

# WASH BASELINE ASSESSMENT REPORT OF CHINTAMANI CITY

(Findings from a Water, Sanitation & Hygiene Survey)



Chintamani aerial view, Image  
(Source: <https://sites.google.com/site/mychintamani/>)



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## Executive summary for Baseline report

Technology Informatics Design Endeavour (TIDE) is the implementing organization in Karnataka for the program 'Integrated water management in urban areas as a core task of municipal services of general interest'. The program has been conceptualized by a German NGO Bremen Overseas Research & Development Agency (BORDA). It has been initiated in 2 states in India, viz Karnataka and Ladakh and in 2 other countries of Nepal and Bangladesh. In Karnataka, Chikkaballapur and Chintamani are the partner towns, chosen for this cycle of the program from 2021 to 2023.

The main objective of the program is 'Improved municipal water and sanitation services are provided to disadvantaged citizens of Chikkaballapur and Chintamani town'. This baseline survey report is a result of the project specific baseline study conducted in both the cities in the first year of the program. The purpose of the survey is to inform about the present situation in the cities on WASH aspects and drive interventions to address gaps and leverage opportunities. The areas covered in the survey include WASH specific features on water resources and management, solid waste management, sewage and grey water treatment, and public toilets. From the governance point of view, institutional arrangements along with municipal finance and capacity enhancement assessment are covered in the study. An interesting focus area under the study is the health and hygiene of sanitation workers who play a vital role in WASH in Indian cities.

The baseline study has drawn data and information from primary surveys to a considerable extent, particularly on WASH aspects. A lot of secondary research has been done through perusal of publicly available relevant documents. The section on municipal finance, for instance is based on the allocated budget. Interaction with CMC officials and personnel at sites are another major source of information for this study, particularly with respect to WASH implementation on the ground.

While Chikkaballapur city is the capital of the Chikkaballapur district, Chintamani city is marginally more populated than the other. Both are categorized as City Municipal Council (CMC) based on their population and have 31 wards each. It is noteworthy that the two cities, though close by, have very different nature of water resources. Chikkaballapur is managing largely with surface water while Chintamani is heavily dependent on its ground water, putting a stress on water table. The study has established the demand supply gap in the cities, which should result in some strong interventions in this area. It is commendable that both the cities have achieved ODF free status and have a good public toilet system. Through a Sanitation mapping tool, the study has identified gaps in the management of some of the public toilets. The sewerage network is largely functional in both cities, with septage management in place. However certain operational issues have been captured in the study. With respect to solid waste management, legacy waste comes out as a big area of concern in both the cities. As part of this study, digital maps have been created for both the towns with respect to certain WASH aspects.

This report is an excellent source that establishes WASH baseline in the two cities. We hope this leads to objective, data driven interventions on the ground either through the program or otherwise. Our ultimate goal is to improve the people's living condition and reduce the health and environmental risks associated with inadequate water supply and sanitation and this study is a first step in that direction.

Please write to us as [iwm@tide-india.org](mailto:iwm@tide-india.org) for any feedback / suggestions on the report.



# Disclaimer

This report is a result of a research study and is intended as a guideline document to help in planning interventions in water, sanitation, and hygiene in the city. It has been developed based on data collected in field, data from municipality records, data and information obtained from concerned officials along with field observations by TIDE team.

All care has been taken to ensure correctness in collecting, validating, and processing the data. All analysis is based on standard scientific principles and made in good faith. Any error is inadvertent and sincerely regretted. The recommendations in the report are made solely based on the data made available to us, our observations made during survey, field assessment and discussion with the concerned officials. The findings of the report are valid as on date of the data provided.

While TIDE welcomes feedback and discussion on the report, we suggest expert consultations. We are not liable for any loss or damage through any action / implementation arising out of this report. Please write to us at [iwm@tide-india.org](mailto:iwm@tide-india.org) for any queries.

# Summary



## City Profile

Chintamani is a city in Chintamani taluk of Chikkaballapur district in the Indian state of Karnataka. The town of Chintamani is approximately 38 km towards the east from district headquarter Chikkaballapur. With an administrative boundary of 15.01 sq. km and has an estimated population of 88,000 as of 2021 (constituting 51% males and 49% females). Chintamani is known for its Tomato production and has the largest market in Karnataka.



## Slums

The city has 17 notified slums, accounting for about 17% of the total city population. Water stagnation, Waste dumping, and an unhygienic environment are commonly prevalent in these slums.



## Toilets

The city has ten public toilets and no community toilets. As per the ODF+ requirement, 4 out of 10 public toilets are in usable condition but dirty, and four are not in usable condition; two are not in operation. One of the primary reasons affecting the functioning of these toilets is the scarcity of water, and most of the PT gets water from tankers.



## Water Supply

The city is supplied with 6.6 MLD of water, approximately 75 liters per capita consumption in a day from borewells & Kannampalli lake. The City comprises a water treatment plant with a capacity of 1.68 million liters per day, only 67% of the households have tapped water connection from the CMC, and others mainly rely on borewells and stand posts. The frequency of water supply is intermittent, with 2 hours of supply per day and twice a week.



## Water resource

The primary source of water supply to the city is from 177 Borewell (Groundwater) and is delivering water to almost 80% of the total city population. The remaining 20% population is meeting their water needs through Kannampalli lake (surface water). Though the city has both surface and groundwater sources, there is a high dependency on groundwater.



## Centralized Sewage

The total wastewater generated in the city is 5.28 MLD approximately. 98% of the households have a UGD connection and are connected to a Sewage Treatment Plant (STP) of 2 MLD capacity. 2% of the household have an unsewered network (single pit) and is getting disposed into the nearest manhole by CMC operators by desludging machine.



## Sewage Treatment facility

STP with a design capacity of 2 MLD is located at Gopasandra tank. The technology adopted is a 'nature-based oxidation pond consisting of a preliminary settling tank and sedimentation tank. With a treatment efficiency of 80%, treated water from the STP is discharged into Bhurmatrahalli lake.





### Greywater

Greywater is not channelized separately from blackwater, and there are no onsite facilities for the treatment in non-sewered areas. UGD connection is 98%, and 2% goes untreated, readily gets disposed into the surrounding areas, low-lying areas & open drains



### Solid waste

The total waste generated in the city is about 30 tonnes per day, with an average of 340 grams of waste generated per person. The CMC collects about 27 tonnes of waste generated through a door-to-door collection system, and the remaining waste is disposed of on the roadside/open space. The collection frequency is daily for wet waste and twice a week for dry waste. The collected waste is processed at the SWM processing unit.



### Solid waste Processing unit

The city has a 10-acre facility at Kanishettihalli village (7 km away from the city). The processing capacity of the unit is 8TPD and comprises a windrow pan, vermicompost tanks, incinerator, and screens of 40 & 20mm.



### Sanitation Workers

There are about 200 sanitation workers employed in the city and reside at Pourakarmikas Bhadavane, out of which 51 are permanent, and the remaining are on a contract basis with limited access to essential services. Safe working procedures is not being followed by sanitation workers, despite various training programs conducted by CMC.



### Municipal Finance

The conventional sources of CMC revenue include tax, non-tax, grants & loans. The municipal finances and revenue break-up on water and sanitation-related services mainly consist of solid waste management capital, O&M expenditures, Capital / Revenue Income.



### Capacity Enhancement


The City Municipal Council Chikkaballapur undertakes capacity building through exposure visits and training for the high and mid-level professionals. The sanitation workers are sensitized periodically on health, safety, waste management practices, and safe handling.

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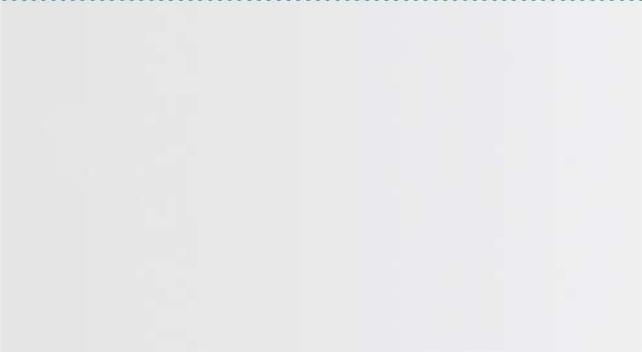
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# List of Abbreviations

ADB	Asian Development Bank
CMC	City Municipal Council
CSR	Corporate Social Responsibility
FSTP	Fecal sludge treatment plant
FSM	Fecal sludge treatment plant
FHTC	Functional household tap connection
GLSR	Ground level service reservoir
HHS	House Holds
HP	Horsepower
IHHL	Individual Household Latrines
IT	Individual Toilet
KM	Kilometer
LPCD	Liters per capita per day
MLD	Million liters per day
MSW	Municipal solid waste
NRW	Non-revenue water
O&M	Operation and maintenance
PPE	Personal Protection Equipment's
STP	Sewage treatment plant
SWM	Solid waste management
TPD	Tonnes per day
ULB	Urban Local Body
UGD	Under Ground Drainage
WTP	Water treatment plant
WSP	Waste stabilization pond
WASH	Water and Sanitation Hygiene



# 1.City Profile

Chintamani is a city in Chintamani taluk of Chikkaballapur district, Karnataka, India (Figure 1.1). The city lies between 13.400°N and 78.066°E with an average elevation of 865 m (2,838 ft). It is located 38.3 km towards the east from district headquarter Chikkaballapur. The city is divided into 31 wards for administrative purposes and the city has a population of 76,068 (2011 census) with an area of 15.01 sq. km. There are 17 notified slums and a total of 13134 residential, with an average household size of 6.7 persons per household, 2000 commercial and 150 institutional properties. The city profile is presented in Table 1.1.



Figure 1.1 Location of Chintamani City

Table 1.1 City Profile

CHINTAMANI CITY		
1	Province/District/State/UT	Karnataka State, Chintamani
2	Area of the Town (sq. km)	15.01
3	Number of administrative division (Wards)	31
4	Total population	2011 census Male 38334
		2011 census Female 37734
		Estimated Present:Male 44343

		Estimated Present: Female	43656
5	Population growth rate (%)	2011 census	76068
		Estimated 2021	16% (Population-88000)
6	No. Properties	Residential	13134
		Commercial	2000
		Institutional	150
7	No. of Notified Slums		

Source: SWM-DPR, CMC, Chikkaballapur

## 1.1 Demography

Chintamani city is a City Municipal Council with 38,334 (50.39%) males and 37,734 (49.61%) females as per a report released by Census India 2011.

Analyzing the previous growth trend, it is estimated that the population of the city is increasing at a growth rate of 16%, details of which can be seen in Figure 1.2 & 1.3, respectively. The projected population in the year 2021 is estimated to be 88,000 (Geometrical Increase method, 2021) of which 44,343 are males while 43,656 are females (Table 1.2). The List of the wards with population distribution along with ward number and households is as shown in Figure 1.4. The building typology of the city is shown in Figure 1.5

