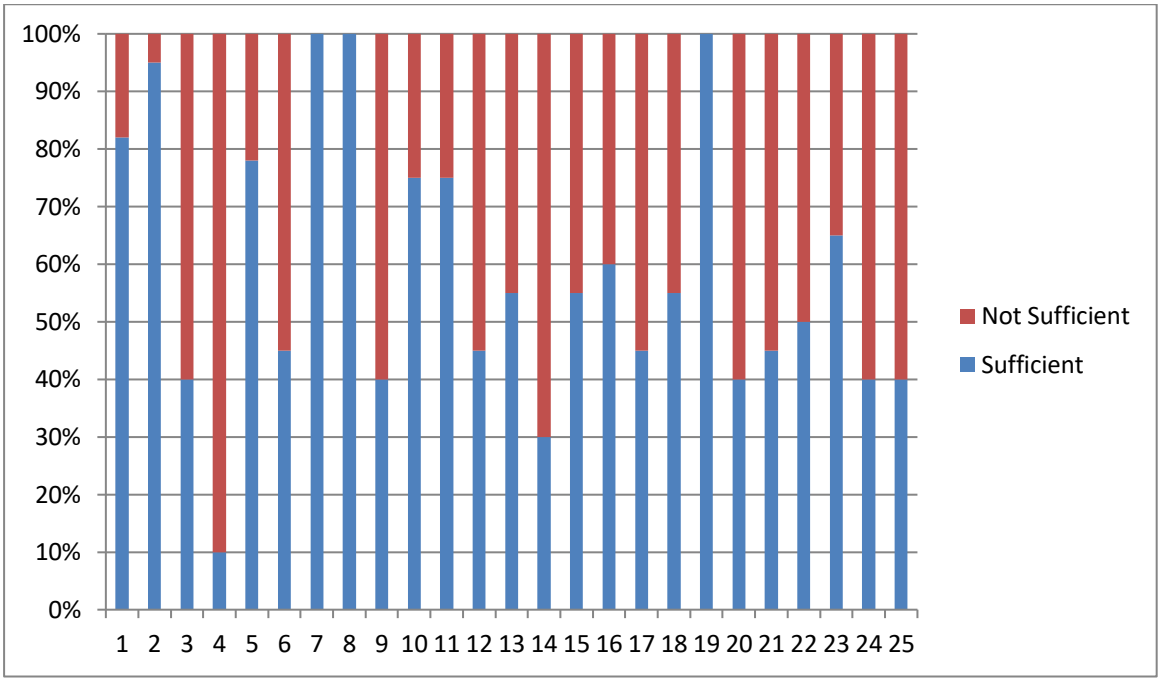
In all the wards most of the respondents reported to get drinkable water.



Graph 11: Survey results on water quality across wards indicate most respondents receive drinkable water, with the city's official water supply covering 11 MLD through 8,083 domestic connections; the remainder relies on unauthorized sources.

The quality of water is up to the mark. The total water consumption of the city through 8083 domestic water supply connections is 11 MLD. This data indicates that rest of the city is getting water from unauthorized sources.

WATER SUFFICIENCY (WARD WISE)



Graph 12: Ward-wise analysis of water sufficiency shows a mixed scenario, where some residents receive adequate water supply while others face shortages; many households use submersible pumps to meet their water needs.

In all the wards some respondents are getting sufficient water and some of them are not getting sufficient water supply to fulfil for their needs. People are having submersible in their premises to fulfil their waste needs.

STORAGE:

Presently, clear water being collected in Overhead Tank. Over all 3 Overhead Tanks has been constructed in the city.

GAP ANALYSIS:

S.No.	Indicator	Gap
1.	Total Households	20726
2.	Gap in household Connection	13163 (63%)
3.	Non domestic use	2 MLD
4.	Duration of supply daily	13 hrs
5.	Water supply Gap	6 MLD

6.	Length of Water Supply Network	23.5

Table 16: Gap Analysis of Water Supply and Storage Infrastructure in Chandausi City

- Gap in water demand is 6 MLD.
- Gap in domestic connection is 13163 (63%)
- Gap in water supply Network is 3.7%

SWOT, ISSUES AND PRIORITIES

The given table captures the SWOT analysis for Water within NAGAR PALIKA PARISHAD.

