City Sanitation Plan for Narsaraopet

Produced by:

Consortium for DEWATS Dissemination Society

Produced for:

german cooperation
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giz

Narsaraopet Municipality

November 2016

Narsaraopet City Sanitation Plan

Prepared by:

This report has been prepared within the context of GIZ's CSP template. Herein, the project team have assessed all the sectors (i.e. Access to Toilets, Wastewater management, Solid Waste Management, Water Supply, Storm Water Drain Management and Receiving water bodies management) based on a review of the existing situation in the sector and evaluating demand for each sector. The demands have been understood based on discussion with city level stakeholders and through assessment of the secondary data resources made available to the project team. The final section of the report aims to identify the way forward in terms of action points and an investment plan for the same.

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Section I – Introduction and Context

1. Introduction and Background

1.1 The NUSP and CSP Initiative

The National Urban Sanitation Policy launched during 2008 envisages *"All Indian cities and towns become totally sanitized, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women."*

The overall goal of this national policy is to transform Urban India into community-driven, totally sanitized, healthy and livable cities and towns. Specific goals include:

- Awareness Generation and Behavior Change,
- Open Defecation Free Cities,
- Integrated Town-Wide Sanitation,
- Sanitary and Safe Disposal, and
- Proper Operation & Maintenance of all Sanitary Installations.

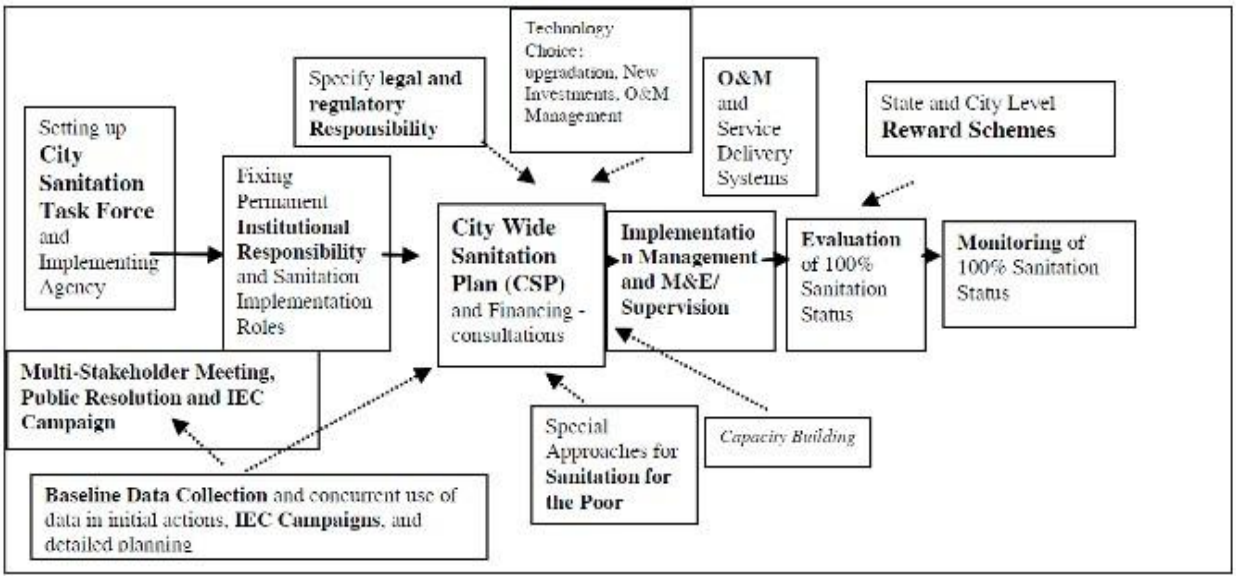
Believing that without a City Sanitation Plan a comprehensive planning cannot be achieved to attain the objectives of Swachh Bharat Mission, Narsaraopet Municipality is developing a City Sanitation Plan for Narsaraopet Town that identifies the issues related to governance, technical, financial, capacity enhancement, awareness raising and pro-poor interventions and proposes short, medium and long term measures to achieve the goals of National Urban Sanitation Policy (NUSP) to create community driven, totally sanitized, healthy and livable cities and towns.

The CSP's main purpose is to support urban local bodies and NGOs, CBOs, citizens and private sector agencies to take concrete steps to achieve 100% sanitation in their respective cities that includes Water Supply, Waste Water and Sewerage, Storm Water, Sanitation, and Solid Waste Management. The mentioned sectors are considered under CSP as these are directly and indirectly linked to the other sectors that ultimately affect the hygiene of the city. Thus considering the influence of all these sectors on the city sanitation, the Narsaraopet Municipality in consultation and considering the recommendations from citizen groups, elected representatives, government departments and City Sanitation Task Force is developing the CSP. The main aim of the CSTF is to achieve 100% sanitation in the city by involving the suggestions from public, private institutions, NGOs and Aided Organizations in coordination with Town Planning Wing. [1]

Considering the local situations and its need, the Narsaraopet Municipality has followed the procedure that is depicted in the below figure while planning, implementing and evaluating a CSP.

[1] Narsaraopet Municipality (2016)

Figure 1 Generic Elements of Planning, Implemenation and M and E of City Sanitation



The City Sanitation Plan (CSP) is aimed at developing and maintaining a clean, safe and pleasant physical environment in Narsaraopet Town to promote social, economic and physical well-being of all sections of the population. It encompasses plan of action for achieving 100% sanitation in the town of Narsaraopet through demand gefneration and awareness campaign, sustainable technology selection, construction and maintenance of sanitary infrastructure, provision of services, O&M issues, institutional roles and responsibilities, public education, community and individual action, regulation and legislation.

To tackle the above challenges and to accord thrust to sanitation as a priority area, the Government of India (GoI) launched the National Urban Sanitation Policy (NUSP) in 2008. The NUSP articulates the resolve of GoI to achieve United Nations Millennium Development Goals specifically, MDG 7 pertaining to secure ecological sustainability and MDGs 4, 5 and 6, pertaining to health and hygienic conditions of the poor and women. In particular, the NUSP

- Envisions that all Indian cities and towns should become totally sanitized, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for urban poor and women.
- Identifies
    - poor awareness,
    - social and occupational aspects of sanitation,
    - fragmented institutional roles and responsibilities,
    - lack of integrated town-wide sanitation approaches,
    - limited technology choices,
    - reaching the un-served and poor and
    - lack of demand responsiveness

  as the key policy issues to be tackled and aims to transform urban India into community-driven, totally sanitized, healthy and livable cities/towns through achieving:

The principal components of town-wide approach include:

- Collection and sanitary disposal of wastes, including solid wastes, liquid wastes, excreta, industrial wastes, clinical and other hazardous wastes;

- Storm water drainage;
- Cleansing of thoroughfares, markets and other public spaces;
- Environmental sanitation education;
- Inspection and enforcement of sanitary regulations;
- Monitoring the observance of environmental standards.[2]

1.2 Understanding of the Assignment

The assignment on 'Supporting in City Sanitation Plan Finalization' is part of a larger support project (SNUSP[3]-II) to the Ministry of Urban Development (MoUD) by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH for implementation of the National Government's sanitation policy guidelines for improving the sanitation situation. The SNUSP-II project aims to achieve this by building on lessons of providing City Sanitation Plan (CSP) support to 6 cities and collaborating with 2 states while preparing their State Sanitation Strategies.

As part of the second phase of the SNUSP, master trainers from the nominated 34 small and medium towns (which include 10 towns each in Telangana and Andhra Pradesh) for up scaling the achievements of concrete results on the ground in the sanitation sector. The trainings focus on 'Preparation of City Sanitation Plans' and capacitate state level government functionaries to be the driving up scaling agent in the sanitation sector.

As a follow up to the trainings, the towns are preparing their CSPs and related cost estimates. The objective of the assignment is to handhold and support 3 Urban Local Bodies (ULBs) out of 10 selected ULBs in Telangana and 3 ULBs out of 10 selected ULBs in Andhra Pradesh (overall 6 towns) *to shortlist projects*, *prepare the investment plan* and *finalize the CSP* in close collaboration with the ULB officials and the City Sanitation Task Force (CSTF) following the process and format developed by GIZ. The overall goal is to not just guide but work towards implementing and replicating the CSPs within the respective states, making the Sanitation Plans so prepared both implementable and sustainable.

As such, CDD Society has been commissioned to undertake this support towards finalization of the City Sanitation Plans for the following cities:

- Telengana
  a. Khammam
  b. Karimnagar
  c. Sircilla
- Andhra Pradesh
  a. Nandyal
  b. Narsaraopet
  c. Amalapuram[4]

[2] Narsaraopet Municipality (2016)
[3] SNUSP – Support to the National Urban Sanitation Policy
[4] Inception Report CDD Society (2016)

1.3 Steps towards preparation of CSP

According to the National Urban Sanitation Policy, the preparatory actions that has been carried out in order to achieve 100% sanitation are

1. ***Formation of City Sanitation Task Force***

Mobilize Stakeholders: The first step in making the cities 100% sanitized is to elevate the consciousness about sanitation in the mind of municipal agencies, government agencies and most importantly, amongst the people of the city. A multi-stakeholder City Sanitation Task Force has been formed, comprised by representatives from agencies directly responsible for sanitation (divisions and departments of the ULB, PHED, etc.), agencies indirectly involved, and practitioners, representatives of the different stakeholders sectors, NGOs and sanitary workers.

2. ***Baseline Data Collection and Creating Database***

In parallel with the preparatory steps, the ULB / Implementing Agency have collated the information on sanitation that exists with the ULB itself and other agencies in the city. This has included demographic, institutional, technical, social and financial information.

3. ***Awareness Generation and Launch of 100% Sanitation Campaign***

After a reasonable amount of data has been collated from secondary and primary sources, and the Task Force is in place, the first task will be of launching a citywide 100% Sanitation Campaign.

4. ***Specifying Legal and Regulatory Institutional Responsibilities***

Even though many of the municipal laws refer to sanitation responsibilities of households and ULB, etc. these are not clearly laid out or comprehensive. The Implementing Agency will examine the law and rules in this regard and make recommendations for the Task Force to make the rules explicit regarding total sanitation services.

5. ***Planning and Financing***

The task of planning and finding sources of funding will be under the oversight of the Task Force but carried out by the Implementing Agency. The Agency has developed plans for the city for different aspects including institutional, social, technical, financial, etc with the help of different departments involved in city sanitation.

6. ***Technical Options***

Technology choice poses a major problem in Indian cities not only because of lack of information on what exists at present, but also because of the constraints of land, tenure, and low budgetary priority accorded to sanitation historically. Considering the current practices and obstacles that are stopping for the development of sanitation sector in the city, certain technologies that suit best for the city has been recommended.

7. ***Reaching the Un-served Population and the Urban Poor***

Experiences from many Indian cities show that a differentiated approach is necessary to extend good quality sanitation services to the poor – the group that suffers the most in terms of adverse impacts on health and lost earnings.

8. ***Operation & Maintenance and Service Delivery Systems***

Institutional systems for O&M are at the heart of any successful set of systems and procedures to achieve and sustain 100% sanitation.

9. Capacity Building & Training

The role of capacity building and training is crucial in achieving and sustaining 100 % sanitation.

10. Implementation Plan and Monitoring and Evaluation

While the Implementation Agency will be responsible for overall implementation, it is useful to think about plan implementation and delivery mechanisms for each of the components of the Plan. The City Sanitation Task Force and the Implementing Agency need to think about Monitoring & Evaluation of the implementation as an integral part of the City Sanitation Plan.[5]

1.4 Approach for the Assignment

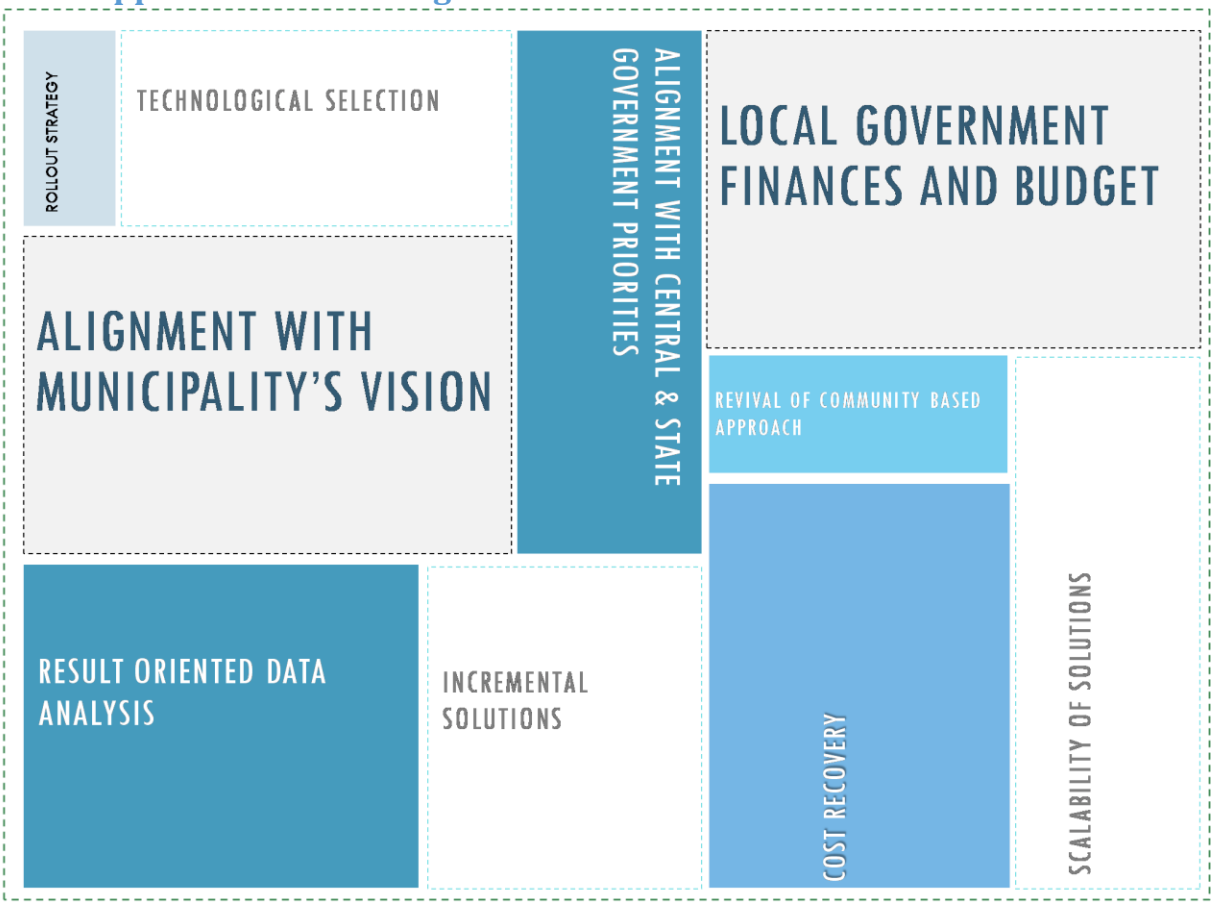


Figure 2 Principles for an Implementable Sanitation Action Plan

[5] Narsaraopet Municipality (2016)