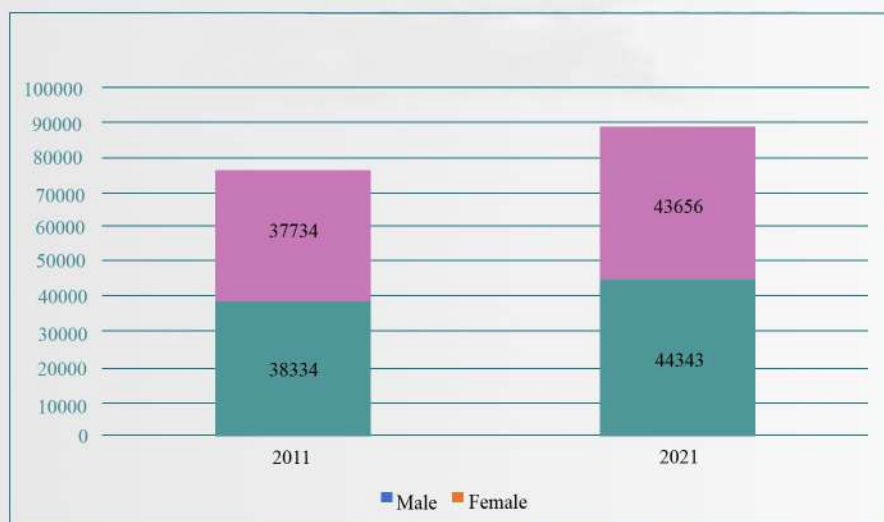


Figure 1.2 Male: Female Population Ratio



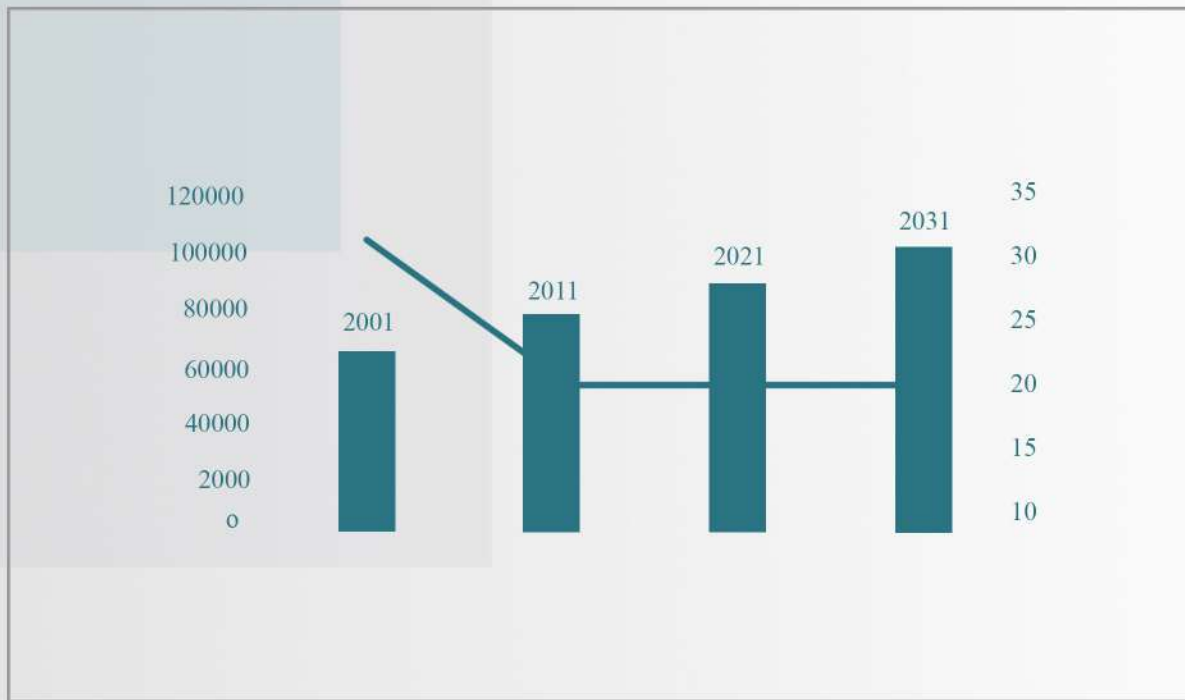


Figure 1.3 Population Growth rate, Chintamani

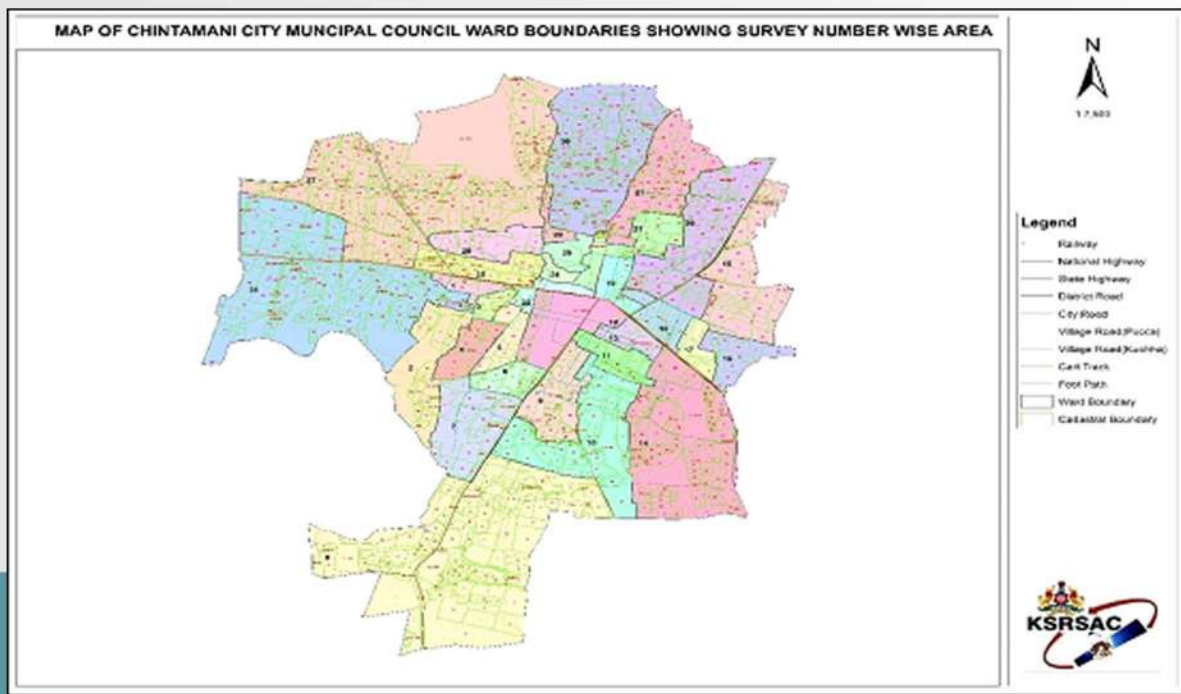
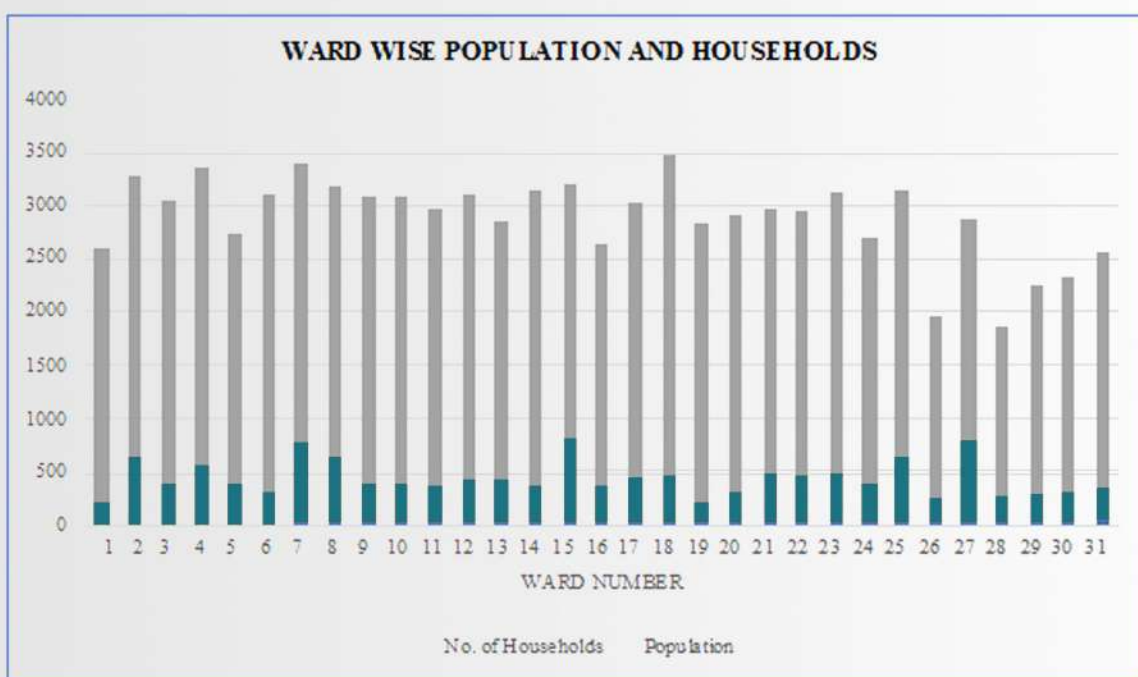


Figure 1.4 Ward wise map, Chintamani



Ward. No.	Name	No. of Households	Population 2011	Population 2011	General Income status (Ex: Low, High, Mix, High Slum population etc.)
1	Venkatagirikote North	2222	3010	2765	Mix
2	Venkatagirikote south	635	3294	3052	Mix
3	Venkatagirikote colony	378	2054	3109	Slum population
4	Tank bund roawest	562	3481	3214	High
5	Tank bund road east	395	2356	2707	High/Slum population
6	Anjani extension	319	2785	3231	Mix
7	Ashwini extension	750	2735	3077	Slum population
8	Kannampalli	628	4089	2943	Mix
9	Malapalli	383	1810	3109	Mix
10	N R Extension	380	2405	3102	Medium
11	Venkateshwara extension	348	2066	3030	Slum population
12	K R Extension	401	1950	3111	Slum population
13	Sonnashettyhalli	396	2438	2828	Slum population
14	Tapatheswaracolony	366	3133	3210	Slum population
15	Tippunagar	788	3043	2776	Medium
16	Gandhi Nagar	352	2248	2608	Medium
17	Chowdareddypalya	428	2346	2999	Mix
18	Keerthi Nagar	454	2408	3487	Medium
19	Bamboo bazar	205	1813	3021	Medium



20	Sriramanagar	303	2798	2981	Medium
21	J J Colony	464	2251	2876	Slum population
22	Hoovinpete	456	1751	2874	Medium
23	Halepete	479	1886	3029	Medium
24	Narashimapete	364	1716	2682	Medium
25	N N T South	620	3970	2921	Medium
26	N N T North	219	1745	1992	Medium
27	Shantinagar	752	2986	2430	Medium
28	Mehaboobnagar	246	1757	1847	Medium
29	Nekkundipete	257	1483	2286	Slum population
30	Agrahara	279	2031	2356	Slum population
31	Thimmasandra	305	2230	2587	Medium
TOTAL		13134	76068	8800	

Source: CMC, Chintamani

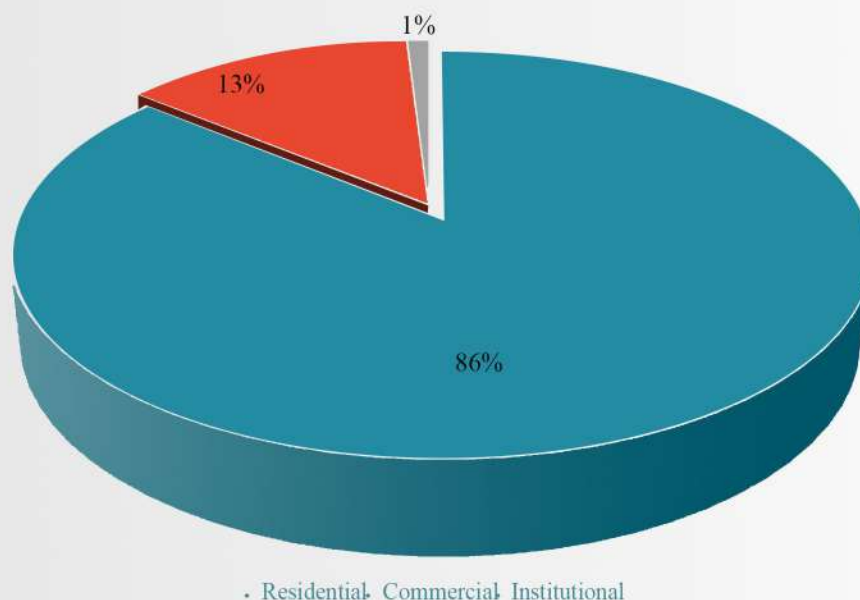


Figure 1.6 Building typology, Chintamani.

## 1.2 Slums

Chintamani city has 17 notified slums with a total population of 15,037 people residing in slums, which accounts for 17.04% of the total population (Figure 1.7). There are a total number of 3,561 slum HHs in the city with an average HH size of 4.22 persons per household. All the slums identified in the city are notified and are registered under government records. Few small patches of settlements for poor exist within the municipal boundary, however, these are not recognized by

the municipality and the actual number of the same was unknown during the time of formulation of this report.

During the physical survey it is observed that there is unhygienic environment in slum areas in terms of water stagnation, presence of vectors etc. which increases the vulnerability of the population towards diseases (Figure 1.8). Living conditions of the poor have deteriorated due to several factors like inadequate environmental infrastructure and basic services. The Distribution of population across the slums along with the ward numbers are as shown in Table 1.3.