STRENGTH	WEAKNESSES
• Connection fees and user charge framework in place.	• High NRW levels ; no previous audit data on loss levels. • Likely water shortage • Groundwater exploitation and pollution are key concerns • Low connections (63% of properties) and poor service levels • High O&M costs
OPPORTUNITIES	**THREATS**
• Potential to expand access to entire TUA by initiating a regional water master plan • Potential to address service delivery gaps through a time-bound performance improvement program.	• Inadequate focus on O&M • Poor cost recovery and collection efficiency • Execution capacity and weak local financials could constrain implementation • Ground water exploitation and pollution is a concern.

Table 17: SWOT Analysis, Issues, and Priorities for Water Supply Management in Nagar Palika Parishad, Chandausi

Key issues and priorities with respect to water supply within Nagar Palika Parishad are summarized below –

- Service delivery in Water Supply within Nagar Palika Parishad falls significantly short of service level norms as it not even close to 90% coverage. This is a need to explore and implement options to bring water to Nagar Palika Parishad and other extended areas within Nagar Palika.
- Information discrepancies and inadequacies constrain analysis and decision making. No information regarding presence of metered connections and need to validate higher dependency on ground water (primary source) when municipal connections are be made available.
- Absence of Water Treatment Plant and water quality monitoring station.
- Institutional issues included inadequate capacity, multiplicity of agencies and weak monitoring.
- Inadequate enforcement of groundwater conservation is leading to indiscriminate extraction. Further there is need for clarity on processes for dealing with unauthorized water connections and action in case of user charge defaulters.

Since the UP JAL NIGAM is responsible for planning and designing the water supply and sewerage projects of the State. However, Implementation, Operation and Maintenance is done by the NAGAR PALIKA and there is insufficient involvement of Nagar Palika Parishad in planning for water supply during planning and execution as a result of which ownership, capacity and accountability for O&M within is weak. Inadequate exposure to modern water management practices is also a constraint.

CONCEPTUAL BASIS AND BEST PRACTICES

Apart from ensuring equitable supply of water, cities should initiate measures to ensure measures to promote water conservation and protection of its water bodies. Apart from protection of water bodies against dumping of WASTE RAIN WATER HARVESTING (RWH) and NON-REVENUE WATER (NRW) reduction/prevention should two critical focus areas as the city embark on improving its water supply systems.

ISSUES

The city's water supply system faces several critical challenges. There is a varying quantum of water availability at the source, leading to erratic supply, particularly during the summer months. The coverage of the water supply network is limited, with relatively few household connections. Additionally, the absence of a proper metering system and low efficiency in collecting water charges hamper financial sustainability. Maintenance of water sources and infrastructure is inadequate, further affecting service delivery. Moreover, there is a lack of accurate and comprehensive consumer data, which impedes effective planning and management.

RECOMMENDATIONS

To improve water and sanitation services, it is essential to strengthen baseline information on key water and sanitation indicators. Conducting a comprehensive Household Sanitation Survey will help capture accurate baseline sanitation data. Implementing a robust water quality monitoring protocol for both piped water supply and groundwater sources is crucial to ensure safety and compliance. A thorough Water Loss Audit should be carried out within the corporation areas, followed by targeted actions to reduce losses. Preparing and implementing a detailed water supply master plan will guide future development and management. Additionally, initiatives must be taken to increase the penetration of piped water connections and to improve and sustain efficient revenue collection.

7. RESEARCH METHODOLOGY:

Deductive Approach

The deductive approach involves developing a hypothesis based on existing theory and then designing research to test that hypothesis. It reasons from the particular to the general—if a causal relationship appears in a specific case, it may hold true more broadly. In this study, I formulated a hypothesis and sought to prove it through systematic investigation.

Case Study

A case study is an empirical inquiry that investigates a phenomenon in its real-life context. It involves an in-depth analysis of a single individual, group, or event to explore underlying

causes and principles. Here, I conducted a case study of Chandausi, a small town in Sambhal district.

Analytical Approach

The study involved collecting data through surveys and interviews and analyzing the entire sanitation and waste management scenario in Chandausi. This analytical approach helped derive meaningful insights from the data gathered.

8. CONCLUSION:

I would like to conclude with a powerful thought:
"Health is not a matter of income; it is a fundamental human right."

Every individual deserves good health, which depends greatly on sustained sanitation and cleanliness. Maintaining sanitation is not only the responsibility of local authorities but also of every person. Awareness and small actions by individuals can create a ripple effect, eventually bringing significant change.

The government must also act swiftly and efficiently—building proper sewerage treatment plants, closing open drains, and sensitizing the public about sanitation's importance are critical steps.