The experiences from the first generation of urban sanitation reforms are that solutions fail repeatedly because they are generalized rather than being demand-responsive and site specific. Backed by our field level experiences and stakeholder consultations, we reflected on **'What makes an Action Plan Implementable?'** Our understanding is that the major tenets of successfully demonstrating sustainable sanitation solutions depend on the following principles:

1. ***Alignment with Municipality's Vision:*** It is essential to view the sanitation plan as a strategic planning exercise that is conducted by providing guidance but in complete collaboration with the municipality. At the end of the day, no plan however rigorous could be executed through to its rightful conclusion without the collaborative support of the municipality, also keeping in view their tacit experience in the town. As such, it becomes essential to take the municipality into confidence and seek their inputs and understanding on the sanitation reform priorities.
2. ***Local Government Finances and Budget:*** The solutions to be proposed across all segments of the sanitation value chain have to be sensitive to the municipal finance situation of the town to have any realistic prospect of moving into the implementation phase. Additionally, it will be essential to explore funding possibilities from donor agencies in the form of grants and loans. Additionally, the solutions proposed within the CSP must take into account the sustainability in terms of whether the municipal government is able to meet recurring expenses to operate and maintain a sanitation system.
3. ***Alignment with Central and State Government priorities:*** The Central Government has reinstated its commitment to sanitation in 2014 with the launch of the Swachh Bharat Mission (SBM) and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), another scheme to improve the urban sector of the country. It is essential that proposals suggested within a CSP are in alignment with such Governmental programs, to draw strategic leverage and receive any possible financial support. It is important for the local government to be sensitive to any available grant (due to their generally pure financial situation) for infrastructure creation from programmatic support received from State or Central Governments. Also, sanitation is a state subject and so the state can make changes in devolution of institutional responsibilities and financial devolution as well. Moreover, it is only through effective governance by the local government, that the policy guidelines of AMRUT and SBM can be implemented.
4. ***Result Oriented Data Collection:*** It has become clear that data collection only to back a cookie cutter solution will not help with creating an implementable CSP. Rather data collection methods should be driven with the specific purpose of solving the issue and serving a solution.
5. ***Scalability of solutions:*** The scale at which a solution (for e.g. a wastewater treatment or a faecal sludge treatment unit) is provided will have a major bearing on the level of financial investment required in a town. Based on the drainage and topographic profile of the town, centralized systems have to be complemented with decentralized approaches to solve the sanitation issues. There generally is a lot of resistance amongst city engineers to go for decentralized options with community involvement, which points out the need of education and capacity building. If the sanitation issues in the city are dealt properly, the natural water bodies can also be revived. Scalability can also be seen as the 'level of decentralization' at which solutions can be provided. The idea that drives this concept is that treatment of wastewater/ faecal sludge should be as close to the source as possible, rather than adopting large scale investments for conveyance. This could be relaxed in cases governed by topographic criteria of the natural setting.
6. ***Incremental Solutions:*** The project team will adopt an approach of incremental improvement (in terms of interventions and investments) over a period of time to address the entire sanitation value chain. For example, incremental improvements could be envisaged in terms of the level of access to a toilet. The proposed interventions will aim at elevating community from practicing

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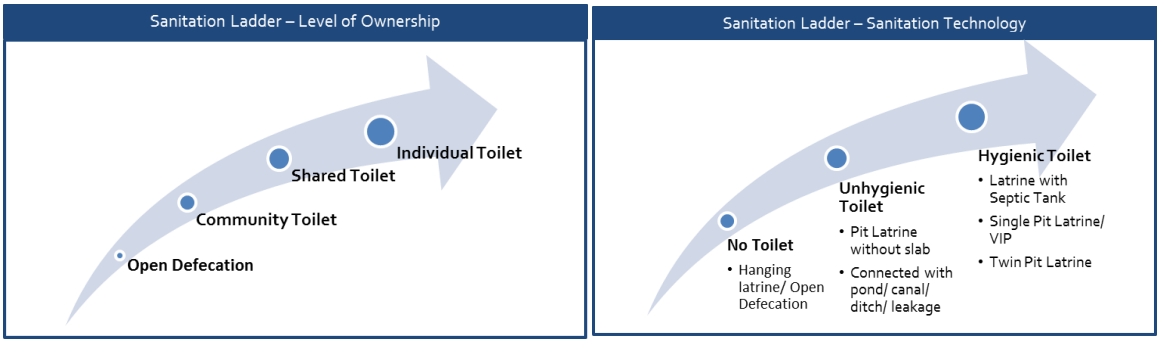
en defecation to having access to a shared/ community toilet, gradually moving towards each resident having access to an "individual toilet".

Figure 3: Incremental Approach



Another type of incremental improvement here is in terms of moving up the ladder in the quality of sanitation technologies (from pit to twin pit to septic tank). Though the function of each sanitation system is confinement of the human excreta, the physiographic setting, and socio-economic contexts will have a bearing on the selection of these technologies.

The project focuses on progressing along the sanitation ladder in a phased manner, with the primary motive to ensure that the entire population has access to a hygienic toilet. The progression must also take into consideration the institutional capacities to operate and maintain the systems, financial capacities to sustain the interventions and behavioural changes for engagement of community in the movement of sanitation improvement.

7. ***Technology selection:*** The technology solutions/ systems to be selected to address the complete chain of wastewater/ faecal sludge management issues must be sensitive to local situations in terms of:

    - The socio economic profile of the cluster
    - Environmental implications
    - Cultural acceptability
    - Cost considerations[6]
    - Operations and maintenance (O&M) requirements
    - Land availability
    - Treatment efficiency
    - Energy requirements
    - Health impact
    - Reuse opportunity
    - Adequacy of water
    - Ground water table
    - Type and permeability of soil
    - Climatic conditions
    - Compliance with discharge standards

[6] This is limited to understanding derived from consultations and not a detailed review of the municipal budget.

8. ***Cost Recovery:*** An implementable solution should have a cost recovery model to make its implementation sustainable. This would mean that the cost incurred by the municipal government for all the infrastructure to facilitate the sanitation solutions (say the 'purchase of vacuum trucks', 'training of service delivery related to faecal sludge collection' and 'installation of the treatment plant by government') should be recovered. This could be through an effective user charge (collected from the households) collection strategy, through sale of treated wastewater/ faecal sludge etc.
9. ***Revival of Community Based Approaches:*** Instead of only providing the sanitation "hardware", sanitation implementation need to take a holistic approach. This means there has to be a focus on improving hygiene behaviour, and communities need to understand the O&M aspects, at least of their onsite systems to the extent necessary. The Community Based Sanitation approach also focuses on critical stress areas populated by the poorer income segments and densely populated areas, so as to closely reflect preferences of target communities.

10. ***Rollout Strategy:*** It is important that the roll out of the implementation of a CSP has to be done strategically focused on addressing high priority issues in the immediate term and big ticket projects in the long term. The solutions must be phased in alignment with the principle of 'incrementalism', so that the solutions are first implemented to the highest concern population segments, and the improvements are sustained (technically, environmentally and socio-economically) over a period of time to address the entire sanitation value chain.[7]

1.5 Project Activities

The following activities have been completed for Narsaraopet:

a. The **inception report** for all the towns have been submitted on 8th September 2016. The inception report covers the scope of work for CDD Society under the project. It also highlights the approach and methodology for the preparation of a City Sanitation Action Plan (CSAP). It covers the core areas to be covered under each sector in the preparation of the CSAP, along with the cross-cutting themes, such as municipal finance, institutional framework and governance, capacity enhancement and health and hygiene. The inception report also states the work plan and the timelines for the deliverables and site visits under the project. Three visits to each town were also planned under the scope of the project.
b. The **first visit** of the team from CDD Society to Narsaraopet was on the 17th of October 2016. The visit included meetings with the CSTF, municipal officials, and visits to selected areas within the town which are significant from the prospect of water supply and sanitation sectors. Collection of important secondary data from the municipal departments and other offices related to water supply and sanitation were also covered during this period.
c. There also has been the **submission of Action Plan** to the municipal corporation and to the AP government. The action plan document and presentation was submitted on the 11th of November 2016. The action plan included the key issues for each sector under the CSAP, the resultant goals, and their action plan for implementation. For each of the suggested initiatives, there was a section on the cost estimates planned for the town.

[7] Inception Report, CDD Society (2016)

Figure 4 Site Visit to Vermi-Composting Site Narsaropet

2. City Sanitation Task Force (CSTF)

2.1 Responsibilities of the CSTF

The City Sanitation Task Force is responsible for:

- Launching the City 100% Sanitation Campaign,
- Generating awareness amongst the city's citizens and stakeholders,
- Approving materials and progress reports provided by the implementing agency, other public agencies, as well as NGOs and private parties contracted by the Implementing Agency, for different aspects of implementation,
- Approving the CSP for the city prepared,
- Undertaking field visits from time to time to supervise progress,
- Issue briefings to the press/media and state government about progress,
- Providing overall guidance to the Implementation Agency, and
- Recommend to the ULB fixing of responsibilities for city-wide sanitation on a permanent basis.

The CSTF shall also responsible to monitor and guide the planning process and implementation at the initial stages of the project and shall conduct meetings and field visits at a later stage on an as-needed basis to ensure quality implementation of the project.

The CSTF shall responsibly recommend and assign below listed aspects to the ULB for the citywide sanitation.

- The ULB shall have final overall responsibility for citywide sanitation, including devolving power, functions, functionaries and funds to them,
- Planning and financing including State Government and Government of India schemes,
- Asset creation including improvement and augmentation,
- Operations and Management (O and M) arrangements for all networks, on-site, individual, community and public sanitation facilities and systems (including transportation up to final treatment and disposal of wastes),
- Fixing tariffs and revenue collections in order to make O and M sustainable,
- Improving access and instituting special O and M arrangements for the urban poor and un-served populations in slum areas and in mixed areas,
- Adopting Service delivery standards (e.g. by urban development departments),
- Adoption of regulatory roles including environmental standards (e.g. state pollution control boards), health outcomes (e.g. health departments),
- Measures in case specific stakeholders do not discharge their responsibilities properly,
- Training and capacity building of implementing agency and related personnel, and
- Monitoring of 100% sanitation involving multiple stakeholders.[8]

2.2 Members of CSTF

The constitution of Town Sanitation Task Force is mandatory. As per the NUSP guidelines, considering that CSTF shall comprise of representative/agencies from some of the elected members of ULB, social volunteers, institutions involved in law, health, water supply, sanitation, town planning, slum development, eminent persons and practitioners in civil affairs, health, urban poverty, NGOs working on environmental components and representatives of unions of Safai Karmachari's etc, As per the National Urban Sanitation policy 2008 proposed with following members and the matter was placed in council meeting for approval. The council has unanimously approved the resolution.

[8] Narsaraopet Municipality (2016)

Table 1: Members of the City Sanitation Task Force

Sl.No	Name	Designation
1	Sri Nagasarapu Subbaraya Gupta	Chairperson (Head of the CSTF)
2	Sri Annapragada Bhanu Pratap	Commissioner (Convener)
3	Sri G.R.T.Omprakash	Municipal Engineer
4	Sri J.Siva Ramakrishna	Deputy Executive Engineer
5	Sri V.Eswar Reddy	Sanitary Supervisor
6	Sri N.Harinarayana	Contractor
7	Sri B.Sambasiva Rao	Hoteliers Associated President
8	Sri Majeti Venkatesh	President, Chamber of Commerce & Industries
9	Smt Bh.Swarnalakshmi	CDPO, ICDS, Narasaraopet
10	Sri Rukmangadhar Rao	Rotary Club
12	Sri Gandham Surya Narayana	Lions Club
13	Sri Jayampu Srinivasa Rao	Yanadula ST Parishudya Panivarala Seva Sangam
14	Sri Gallepogu Yesudasu	Mouna Parishudya Panivarala Seva Sangam
15	Sri Shaik Kareem	Eswar Engineering College.
16	Smt Popuri Vijayalakshmi	TLF President
17	Sri Tirumamilla Ankamma	SLF
18	Sri N.Rama Rao	Telugu Seva Sangam

Source: Narsaraopet Municipality (2016)

3. Town Profile

Category	2011
Area	7.65 Sq.Kms
Population (Census 2011) and (Present) – based on availability	**1,17,489**
Population Density	15,368 p/Sq. Km
No. of Households	29,132
No. of Slum settlements/colonies	41 notified slums, 3 non-notified slums
No. of Slum households	17,739
Soil Type	Black Cotton Soil
Revenue wards	23
Election wards	34

3.1 Location and Physical Aspects

Narasaraopet is spread in an extent of 7.65 Sq.kms in a scenic serene environment and is an important town in Guntur District, Andhra Pradesh, India. The name comes from Narasa Rao, a wealthy landlord who owned much of the surrounding areas some time back. Narasaraopet is the major commercial trading centre after Tenali in coastal Andhra Pradesh, having a lot of educational institutes. Narasaraopet is built on flat land ringed by hills that are an offshoot of the Eastern Ghats. The summer months can get exceedingly hot while winters are mild. The population of the town is 1,17,489 as per 2011 Census.

It is located at a distance of 48.00 Kms from the District Head Quarters town Guntur and 275.00 Kms from the combined State Capital Hyderabad.

The Lord Shiva's Temple which is in Kotappakonda village is one of the most important pilgrim places located at a distance of 8 Km from Narasaraopet Town and every year State Festival will be celebrated on the Maha Shivratri day.

3.2 Climate and Rainfall

The climate is tropical in Narasaraopet. In winter there is much more Rainfall in Narasaraopet than in summer. The average temperature in Narasaraopet is 32 °C. In December, the temperature is 20 °C and is the lowest temperature of the whole year. The warmest month of the year is May with a temperature of 33 °C. About 710 mm of precipitation falls annually.

3.3 Demography and Growth Patterns

As per 2001 census report, the population of the town is 95,349 and it is increased to 1,17,489 in the year 2011 census report thus recording 22.1% decadal growth. The density of population comes to be about 15,368 persons per SQ.KM.