Table 1.3 Slum Details

Sl. No.	Slum Name	Ward No	Location	No. of Households	Population
1	Venkatagirikote Colony	3	13°24'8.25"N, 78° 2'53.02"E	260	943
2	Kannampalli	8	13°23'6.19"N, 78° 2'40.51"E	60	168
3	Malapalli	9	13°23'38.42"N, 78° 3'10.98"E	146	530
4	Vinoba colony	Near KSRTC Bus stand	13°23'58.35"N, 78° 3'24.08"E	213	915
5	Tippu nagara	15	13°23'56.52"N, 78° 3'45.94"E	501	2080
6	Gandhi nagara	16	13° 24' 9.16"N, 78° 4' 2.45"E	142	591
7	Bamboo bazar	19	13° 24' 3.96"N, 78° 3' 25.99"E	150	691
8	Keerthi nagara	18	13°24'7.12"N, 78° 3'24.93"E	190	676
9	Bandemelesriramanagara	Chelur road	13° 24' 13.29"N, 78° 3' 37.57"E	200	793
10	Kattekeleage sriramanagara	Chelur road	13° 24' 19.74"N, 78° 3' 36.64"E	103	460
11	J J Colony	21	13°24'29.87"N, 78° 3'20.42"E	236	1038
12	Tapatheswara colony	M G Road	13°23'50.26"N, 78° 3'39.23"E	229	1783
13	Thimmasandra	M G Road	13° 24' 22.12"N, 78° 3'2.14"E	230	780
14	Nallagutta	27	13° 24' 33.07"N, 78° 3' 2.57"E	210	876
15	Hydarali nagara	26	13°24'29.38"N, 78° 3'4.41"E	272	1145
16	N N T Colony	25	13°24'36.39"N, 78° 3'1.98"E	229	917
17	Ambedkar Colony	25	13°24'12.81"N, 78° 3'1.47"E	190	651
		<b>Total</b>		<b>3561</b>	<b>15037</b>

Source: Baseline Survey





Figure 1.7 Location of slums, Chintamani



Figure 1.8 Living condition in slum





Figure 1.8 Living condition in slum



## 2. Access to Toilet

### 2.1 Baseline Status

The city is ODF+ Certified in December 2020 by TPI (Third Party Inspection). To facilitate the public and address the floating population of approximate 5000, the public toilets are constructed by the Municipality across the city. Most of the households have latrines and are constructed in two main structures, the toilet superstructure (including the pan and water closet) and the substructure.

#### 2.1.1 Individual Toilets

The city comprises 31 wards with 13134 households with a total toilet coverage of 100% (under the SBM-U scheme) & 98% sewer connection. The 41 HH's spread over a small pocket in ward no2, 7 & 8 which are connected to single pits. There are 17 notified slums with 3807 HH's spread in ward no - 3, 8, 9, 15, 16, 18, 19, 21, 25, 26 & 27.

#### 2.1.2 Community Toilets & Public Toilets

Chintamani city has no community toilets and to address the population at the public places, ten public toilets (Table 2.1) have been constructed across the city with an average usage varying from 200 to 1000 persons per day depending upon their locations. The geographical location of the public toilet is shown in Figure 2.1.

Public toilets (Figure 2.2) are in good condition with proper maintenance. But the issue of shortage of water facilities is almost at each public toilet spread over the city. The water supply is limited, and they hire the water tanker frequently. The toilets are maintained by Sri Sai Foundation, Surya International Social Service Organization, City municipal council, and the private sectors, respectively. User fee collection varies from Rs 200 to Rs 1500 per day. The Details of all public toilets are shown in Table 2.2.

Usage charges per person in public toilets are as follows: Rs.2 for (Urinal), Rs.5 (Toilet).





Figure 2.1 Location of Public toilet, Chintamani



Table 2.1 Public Toilets, Chintamani

Sl.no	Name of Public toilet	Location	Quantity of water supplied (liters)	Source of water supply
PUBLIC TOILETS				
1	Bengaluru circle	13°24'0.57"N, 78° 3'15.03"E	>3500 liters	The water tankers are hired for Rs 450. 3500 liters capacity every 2days
2	IB circle	13°23'50.36"N, 78° 3'6.16"E	2000- 3500 liters	
3	Gajananan circle	13°24'8.32"N, 78° 3'9.83"E		
4	R K Nursing home	13°24'1.20"N, 78° 3'6.65"E		
5	Azad chowk	13°24'11.29"N, 78° 3'23.25"E		
6	IDSMT complex	13°24'5.04"N, 78° 3'17.99"E		
7	Sriramanagar	13° 23' 44.96"N, 78° 3' 26.85"E		
8	Court	13°23'53.63"N, 78° 3'7.58"E		
9	Stadium	13°23'54.18"N, 78° 3'8.30"E		
10	KSRTC Bus stand	13°24'2.99"N, 78° 3'21.21"E	>3500 liters	

Source: Baseline Survey

Table 2.2 Status of Public toilet

No of Seats      Waste											
Sl. no	Location / Ward	No of Seats Waste Avg. no of users per day	Men	Men urinals		disposal arrangement (sewered, septic tank, open drains, etc.)	Functional status (water, lighting, etc.)	Complaint redressal system available	Owned by CMC & Maintained by	User charges (Rs)	Cost Recovery (%)
1	Bengaluru circle	250-400	8	8 (5 functioning and 3 nonfunctioning)	3	UGD (Sewered)	Yes	Yes	Sri Sai foundation	Urinals- Rs 2 Toilet- Rs 5	Rs 200-400/day
2	IB circle	100-200	4	4	2	UGD (Sewered)	Yes	Yes	Surya International	Urinals- free Toilet- Rs 2	Rs 200-600/day
3	Gajananan circle	150-250	3	3	2	UGD (Sewered)	Yes	Yes	Surya International	Urinals- free	Rs 200-500/day

									Toilet- Rs 2	
4	R K Nursing home	100-200	3	3	3	UGD (Sewered)	Yes	Yes	Urinals- 1 Rs Toilet-3 Rs	Rs 200-500/day
5	Azad chowk	80-100	3	3	3	UGD (Sewered)	Yes	Yes	Urinals- free Toilet-5 Rs	Rs 500-1000/day
6	IDSMT complex, market	200-300	4	5	5	Pit Usage once in a week	Yes	Yes	Urinals- Rs 2 Toilet-5 Rs	Rs 500-600/day
7										
8	Court	100-250	3	6	6	UGD (Sewered)	Yes	Yes	Urinals- Rs 2 Toilet-5 Rs	Rs 400-500/day
9	Stadium	Not in use	3	1	1	UGD (Sewered)	Yes	Yes	Urinals- free Toilet-5 Rs	Rs 1000-1500/day
10	KSRTC Bus stand	1250-1500	6	2	2	UGD (Sewered)	Yes	Yes	Urinals- 1 Rs Toilet-5 Rs	Rs 800-1000/day

Source: Baseline Survey





Figure 2.2 Public toilets, Chintamaniv

## 2.2 Public Toilet gaps & issues

- No Community toilets across the city
- Issue of shortage of water supply in almost all public toilets spread over the city and they hire the water tankers frequently
- The Sriramanagar public toilet is available for public usage only once a week.
- The willingness to pay by the community at Bengaluru circle is limited



# 3. Water Supply and Management of Local Water Resources

## 3.1 Baseline status

The local water resource present within the administrative boundary is kanampalli-chikka kere spread over an extent of 10 acres (Figure 3.1), Bhaktarahalli-arasikere (out of the administrative boundary, 6km away from the city, Figure 3.2) and another source of water is 177 borewells spread across the city (Table 3.1).

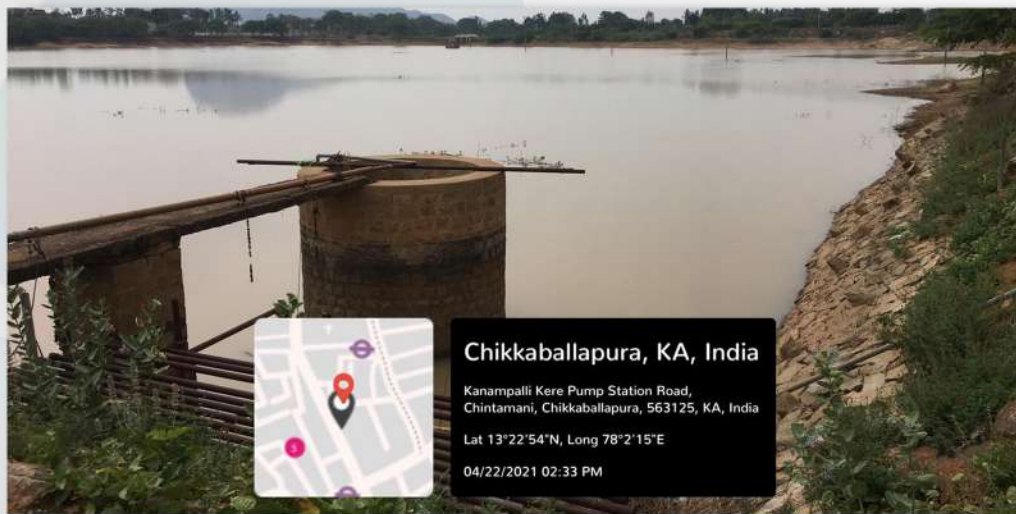


Figure 3.2 Bhaktrahalli Kere



Though the city has both surface and groundwater sources, it is largely dependent on groundwater (80%). The City Municipal Council is responsible for planning, asset construction and operation & maintenance process, cost recovery & regulation for water supply delivery within the city limits. The satellite image is shown in Figure 3.3.

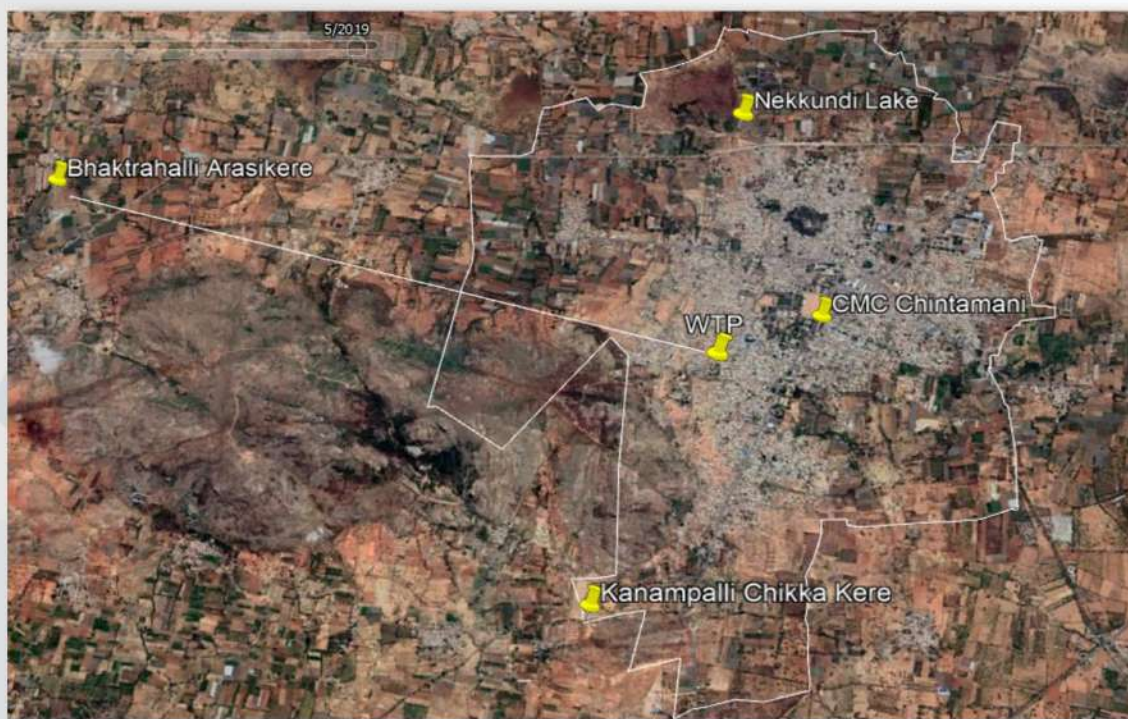


Figure 3.3 Satellite Image, Bhaktrahalli, Kannampalli -chikka kere and Nekkundi lake locations

The total no of households with functional household tap connection (FHTC) and without FHTC are 8812 and 4322, respectively. However, the frequency of water supply is an intermittent type (2hours of peak and lean periods of the day). Under the HH's without FHTC connections, there are 3000 HH's dependent on public stand posts that too mainly in slums and the remaining 1000 HH's have no proper access to the stand post with which they have unauthorized connections.