Without proper waste management, living conditions deteriorate, affecting public health and, consequently, all other sectors of society. After all, **"A healthy mind resides only in a healthy body."**

This research has been crucial in highlighting the real conditions in Chandausi, identifying key problems, and providing actionable recommendations to the Nagar Palika Parishad (NPP) to improve the town's sanitation and public health.

9. ANNEXURE

ANNEXURE 1


जहाँ सोच ,वहाँ शौचालय
स्वच्छ
भारत
मिशन
बदलो सोच बनाओ शौचालय अपनाओ शौचालय


जहाँ सोच ,वहाँ शौचालय
स्वच्छ
भारत
मिशन
बदलो सोच बनाओ शौचालय अपनाओ शौचालय


सामुदायिक शौचालय सह बायो गैस सयन्त्र
लोकार्पण
आज दिनांक 24 अप्रैल 2010 को सम्पन्न हुआ
आर.ए. खान
परियोजना अधिकारी
यू.पी.नेडा मुरादाबाद
शंकर लाल त्रिपाठी
परियोजना निदेशक
जिला ग्राम्य विकास अभिकरण
मुरादाबाद
रमेश चन्द्र बाजपेयी
अवर अभियन्ता
यू.पी.नेडा मुरादाबाद
वी.के. झा
अधिशासी अधिकारी
नगर पालिका परिषद चन्दौसी


ADMISSION HELPLINE:


स्वच्छ भारत

ANNEXURE 2

SURVEY QUESTIONNAIRE

Q.	Questions	Responses
I.	Sanitation System	
1.	Is there toilet facility available in house?	Yes
		No
		Total
	Type of Toilet (Wet-Flush/ Dry- Soak Pit)	
2.	If yes.	
3.	If No, do you use a public/community toilet	
4.	Are there Community toilets/ Urinals in your locality?	Yes
		No
		Total
4a.	If Yes :	
	What is the condition of the public toilet?	
	Who is responsible for maintenance of the public toilet?	
	Are there any user fee/charges for the usage of public toilet?	
	If Yes, what are the charges?	
	How many people use the public toilet (average)	
	Any toilet facility for physically handicapped persons?	
4b.	If Not, are you willing to contribute to such facilities?	Yes
		No
5.	Will you also contribute to O&M of such facilities?	Yes
		No
6.	Where the toilet waste is disposed?	Open drains
		Manual Scavenging
		Septic Tank
II.	Sewerage System	
1.	Do you have sewer connection?	Yes

		No
2.	If yes, what is the cost of the connection you pay?	
	Any monthly fee?	
3.	If No, Are you willing to pay for sewerage connection and how much?	Yes
		No
4.	How often the cooporation people visit you for health/sewerage purpose	Quaterly
		Half yearly
		Annually
		When complaint is there
5.	Where does the sewage go from your place?	STP (Sewerage Treatment Plan)
		Open
III. Septic Tanks		
1.	Are you connected to individual septic tank?	Yes
		No
2.	Who manages the septic tanks?	Municipality
		Community initiatives
		Individuals
		No one
3.	How often do you get the septic tank cleaned?	Once in a year
		Once in two years
		Once in three years
		Not yet done
4.	How much do you pay for septic tank cleaning?	
5.	Where is septic tank waste disposed of?	Sewerage Treatment Plan (STP)
		Open Drain
		Don't know
IV. Water Supply		
1.	What is the source of water supply?	Nagar Palika Parishad

		Bore-well
		Private tankers
2.	What is the frequency of water supply?	< 2 hours
		2-4 hours
		4-8 hours
		>8 hours
3.	What is the quality of water supplied?	Always poor
		Occasionally poor
		Good
4.	Do you have your own house water connection?	Yes
		No
5.	What is the adequacy of water supply?	Sufficient
		Not Sufficient
V. Solid Waste Management		
1.	Where do you dispose your household solid waste?	In drain
		In Open
		To nominated agency
		Waste Containers
2.	How far is the place, where solid waste is dumped?	< 100 mts
		100-200 mts
		200-500 mts
		>500 mts
3.	How often the garbage is collected by ULBs?	Once in a day
		Once in two days
		Once in three days
		Never picked up
4.	Do you have any domestic animal?	Yes
		No
5.	Where do you dispose the animal waste?	In open
		Use/dispose at home

		Outside the city

REFERENCES

- Nagar Palika Parishad, Chandausi, Sambhal District, Uttar Pradesh
- Mr. Raj Kumar (Executive Officer), Nagar Palika Parishad
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