Table 2: Ward Data of Narsaraopet

Ward. No.	Name	Area (Hectare)	No. of Households	Population			Density (persons/ Hectare)
				Total	Male	Female	
1	Chandrababu Naidu colony Sa Sai Nagar	48.6	1216	5020	2500	2520	103
2	Ila Bazar	14.9	1053	3955	1981	1974	265
3	Nimmathota	15.6	817	3266	1633	1633	209
4	Panasathota	17.6	724	2968	1486	1482	168
5	Christianpalem	42.9	1057	4353	2105	2248	101
6	Babapet	14.6	1047	4302	2011	2291	294
7	Vengalareddy colony	38.4	1133	4149	2502	1647	108
8	Islampet	16.6	1053	3955	1981	1974	238
9	Srinivasa Nagar	31.6	724	2968	1486	1482	93
10	Jupalli Centre	17.9	807	3266	1633	1633	182
11	Prakash nagar	18.45	987	3700	2100	1600	200
12	Shalem Nagar	28.9	1054	3938	1981	1957	136
13	Prakash Nagar	14.67	715	2960	1480	1480	201
14	Khambampalem	24.90	1047	4307	2224	2083	172
15	Kondalaraopet	16.30	714	2968	1386	1582	182
16	Kakumanu Bazar	14.90	538	2768	1386	1382	185
17	Varavakatta	16.90	589	2984	1460	1524	176
18	Arundelpet	19.24	642	3026	1492	1534	157
19	Vaddera Bazar	19.30	631	3064	1598	1466	158
20	Ramireddypet	13.20	583	2246	1169	1077	170
21	Remireddypet	14.24	611	2387	1208	1179	167
22	Ramireddypet	19.79	628	3056	1556	1500	154
23	Palapadu Road	25.15	717	3246	1619	1627	129
24	Navodaya Nagar	30.10	1127	5003	2702	2301	166
25	N.G.O. Colony	23.74	1239	5016	2286	2730	211
26	Pedacheruvu	17.85	942	3067	1586	1481	171
27	Pathuru	18.72	643	2210	1120	1090	118
28		18.24	843	2469	1287	1182	135
29		17.10	794	2735	1289	1446	159
30	Yenugula bazaar	16.11	805	2781	1504	1277	172
31	Pedacheruvu	34.40	979	4506	2094	2412	130
32	Burnpet	27.20	703	2827	1398	1429	103
33	Chakirala Mitta	30.80	847	3027	1603	1424	98
34	B.C. Colony	26.10	1123	4996	2578	2418	191

Source: Narsaraopet Municipality (2016)

In this Municipality, considerable growth in population is taking place, The demand for water is also going up abnormally. The population densities in the ULB have considerably increased and a rational approach for arriving at the future population growth is necessary.

The process of Estimation of population with the data obtained from the ULB/Census from the Census decade 1961 – 2011 were considered and illustrated in detail as follows:

Table 3: Decadal Growth Rate

Sl.No.	Decadal Year	Population	Increment
1	1961	29744	----
2	1971	43467	13723
3	1981	67032	23565
4	1991	88726	21694
5	2001	95349	6623
6	2011	117489	22140

Source: Narsaraopet Municipality, (2016)

3.4 Urban Poor - Slum Profile of the Town

There are 41 notified slums and 3 non – notified slums in the town. Slum Population in this town is around 40,740 while BPL Population is around 48,653 and the Percentage of BPL Population comes to 41.41%.

Table 4: Slum data of Narsaraopet

Sr. No	Slum Name	Location / Ward	Category	Area (Ha)	No. of Households	Population			Density
						Total	Male	Female	(p / Ha)
1	Chandrababu Naidu Colony	1	Notified	14.7	463	2021	1263	758	137
2	Yanadhi Colony	1	Notified	7.7	156	631	394	237	81
3	Lakshmaiah Chowtry Area	1	Notified	6.7	150	625	390	235	93
4	Yerukula Colony (SAP Road)	34	Notified	9.9	327	1174	733	441	118
5	Chenchu Colony	1	Notified	13.6	50	1671	1044	627	122
6	Ila Bazar / Ganugula Bazar	2	Notified	7.9	153	631	394	237	79
7	Nimma Thota	3	Notified	15.6	488	2098	1311	787	134
8	Panasathota	4	Notified	17.6	502	2196	1392	824	124
9	Christain Palem	5	Notified	24.2	1199	4583	2864	1719	189
10	Babapet	6	Notified	7.9	252	931	581	350	117
11	Venkata Reddy Nagar	7	Notified	13.7	450	1816	1135	681	132
12	Islam Pet	7	Notified	16.8	1199	7820	4887	2933	212
13	Vengalareddy Nagar	8	Notified	5.7	67	289	180	109	50
14	Yerukula Colony	9	Notified	6.9	164	631	394	237	10
15	Sambasiva Pet	9	Notified	17.9	652	2697	1685	1012	150

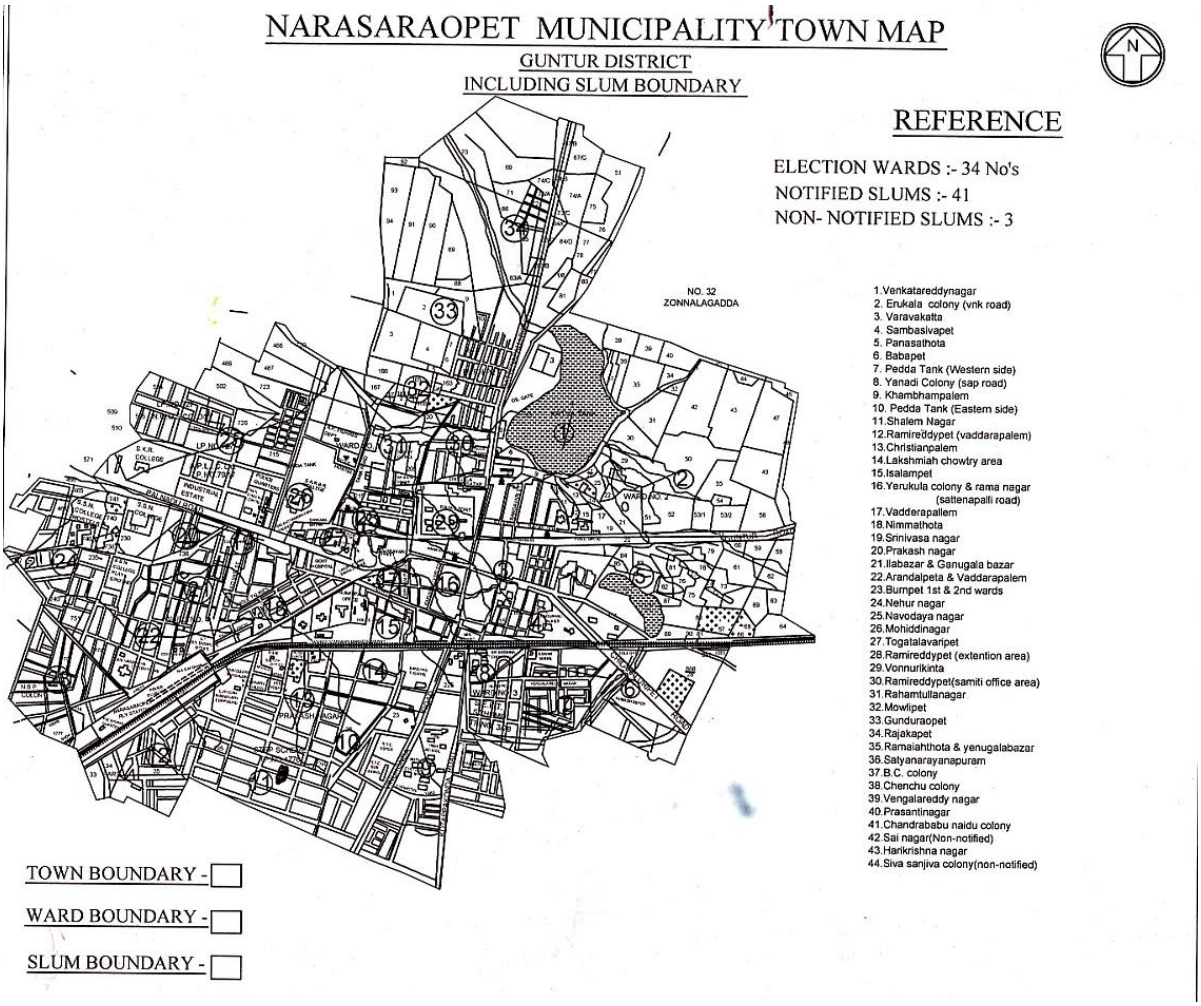
16	Srinivasanagar	9	Notified	6.8	150	595	371	224	87
17	Shalem Nagar	12	Notified	9.1	249	1053	658	395	115
18	Ramireddypet Vadderapalem	19	Notified	8.2	198	933	583	350	113
19	Vadderapalem Arundelpet	19	Notified	6.3	128	507	316	191	80
20	Prakash Nagar	11,12	Notified	11.9	414	1656	1035	621	139
21	Arundelpet Vadderapalem	18,19	Notified	5.6	98	352	220	132	62
22	Barampet 1,2 Wards	32,33,34	Notified	50.1	2359	9436	5897	3539	188
23	Nehru Nagar	26	Notified	6.8	165	620	387	233	91
24	Navodaya Nagar	23	Notified	15.7	557	2085	1303	782	132
25	Mohiddin Nagar	7	Notified	7.9	533	2237	1398	839	124
26	Togatilavari palem	17	Notified	5.6	65	280	175	105	50
27	Ramireddypet Ext. Area	23,24	Notified	10.2	355	1429	893	536	140
28	Vannuru Kunta	11	Notified	2.5	15	58	36	22	23
29	Ramireddypet Samithi Office Area	23,24	Notified	10.9	390	1520	950	570	139
30	Rehamtulla Nagar	6	Notified	6.7	165	622	388	234	92
31	Moulipet	30,31	Notified	9.8	327	1264	790	474	128
32	Gunduraopet	30,32	Notified	14.2	482	1920	1200	720	135
33	Rajakapet	23	Notified	8.9	232	956	597	359	107
34	Ramaiahthota / Enugulabazar	30,32	Notified	6.8	145	544	340	234	80
35	Satyanarayana puram	33	Notified	14.1	485	1856	1160	696	131
36	BC Colony	34	Notified	9.5	323	1241	775	466	130
37	Prasanthi Nagar	24	Notified	9.9	355	1429	893	536	144
38	Harikrishnanagar	24	Notified	16.6	504	2168	1355	813	130
39	Sai Nagar Sattenapalli Road	1	Notified	25.1	1131	4647	2904	1743	185
40	Sivasanjeevaiah Colony	5	Notified	19.7	856	3509	2193	1316	178
41	Varavakatta	15,17	Notified	9.4	297	1154	721	433	123
42	Pedatank Western side	25,31	Non Notified	3.9	35	225	140	85	58
43	Peddatank Eastern Side	26,31	Non Notified	5.9	52	369	230	139	62
44	Khambampalem	14	Non Notified	18.7	402	2710	1693	1017	144

Source: Narsaraopet Municipality (2016)

3.5 Economic Base of Town

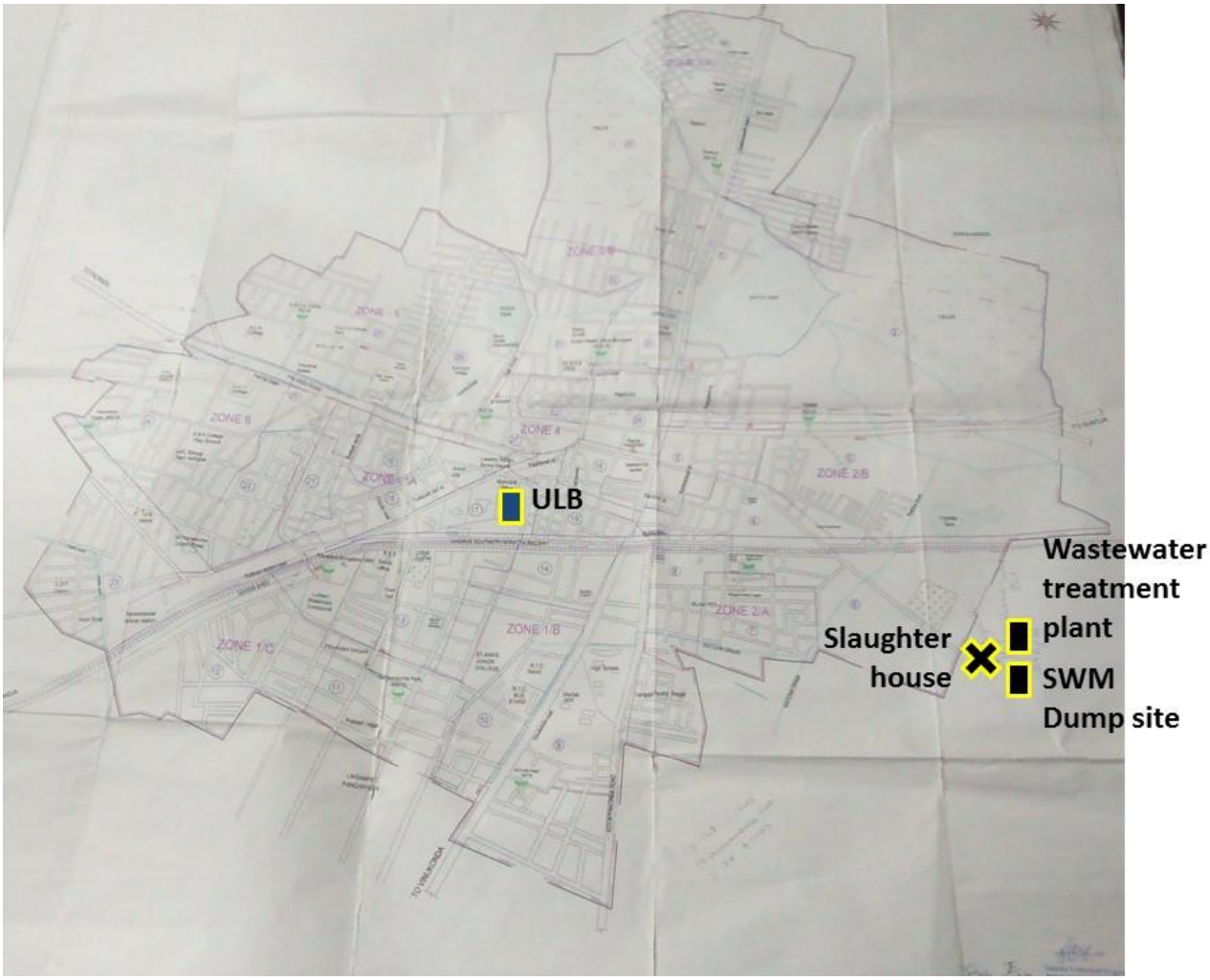
Narasaraopet is one of the important Commercial Centres in Guntur District, being surrounded by a number of villages whose activity is mainly agriculture. The major crops cultivated here are Paddy, Mirchi and cotton. Other crops that are grown here are Groundnuts, Bengal gram, Mustard seeds. The vegetation of most famous peas has its native here. Other vegetables include Chillies, Tomatoes, Ridge Gourd, Indian Broad Beans, Cluster Beans. All types of leafy vegetables are grown here. The soil here is of mixed varieties making it suitable to grow many crops. Commercial crops like Castor Seeds are also grown**.**

Figure 5: Town Map, Narsaraopet



Source: Narsaraopet Municipality (2016)

Figure 6 Town map, Narsaraopet



Source: Narsaraopet Municipality (2016)

Section II – Technical Sectors

4. Water supply

4.1 Baseline Status

Source of Water Supply

- The main source of drinking water is Nagarjuna Sagar Right Canal at Narikallu Village. This canal is running 25 Kms away from the town. Daily 16 million liters of protected drinking water is being supplied in the town.
- There are two Summer Storage Tanks. The old S. S. Tank Capacity is 568 ML, the New S. S. Tank has a capacity of 4452 ML. Hence the combined Capacity of S. S. Tanks is 5020 ML.
- Nagarjuna Sagar Right Canal runs dry for 6 months during summer months. S.S. Tanks is utilized during this period of year.[9]

Water Treatment System

- Shantinagar filtration plant is equipped with three Filtration plants of combined Capacity of 9 MLD, 7 MLD and 6 MLD totaling filtration capacity to 22 MLD[10].
- The treated water collected in clear water sumps is supplied to service reservoirs by gravity and distributed through clear water gravity mains.
- Treatment capacity of 22 MLD is sufficient as of now since water supplied by Right NS Canal is 16 Million liters.