The water supply in the slum area is mainly through the borewells. The average groundwater depth is around 800 feet. The city has 10 OHT'S with 5 lakhs, 2.5lakh and 1 lakh liter capacity. The water is being pumped from all working borewells (Figure 3.4) to the sump of 1 lakh and 50,000- liter capacity and then it is pumped to OHT's and further distributed across the city through a piped network. Around 4lakhs liters of water is pumped daily from Kannampalli kere through filter bed then to the WTP and finally to the piped network.





Figure 2.2 Public toilets, Chintamaniv

## 3.2 Water body status

The water body status of the Chintamani city is shown in Table 3.1.

Table 3.1 Water body status

Type of water Resource	Current condition (On physical observation)	Current use	Supply to ward number
Bhaktrahalli kere	Good	Drinking/ Domestic use	Under Progress
Kannampalli Lake			Daily: Ward numbers 4,5,6,7 Weekly once for 9,10
Nekkundi Lake	Polluted	Wastewater outlet	Currently no supply

Bore wells: 177 (Working condition:91, Dried up:82, New Borewells:4)	Good	Drinking/Domestic use	Remaining wards
---	------	-----------------------	-----------------

Source: CMC, Chintamani

- 1 **Bhaktrahalli Kere:** The water body is situated 6 km away from the city, the process of conveying the water from the lake is initiated under Naglathona Phase II (11 Crore Project) & it is still in the process stage.
- 2 **Kannampalli Lake:** The water body comes under the city's administrative boundary with an area coverage of around 10 acres. The water body is fenced and no dumping of solid waste in the lake is observed. On daily basis around 4 lakh, liters of water is pumped from the lake through the filter bed to the WTP. Further from WTP water is supplied daily to ward no's 4, 5, 6 & 7, weekly once to ward no's 9 & 10. The quality of the water is acceptable, and it is used for drinking and domestic purpose.
- 3 **Bore wells:** The city comprises 177 borewells (Figure 3.5) (Figure 3.6), out of which 91 borewells are in good working condition and 82 borewells are dried up (As per CMC survey and records). The water supply chain mainly consists of borewells (16 to 20 hours, continuous supply), Sump, OHTs, GLSR and finally to the HHs through piped networks.

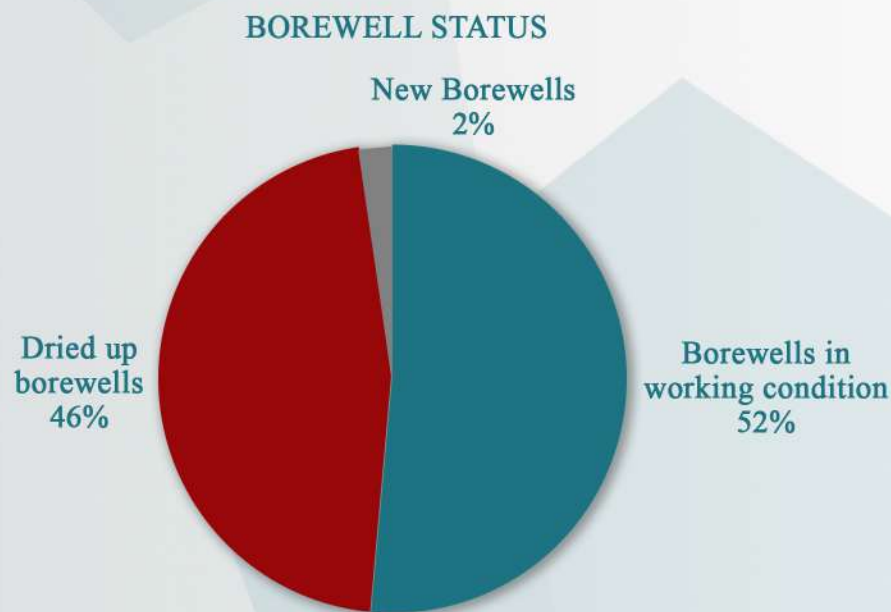


Figure 3.5 Borewell Status



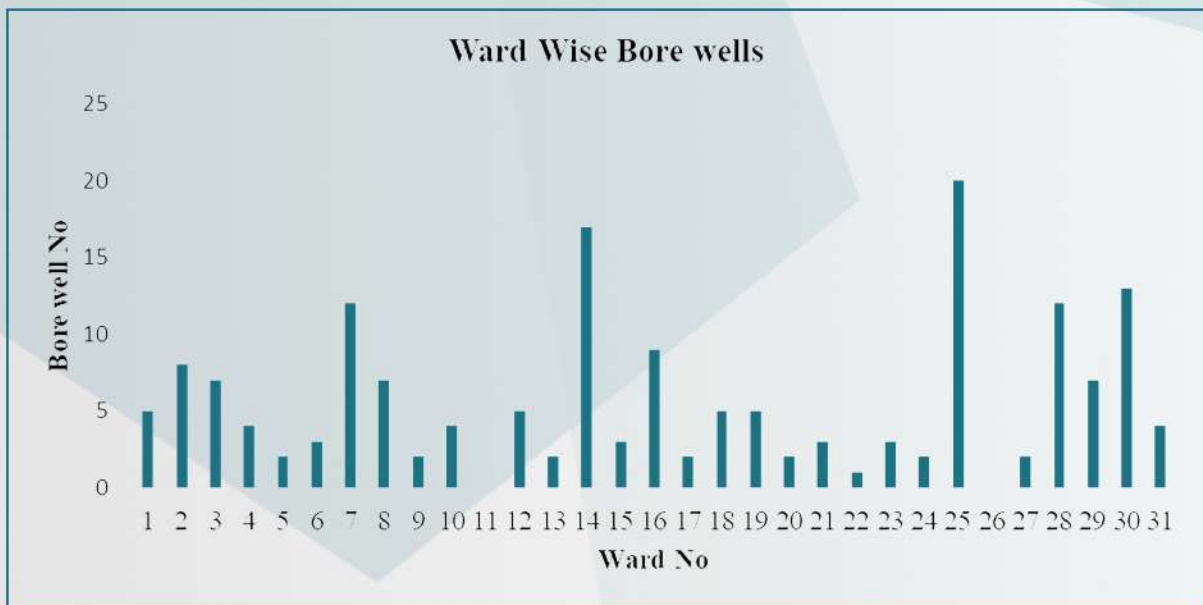


Figure 3.6 Ward wise borewells, Chintamani

**Nekkundi Lake:** The Lake was a drinking water source serving for 5 to 6 wards of the Currently, due to contamination of the lake (raw wastewater from the 50% UGD), it is not serving the population (Figure 3.7).



Figure 3.7 Nekkundi Lake

### 3.3 Water supply and connections

The water treatment plant is commissioned at ward no.7 with a capacity of 1.68 MLD. The plant is of conventional type: - the treatment includes aeration, sedimentation post clarifloculator, sand filtration along with backwash and disinfection unit. Chlorine is used for the disinfection of water (Figure 3.8).



Figure 3.8 Water treatment Plant, Chintamani

### 3.4 Tap connection charges, Water tariff & status.

The cess/user fee is collected by the Municipal council via cash mode, as they possess the tax collection wing. Most of the users pay the tariff once a year along with other taxes. The tariff structure of the water supply is shown in Table 3.2

Table 3.2 Tariff structure of water supply

Category	Tariff (Rs)
One-time water connection charges	2500 per HH + road cutting charges for different types of road)
Water usage charges	Residential-160 Rs/month & Commercial-640 Rs/month

### 3.5 Water demand vs supply and Upcoming Water supply project

The current population of the city is estimated to be 88,000 (forecasted population, Geometrical increase method, 2021). The current water demand is of the order 11.88 MLD @ 135lpcd. However, currently, the supply is 6.6 MLD@75lpcd, which is insufficient to meet the current water demand (Figure 3.9).



## Water Supply and Demand Scenario (MLD)

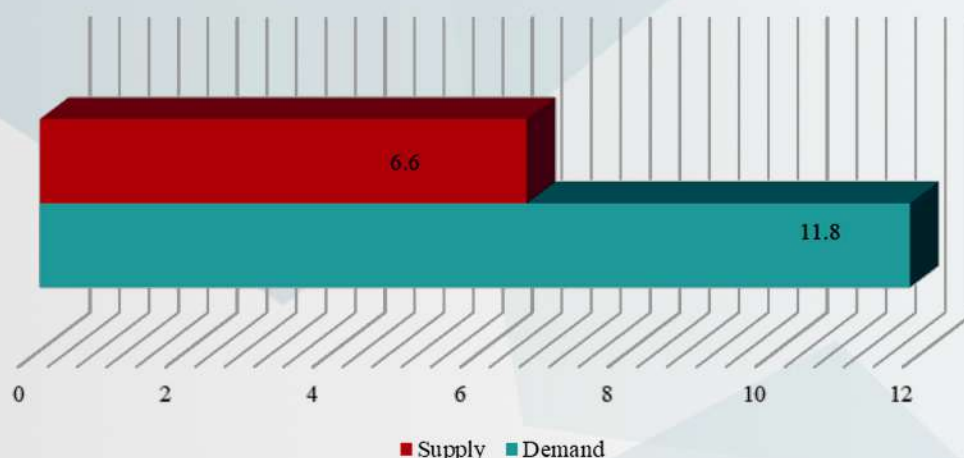


Figure 3.9 Water supply & demand

### 3.5.1 Upcoming Water supply project

- For the improvement and up-gradation in the water supply chain, the extension of the pipeline network across the city (ward 1 to 31) in Naglathona Phase-III is under progress (Project cost 11 crore)
- Drilling up of additional borewells and recharging of existing borewells (Upon discussion with CMC officials)

### 3.5.2 Water leakage/losses

It is estimated that approximately 10% of water is lost during transmission. Also, there is an estimated loss of about 20% of water due to leakages in the distribution network. These physical and commercial losses account is estimated at 30%.

The staff in position at Chintamani CMC is shown in table 3.3.

Table 3.3 Staff in position, Water supply section

Employees	No's
Assistant Executive Engineer, Water Supply	01
Junior Engineer	01
Supervisor	01

Pump Operator at pump house	02
WTP Operator	02
Water Men	40
Total	47

Source: Baseline survey

### 3.6 Water supply gaps and issues

- The Inadequate per capita water supply of 6.6 MLD is insufficient to meet the present water demand of 11.8 MLD.
- Infrequent water supply practice especially in slums where the intermittent type is practised, 2 hours of peak and lean periods of the day, area wise water is being supplied.
- Insufficient functional household tap connections (HH's without tap connection - 7672, 33%)
- No water metering across the city



## 4. WASTE WATER MANAGEMENT

### 4.1 Wastewater disposal arrangement (Network, Coverage, and connection)

The city comprises 31 wards with 13134 households including 17 notified slums (3807 households). The underground drainage network coverage of the city is 98% (12871 HHs) and the small pockets of ward no 8 & 9 (2%, 263 HH's) are unsewered. In unsewered networked wards, the greywater is let into the stormwater drain and the pits/ septic tanks are used for treating the blackwater.

The average per capita consumption of water in the city is estimated to be 75 lpcd out of which 80% will be the wastewater generation i.e. (60 lpcd). The total wastewater generation in the town is estimated to be 5.28MLD. The wastewater disposal arrangements in the city mainly comprise functional toilets, sewerage connections & single pit latrines.

### 4.2 Sewage management

The sewage from the 31 wards ends up at the Sewage Treatment Plant. There are two STP units in Chintamani, existing is located at Gopasandra tank (Figure 4.1) with the design load/total of 2 MLD and the proposed is at Bhukkanahalli.

The technology used in this STP involves a nature-based oxidation pond consisting of a preliminary settling tank and sedimentation tank (Table 4.1) the water from the STP is let into Bhurmatrahalli kere, 50% of the city's sewage generated is connected to an old existing STP, which includes the Ward numbers from 5 to 23 and the remaining 50% is connected to the new STP of 6.4 MLD capacity, which is spread over the area 2 acres at Bhukkanahalli.

The construction of the new STP is in the initial stage (land clearance, preliminary engineering surveys) and the excess wastewater generated nearby this STP is let into Nekkundi Lake (Figure 4.2), and the lake water is not a drinking water source, but exclusively used for groundwater recharge.





Figure 4.1 Gopasandra, Sewage Treatment plant





Figure 4.2 Nekkundi Lake

Table 4.1 Sewage Treatment Plant, Chintamani

Sewage Treatment Plant, Chintamani		
Location (Co-ordinates)	Existing STP – Gopasandra Tank 13°23'52.32" N, 78° 4'11.06" E	Proposed- Bhukkanahalli
Design Capacity	2 MLD	6.4MLD
Area extent covered under STP	4 acres	2 acres
Year of commissioning	2006	Under progress
No. Properties connected to Sewerage Network	7811 HH's	5282 HH's
Technology Description	Oxidation pond consisting of Settling tanks	WSP
Wastewater generation in the city (MLD)	5.28	
Current Sewage inflow into STP (MLD)	3.5	
Outlet water source	Post treatment form Bhurmatrahalli Kere, the treated wastewater is used by the surrounding farmers for cultivation of fodder	Nekkundi Lake, Ground water recharge
Outlet water source	<ul style="list-style-type: none"> <li>• The physical condition of the pond is satisfactory.</li> <li>• Development of weeds in the STP premises along with the algal bloom in the ponds</li> <li>• Immediate surroundings-Gopasandra lake and irrigation fields</li> </ul>	Under construction phase
Current Status Of STP	<ul style="list-style-type: none"> <li>• Operational Personnel – Mr Babu</li> <li>• Desludging is carried out once in every 3 years.</li> </ul>	

### 4.3 Septage management

The 31 wards of the city have flush/pour flush toilets connected to an underground drainage system whereas the small pockets of ward no's 8 and 9 are unsewered and the greywater is let into the stormwater drain. Currently, the CMC provides services for cleaning single pits by deputing the desludging vehicle (Figure 4.3). The desludging price ranges between Rs 500-1000 for a 3000- litres capacity tank. The septage collected is often dumped into the nearest manhole. The Faecal Sludge Management status is shown in Table 4.2.



Figure 4.3 Desludging machine, Chintamani CMC

Table 4.2 Faecal sludge management status

Type of containment systems in city	31 wards are covered with the UGD connection and in ward no 8 & 9 have small pockets of unsewered connections connected to single pit & septic tank containment systems			
Existing mechanism for emptying of containment unit	Chintamani Municipal Council			
No. of desludging trucks owned	By ULB	02	By Private Operator	No
Capacity of the Truck (litres)		3000 litres Sucking machine. 2000 litres Sucking and jetting machine		
Average No. of desludging trips in a month		01		
Source: CMC, Chintamani				



## 4.4 Gaps and Issues

### 4.4.1 Gaps in Wastewater disposal arrangement

- Limited UGD coverage and direct disposal of wastewater into the open drains in ward 8 and 9 respectively
- The 50% of the wastewater generated is left untreated and discharged into the Nekkundi lake (Figure 4.4)
- Some of the houses especially in the slums are constructed on the drain itself as it becomes tough to carry out O & M activities by the CMC (Figure 4.5)



Figure 4.4 Untreated wastewater letting into Nekkundi Lake





Figure 4.5 Open drain, construction of houses on drain

#### 4.4.2 Gaps in sewerage management

- Dumping of solid waste in the drains and poor condition (breakage, blockage etc.) of the sewer network in slum areas (Figure 4.6)
- No immediate action/measure is taken up by the CMC post complaints received from the community

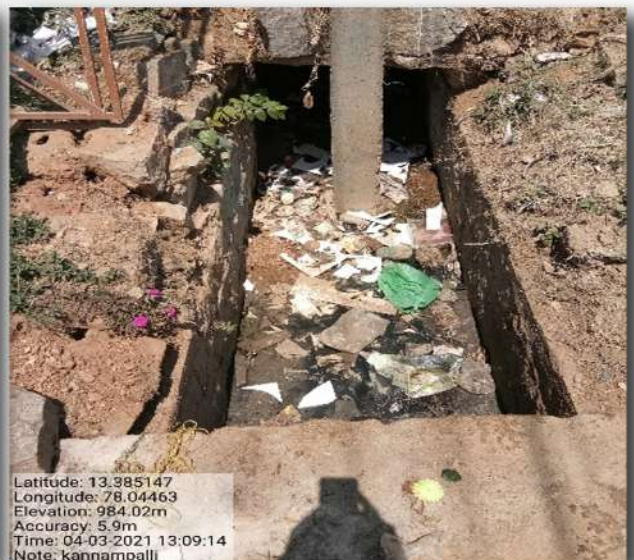


Figure 4.6 Dumping of solid waste in open drains



#### 4.4.3 Sewage Treatment Plants (STPs)

- No scraping of the algal boom and solid waste in the ponds (Figure 4.7)
- Improper Functioning of the STP ponds
- No recycle/reuse of sludge
- Misfunctioning of the pump from past 1 months, as the sewage from the wards, is diverted to the Bhurmatrahalli kere



Figure 4.6 Dumping of solid waste in open drains

# 5. Grey Water Management

## 5.1 Baseline status

Out of the 31 wards, greywater from 29 wards is disposed into the UGD network and for some portion of the remaining two wards, i.e., ward 8 and Ward 9 let into the open drains/ fields. The UGD network coverage is 98% in the city and the remaining 2% is readily disposed into the open drains and there are no onsite facilities for treatment in non sewered areas. (Figure 5.1). The major wastewater outlet is the Nekkundi Lake and is mainly used for groundwater recharge.

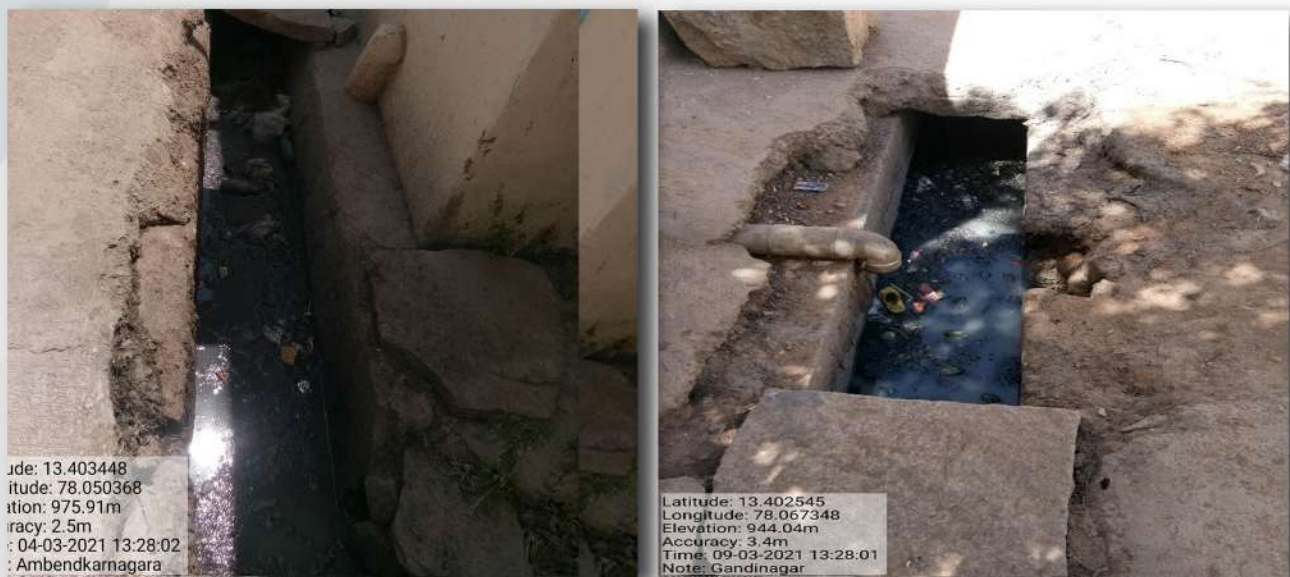


Figure 5.1 Grey water scenario, Ambedkar & Gandhi nagar

## 5.2 Gaps and Issue

Following are the gaps and issue identified concerning greywater management in the municipality.

- CMC is lacking in technical expertise in the management of greywater.
- No onsite facility for greywater treatment in low-income pockets in ward no's 8 and 9
- Direct discharge of greywater into open drains in non sewered networked wards
- Some portion of the city disposes of greywater in the drains, reaching the lake without undergoing any treatment, thus polluting the lake water



# 6. Solid Waste Management

## 6.1 Baseline Status

The total waste generated in the city is 30 tonnes per day, of which about 27 tonnes of waste is collected and transported to the SWM processing unit. An average of 0.341kg/capita waste is generated from the population of 88,000 per day (Figure 6.1). The sweeping, collection and drain cleaning activities are handled by Pourakarmikas, contract labourers and SHG's managed by Chintamani CMC. Table 6.1 shows the current solid waste management status of the city.

### EXISTING TRANSPORTATION MECHANISM

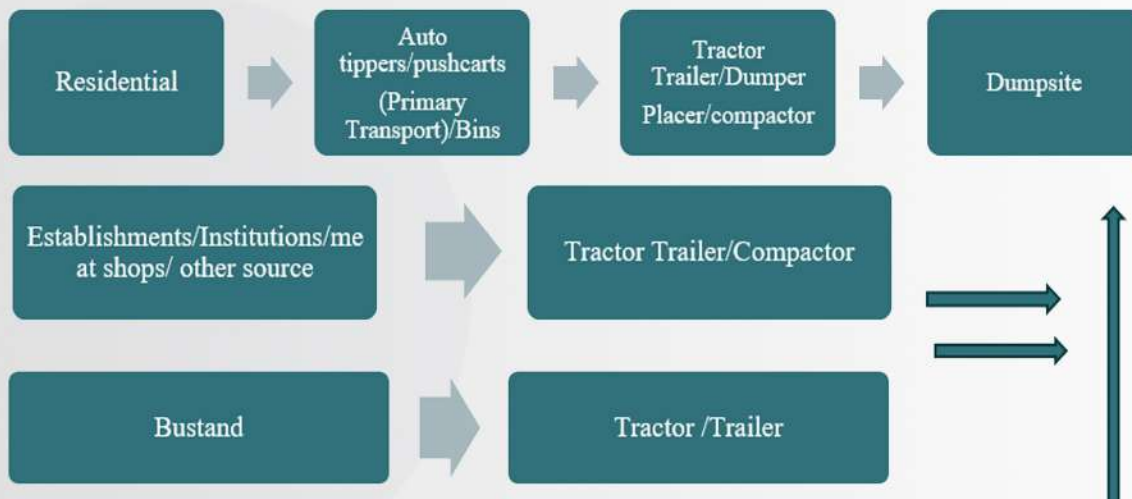


Figure 6.1 Solid waste transportation mechanism

Table 6.1 Solid waste management status

<b>Quantity of waste generated from the city (tonnes/day)</b>	<b>30</b>
Coverage of Door-to-Door waste collection in household	100%
D2D Waste collection frequency	Alternate days
Number and Type of equipment present for Solid waste management	Door to Door Collection Push carts: - 25 no's Mini tippers (Tata Ace): -11 no's E-ricksha: - 4 no's Compactor: -1 no Tractors:4 no's JCB:1 no Skid Steer loader:1 no Screening machine:1 no
Number of community bins available for secondary collection	NIL
Quantity of waste collected from the city per day (TPD)	27
	Door to Door collection by mini auto tippers.

Source: Baseline Survey

The transportation of waste from all the sources across the city happens by using pushcarts, bins, mini tippers, tractor-trailers, and dumper placer (Figure 6.2). Primary collection is conducted door-to-door from both residential and commercial establishments in all wards. Collection and transportation of waste are conducted in two phases. Firstly, pushcarts/ auto tippers collect waste from households/commercial establishments and secondly, it is transferred to the tractor-trailer and compactors and ultimately transported to the processing site at Kanishettihalli village, which is 10 km away from the city.

The site has been allotted for the treatment and disposal of solid waste. Biomedical waste generated by hospital and clinics is transported and managed by Meera Envirotech. The agency collects waste from hospitals and clinics.