Storages of Water (ELSR)

- The town is having 10 No. Elevated Level Service Reservoirs of combined Capacity of 7975 KL located in various localities of town.

Distribution Network

- The existing Distribution Network in part is as old as the scheme itself i.e. over 30 Years.
- The total length of distribution pipe line laid in the town is 114.80 Km[11]
- Total road length in the town 134.85 Km and not all the streets are provided with pipe lines[12].
- To achieve universal coverage additional 20Km of distribution line is to be laid[13]
- In the existing Distribution lines pipes of various materials namely HDPE, AC, RCC pipes are used.

Household Coverage

- Narasaraopet Town divided into 10 water supply zones at present.[14]
- As per SLIP data, coverage of household water supply connections in Narsaraopet is 61.46%
- This Municipality is having 16,395 house hold water supply connections and 209 metered connections in the town.[15]

[9] Sectorwise SLIP template: Water supply , Narsaraopet Municiplaity (2016)
[10] Sectorwise SLIP template: Water supply , Narsaraopet Municiplaity (2016)
[11] Sectorwise SLIP template: Water supply , Narsaraopet Municiplaity (2016)
[12] Sectorwise SLIP template: Water supply , Narsaraopet Municiplaity (2016)
[13] Sectorwise SLIP template: Water supply , Narsaraopet Municiplaity (2016)
[14] Narsaraopet Municipality (2016)

Table 5: Zone wise household water supply coverage, Narsaraopet

Zone No	Total No of Households	Households with Water Tap Connection	Households without Water Tap Connections
1	6552	2590	3962
2	3324	1394	1930
3	2151	1543	608
4	2452	1594	858
5	3209	1743	1466
6	1984	1514	470
7	2098	1433	665
8	2986	1741	1245
9	2123	1493	630
10	2250	1350	900
Total	**29,129**	**16,395**	**12,734**

Source: Narsaraopet Municipality (2016)

Table 6: Zone wise coverage of pipe lines

Zone No	Total Street Length (km)	Street length with water distribution pipe line (km)	Street length without water distribution pipe line (km)
1	22.80	20.30	2.30
2	13.10	11.30	1.40

[15] Narsaraopet Municipality (2016)

3	13.90	12.50	1.10
4	12.10	9.80	2.30
5	13.20	11.15	2.05
6	10.90	9.20	1.70
7	11.20	8.90	2.30
8	13.50	11.10	2.40
9	11.00	9.85	1.15
10	13.10	10.10	1.50
Total	**134.80**	**114.80**	**20**

Source: Narsaraopet Municipality (2016)

Table 7: Zone Wise Water Supply Coverage

Zone No	Zone name	Reservoir Type	Capacity (KL)	Wards served	No. of HH	No. of connections	Frequency of water supply	Hours of supply
1	Municipal T.B.	E.L.S.R	1475	11,12,14,19	3719	1672	Once in Two days	1 Hour
2	Burnpet	E.L.S.R	1000	1,28, 29,30, 32,	3767	1612	Once in Two days	1 Hour
3	Venkatareddy Nagar	E.L.S.R	500	6,7,8	3233	1610	Once in Two days	1 Hour
4	Navodaya Nagar	E.L.S.R	800	19,20,21, 23,24	3669	1610	Once in Two days	1 Hour
5	Srinivasa Nagar	E.L.S.R	500	8,9	1777	1609	Once in Two days	1 Hour
6	N.G.O.'s Colony	E.L.S.R	700	22,25, 26,32	3512	1608	Once in Two days	1 Hour
7	High School	E.L.S.R	800	15,16,17, 27,28	3327	1599	Once in Two days	1 Hour
8	Vannurukunta Park	E.L.S.R	800	10,12,13	2576	1595	Once in Two days	1 Hour
9	Stadium Tank	E.L.S.R	600	1,33, 34	2570	1594	Once in Two days	1 Hour

10	Kabela Tank	E.L.S.R	800	2,3,4, 5	3651	1590	Once in Two days	1 Hour

Source: Narsaraopet Municipality (2016)

Per Capita Supply of Water

- As per SLIP data, per capita supply of water in Narsaraopet is 125.76 LPCD
- Water is supplied for 1hour once in two days.

Extent of Metering of Water Connections

- As per SLIP data, extent of metering of water connections in Narsaraopet is 1.03%.

Extent of Non-Revenue Water

- As per SLIP data, extent of Non- revenue water in Narsaraopet is 23.3%.

Quality of Water supplied

- As per SLIP data, quality of water supplied in Narsaraopet is 100 % upto the standards.

Cost Recovery in Water Supply Services

- As per SLIP data, cost recovery in water supply services in Narsaraopet is 125%.
- Since the raw water and clear water is functioning by gravity, power supply charges are reduced.

Efficiency in collection of water supply related charges

- As per SLIP data, collection of water supply related charges in Narsaraopet is 80%.

Operation and Maintenance (O and M)

This Municipality is having 120 Nos out sourced workers and 15 nos of permanent workers who are being working for the maintenance of water supply.

The expenditure for Operation and Maintenance of water supply per Annum are as detailed below.

Table 8: Revenue and O and M costs of Water Supply

Cost Recovery		2006-07	2007-08	2008-09	2009-10 (till Dec)
Operating Expenses	Rs. Million	**64**	**66**	**72.1**	**74.09**
Revenue billed	Rs. Million	**100.89**	**103.99**	**114.08**	**117.008**
Cost recovery %		**63.44%**	**64.16%**	**63.20%**	**63.32%**

Source: Narsaraopet Municipality (2016)

Table 9: Water Supply- Demand, Collection and Balance

Water Supply	2011-12	2012-13	2013-14	2014-15
No of Assestments	13074	13678	14118	14876
Demand				
Arrears	45.23	49.17	56.65	40.11
Current	125.52	131.31	135.53	144.68

Total	**170.75**	**180.48**	**192.18**	**184.79**
Collection				
Arrears	20.46	20.19	23.19	20.72
Current	101.12	103.64	104.62	110.26
Total	**121.58**	**123.83**	**127.81**	**130.98**
Balance				
Arrears	24.77	28.98	33.46	19.39
Current	24.40	27.67	30.91	34.42
Total	**49.17**	**56.65**	**64.37**	**53.81**

Source: Narsaraopet Municipality, (2016)

Table 10 Water Supply Costs

1	**Regular staff salary**	**50.00 Lakhs**
2	**Out sourcing staff salary**	**69.05 Lakhs**
3	**Power charges**	**102.00 Lakhs**
4	**Chemicals**	**20.00 Lakhs**
5	**Other maintenance and repairs**	**30.00 Lakhs**
	Total	**271.05 Lakhs**

Source: Narsaraopet Municipality, (2016)

Water Supply Charges

This Municipality presently collecting monthly consuming charges from the domestic users @ Rs. 80/- P.M i.e. flat tariff and beside this from the commercial consumer users @ Rs. 20 per KL. The total current demand of water charges 184.79 Lakhs and collection made 130.98 Lakhs during the year 2014-15.[16]

Proposed Water Supply Projects

It is proposed to meet the following objectives in AMRUT scheme as proposed:

- Laying of new distribution pipe line network in Un-served areas.
- Improving the efficiency of existing water treatment plants.
- Motivating and giving 100% house service connections.

Overall Status of Water Supply service levels

Table 11: Overall status of water supply service levels in Narsaraopet

No.	Indicators	Present status	MOUD Benchmark
1	Coverage of water supply connections	**61.46%**	100%
2	Per capita supply of water	**125.76 LPCD**	135 LPCD
3	Extent of metering water connections	**1.03%**	100%
4	Extent of non-revenue water	**23.3%**	20%
5	Quality of water supplied	**100%**	100%
6	Cost recovery in water supply services	**125%**	100%
7	Efficiency in collection of water supply related charges	**80%**	100%

Source: Sector wise SLIP template, Narsaraopet Municipality (2016)

[16] Narsaraopet Municipality (2016)

4.2 Gaps and Issues

- The coverage of individual water supply connections to households is low i.e. 61.46%.
- Town is facing scarcity of water during summer months. Increase in water supply connections will require additional requirements of water.
- 99% of the water supply connections are unmetered.
- 10 Liters gap in per capita LPCD.
- One hour alternate days water supply.

5. Access to Toilets

Proper access to sanitation is very important to maintain health and hygiene of the citizens and is also necessary from town's aesthetic point of view. Human waste (feces and urine) can pollute water, food, and soil with germs and worms, leading to serious health problems. The safe disposal of human waste not only involves building sanitation infrastructure but also demands proper conveyance (sewerage system) and treatment of the waste (sewage). The city of Narsaraopet needs safe, clean and well-designed sanitation facilities to prevent the practice of open defecation, spread of diseases and environmental pollution. The following section describes the present sanitation status of the Narsaraopet Town and delineates various issues which need to be tackled to provide better access to sanitation to the city dwellers.

5.1 Baseline Status

In the following sections the conditions of Narsaraopet Town related to provision of sanitation services are described, including access to private toilet facilities, availability of public toilets, open defecation and community toilets in the slums and school sanitation.

Coverage of Toilets

- Individual Household Toilets:
  Pour flush type toilets: 29,001 as against 29,132 Households.[17]

Table 12: Coverage of Toilets (Individual and Community)

Ward	Total HHs	Urban poor HHs	No. of HHs			No of urban poor HHs		
			Having individual toilets	Dependent on community toilets	Practicing open defecation	Having individual toilets	Dependent on community toilets	Practicing open defecation
1	1216	871	345	0	0	866	0	5
2	1053	153	900	0	0	152	0	1
3	817	488	329	0	0	487	0	1
4	724	502	222	0	0	501	0	1
5	1057	1031	26	0	0	999	0	32
6	1047	874	173	0	0	870	0	4
7	1133	1106	27	0	0	1100	0	6
8	1053	100	953	0	0	96	0	4
9	724	690	34	0	0	685	0	5
10	807	120	687	0	0	115	0	5
11	987	900	87	0	0	900	0	0
12	1054	925	129	0	0	912	0	13
13	715	121	594	0	0	121	0	0
14	1047	950	97	0	0	950	0	0
15	714	111	603	0	0	109	0	2
16	538	209	329	0	0	209	0	0
17	589	532	57	0	0	532	0	0

[17] Narsaraopet Municipality

18	642	420	222	0	0	420	0	0
19	631	423	208	0	0	423	0	0
20	583	425	158	0	0	425	0	0
21	611	323	288	0	0	323	0	0
22	628	393	235	0	0	393	0	0
23	717	378	339	0	0	378	0	0
24	1127	625	502	0	0	620	0	5
25	1239	565	674	0	0	555	0	10
26	942	585	357	0	0	583	0	2
27	643	85	558	0	0	85	0	0
28	843	75	768	0	0	75	0	0
29	794	100	694	0	0	100	0	0
30	805	699	106	0	0	697	0	2
31	979	932	47	0	0	927	0	5
32	703	585	118	0	0	581	0	4
33	847	789	58	0	0	785	0	4
34	1123	1046	77	0	0	1026	0	20
Total	**29132**	**18131**	**11001**			**18000**		**131**

Source: Narsaraopet Municipality, (2016)

- Public Toilets:
  There are 9 No's public toilets with 67 seats which cater floating population of 3,600.[18]
  All the public toilets are operated by private agencies on BOT mode.

Table 13: Public Toilets Details

Sr. No.	Location / Ward	No. of floating population dependent	No of Seats		No of Urinals		Waste disposal arrangement	Functional status	Design consideration for men & women (privacy) – Yes / No	Complaint redressal system available	Owned & Maintained by	Cost Recovery (%)
			Men	Women	Men	Women						
1	L.B. Market	600	4	4	1	1	Septic Tank	Yes	Yes	Yes	Keerthi Sanitation	B.O.T. System
2	Rural Police Station	500	3	3	1	1	Septic Tank	Yes	Yes	Yes	Keerthi Sanitation	B.O.T. System

[18] Narsaraopet Municipality (2016)

3	Near Govt. Hospital	400	5	5	1	1	Septic Tank	Yes	Yes	Yes	Rose Sanitation	B.O.T. System
4	Near Fish Market	450	5	5	1	1	Septic Tank	Yes	Yes	Yes	Sulabh Complex	B.O.T. System
5	SAP Road	350	5	5	1	1	Septic Tank	Yes	Yes	Yes	Dhanush Poor people Seva Samithi	B.O.T. System
6	Near Gandhi Park	350	3	3	1	1	Septic Tank	Yes	Yes	Yes	Dhanush Poor people Seva Samithi	B.O.T. System
7	Near Bhargavi Hotel	400	3	3	1	1	Septic Tank	Yes	Yes	Yes	Rose Sanitation	B.O.T. System
8	Near L.N. Deluxe	450	3	3	1	1	Septic Tank	Yes	Yes	Yes	Keerthi Sanitation	B.O.T. System
9	Varavakkatta School	100	2	3	1	1	Septic Tank	Yes	Yes	Yes	Keerthi Sanitation	B.O.T. System
	Total	**3600**	**33**	**34**	**9**	**9**						

Source: Narsaraopet Municipality, (2016)

- School Sanitation:
  There are 29 Municipal schools.

Open Defecation

- Under Swachha Bharat- Swachha Andhra mission, total 1,081 applications were received for new individual household toilets.
- After initial survey and photo geo-tagging, 1074 new individual household toilets are constructed.
- All the households currently are covered with individual toilets in Narsaraopet and Narsaraopet is classified as open defecation free town[19].

[19] Progress of IHT Report, Narsaraopet Municipality (2016)

Figure 7 Public Toilet in Narsaraopet

5.2 Gaps and Issues

1. Improper Waste Water disposal arrangement.
2. All the public toilets catering to floating population have insufficient no's of urinals.

6. Waste Water Management

6.1 Sewerage Management

6.1.1 Baseline Status

Coverage of Latrines (Individual or Community)

- The town has 100% coverage of household latrines after successful implementation of Swachha Bharat- Swachha Andhra Mission.[20]

Coverage of sewerage network services

- Work of laying of 88.8 Km i.e. of sewer line amounting to 29.64 Crore was completed in 2011, but household connections are not been given as work of inspection chambers is still not commenced. [21]
- 65.78% of households have access to sewer line but connections are not yet given.[22]
- At present town is totally dependent on on-site sanitation.
- Both grey and blackwater outlets from households discharge into open earthen drains making them combined sewers, carrying this untreated wastewater into open environment. Presently, the town is not serviced by a comprehensive underground drainage system.
- Part of the universal coverage achievement will also require building more sewer lines, i.e. 46 kms of sewer network.[23]

Efficiency in treatment: Adequacy of sewage treatment capacity

- Site is being identified for STP but construction has not yet commenced.
- 12.8 MLD wastewater is generated in the town which all goes untreated.