Figure 6.2 Collection of solid waste in Chintamani

## 6.2 Primary/secondary collection and transportation of waste

The quantity of municipal solid waste generated in the city both from primary & secondary sources. The primary source includes waste collected from the door-to-door households, doorstep collection from commercial establishments & others (Table 6.2). The secondary source includes waste collected from secondary vehicle and waste from the waste storage points across the city. The vehicles deputed for waste collection is shown in Table 6.3. There are around 2200 commercial establishments in the city, out of which only 400 to 450 commercial establishment's solid waste is has been collected

Table 6.2 Primary waste generations

SL. NO	Waste Generator	No of generators	Avg. waste per day in Kg	Total waste in Kg	Total waste in Tones
1	Household	17841	1	17305.77	17.31
2	Commercial Establishment	2152	1.9	4110.32	4.11
3	Veg. Markets	3	320	960	0.96
4	Meat shops	55	14.7	809	0.81
5	Hotel	140	4.2	588	0.59
6	Institutions	35	5.4	189	0.19
7	Petty Shops	104	1.4	145.6	0.51
8	Street Sweeping				
	Type A – Sweeped daily	16	52	832	0.83
	Type B – Twice in a week	35.2	30	1056	1.06
	Type C- Once in a week	33	26	858	0.86
	Type D- Once in a week	25	22.1	552.5	0.55
9	Miscellaneous waste	3%		847.78	0.85
				28255.65	28.26
					4.7

Source: SWM-DPR, CMC, Chintamani

Table 6.3 Vehicle used for waste collection

Sl.no	Type of vehicle	No. of vehicles	Source of collection	Disposal
1	Tractor trailer	2	Open points/ street Sweepings	Disposal site
2	Dumper placer (3m3)	2	From bins	
3	Auto tippers (0.6 tonnes)	8	Household/ Commercial	Tractor trailer
4	Mini Tipper	5	Household/ Commercial	Tractor trailer
5	Bins	35+25	From bins	Disposal site
6	Push carts	30	Door to door	Into auto tippers
7	Loader	1		
	TOTAL	50		

Source: SWM-DPR, CMC, Chintamani

### 6.3 Legacy waste

On physical survey it is found that the dumpsite has accumulated a legacy waste roughly estimated to be 20,000 tonnes (Figure 6.3)





Figure 6.3 Legacy waste at dump site, Chintamani

## 6.4 Street sweeping

Street sweeping and drain cleaning are the major components of total MSW generated in the city. The quantum of street sweeping details are shown in Table 6.4 below.

Street sweeping carried out by	Pourakarmikas
<ul style="list-style-type: none"> <li>• Total road length covered.</li> <li>• Type A – Swept daily</li> <li>• Type B – Twice in a week</li> <li>• Type C- Once in a week</li> </ul>	<p>109.2 km</p> <p>16km (city centres, near bus stand commercial areas)</p> <p>35.2 km (semi resident, school areas, not so densely populated)</p> <p>58km (purely residential areas)</p>
Total no of Pourakarmikas	120

Source: SWM-DPR, CMC, Chintamani

## 6.5 Solid waste processing and disposal site

Chintamani city has set up a municipal solid waste processing unit site at Kanishettihalli village located 7 km away from the city with a total area of about 10 acres. The facility has been provided with a watchman's room, weighbridge, Vermicomposting tanks, shredding machinery (Figure 6.4). The details of facilities at the disposal site are listed in Table 6.5.



Screens mm



Vermi Compost tank

Figure 6.4 Facilities at SWM Processing unit

Table 6.5 Facilities at disposal site

SL.NO	List of Facilities	Size
1	Security Building	4.2m*3.7m
2	Vermi compost shed -1	20m*4.5m
3	Vermi compost shed -2	18m*10m
4	Water Tank	3m*3m
5	Sanitary Landfill	47m*28m
6	Weigh bridge cabin	3.5m*3.5m
7	Length of the Bituminous Road	241m
8	Length of Drain	137.5m
9	Park	10.3mx15.3m
10	Area of processing site	57328 Sq.m

Source: SWM-DPR, CMC, Chintamani

## 6.6 Gaps & Issues

- No proper Commercial Waste Management: Collection of commercial waste from the commercial establishments is around only 20% (Upon discussion with the CMC officials) & the remaining waste is dumped on the nearby roads or the open lands



- Dumping of solid waste in the open drains and nearby roads due to lack of awareness especially in slums, negligence, and community engagement in managing waste (Figure 6.5)
- No following of Health & safety standards by the sanitation workers
- Vermicompost is not in good condition to manage the waste and it is being used as a dumping pit (Figure 6.6)
- No legacy waste management at the dumpsite



Figure 6.5 Dumping of solid waste on open land



Figure 6.6 Vermi compost tank status



## 7. Health and Hygiene of Sanitation Workers

The sanitation workers in the city are those behind the provision and maintenance of sanitation systems (Figure 7.1). The sanitation workers lack awareness of safe working procedure even after conducting various training programs by CMC. They mainly reside in wards 12 & 14 allotted by the government: **Pourakarmikas Bhadavane** (Figure 7.2) with access to basic services.



Figure 7.2 Pourakarmikas Bhadavane



## 7.1 Staffing details of Chintamani

Table 7.1 staffing details, Chintamani

Total number of sanitation workers working in the town Sanitation workers	
Under SWM	Permanent-51 Direct payment-42 Outsource-31 SHG Members-25
Under wastewater management	6
Operators under water supply	40
Others	11 (Including drivers, cleaners and STP maintenance)
TOTAL	200

Source: CMC, Chintamani

- **Use of Personal Protection equipment Kits:** The sanitation workers under SWM and wastewater management regularly use the PPE kits (Figure 7.3) Gumboots, Hand Gloves, Jacket, Masks, sanitiser etc.



Figure 7.3 Sanitation workers with PPE kits, CMC Chintamani

### Health services/Benefits provided to sanitation workers.

- Health camps ((Figure 7.4)
- Employees' State Insurance Corporation (ESIC)
- SBI accidental insurance
- Pradhan Mantri Awas Yojana (PMAY)
- PKGBY



Figure 7.3 Sanitation workers with PPE kits, CMC Chintamani

## 7.2 Gaps and issues

- The sanitary workers have taken up the job as a family profession, where the interchanging of family members mainly forcing their children rather than educating them is observed.
- Alcohol in the Workplace: The workers consume alcohol during work, which impacts health and safety, work performance and working relationships among the sanitary workers.
- Superstitious belief: If the sanitation workers are unwell, they pay a visit to the Mattha's/temples rather than consulting a doctor.
- Lack of awareness on the safe working procedure despite various training on health and sanitation



# 8. Institutional Arrangement

## 8.1 Baseline status

This chapter includes information regarding the existing institutional roles & responsibilities at CMC for managing urban infrastructure services and municipal governance. The Institutional arrangement, Organogram of ULB and department wise staff in-position for each category is listed in Table no 8.1. The organizational structure is shown below in Figure 8.1.

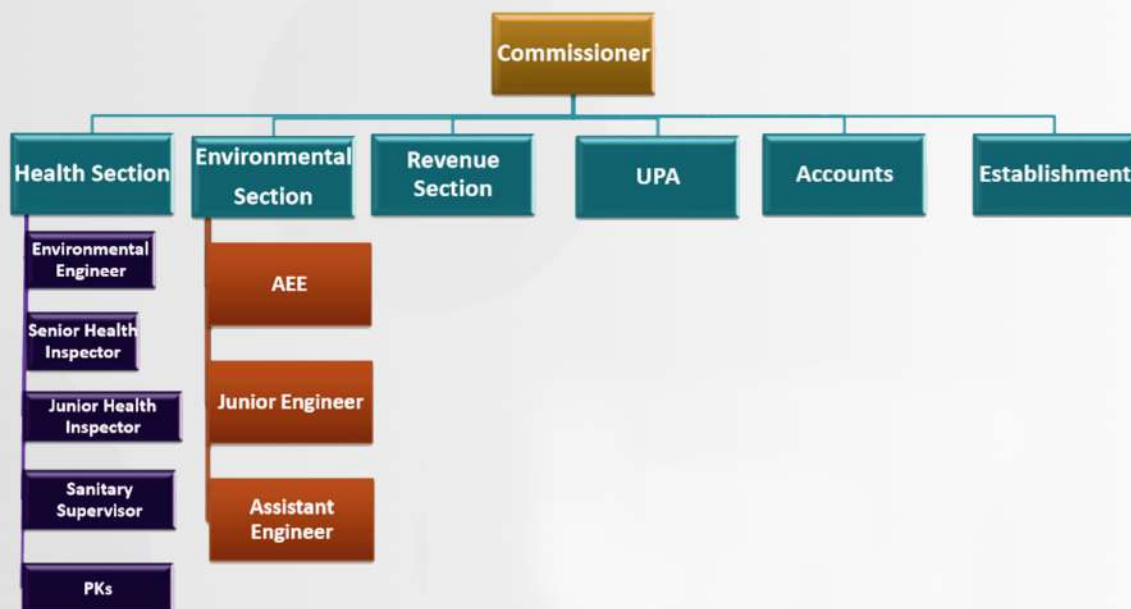


Figure 8.1 Organizational structure, CMC

Urban Services	Institutions in charge of planning	Institutions in charge of implementation	Institutions in charge of O&M	Institutions in charge of collecting user charges
Septage management	Municipal Council, Assistant Executive Engineer (Civil/Water supply/ Environmental Engineer)	Municipal Council	Municipal Council/ Private operator	Municipal Council
Water Supply/ Storm Water Drainage		Karnataka Urban Water Supply and Drainage board (KUWS&DB)	Municipal Council	

Solid waste		Municipal Council		Organisation In charge
management Public Toilets				

Source: Baseline Survey

## 8.2 Gaps & Issues

This section will identify gaps and issues related to Institution and Governance with relevance to the sanitation-related sector:

- Lack of sufficient staff in various categories: Vacant post related to sanitation sector in the ULB (Pourakarmikas and Supervisors)



## 9. Municipal Finance

- The municipal finances and revenue break-up on water and sanitation-related services mainly Water supply, sewerage, solid waste capital, O&M expenditures, Capital / Revenue Income
- Grants & loans for sanitation services and externally aided projects (WB, ADB, etc.) Financial sustainability measures
- Details of existing financial reforms, transparency and monitoring mechanism, existing incentives, and punitive measures

**The budget sheet 20-21 is attached in annexure II**

# 10 CAPACITY ENHANCEMENT

## 10.1 Baseline status

The CMC, Chintamani is involved in providing a skill, capacity building and organizing exposure visits to the officials including high and mid-level professionals working in the sector. The training is given to the Pourakarmikas for ensuring sustainable sanitation & hygiene and to sensitize sanitary workers on health/safety, waste management and safe handling. The detail of training is listed in Table 10.1.

Table 10.1 Training and Workshop under WASH

Trainings received by ULB officials/sanitation workers/ operators under WASH		
Participants	Place of visit	Purpose
Pourakarmikas	Singapore	Cleanliness of the Sanitation workers

Source: CMC, Chintamani

## 10.2 Gaps & Issues

This section will identify gaps and issues related to the capacity Enhancement of Institution / Human resources for improving the WASH services.

Lack of:

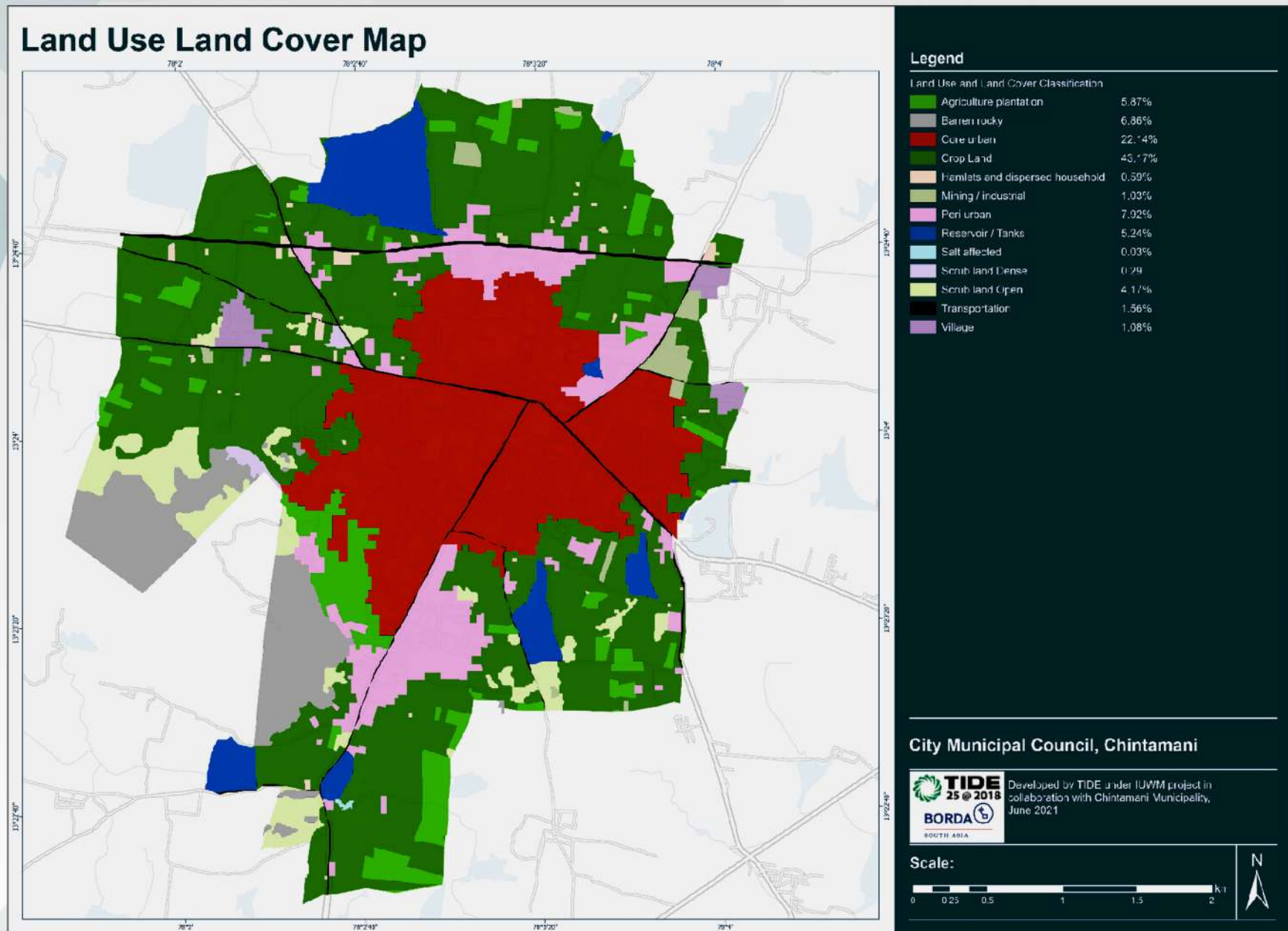
- Capacities (technical & managerial) in CMC Chintamani
- Capacities for new technologies and innovative projects
- Planned capacity-building strategy for improving sanitation services.

## REFERENCES

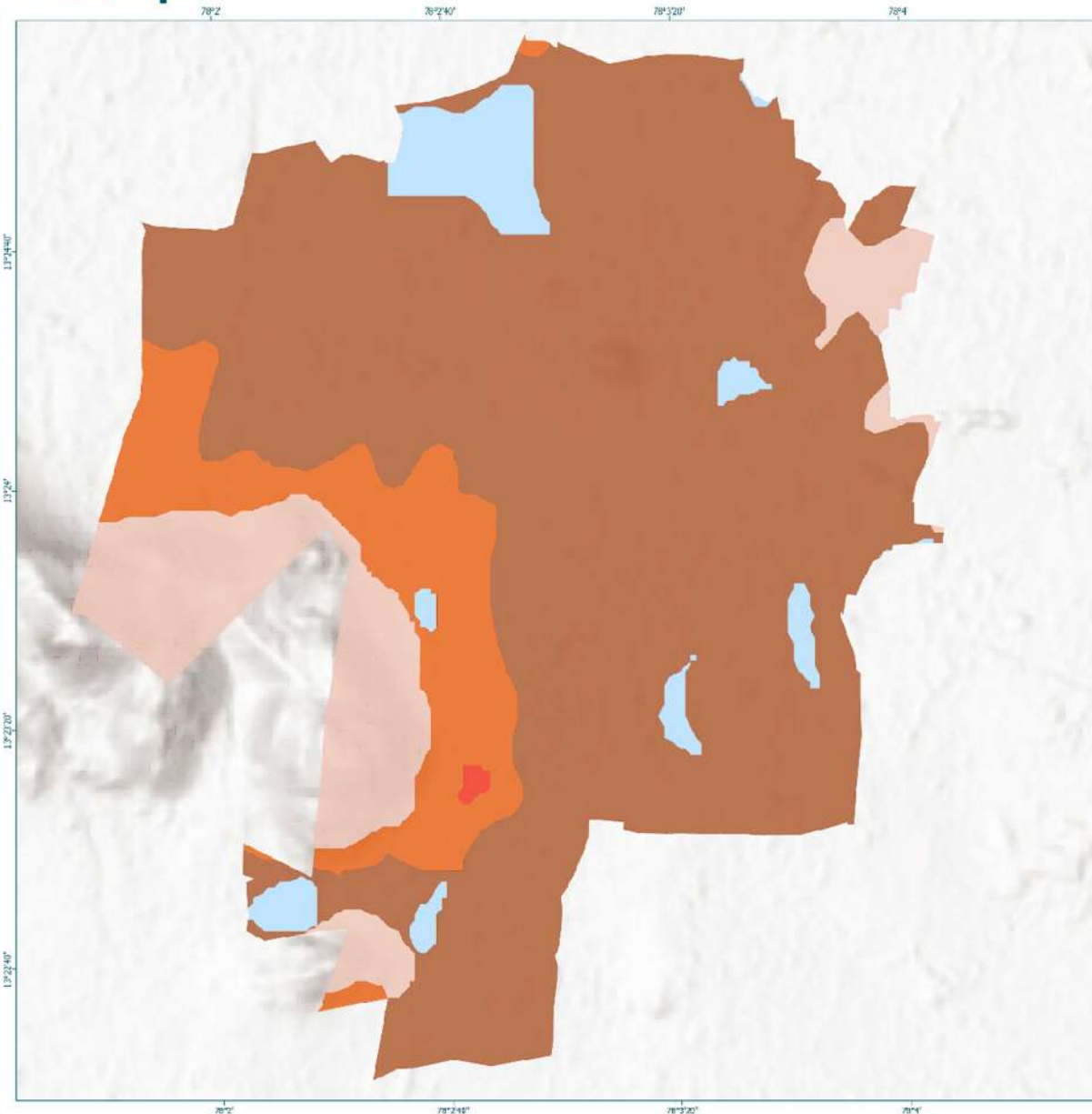
1. Solid Waste Management, Detailed Project Report, CMC Chintamani.



## ANNEXURE I: BASE MAPS



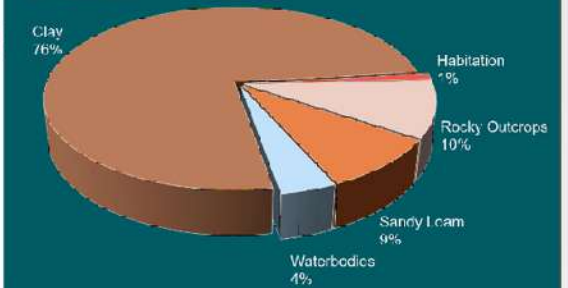
# Soil Map



## Legend

- Soil Type
- Clay
  - Habitation
  - Rock Outcrops
  - Sandy Loam
  - Waterbodies

## Soil classification



City Municipal Council, Chintamani



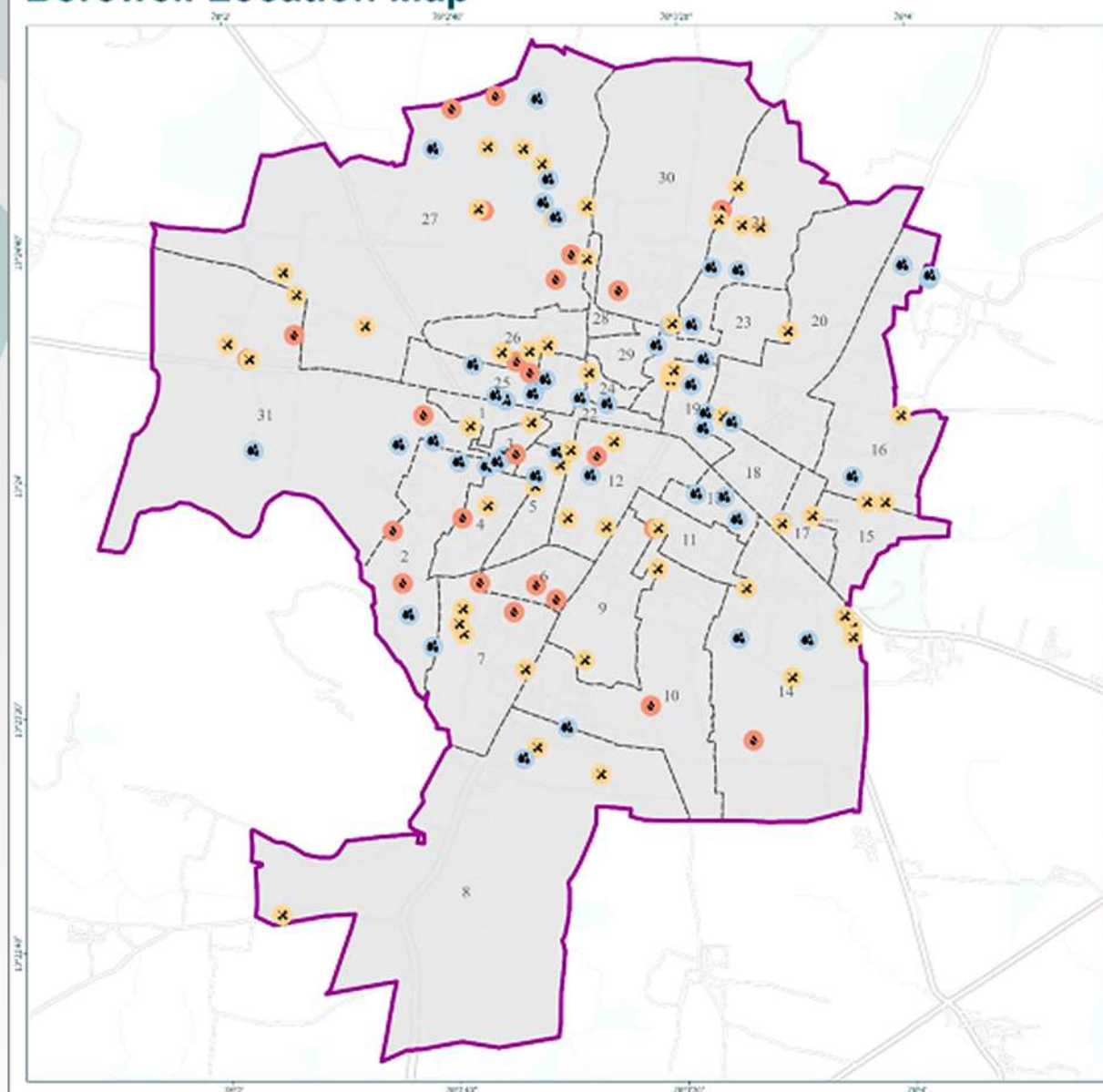
Developed by TIDE under IUWM project in collaboration with Chintamani Municipality, June 2021

Scale:



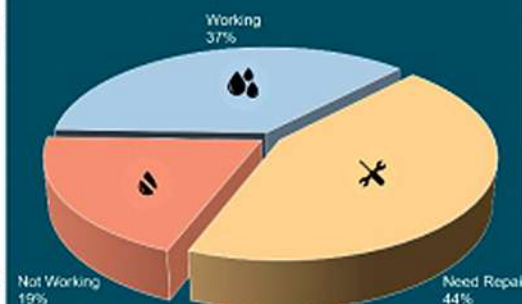


## Borewell Location Map



### Legend

- City Boundary
- Wards
- Condition of the Borewell
  - Working
  - Not Working
  - Need Repair