Projects identified or underway

1. Construction of inspection chambers and increasing household connectivity.
2. Sewage treatment plant of 15.55 MLD capacity.[24]

SLIP Targets for the Sector

Table 14: Overall Status of Sewerage Network and Service Levels in Narsaraopet

No.	Indicators	Present status	MOUD Benchmark
1	Coverage of sewer network services	**65.87%**	100%
2	Efficiency of collection of sewerage	**0**	100%
3	Efficiency in treatment: adequacy of sewerage treatment capacity	**0**	100%

Source: Sector wise SLIP template, Narsaraopet Municipality (2016)

[20] Narsaraopet Municipality (2016)
[21] Sectorwise SLIP template: sewerage, Narsaraopet Municiplaity (2016)
[22] Sectorwise SLIP template: sewerage, Narsaraopet Municiplaity (2016)
[23] Sectorwise SLIP template: sewerage, Narsaraopet Municiplaity (2016)
[24] Sectorwise SLIP template: sewerage, Narsaraopet Municiplaity (2016)

Functions, Roles, and Responsibilities

Planning and Design	Construction/ Implementation	O&M
Planning and design of sewerage network system taken up by Narsaraopet Municipality, under the technical guidance of PHED.	***The execution of sewerage network system will be taken up by the Narsaraopet Municipality under the guidance of PHED.***	***The overall responsibility of operation and maintenance of the sewerage network system will be on the Narsaraopet , Municipality.***

Source: Sector wise SLIP template, Narsaraopet Municipality (2016)

6.1.2 Gaps and Issues

- Non availability of funds is an issue to for construction of inspection chambers so that 65.87% of households having access to underground sewer network laid in 2011can be given connections.
- There is no sewage treatment plant.
- The town has no waste-water management system in place.

6.2. Septage Management

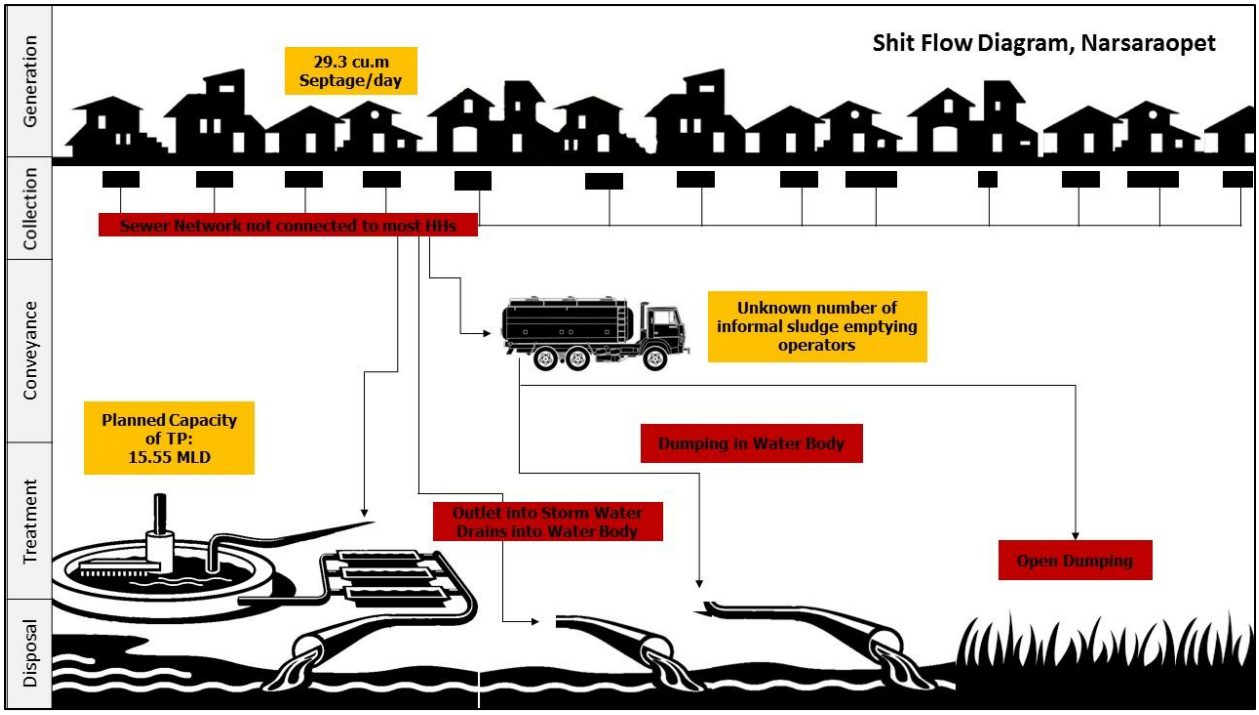


Figure 8 Shit Flow Diagram Narsaraopet

6.2.1 Baseline Status

- Approximately 21.57 cu.m[25] of septage is generated by population of 1,17,489[26] on daily basis in Narsaraopet.

[25] Assuming 250 grams of septage generated per person on daily basis.

- Desludging is carried out by private service providers in Narsaraopet. There is no formal fecal sludge emptying service provided by the municipality.
- The septic tanks and pits in the town are serviced by informal fecal sludge emptying operators, regarding whom there is no database with the municipality.
- The sludge emptied from the septic tanks of households is dumped in open fields and open environment. There is no regulation or awareness against such practices.
- The duration of cleaning varies based on the size of the tank and pit, for which there is no existing database.
- As the septic tanks are not connected to a soak pit, the tanks outflow conveniently empties into an adjacent drain, thus not requiring the households to desludge regularly.

6.2.2 Gaps and Issues

Septic Tanks

- Non-conformity of the design of existing septic tanks in the city to IS 2470 (Part 1)-1985,
- Septic tanks are single chambered and are not water tight,
- Septic tanks are broken and are of inadequate size,
- Grey water is entering the septic tanks,
- Septic tanks are inaccessible for cleaning,
- Design of septic tanks is not controlled through building / planning rules,
- Absence of secondary treatment systems (eg. soak pits) for disposal of grey water & septic tank effluent.[27]

Septage Collection and Conveyance

- Lack of data on private operators involved in desludging
- The private operators are not authorized and not regulated
- Desludging of septic tanks is not carried out regularly (once in every 2-3 years)[28]

Septage Treatment and Disposal/Reuse

- Absence of fecal sludge treatment plant.
- Disposal of untreated sludge into open environment.[29]

[26] Census of India (2011), New Delhi.
[27] Narsaraopet Municipality (2016)
[28] Narsaraopet Municipality (2016)
[29] Narsaraopet Municipality (2016)

Table 15 Sludge Generation Method for calculating Trips

Sludge Generation Method for calculating Trips	Number	
Sludge Accumulation Rate for Septic Tanks (litres per capita per year)	67.00	CPHEEO manual
Total septage generated after 3 years in each HHs (if cleaning cycle is 3 years) (litres)	23615289.00	Population*sludge accumulation rate* 3 years
Total septage generated per HHs in a year (litres)	7871763.00	Population*sludge accumulation rate* 1 years
Total septage generated per HHs in a day (litres)	21566.47 (21.57 Cu.m)	
No. of working days	365.00	
Truck capacity	4000.00	
No. of trips by each cess-pool in a day (no.)	5.39	No. of HH * 2(since 2 trips are required to clean one septic tank
Note: Sludge Accumulation rate for Pits	97 liters for 2 years	
	67 liters for 3 years	

Table 16 Cost of Septage Management

Cost of Septage Management (from Case Study Citings) Plant Capacity (In cu m)	Case Studies for FSTP Demonstrations	Cost (in INR) (Cr)	Cost per Cu m (in INR) (Cr)
6.5	Devanahalli, Karnataka	0.67	0.103
22	Tiruchirapalli, Tamil Nadu	2.3	0.105
Calculating tentative FSTP treatment plant cost for Nandyal based on above case studies			
21.57	Narsaraopet, Andhra Pradesh	2.156647397	

7. Solid Waste Management

7.1 Baseline Status

Waste Generation

- 65 MT[30] of waste is generated in Narsaraopet.
- Hence, per capita waste generation is 553 grams.

Waste Collections

- There is presently 100% door to door collection solid waste which starts at 6:00am and continues till 10:30 am.
- 65 MT of waste is collected in a day.
- There are 68 push carts used for door to door collection with each push cart covering upto 350 households.
- 12 tractors, 5 three wheeler autos and 2 four wheeler autos are used to collect segregated wet waste from push cart bins and to transfer it to composting yard.
- Street sweeping is carried out in 2 shifts by 35 workers. 1st shift from 4:30 am to 8:30 am and 2nd shift from 2:00pm to 5:00 pm.
- 2 workers are allotted per ward to clean the drains and check the growth of weeds and bushes. A batch of 8 workers are exclusively deputed to clean and desilt the drains in each division.
- There are 6 dumper bins in town. 2 are placed in market area and one each at main commercial centres. These dumper bins are cleaned daily using one available dumper placer.
- Currently no fee is levied on door to door waste collection.
- All the solid waste collection and transportation is carried out by 355 sanitary workers and is managed by 8 sanitary maistries and 1 sanitary inspector.[31]

Waste Segregation

- Segregation of waste is done by public health workers on push carts. Per day 1- 1.5 MT of dry waste is segregated and sold to private agency appointed by MC at Rs.3/kg.[32]

Processing and Disposal

- Every day out of 3 MT market waste generated, out of which 0.5- 1 MT of waste is subjected to vermi-composting.[33]
- Left over market waste and the wet waste collected from door to door collection was laid as beds in compost yard and being subjected to windrows composting.
- Solid waste dump site is located at 4 Km from core city area towards Guntur road.

[30] Narsaraopet Municipality (2016)
[31] Narsaraopet Municipality (2016)
[32] Narsaraopet Municipality (2016)
[33] Narsaraopet Municipality (2016)

SWM Mass Balance Diagram

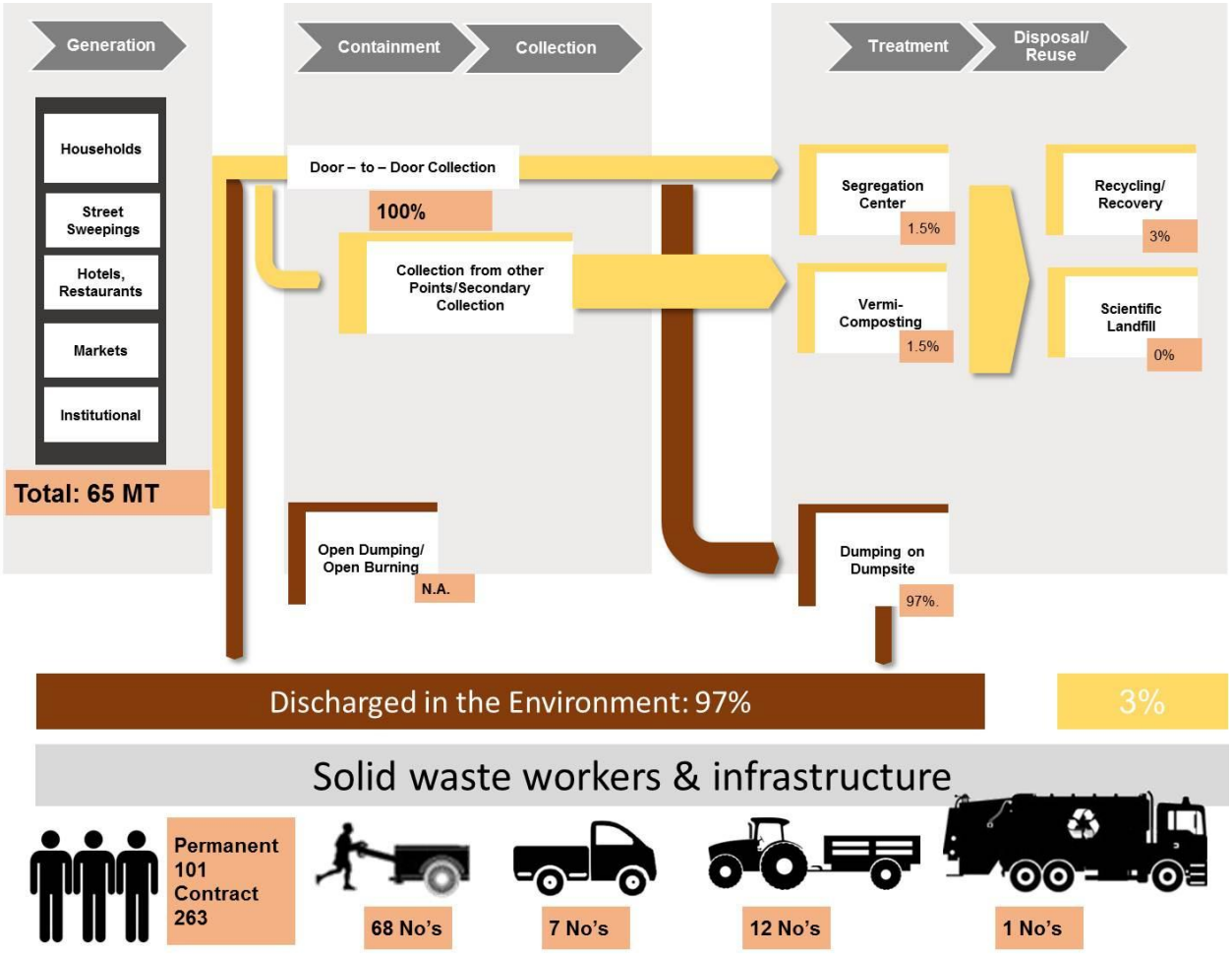


Figure 9: SWM Mass Balance Diagram, Narsaraopet

Figure 10: Pictures of Solid Waste Management Narsaraopet

7.2 Gaps and Issues

- Out of 65 MT of waste generated every day, only 1-1.5 MT dry waste is segregated and about 0.5-1 MT of market waste is converted to compost using vermicomposting techniques.
- All remaining waste ends up in dumping yard.

- Monthly 1,890 MT of waste produced in town is only being blatantly dumped leading to unhygienic conditions.
- Windrow composting site exists but it's not being practiced.
- Over time, the leachate from the waste would have severe effects on the environment.
- The lack of solid waste processing facility (for biodegradable & non-biodegradable waste) leads to unhygienic and unhealthy conditions.

8. Storm Water Management

8.1 Baseline Status

- Narsaraopet has 3 drainage zones.
- Length of the road in Narsaraopet is 134.8 Kms.
- 9.1 Km of major pacca drains.
- 19.75 Km of major kachha drains.
- Two values conflicts in single data source for coverage of drains. 38.6% and 89.6%.[34]
- 241.8 Km of manmade drains and 24 km of natural drains[35].
- Clogging of storm water drains due to solid waste dumping.
- Waste water discharged into storm water drains.

Water Logging/Flooding

Certain areas of this Municipality are being effected with water losing and flooding when the heavy rains fall due to cyclone.

Table 17: Flood Prone Points in the City

Area	No. of Points	No. of times waterlogging reported in a year (stagnant water for more than 4 hours of a depth more than 6")
Key road intersection	1	2
Along roads (50 m length or more)	1	2
Locality (affecting 50 HH or more)	3	2

Source: Sector wise SLIP template, Narsaraopet Municipality (2016)

Table 18: Details Of Location Prone to Chocking of Drains due to Solid Waste

Location	Stretch length affected	Reason
Guntur road at burial ground	100 m	Due to floating materials accumulating at culvert points
Palnadu road at Skbr college	750 m	Due to floating materials accumulating at culvert points
Sattenapalli road at stadium	600 m	Due to floating materials accumulating at culvert points

Source: Sector wise SLIP template, Narsaraopet Municipality (2016)

Present Projects under Storm Water Management

- The Detailed Project Report for Comprehensive Storm Water Drainage System was prepared for Rs. 66 Crore. The DPR to be sent to the Government of Andhra Pradesh for approval and sanction.

[34] Sectorwise SLIP Template: Storm Water Drainage , Narsaraopet Municiplaity (2016)
[35] Sectorwise SLIP Template: Storm Water Drainage , Narsaraopet Municiplaity (2016)

8.2 Gaps and Issues

- Open drains are not lined at all places.
- Drains are poorly maintained. Dumping of solid waste in drains and chocking/blockages is prevalent.
- There is improper provision for water flow and there is stagnation of water at many places.

Section III – Cross-Cutting Aspects

9. Institutional and Governance

9.1 Baseline Status

Legal Framework

A number of institutions are involved in the governance of the town and surrounding villages. Some of them are established through Acts of Legislation and others are part of states governance framework. The institutions established by law are given below.

Table 19 Legaslative Basis of Governing Institutions

Names of institutions	Corresponding acts
Municipal Council, Narasaraopet	Andhra Pradesh Municipalities Act, 1965
Andhra Pradesh Pollution Control Board	Water (Protection and Control of Pollution) Act, 1974

Responsibilities of Municipality

Narasaraopet Municipality, like other urban local bodies in Andhra Pradesh, is primarily responsible for providing basic infrastructure services and other civic services within its jurisdiction. The municipality is responsible for the following functions:

- Construction and maintenance of roads, bridges, causeways and culverts
- Construction and maintenance of storm water and sullage water drains
- Supply of protected water
- Cleaning of streets, drains, removal of rubbish and scavenging
- Lighting of public streets
- Maintenance of burial grounds
- Maintenance of hospitals and dispensaries for the treatment of the poor
- Maintenance of elementary schools
- Registration of births and deaths
- Vaccination
- Provision of slaughter houses and markets
- Maintenance of parks and play grounds

In addition, the municipality implements a number of plan and non-plan schemes, funds for which are received from state and central governments. They include:

- Integrated Development of Small & Medium Towns (IDSMT)
- Swarna Jayanthi Sahari Rozgar Yojana (SJSRY)
- National Slum Development Programme (NSDP)
- Andhra Pradesh Urban Services for the Poor (APUSP)
- Rajeev Nagara Bata (RNB)
- Andhra Pradesh Urban Reforms and Municipal Services Project (APURMSP)
- Integrated Low Cost Sanitation (ILCS)
- Construction of School Buildings

The functional domain of the Narasaraopet Municipality, as with other urban local bodies in the state, was expanded in 1980, when the Andhra Pradesh Municipalities Act was amended incorporating the functions included in the 12th Schedule of the 74th Constitution Amendment Act. In Andhra Pradesh, the Municipalities Act provides for a majority of the functions listed in the 12th Schedule of the Constitution. They include:

- Urban Planning including Town Planning
- Regulation of land use and construction of buildings
- Roads and bridges
- Water supply for domestic, industrial and commercial purposes
- Public health, sanitation, conservancy and solid waste management
- Slum improvement and upgrade.
- Provision of urban amenities and facilities such as parks, gardens, play grounds
- Burials and burial ground; cremations, cremation grounds and electric crematoriums
- Cattle ponds; prevention of cruelty to animals
- Vital statistics including registration of births and death
- Public amenities including street lighting, parking lots, bus stops and public conveniences.
- Regulation of slaughter houses and tanneries

In 2004, the Government of Andhra Pradesh after a review of functions of urban local bodies, transferred five more functions to the urban local bodies through government orders. They are:

a. Planning for economic and social development
b. Urban forestry, protection of the environment and promotion of ecological aspects
c. Urban Poverty alleviation
d. Safeguarding the interest of weaker sections including the handicapped and mentally retarded
e. Promotion of cultural and aesthetic aspects.

The Government decided that the remaining function i.e. Fire Services, should continue to remain with the state government and will be transferred after a review later. Though the five functions were transferred, they have no statutory basis as they were transferred through government orders.

Organization Structure

The organizational structure of Narasaraopet Municipality consists of an elected body – the Municipal Council - and an executive body. The elected body is headed by a Chairperson and has 34 councilors each representing a ward - one of the 34 wards into which the town is divided. The Chairperson is elected directly by all the elected ward councilors of the town. Based on the 74th Constitution Amendment Act, 1992, the constitution and composition of the urban local bodies in the state was changed. All the mandatory provisions like reservations to SCs and STs, fixed tenure to the local body, constitution of State Election Commission with responsibility to hold elections to the local bodies in the state, etc., have been incorporated in the Act. After 1995, elections to the urban local bodies were conducted thrice based on these amended provisions.

The civic administration is headed by Municipal Commissioner belonging to the cadre of state municipal commissioners. The Commissioner is assisted by officials in the areas of public health,

engineering, town planning, health, poverty, etc. Technical officials head each of these areas and in administration, the Manager assists the Commissioner.

A summary of positions in various departments and the organ gram of Narasaraopet Municipality is given below.

Table 20: Sanctioned posts

Department	Sanctioned Posts
General Administration	59
Accounts Department	8
Revenue Section	9
Engineering Wing	15
Street Lighting	3
Water Supply	10
Public Health	146
Medical Service and IPPV	5
Town Planning	9
Parks & Gardens	3
Total	**267**

Source: Narsaraopet Municipality (2016)

Municipality Staff

Table 21: Posts sanctioned, filled and vacant

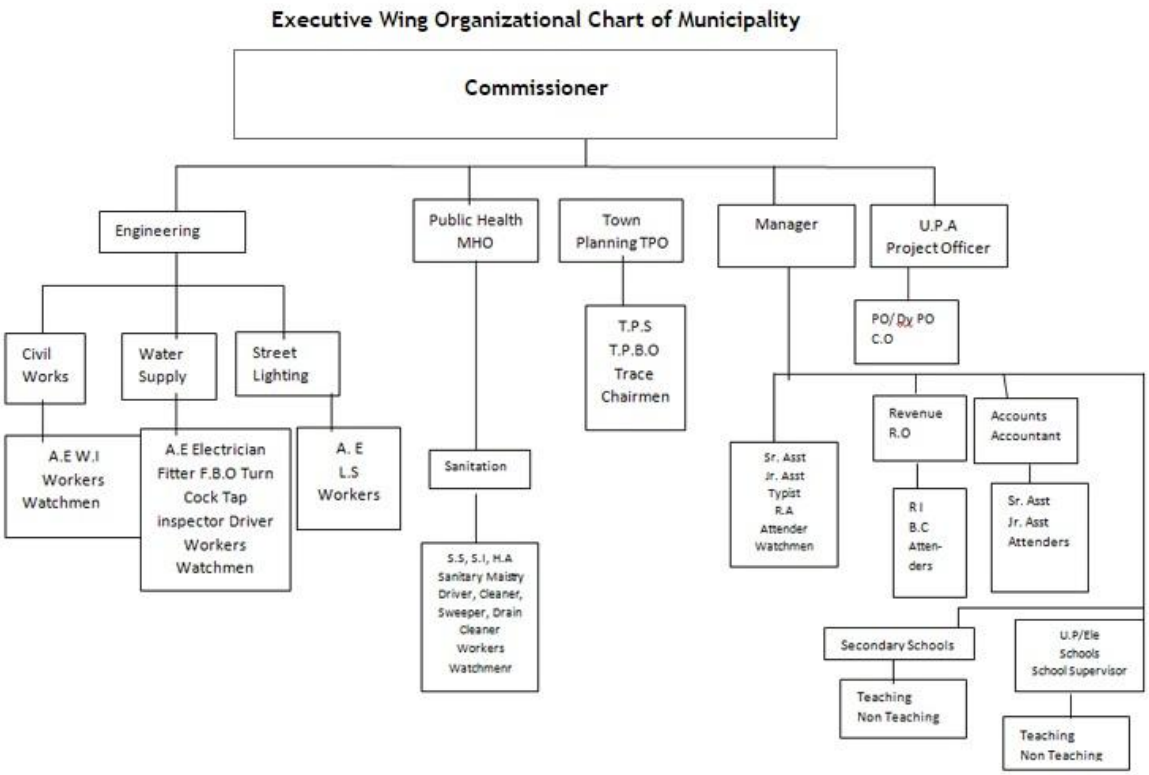
Sl. No	Name of the Municipality	Category of posts	Total no. of Sanctioned posts	Working Strength	No.of posts vacant	Reason for vacancy
1	Narasaraopet Municipality	Sr Accountant	3	1	2	
2		Town Planning Supervisor	2	1	1	
3		Sweeper	2	1	1	
4		Lab Assistant	3	2	1	
5		Fitter	2	1	1	
6		Filter Bed Operator	3	0	3	
7		Watchman	7	5	2	
8		Work Inspector	2	0	2	
9		Assistant Engineer	2	2	0	
10		Meter Reader	1	0	1	
11		Ayah	2	1	1	
12		P.W. Maistry (1978-Rs.325-500)	1	0	1	

13		Switch Board Operator	1	0	1	
14		Lighting Superintendent	1	0	1	
15		Typist	1	0	1	
16		Accountant	1	0	1	
17		Librarian (Guntur Municipality	1	0	1	
18		Town Planning Tracer	1	0	1	
19		Deputy Executive Engineer	1	1	0	
20		Public Health Maistry	8	7	1	
21		Manager	1	1	0	
22		Town Planning Officer	1	0	1	
23		Turn cock	2	0	2	
24		Sanitary Superviser	1	1	0	
25		Attender	11	10	1	
26		Gardener	2	1	1	
27		Accounts Officer	1	1	0	
28		Fitter Grade-1	0	0	0	
29		Library Attender	1	1	0	
30		Junior Assistant	13	10	3	1 abscanded
31		Record Assistant	6	3	3	
32		Tap Inspector	1	0	1	
33		Jr Accountant	3	1	2	
34		U.d.r.i	1	1	0	
35		Health Assistant	2	2	0	
36		T P and Building Overseer	4	1	3	
37		Masalgi	1	1	0	
38		Meternity Assistant	2	0	2	
39		Electrician Gr.I	2	0	2	
40		Avenue Cooly	1	1	0	
41		Jeep Driver	1	0	1	
42		Bill Collector	7	6	1	
43		Revenue Officer(Spl)	1	1	0	

44		Sanitary Inspector	4	0	4	
45		Chainman	2	1	1	
46		Superior Field Worker	2	1	1	
47		Tractor Driver	2	2	0	
48		Fitter Mazoors	6	3	3	
49		Gang Cooly	4	2	2	
50		Library Assistant	1	0	1	
51		Municipal Engineer	1	1	0	
52		Public Health Worker	128	93	35	8 abscanded
53		Waterwomen	2	1	1	
54		Senior Assistant/Senior Accoun	5	5	0	
Total			**267**	**173**	**94**	

Source: Narsaraopet Municipality (2016)

Table 22: Municipality Organogram, Narsaraopet



Source: Narsaraopet Municipality (2016)

Role of Parastatals and State Departments

The functions and role of some of these institutions are discussed below.

The Municipal Administration and Urban Development Department (MAUD)

The MAUD Department is responsible for policy formulation, preparation of municipal laws, monitoring and evaluation of programmes, supervision of municipal administration, coordination with related state government departments, liaison with the central government and external funding agencies, etc. It controls, supervises and guides the line departments like Directorate of Municipal Administration, Department of Town and Country Planning, and Public Health Engineering Department.

The Directorate of Municipal Administration (CD&MA)

The CD&MA is the executive arm of MAUD and is responsible for the implementation of laws, policies and programmes relating to the urban sector. It is responsible for administrative and financial management of municipalities, implementation of development programmes like IDSMT, SJSRY, UIDSSMT, IHSDP, ILCS, etc. The CD&MA acts as a conduit between the municipalities and the government and provide guidance, help and assistance to all local bodies. To assist the Commissioner and Director of Municipal Administration, there are six regional offices, which are considered to be field offices of the Directorate of Municipal Administration. The Regional Directors are

responsible broadly for the implementation of municipal laws and schemes, and monitoring and review of projects. They periodically to review and provide necessary guidance to local bodies and liaise with other related departments like Town and Country Planning, Public Health Engineering and the District Collectors for proper functioning of municipalities in their jurisdiction. The Narasaraopet Municipality comes under Guntur Region.

Directorate of Town and Country Planning (DTCP)

The DTCP is responsible for the planning orderly growth of cities and towns, preparation of Master Plans, their review and revision, preparation of regional development plans, etc. To assist the Directorate six regional offices are established and the Narasaraopet Municipality comes under the jurisdiction of Guntur regional office.

Public Health and Municipal Engineering Department (PHED)

The PHED provides technical support to local bodies in the execution of major public health engineering works like water supply schemes, drainage and sewerage works, major roads, etc. Apart from directly executing the major works, the Department also provides technical guidance to the municipalities in the preparation and execution of similar schemes. This Department accords the technical scrutiny and sanction of the public health engineering works. The PHED is organised into five Circle Offices for administrative convenience and Narasaraopet Municipality comes under Guntur Circle.

Roads and Buildings Department (R&B)

R&B Department is responsible for development and maintenance of road network in the state. They maintain all state roads that pass through Narasaraopet Municipality.

Andhra Pradesh Urban Finance and Infrastructure Development Corporation (APUFIDC)

The APUFIDC extends technical assistance to the local bodies in the preparation and implementation of development schemes. It acts as a conduit between the ULBs, the Government of India and financing agencies like HUDCO. The Corporation, on behalf of the municipalities borrows loans from HUDCO and other financial institutions and acts as a financial intermediary.

Andhra Pradesh Pollution Control Board (APPCB)

The APPCB is responsible for controlling of water and air pollution caused by various sources across the state including Narasaraopet.

Andhra Pradesh Housing Corporation (APHC)

The APHC is responsible for formation of layouts, land development, preparation and implementation of housing schemes particularly for the weaker sections, etc. Implementation of the prestigious Rajiv Gruha Kalpa is their responsibility.

Other state agencies

At the district and local levels also there are several agencies with which the Narasaraopet Municipality liaises in the management of the civic affairs. Most important of them being the administrative offices of the state government departments like Director of School Education, Director of Medical and Health, Tahsildar, Director Treasuries, etc.

The District Collector

At the district level the District Collectors have supervisory powers over the municipalities. They facilitate coordination and convergence between different agencies involved in the management of the town – particularly implementation of welfare programs.

10. Municipal Finance

10.1 Baseline Status

This section provides a measure of the financial capacity of Narsaraopet to maintain the new infrastructure built in Narsaraopet. In maintaining new facilities like Public Toilets, and operating a city FSM, or water supply related activities such as increasing metering or the number of connections, the MC would have to undertake the operating expenses related to running these infrastructures, and so the existing gap in the water supply and sanitation budget is bound to increase. As such, the new interventions are proposed to make the MC as self-sufficient as possible.

The income and expenditure patterns under sanitation have been calculated for MC Narsaraopet by analysing the revised budgets for the years of 2012-13, 2013-14, and 2014-15 respectively[36]. It has been observed that:

- Narsaraopet registers a **surplus** of about 7.82% in 2014-15, 15.51 % in 2015-16 and 1.63% in 2016-17. The maximum revenue generators are taxes and fees.
- **Income from water supply and drainage related activities** form a maximum of about 21.02% (2014-15) in the overall income in Narsaraopet
- **Expenditure from water supply and drainage related activities** form a maximum of about 46.67% (2016-17) in the overall expenditure in Narsaraopet
- **Income on sanitation related activities** forms a maximum of about 5.25% (2014-15) of the overall income in Narsaraopet.
- **Expenditure on sanitation related activities** forms a maximum of about 27.86% (2016-17) of the overall expenditure in Narsaraopet.

The following tables show the important heads under income and expenditure and their percentage of the total water supply and sanitation budgets respectively for the three years. It is observed that the major income source for water supply and drainage has been from water charges (taps) (for all three years) as shown in Table 21. The major expenditure head has been contract labour (for annual years 2014-15 and 2015-16) and 'Providing house service connections, distribution lines, reservoirs and source improvement under AMRUT scheme' (2016-17) as shown in Table 22. The major source of income for sewerage and sanitation has been Scavenging tax (for all three annual years) as shown in Table 23. The major expenditure head has been sanitation privatisation (all three years) and municipal grants (2016-17) as shown in Table 24. Presently, there is no specific budget head to record water supply and sanitation based expenditure.

Table 23: Income Heads and Percentage for Water supply and drainage- Narsaraopet Municipality (all figures in lakhs)

Income Heads- Water supply and drainage	2014-15	2015-16	2016-17
Water tax	53.03 (16.24%)	54.97 (15.29 %)	59.52 (17.44%)
Water charges (taps)	140(42.87%)	150 (41.72%)	165 (48.36%)
Water charges (meter)	10(3.06%)	8 (2.25%)	7.5 (2.19%)
Water tanker earnings	0.5 (0.15%)	0.5 (0.14%)	1 (0.29%)
Water tap security deposits	1 (0.30%)	2.3 (0.64%)	2.5 (0.73%)
Tap deposits	18 (5.51%)	26 (7.23%)	27(7.91%)
Estimated charges		2 (0.56%)	3(0.88%)
State finance commission for water supply	104.01 (31.85%)		30 (8.8%)
Natural calamities grant		4.13 (1.15%)	6 (1.76%)

[36] Source: Assessment of the Municipal Budgets for MC Narsaraopet (2014-15,2015-16 and 2016-17)

13th Pay Commission grant		75 (20.86%)	
Total Income from Water Supply and Drainage	**326.54**	**359.55**	**341.209**

Source: Assessment of the Municipal Budgets for Narsaraopet Municipality (2014-15. 2015-16, 2016-17)

Table 24: Expenditure Heads and Percentage for Water supply and drainage- Narsaraopet Municipality (all figures in lakhs)

Expenditure Heads for Water supply and drainage	2014-15	2015-16	2016-17
Property Tax, Water Tax and Alertness Programme	1.5 (0.62 %)	1.5 (0.39%)	1.5 (0.1%)
Water supply operation expenses, contingencies	35 (14.46%)	40 (10.35%)	60 (4.075%)
Electricity bills (under WS and drainage)	15 (6.2%)	10 (2.59%)	4 (0.27%)
Contract labour (under WS and drainage)	65 (26.86%)	100 (25.9%)	90 (6.11%)
Tractors, generators, diesel	14 (5.79%)	20 (5.18%)	4 (0.27%)
Borewell materials and water supply	11 (5.54%)	1 (0.26%)	10 (0.68%)
BPL tap constructions	2.5 (1.03%)		
BPC tap implementation		4 (1.04)	4 (0.27%)
Drainage, drain repairs and manholes		1 (0.26%)	
JCB operation cost, oil expenses, etc.	12 (3.51%)	6 (1.55%)	
Water supplied through tankers	4 (1.17%)	3 (0.77%)	
Arrangements for Mahashivratri	17 (4.97%)	20 (5.18%)	25 (1.7%)
Computers, printers, furniture	2 (0.83%)	0.6 (0.16%)	1.5 (0.1%)
Preparation of DPR for improvement of WS and comprehensive storm water drainage in Narsaraopet town			31.236 (2.12%)
Extending water supply lines	20 (8.26%)	30.567 (7.91%)	92 (6.25%)
State finance funds for WS and drainage	30 (12.4%)	60 (15.53%)	30 (2.03%)
13th Pay Commission Grant (under WSW)		60 (15.53%)	
Drains and bridge construction	10 (4.13%)	15.534 (4.02%)	
Natural calamities grant	3 (1.24%)	4.13 (1.07%)	
Environmental grant under water supply			6 (0.4%)
Providing house service connections wherever network reservoirs and source is available under AMRUT scheme			150 (10.19%)
Providing house service connections, distribution lines, reservoirs and source improvement under AMRUT scheme			963 (65.41%)
Total Expenditure from Water Supply and Drainage	**242**	**386.33**	**1472.236**

Source: Assessment of the Municipal Budgets for Narsaraopet Municipality (2014-15. 2015-16, 2016-17)

Table 25: Income Heads and Percentage for Sewerage and Sanitation- Narsaraopet Municipality (all figures in lakhs)

Income Heads- Sewerage and Sanitation	2014-15	2015-16	2016-17

Scavenging Tax (under public health)	79.55 (97.42%)	82.459 (97.13%)	89.288 (82.24%)
Slaughter houses	0.45 (0.55%)	0.785 (0.92%)	0.645 (0.59%)
Sweeping charges	1.65 (2.02%)	1.65 (1.94%)	1.65 (1.52%)
Swachh Bharat Programme Grant			8.99 (8.28%)
Sewerage Charges (under fixed deposits and advances)			8 (7.37%)
Total Income from Sewerage and Sanitation	**81.65**	**84.89**	**108.57**

Source: Assessment of the Municipal Budgets for Narsaraopet Municipality (2014-15. 2015-16, 2016-17)

Table 26: Expenditure Heads and Percentage for Sewerage and Sanitation- Narsaraopet Municipality (all figures in lakhs)

Expenditure Heads- Sanitation	2014-15	2015-16	2016-17
Vehicle repairs		10 (2.39%)	
Malaria oils, feroids	13 (3.7%)		12 (1.37%)
Coconut oil, soap purchases	2 (0.57%)	5.5 (1.32%)	1.5 (0.17%)
Uniforms and slippers for workers	4 (1.14%)	6 (1.44%)	7 (0.79%)
Sanitation privatisation	150 (42.79%)	200 (47.97%)	317 (36.06%)
Special sanitary public health contract workers		10 (2.39%)	
Monkeys and dogs control	5 (1.43%)	3 (0.72%)	1 (0.11%)
Printing of pamphlets	0.4 (0.114%)	0.3 (0.07%)	
Night sweeping	31 (8.84%)	42 (10.07%)	
Conservancy tools/ vehicle management	5 (1.43%)	3.5 (0.84%)	8 (0.91%)
Lime, bleaching, tractor diesel	65 (18.54%)	70 (16.79%)	60 (6.83%)
Dustbins and pushcarts	3 (0.86%)	6 (1.44%)	15 (1.7%)
Sanitation for Mahashivratri	2 (0.57%)	2 (0.48%)	
Crematorium maintenance	10 (2.85%)	0.5 (0.12%)	
Cremation of unknown dead bodies	0.1 (0.285%)	0.1 (0.024%)	
Contract workers	8 (2.28%)	33 (7.91%)	
Men hired for special sanitation needs			1 (0.11%)
Environmental engineer salary		1.8 (0.43%)	2.5 (0.28%)
Public health workers		10 (2.39%)	
Sanitation staff workers			23 (2.62%)
Room rent	0.036 (0.103%)		
Contractual drivers for trucks	23 (6.56%)		
Sewage drain repairs, manholes (under WS and drainage)	4 (1.14%)		1 (0.11%)
Development works through municipal funds (under public health)	25 (7.13%)	13.26 (3.78%)	
Swachh Bharat Programme Grant			8.99 (1.02%)
Municipal grants			316 (35.95%)
Drain construction			105 (11.95%)
Total Expenditure from Sewerage and Sanitation	**350.536**	**416.96**	**878.99**

Source: Assessment of the Municipal Budgets for Narsaraopet Municipality (2014-15. 2015-16, 2016-17)

The Narsaraopet Municipality budget calculates revenue and developmental budget accounts. The revenue income budget has heads on taxes and fees, rent, own source income. The developmental income budget includes SFC and grants awarded to the municipality. The revenue expenditure budget has heads on own income expenditure, delegated functions, maintenance/repair / depreciation of assets and other expenditure heads. The developmental expenditure budget has expenditure from the SFC and grants awarded.

The budget analysis has been done by combining water supply and storm water drainage- "Water Supply and Drainage" under one head, and sewerage, sanitation and solid waste management as another component- "Sewerage and Sanitation". This has been consciously done keeping in mind the trends in the budget details.

10.2 Gaps and Issues

- The overall deficit for water supply and drainage sectors of the town is **-331.48%.**
- The overall deficit for sewerage and sanitation sectors of the town is **-329.32%.**

11. Capacity Enhancement

11.1 Baseline Status

This chapter includes information regarding the current capacities of the ULB and on-going initiatives for capacity enhancement.

Table 27: Capacity assessment

Institution/Department (Engineering, Sanitation, Poverty Alleviation, etc)	Tasks to be performed	Permanent Staff	Contractual Staff	Gaps in Number	Gaps in Skills
Engineering Section	Water Supply	16	113	8	4
Sanitation	Sanitation Solid Waste Management	92	261	10	---

Source: Narsaraopet Municiplaity (2016)

11.2 Gaps and Issues

- Out of the sanctioned posts for Water Supply and Sanitation and Solid Waste Management, 18 positions are vacant. There is a clear lack of skills and human resources to fulfill all the tasks.
- There is a general lack of monitoring and evaluation within the Municipality that leads to the limited quality of data provided. There is a lack of consistency within the data regarding the Service Level Benchmarks.

Section IV – Key Issues, Action Plan & Investment Plan

12. City Wide Key Issues

Of all the issues identified in the town, following key issues with respect to sanitation have been identified for Narsaraopet town.

Key Issue 1	The coverage of individual water supply connections to households is low.
Rationale for this key issue	1. Only 61.46% of the households (of total 17,906) have water supply connections. While remaining half of population receive access to water supply by means of 425 public stand posts (PSPs). 2. Part of the universal coverage achievement will also require building more distribution lines, i.e. 20 kms of water supply distribution lines.

Key Issue 2	The town has no waste-water management system in place.
Rationale for this key issue	1. 65.87% of underground sewer network was completed in 2011 but no household connections are given. 2. Both grey and blackwater outlets from households discharge into open earthen drains making them combined sewers, carrying this untreated wastewater into open environment, Presently, the town is not serviced by a comprehensive underground drainage system. However, 88.8 kms of sewerage network have been laid, but not functioning. 3. 12.8 MLD wastewater is generated in the town which all goes untreated 4. No sewage treatment plant in place. 5. Part of the universal coverage achievement will also require building more sewer lines, i.e. 46 kms of sewer network.

Key Issue 3	No systematic or organized method to collect, convey and treat fecal sludge (Fecal sludge management) collected from the pits and septic tanks of the town.
Rationale for this key issue	1. There is no formal fecal sludge emptying service provided by the municipality. 2. The septic tanks and pits in the town are serviced by informal fecal sludge emptying operators, regarding whom there is no database with the municipality. 3. The sludge emptied from the septic tanks of households are dumped in open fields and open environment. There is no regulation or awareness against such practices. 4. The duration of cleaning varies based on the size of the tank and pit, for which there is no existing database. 5. As the septic tanks are not connected to a soak pit, the tanks outflow conveniently empties into an adjacent drain, thus not requiring the households to desludge regularly.

Key Issue 4	No treatment for wastewater emerging from slaughter house.
Rationale for this key issue	The existing slaughter house in the town has no treatment unit for the wastewater coming out. This wastewater is openly let out into the open drains.

Key Issue 5	An important issue with the municipality is the limited quality of data (due to lack of monitoring and evaluation). Across all the basic needs services – covered within the SNUSP program – there is lack of consistency in the data availability for the service level benchmarks of Water Supply, Access to Toilets, Solid Waste Management, Wastewater management and Storm water drainage. Presently, the arrangement is to have specific ad-hoc arrangements to furnish data, whenever there is a documentation required (of service levels) for a municipal program like AMRUT, SBM and other independent grant projects (from the state government or non-governmental sources). Hence, the prevailing situation is that we have multiple values for the same indicator (for e.g. one report states 112 lpcd, while another states 99 lpcd).

Rationale for this key issue	• A Performance Assessment framework needs to be introduced by 2018 to unify all service level benchmarks of the town under one window to avoid any contradiction of data and lack of comparability. This includes unifying information from all sources like:
	  ◦ SLB[37]/SLIP[38]
	  ◦ Swachh Sarvekshan
	  ◦ PAS[39]
	  ◦ Logistical Data concerning implementing GO 279
	  ◦ SBM[40]
	• Focus on the organizing a citywide database (by end of 2017) of wastewater disposal process – as an aftermath of the ODF declaration - at the household level (i.e. type of containment: Septic Tank, Pits, Twin Pits). This can be in alignment with the sanitation census forms last organized in 2011. A listing of insanitary latrines must be inventoried and geo-tagged by 2018

[37] SLB – Service Level Benchmarks
[38] SLIP – Service Level Improvement Plan
[39] PAS – Performance Assessment Systems template for service level benchmarking
[40] SBM – Swachh Bharat Mission

13. Goals corresponding to City-Wide Key Issues

To gradually and effectively improve the sanitation situation in Narsaraopet, following goals with respect to key issues have been arrived after consultation with the CSTF:

No.	Key Issue	Goal
1	The coverage of individual water supply connections to households is low.	Increasing the access of households to individual water supply connections to 80% by 2017 and 100% by 2018.
2	The town has no waste-water management system in place.	Implement a holistic wastewater management program spread across 3 years targeting construction of a citywide STP of 15.55 MLD capacity by 2019 and having low O and M decentralized wastewater treatment units for gated communities.
3	No systematic or organized method to collect, convey and treat fecal sludge (Fecal sludge management) collected from the pits and septic tanks of the town.	Streamline the operations for collection and conveyance process of fecal sludge and its emptying in a regulated manner by 2017.
4	No treatment for wastewater emerging from slaughter house.	An in house treatment facility will be established by end of 2017 to treat the wastewater discharge to the normative standards.

5	An important issue with the municipality is the limited quality of data (due to lack of monitoring and evaluation). Across all the basic needs services – covered within the SNUSP program – there is lack of consistency in the data availability for the service level benchmarks of Water Supply, Access to Toilets, Solid Waste Management, Wastewater management and Storm water drainage. Presently, the arrangement is to have specific ad-hoc arrangements to furnish data, whenever there is a documentation required (of service levels) for a municipal program like AMRUT, SBM and other independent grant projects (from the state government or non-governmental sources). Hence, the prevailing situation	• A Performance Assessment framework needs to be introduced by 2018 to unify all service level benchmarks of the town under one window to avoid any contradiction of data and lack of comparability. This includes unifying information from all sources like:
		  ◦ SLB[41]/SLIP[42]
		  ◦ Swachh Sarvekshan
		  ◦ PAS[43]
		  ◦ Logistical Data concerning implementing GO 279
		  ◦ SBM[44]
		• Focus on the organizing a citywide database (by end of 2017) of wastewater disposal process – as an aftermath of the ODF declaration - at the household level (i.e. type of containment: Septic Tank, Pits, Twin Pits). This can be in alignment with the sanitation census forms last organized in 2011. A listing of insanitary latrines must be inventoried and geo-tagged by 2018.

[41] SLB – Service Level Benchmarks
[42] SLIP – Service Level Improvement Plan
[43] PAS – Performance Assessment Systems template for service level benchmarking
[44] SBM – Swachh Bharat Mission

	is that we have multiple values for the same indicator (for e.g. one report states 112 lpcd, while another states 99 lpcd).	

14. Action Plan

No.	Key Issue	Goal	Actions			Agency responsible for action (ULB, PHED, etc.)
			Short term (within 2 year)	Midterm (3-5 years)	Long term (5-10 years)	
1	The coverage of individual water supply connections to households is low.	Increasing the access of households to individual water supply connections to 80% by 2017 and 100% by 2018.	a. Implementing water supply connections to 18.54% (targeting 80% of households have HSCs[1] by 2017) of the total households (through AMRUT funding). b. Implementing construction of distribution network (25 kms) starting 2016, to convey water to unserved households.	a. Implementing water supply connections to another 20% (targeting 100% of households have HSCs[1] by 2018) of the total households (through AMRUT funding). b. Completion of construction of distribution network (27 kms) to convey water to unserved households. c. Building of Reservoirs (ELSRs) for unserved wards.	a. Providing water supply connections to all additional households that are added to the city, due to extension of urban limits.	**Engineering Department of ULB**
2	The town has no waste-water management system in place.	Implement a holistic wastewater management program spread across 3 years targeting construction of a citywide STP of 15.55 MLD capacity by 2019 and having low O&M decentralised wastewater treatment units for gated communities.	a. Tendering and selection of EPC (Engineering, Procurement and Construction) contractor for execution of construction of sewer network i.e. 46 Km (to be tendered by PHED). b. Undertake a terrain survey (total station) by EPC contractor for topographic detailing to implement sewer construction. c. Undertake a geotechnical investigation by EPC contractor to understand soil structural properties d. Commissioning and inauguration of the network. e. Workshop on sewer maintenance to municipal engineering staff (who are responsible for O&M). f. Awareness campaign for citizens regarding O&M at User Interface (as septic tank will be connected to underground drains which necessitates the need for septage management). Detailed interaction with citizens living in the vicinity of the STP site.	a. Confirmation of STP site by the Municipality b. Satisfaction of all required environmental regulatory clearances. c. Tendering and selection of contractor for construction by PHED. d. Construction of Plant. e. Training workshop on STP and Drainage related Operation and Maintenance activities for municipal staff.	a. Planning for scaling up activities for incrementing treatment capacity of STP (if capacity is less than 15.55 MLD is undertaken due to limitations like land availability and funds).	**Public Health Engineering Department (Construction);** **Engineering Department of ULB (Operation and Maintenance)**
3	No systematic or organized method to collect, convey and treat fecal sludge (Fecal sludge management) collected from the	Streamline the operations for collection and conveyance process of fecal sludge and its emptying in a regulated manner by 2017.	a. Organizing a registry/association of informal/service providers (for better regulation) by early 2017, b. Building an inventory of existing containment systems and their sizes (by mid-2017), c. Workshop on desludging and transportation of faecal sludge	a. Planning for scaling up of construction of new toilets. b. Scaling up activities - Construction of new toilets.		**Engineering Department of ULB**

[1] HSC – House Service Connections

	pits and septic tanks of the town.					
4	No treatment for wastewater emerging from slaughter house.	An in house treatment facility will be established by end of 2017 to treat the wastewater discharge to the normative standards.	a. Tendering and selection of design consultant and contractor for execution of construction decentralised treatment unit for wastewater from slaughter house. b. Tendering and selection of contractor for construction by PHED. c. Construction of Plant. d. Training workshop on STP and Drainage related Operation and Maintenance activities for municipal staff.			**Engineering Department of ULB**
5	An important issue with the municipality is the limited quality of data (due to lack of monitoring and evaluation). Across all the basic needs services – covered within the SNUSP program – there is lack of consistency in the data availability for the service level benchmarks of Water Supply, Access to Toilets, Solid Waste Management, Wastewater management and Storm water drainage. Presently, the arrangement is to have specific ad-hoc arrangements to furnish data, whenever there is a	1. A Performance Assessment framework needs to be introduced by 2018 to unify all service level benchmarks of the town under one window to avoid any contradiction of data and lack of comparability. This includes unifying information from all sources like: • SLB[45]/SLIP[46] • Swachh Sarvekshan • PAS[47] • Logistical Data concerning implementing GO 279 • SBM[48] 2. Focus on the organizing a citywide database (by end of 2017) of wastewater disposal process – as an aftermath of the ODF declaration - at the household level (i.e. type of containment: Septic Tank, Pits, Twin Pits). This can be in alignment with the sanitation census forms last organized in 2011. A listing of insanitary latrines must be inventoried and geo-tagged by 2018.	a. Anchor all data management activities of the town (SLB/SLIP/CSP/PAS/SBM) with one post (preferably the environmental engineer/executive engineer serving as data manager from the public health section). b. Organize a database management workshop for the executive wing of the municipality. c. Streamline all data sources to one source point within the municipality, which needs to be updated timely.	a. Continuous updation and revisit of citywide sanitation, solid waste, water supply data once in 4 months. b. A yearly workshop to present the latest best practices to improve database management practices in the town.		**Engineering Department and Health Department of ULB**

[45] SLB – Service Level Benchmarks
[46] SLIP – Service Level Improvement Plan
[47] PAS – Performance Assessment Systems template for service level benchmarking
[48] SBM – Swachh Bharat Mission

	documentation required (of service levels) for a municipal program like AMRUT, SBM and other independent grant projects (from the state government or non-governmental sources). Hence, the prevailing situation is that we have multiple values for the same indicator (for e.g. one report states 112 lpcd, while another states 99 lpcd).					

15. CSTF Meeting at Narsaraopet

Name	Designation	Number
Bhanu Pratap	Municipal Commissioner	+91 9849905860
M.V. Jaya Saradh	Sanitary Inspector	+91 9849906584
D. Ramudu	Sanitary Inspector	+91 9849907273
V. Eswara Reddy	Sanitary Supervisor	
G.Anil Kumar	Environmental Engineer	
J. Siva Ramakrishna	D.E.E.	
J Praveen Kumar	A.E.	
Sk. Md. Rafiq	Municipal Assistant Engineer	+9849907271
D. Shilpa	Apprentice Assistant Engineer	+91 7680905745
G.Ekalye	GEA, Narsaraopet	+91 7680905744

Figure 11 Members of the Meeting

Solid Waste Management related discussion points:

1. 65.5 MT of total waste generated in town
    a. 3.5 MT is bio degradable waste (this includes only market waste)
    b. 1 ton of Dry recyclable Waste
    c. Household waste is 50 MT (all send to wind row composting site)
    d. Commercial waste is 12 MT
2. The dry waste is worth Rs. 3 per kg, and on a daily basis the town collects Rs. 3000 from the sale of recyclables
3. The existing wind row composting site is 10 acres and divided into 3 parts (every 3 months 1 part is used)
    a. The manure however is not sold but being used to do plantation in parks
    b. The ULB has sent samples of the compost from the wind row unit to Acharya Ranga Agricultural University, but results are yet to be collected on the nutrient value of the soil conditioner developed.
4. 20-30 MT of wet waste is being collected (all of which is not being treated)
5. Market waste constitutes 3 MT (this is only treated)
    a. There are 12 beds, each of 1 MT capacity
    b. At the vermin composting unit, of the 12 MT of wet waste that is sent as one batch, 1 MT of compost is received.
    c. The generated vermin compost is used in parks
6. Biomedical waste in the city is collected by private operators
7. There is also 1 slaughter house which presently is mixed with market waste and not separated. Presently, the wastewater from the slaughter house is openly let out into drains
8. Segregation at source is already prevalent.
9. 1 hour of street sweeping is prevalent but only in few areas.

Water supply related discussion points:

1. Existing total WS network: 114.8 kms

2. Under the AMRUT program, a 20 km distribution network has been envisaged to cover Water Supply this would roughly serve 4000 HSCs[49] (@ 200 Households per km of distribution network)
    a. Tender finalized
    b. Construction work yet to begin
    c. Expected to complete in a year
3. The town presently has no regulation on the use of bore wells
4. 10 MLD is the total water supplied in the town (supplied twice per day), i.e. 9.8 MLD reaching all households
5.
6. Ground water table in the town is 40 ft
7. The water reservoir for the town is the Nagarjuna Sagar right canal which is 25 km from the town
8. The canal supplies 5020 Million liters to Narsaraopet and its surrounding 5 villages
9. The storage capacity of reservoir is 9 months
10. Under the latest BPL scheme, HSCs are being provided to individual households and public taps are being avoided
    a. 8000 was pointed as the demand supply gap of HSCs
11. Coverage of House Service Connections (as per SLB): 61%
12. Per capita quantum of water supplied: 126 lpcd
13. Rs. 12.62 Cr has been allocated for Water Supply under the AMRUT program
14. The city of Narsaraopet has an interesting awareness generation approach for educating the general public on SWM collection. For this, they have a team of 60 Members of SHG (Self Help Group) Members. For each ward, 2 members go to households daily to educate the women. They are paid Rs. 3000 per month as an honorarium for each member. (10 SHG members make 1 self help group; 50 SHGs form a slum level federation; and all Slum level federations form a town level federation)
15. Presently of the 101 permanent staff, only 60 area actively in service, and the rest are on the verge of retirement

Training Needs related discussion points:

16. Estimation and costing for engineering projects
17. Trainings to educate on various Government orders and regulations
18. Leadership training
19. Water Treatment Plant operation and maintenance training
20. Training for improving efficiency of Vermi composting unit and Wind row composting unit
21. Training for O&M of upcoming 15.5. MLD STP

Wastewater related discussion points:

1. The Public health department of the municipality is responsible for this sector
2. Presently, 88.8 kms of sewer lines are covered across the town, and an additional 44 kms need to be laid

[49] HSC – House Service Connection

3. The construction of the 15.5 MLD STP has just initiated in the town, but as per ULB officials, the commissioning will take another 2 years
4. The Ogeru Canal carries the wastewater drained from the city (located 40 kms from the ULB office)
5. The wastewater treatment proposed is Activated ASP process, but this is yet to be finalized; Ankita constructions has been contracted the duty
6. Rs. 20 Cr is the allocation for the construction of this plant

Septage Management related discussion points:

1. 20 private trucks operate in the town as per the ULB officials (catering to ULB area and surrounding villages)
2. During the discussion regarding an interim solution for treatment of septage, it was proposed to have a drying bed at the existing solid waste dump site (for a 1 year period)
3. The prevailing rates for desludging in the town is between Rs. 2000-3000 for a 2000 lit tank capacity

Access to toilets related discussion points:

1. There are 10 public toilets in the town (each having 5 seats)
2. In each of the above, 3 additional urinals have been planned to be installed. Presently, they have 5 Urinals
3. The PTs are operated through 5 year lease, with a 3 year extension provided after every 5 years
4. The lease for the public toilets can be cancelled immediately by the ULB, in case of any lack of service observed in terms of the operation and maintenance of the public toilets.
5. The ULB stated the workers at the toilets also use protective gears as required.
6. All school toilets will also be connected by UGD

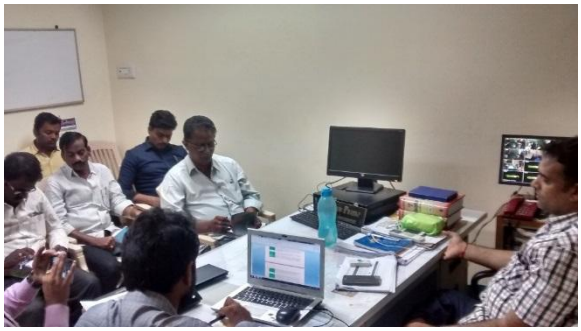



Figure 12 Meeting at Narsaraopet, December 2018

17. Cost Estimates for City-Wide Action Plan for CSP

Intervention Areas	Phase wise investment			Total
	Short-term (2 Years)	Mid-term (5 Years)	Long-Term (10 Years)	
Access to Toilets				
1. Public toilet augmentation	• 3 additional Urinals are envisaged at the existing 10 public toilets in the town (each having 5 seats). • Cost for each Urinal: Rs. 4000			Rs. 1,20,000
Sewage (Wastewater and Greywater)				
2. Sewage treatment plant	• Rs. 20 Cr is the allocation for the construction of the envisaged 15.5 MLD STP[50]			Rs. 20 Cr
3. Wastewater conveyance network	• Construction of additional 44 kms need to be laid, for which Rs. 14.30 Cr has been allocated			Rs. 14.3 Cr
4. Technical assessment[51] of containment units	• This would require a survey of all households within the town, which would entail the cost of human resource as survey personnel			
Storm water drain management				
5. Construction of storm water drain network	• Amount not yet sanctioned	• Construction of major		Rs. 41.72 Cr

[50] Rs. 28.36 Cr was the cost estimated for construction of 15.5 MLD STP and for individual House Service Connections

[51] Desludging pattern and sizes

		outfall drain – Phase 1 (2017-18): Rs. 36.08 Cr • Construction of major outfall drain – Phase 2 (2018): Rs. 5.64 Cr		
Water Supply				
6. New House Service Connections	• Rs. 12.62 Cr has been allocated for Water Supply under the AMRUT program <u>Note</u>: 3.50 Cr has been identified in the SAAP for the year 2016-17			Rs. 12.62 Cr
Solid Waste Management				
7. Outsourcing work packages to private providers	• Costs will include the man hour cost for labor deployed to collect solid waste, drain cleaning (@ 2 workers per 350 Households) and street sweeping (@ 500 meter per worker) • This will depend on the outcome of the tender floated and procurement process undertaken by the municipality			
8. Treatment for Slaughter	• An In house			Site

House	decentralised treatment facility incorporating the DEWATS technology would entail a cost of up to Rs. 2 Lakh for 1KLD of daily wastewater generated from the facility. But this cost is tentative and needs to be validated through a site specific feasibility.			feasibility study required for exact costs