City Municipal Council, Chintamani

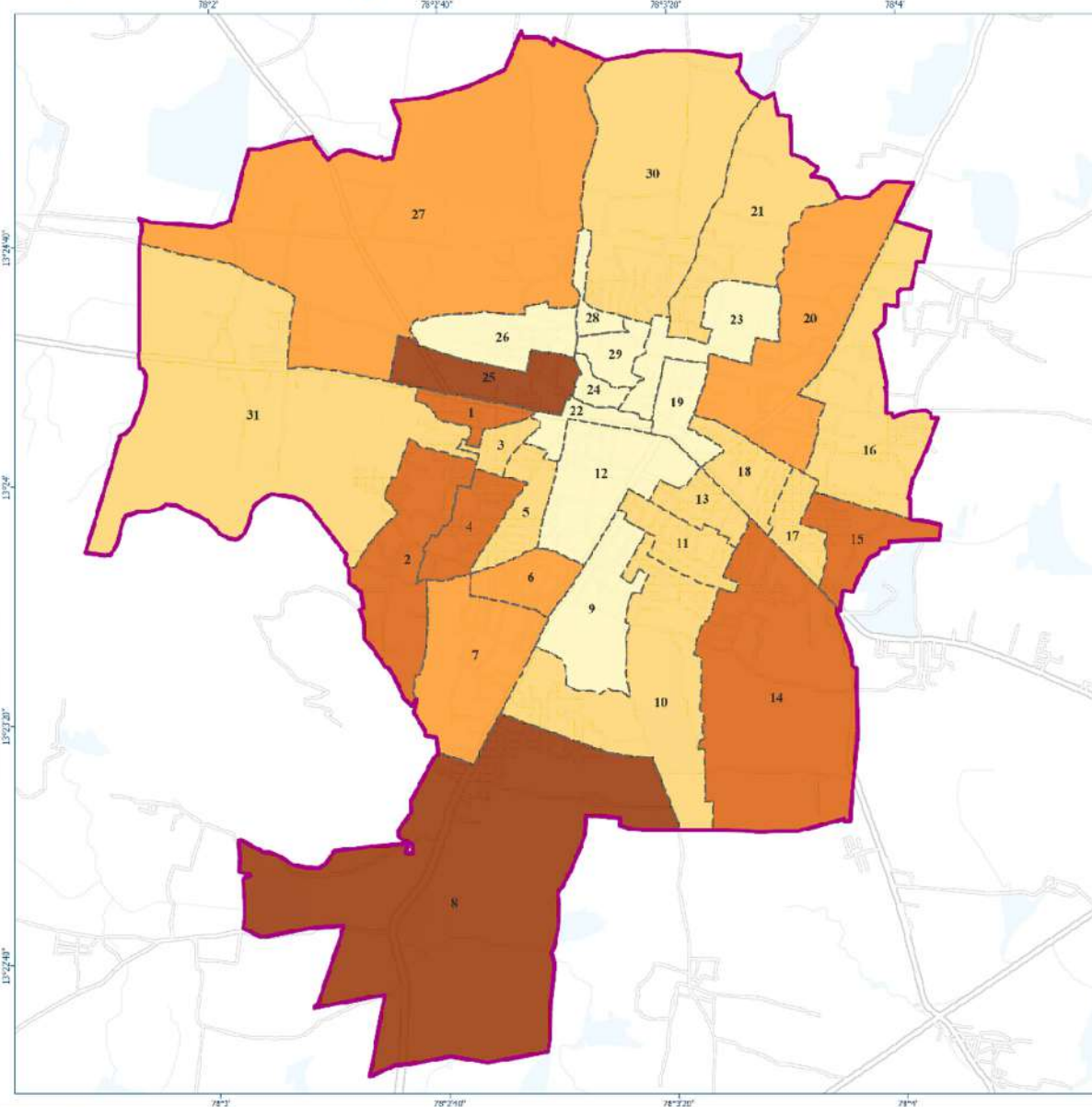


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Scale:



# Population Density Map



## Legend

City Boundary

Ward-wise Population Density

- 1400 - 2000
- 2000 - 2500
- 2500 - 3000
- 3000 - 3500
- 3500 - 4100

Ward Wise Population Details

1	Venkatagirikote North	3010
2	Venkatagirikote south	3294
3	Venkatagirikote colony	2054
4	Tank bund road west	3481
5	Tank bund road east	2356
6	Anjani extension	2785
7	Ashwini extension	2735
8	Kannampalli	4039
9	Malapalli	1810
10	N R Extension	2405
11	Venkareshwara extension	2066
12	K R Extension	1950
13	Sonnashettyhalli	2436
14	Tapatheswara colony	3133
15	Tippunagar	3043
16	Gandhi Nagar	2248
17	Chowdareddypalya	2346
18	Keerthi Nagar	2408
19	Bamboo bazar	1813
20	Sriramanagar	2738
21	J J Colony	2251
22	Hoovinpete	1751
23	Halepete	1886
24	Nerashimapete	1716
25	N N T South	3970
26	N N T North	1745
27	Shantinagar	2985
28	Mehaboobnagar	1757
29	Nekkundi pete	1483
30	Agrahara	2031
31	Thimmasandra	2230

## City Municipal Council, Chintamani



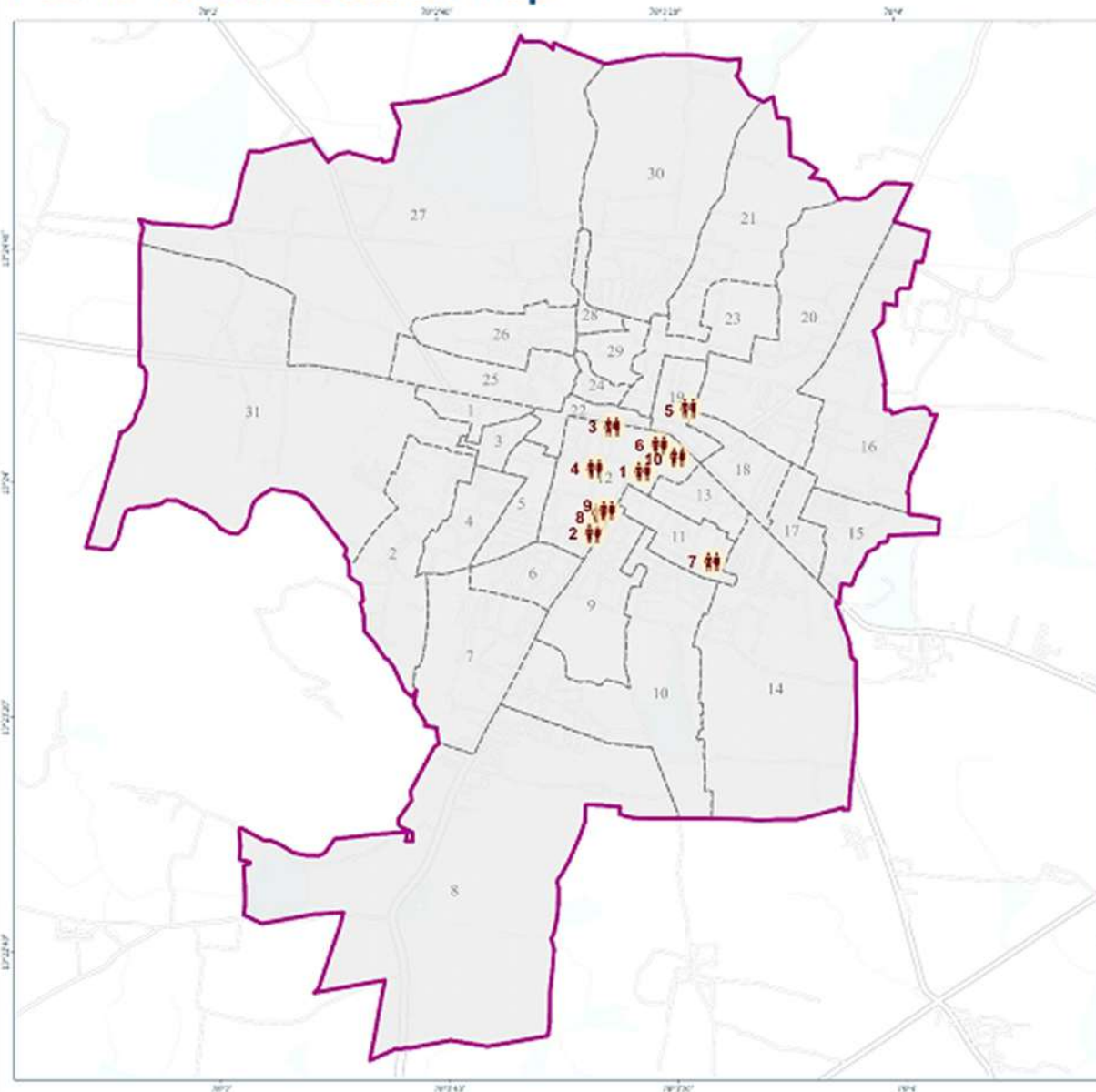
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Scale:





## Public Toilets Location Map



### Legend

- City Boundary
- Wards
-  Public Toilets

### Public Toilet Details

ID	Name	Ward No.
1	Bengakuru Circle	12
2	IB Circle	12
3	Gajananan Circle	12
4	R K Nursing House	12
5	Azad Chowk	19
6	IDSMT Complex	12
7	Sriamangar	11
8	Court	12
9	Stadium	12
10	KSRTC Bus stand	12

### City Municipal Council, Chintamani

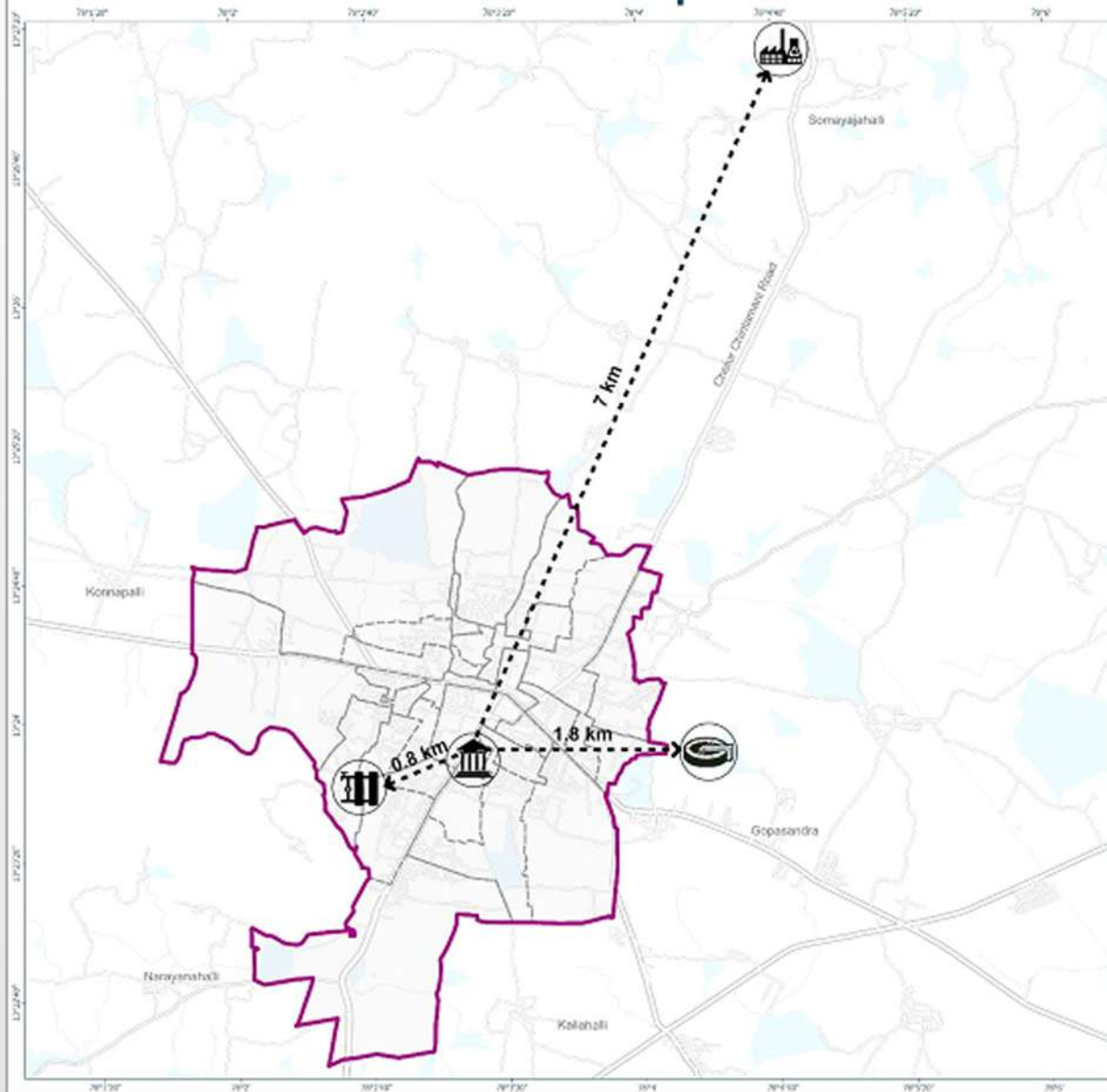


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### Scale:



## WASH Infrastructure Location Map



### Legend

- City Boundary
- Wards
- Solid Waste Management Unit  
Solid waste processing and disposal unit spread over an area of 10 Acre.  
Facilities: Weigh bridge, Vermicomposting tank, Trommel Machine for screening
- Sewage Treatment Plant  
STP with nature based oxidation ponds, spreading over an area of 4 Acre and with a design capacity of 2MLD
- Water Treatment Plant  
1.68MLD capacity Water Treatment Plant, with aeration, sedimentation post clarification, sand filtration along with backwash and disinfection unit for treatment.
- Chintamani Municipality Office

### City Municipal Council, Chintamani



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### Scale:

