

Eluru Municipal Corporation

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	ABBREVIATIONS:	
AMRUT	Atal Mission for Rejuvenation and Urban Transport	
APMDP	Andhra Pradesh Municipal Development Project	
APSRTC	Andhra Pradesh State Road Transport Corporation	
ASP	Activated Sludge Process	
BOST	Build Operate Share Transfer	
BOT	Build Operate Transfer	
СВО	Community Based Organization	
CBSE	Central Board of Secondary Education	
CLTS	Community Led Total Sanitation	
СРНЕЕО	Central Public Health and Environmental Engineering Organization	
CSP	City Sanitation Plan	
CSR	Corporate Social Responsibility	
CSTF	City Sanitation Task Force	
DPR	Detailed Project Report	
DTD	Door to Door	
ELSR	Elevated Level Service Reservoir	
FAB	Fluidized Aerobic Bioreactor	
GoI	Government of India	
GLSR	Ground Level Service Reservoir	
DeWATS	Decentralized Wastewater Treatment System	
НН	Household	
HUDCO	Housing & Urban Development Corporation Limited	
HWW	Head Water Works	
ICDS	Integrated Child Development Services	
IEC	Information, Education and Communication	
IHHL	Individual Household Latrine	
IHSDP	Integrated Housing and Slum Development Programmes	
JNNURM	Jawaharlal Nehru National Urban Renewal Mission	
KPCL	Krishnapatnam Port Company Limited	
KSRTC	Karnataka State Road Transport Corporation	
LPCD	Liters Per Capita per Day	

MA&UD	Municipal Administration & Urban Development	
M&E	Monitoring and Evaluating	
MBBR	Moving Bed Bio Reactor	
MBR	Membrane Bio Reactor	
MDG	Millennium Development Goals	
MLD	Million Liters per Day	
MoHRD	Ministry of Human Resource Development	
MoHUPA	Ministry of Housing and Urban Poverty Alleviation	
MoUD	Ministry of Urban Development	

CITY SANITATION PLAN

1. INTRODUCTION

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 National policy is to transform Urban India into community-driven, totally sanitized, healthy and livable cities and towns. Specific goals include:

- A. Awareness Generation and Behavior Change,
- B. Open Defecation Free Cities,
- C. Integrated City-Wide Sanitation,
- D. Sanitary and Safe Disposal, and
- E. Proper Operation & Maintenance of all Sanitary Installations.

Against this background, and in recognition of its importance to national and state development, the Integrated City-Wide Sanitation Plan for Eluru City is prepared to provide city-wide systematic approach and framework to achieve the goals contemplated under NUSP.

1.1 OBJECTIVES OF CITY-WIDE SANITATION PLAN

The City Sanitation Plan (CSP) is aimed at developing and maintaining a clean, safe and pleasant physical environment in Eluru city 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 city of Eluru through demand generation 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.

The principal components of city-wide approach include:

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

(b) Storm water drainage;

(c) Cleansing of thoroughfares, markets and other public spaces;

(d) Environmental sanitation education;

(e) Inspection and enforcement of sanitary regulations;

(f) Monitoring the observance of environmental standards.

NATIONAL URBAN SANITATION POLICY (NUSP)

The Vision of the NUSP is:

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.

To transform Urban India into community-driven, totally sanitized, healthy and livable cities and towns, the policy sets out the following goals:

A AWARENESS GENERATION AND BEHAVIOUR CHANGE

B OPEN DEFECATION FREE CITIES

C INTEGRATED CITY-WIDE SANITATION

1. Re-orienting Institutions and Mainstreaming Sanitation

2. Sanitary and safe disposal: 100% of human excreta and liquid wastes must be disposed of safely

3. Proper Operations and maintenance (O&M) of all sanitary installations

The policy envisages the preparation of State Sanitation Strategies within the overall National Policy framework. In turn, cities are expected to prepare their city-wide sanitation plans that need to be prepared in a consultative and participatory manner, and using an incremental approach to addressing the issue of sanitation in a comprehensive city-wide manner.

Source: NUSP, 2008.

2. CITY SANITATION TASK FORCE (CSTF)



Figure 1: City Sanitation Task Force (CSTF)

Step- 1. Profiling ULB

As a preparatory work, a preliminary profiling of ULBs using SLB indicators and City Ratings to highlight the ODF status, sanitation situation, health indicators and current projects was undertaken. (Ref Annexure –B for SLB indicators and City rating Indicators).

Step 2. Stakeholder Analysis

Urban Local Bodies (ULBs) are in the frontline of implementation and have a key role in ensuring sanitation and should focus on demand responsive approach. Plan formulation through stakeholder consultation will provide the foundation for CSP which has government endorsement as well as an informed civil society to monitor its implementation. To play their part, as per the requirements of CSP, institutions, organizations, individuals, NGOs, academics, journals, local Corporators, industry owners, consultants, representatives of private sector and etc. are identified in Eluru and analyzed the strengths and competencies required for sanitation.

Step 3. Sensitization / Orientation Workshop

With this background knowledge, a City level orientation workshop at city level involving identified stakeholders has been organized to highlight the need to engage with issues relating to access and arrangement especially in slums; awareness generation for changed behavior and practices; community participation and mobilization to accord sanitation priority at all levels from policy to action on ground; and a number of technical, institutional and financial issues to be addressed in CSP and its various steps of preparation.

Step 4. Constituting: City Sanitation Task Force

A. CITY SANITATION TASK FORCE (CSTF)

CSTF has to be constituted by **EMC** to mobilize Stakeholders to elevate the consciousness about sanitation in the mind of municipal agencies, government agencies and amongst the people of the city. CTF will organize a multi-stakeholder, multi-party meeting in the preparatory stage, and take a formal resolution to make the city 100% sanitized.

Step 5. Initiating IEC activities

The objective of well driven IEC has to be demand-driven with social marketing approaches to increase demand for toilets and ensure hygiene behaviors, promote no subsidies for household toilets in future and encourage diversity in technology and

design. For this purpose ULBs may utilize suitable player for inter-personal IEC and training from the existing system like; ward development committees, health institutions, schools, National Service Scheme (NSC) Volunteers, the private sector (retailers, contractors, suppliers, plumbers, masons), neighborhood committees and NGOs, AnganWadi workers.

Step 6. Situation Analysis and Mapping Current Status

The Situation Analysis, prepared by taking into consideration the ground realities, local conditions, and assessment of the present sanitation situation has been undertaken and broad framework is indicated below:

Table 1: Situation Analysis and Mapping Current Status

Sectors	Spatial units	Finances	Institutional
Service levels and benchmarks for:	 Household Sanitation Slums Public Sanitary Conveniences School Sanitation Institutional Sanitation Map spatially Any town specific areas. 	 Cost Recovery— Policy— Tariffs— Collections— Budget Transfers. PPPs. Study of current programmes (SJSLY,ILCS , etc 	 Institutional Arrangement— Policies, Plans, implémentation , management. Staffing, Organization & Competence

Table 2: Research techniques with the tasks identified

Number	Tasks	Research Tools
1	To assess the current social and	Literature review
	environmental issues in Urban Eluru	Baseline survey
		Case studies
		 Consultations/FGDs
2	To assess the policies, acts,	Literature review
	operational procedures to address, mitigate and manage the social	• Survey
	and environmental issues in sanitation.	• FGDs
		Case studies
		 Discussions
		Stakeholder consultations

3	To assess the people's perception on sanitation, its maintenance and investment (Analysis of data)	Literature review Secondary information review
		Case studies
		Analysis of Rapid survey data
		• FGDs
		Stakeholder Consultations
4	To assess and recommend on the existing institutional arrangements in the urban	Literature review
	sector in managing and mitigating social	Stakeholder Consultations
	and environmental issues.	• FGDs
		Survey data analysis
5	To evolve a social and environmental	Literature review
	framework to mitigate adverse/negative impacts.	Stakeholder consultations

Tools Used: Data Templates, Survey Formats, Transect Walks along with schedules of interviews (Slums, industrial areas, water bodies), FGDs, Technical Analysis, Impact, Indicators, Stakeholder Consultations at city level etc.

Sample survey results for the basic services

Purpose: The objective of conducting the sample field survey was to assess the services at the customer level / field level and validate the information given by the officials.

Methodology: A total of 160 samples were taken across the different parts of the city to validate the information. The distribution of the samples is given in the table as follows.

Areas covered: The survey took spatially from all parts of the city, but the main focus was given to the following areas.

Table 3: Surveys and sample numbers

Sr. No.	Type of surveys	Sample nos.
1	Slum surveys	122
2	School surveys	27
3	Health institutions	7
4	Public toilets	2

Communication Needs Assessment for Eluru City Sanitation Plan

The key idea is to carry out a needs assessment within the existing infrastructure as well as the strategy to go with expansion of infrastructure. Following steps were identified before visiting the field.

- i. Identifying stakeholder groups and available channels of communication.
- ii. Focus Group Discussions, Interviews, Transect Walks with stakeholder groups were planned.
- iii. Topic Guides were prepared for each stakeholder group.
- iv. Data Collection. Field assessment of communications needs was carried out.

<u>Stakeholders:</u> Residents, establishments and ULB officials. Resident includes all those living within city can be classified as HIG, MIG, LIG and slum dwellers. In smaller towns a division into higher income group, middle class and Slum dweller could be sufficient. Shop keepers and commercial establishments constitute a separate group especially for generation of market waste.

Opinion leaders to be targeted as a high influence group both for FGDs and implementation of communications strategies.

- Key officials-Commissioners, Medical/Health officers, Environmental Engineers, sanitation inspectors,
- Councilors, Community elders,
- City media: newspapers reporters,
- RWA office bearers,
- NGOs,
- Safai-karamcharies union office bearers,
- Heads of Commercial establishments and shopkeepers, including public places such as bus stands
- Slum residents
- Residents from neighborhoods
- School teachers, employees
- School children

<u>Parameters</u>: three key parameters

- Environmental Sanitation SWM: market waste, domestic waste, waste segregation at source and at collection point, waste disposal measures
- ODF: public toilets, individual latrines, toilet maintenance, disposal of human waste,
- UGS: awareness, user charges,

Issues on these parameters as explored in primary data will create a basis for topics to be raised in FGD

STEP 7. PROBLEM ANALYSIS AND ASSESSMENT OF OPTIONS

Followed by situational analysis problem and challenges have been identified in coverage, access, treatment and disposal, institutional, financial, social and cultural aspects and capacity concerns. Also reviewed comprehensive range of sanitation and wastewater management options, including industrial and municipal sewerage, sewage treatment, conventional and low cost, centralized and decentralized sewerage, separate and combined and effluent disposal options, on-site sanitation options, separate programs for schools, public toilets, sanitation in slums, community-based NGO-supported programs etc.

Purpose of options analysis is to identify plausible technical, financial and institutional solutions and will consider (i) unit cost per beneficiary, (ii) maximizing both human and environmental benefits, (iii) sustainability, (iv) a long term plan, (v) government policy including land use zoning, (vi) piloting new approaches, (vii) beneficiary participation, (viii) wastewater as a resource, (ix) lessons learned from the past and (x) political commitment.

STEP 8. DEVELOPING AND FINALIZATION OF CSP

Having completed above steps, CSP has been formulated to articulate Sanitation Goals, specific quantifications both in terms of technical, capacities and financials based on stakeholder consultations and the analysis of choices made depending on costs of capital investments, operation and maintenance, monitoring, and evaluation.

Project priorities for sanitation need to consider:

- i. Serving the Unserved Urban Poor
- ii. Serving the Unserved Schools
- iii. Serving the Unserved Public Areas
- iv. Institutional capacity building for sustainability and environmental monitoring
- v. Grant elements for demonstration pilot projects for eco-sanitation (private

developers)

- vi. Rehabilitation of existing facilities.
- vii. Improvement of existing sanitation (septic tank sludge and effluent treatment).
- viii. Extension of existing sewerage and sewage treatment (as a last priority).

DEFINITIONS OF HOUSEHOLD SANITATION ARRANGEMENTS ACCORDING TO CENSUS 2001

<u>Water closet latrine (WC):</u> The sanitary water flush latrines are those latrines that have water closets fitted with flushing cistern. Such latrines that may be connected to a septic tank or an underground sewerage system will also be recorded as water closet latrines. The fecal matter from these types of latrines is removed without the need for scavenging or manual handling of excreta.

<u>Pit latrine:</u> The latrines attached to the pit that is dug into the ground for the reception of night soil are reckoned as pit latrines.

Other latrine: This category includes service latrines (i.e. those that are cleaned manually); latrines serviced by animals such as pigs, etc. and all latrines other than the pit and the water closet types of latrine

Note: the definitions adopted for baseline sanitation survey follow the above definitions.

2.1 STATE URBAN/SANITATION POLICIES

ANDHRA PRADESH URBAN REFORMS AND MUNICIPAL SERVICES PROJECT (APURMSP)

The Municipal Administration & Urban Development department is implementing "Andhra Pradesh Urban reforms and Municipal services Project" in all the Municipalities and Corporations of Andhra Pradesh. The main objective of the project is to improve the living conditions of the urban population, especially the urban poor through sustainable development. The project will finance the infrastructure facilities like roads, drains, water supply, street lighting and solid waste management.

The Development Objectives of the project are:

- o Improve urban governance through the implementation of an agreed reform agenda at State and local levels based, in part, on Government of India's Urban Reform Incentive Fund (URIF).
- Enhance the capacity of State, local, and community groups to manage
 urban affairs through a demand driven capacity enhancement program; and
- Support the rehabilitation and creation of sustainable urban services with economic and social benefits at community and citywide levels.

The project includes the following components:

- o Legal and Institutional Reform;
- Municipal Capacity Enhancement;
- o Urban Infrastructure Investment; and
- o Project Management

INTEGRATED LOW COST SANITATION (ILCS)

The programme envisages construction of new sanitary latrines in households not having latrines by adopting the low-cost leach pit system, with an objective to eliminate dry latrines and manual scavenging. The scheme is being implemented with 63% HUDCO loan, 32% Government of India subsidy and 5% of contribution of beneficiary. Initially during the year 1992 the Integrated Low Cost Sanitation Scheme was taken up in 34 municipalities, subsequently extended the programme covering all the Urban Local Bodies in a phased programme. The scheme was implemented in all 113 Urban Local Bodies with HUDCO financial assistance.

INTEGRATED NOVEL DEVELOPMENT IN RURAL AREAS AND MODEL MUNICIPAL AREAS (INDIRAMMA)

Andhra Pradesh Government has taken a decision to take up development of model villages and towns with an intention to saturate certain identified basic needs of the people and the village/town Infrastructure In an integrated and focused manner. This is planned to be achieved in a period of three years. The primary aim of this programme is to provide in every village pucca houses, drinking water supply, individual sanitary latrines,

drainage, power supply to every household, road facilities for transport, pensions to eligible old age persons, weavers, widows and the disabled, primary education to all, special nutrition to adolescent girls/pregnant and lactating women and better health facilities in all the villages over a period of three years in a saturation mode, This shall improve the living standards of the people significantly.

2.2 MEMBERS OF CITY SANITATION TASK FORCE (CSTF)

It is submitted as per the circular instructions vide Roc. No. 2708/2015/M3, Dt. 16.04.2015 issued by the Commissioner & Director Municipal Administration, Andhra Pradesh, City Sanitation Plan has to be prepared for all the cities in the State. For preparation of City Sanitation Plan for Municipal Corporation, Eluru constitution of City Sanitation Task Force is mandatory as per the National Urban Sanitation Policy 2008 with following members (members shall be selected as in annexure -1).

Table 4: Members of City Sanitation Task Force (CSTF)

1.	Smt. SK. Noorjahan	Hon'ble Mayor & Chairman
2.	Sri Y. Sayie Shreekanth	Commissioner & Convener
3.	Sri Ch. Venkata Ratnam	Hon'ble Deputy Mayor & Member
4.	Sri Shaik Muzbul Rehaman (Peda Babu)	Cooption Member & Member
5.	Sri K.Venu Gopala Rao	Corporator & Member
6.	Smt P.Deepthi	Corporator & Member
7.	Sri P.Pardha Saradhi	Corporator & Member
8.	Sri P.Rama Dasu	Corporator & Member
9.	Dr. V. Surya Rao	Municipal Health Officer & Member
10.	Sri G. Pradeep Kumar	Executive Engineer & Member
11.	Sri V.V. Satyanarayana	Environmental Engineer & Member
12.	Sri V. Srinivas	Assistant City Planner – I & Member
13.	Sri G.V.S. Murthy	Assistant City Planner – II & Member
14.	Sri Sirajuddin	Revenue Officer
15.	Sri Bhaskara Rao	Project Officer
16.	Sri M. Nagarjuna	Environmental Engineer, A.P. Pollution Board & Member
17.	Sri M. Ramachandra Rao	Residential Welfare Association & Member
18.	Sri S.T. Tirupathi Rao	Sanitary Supervisor & Member

19.	Sri K. Bala Krishna	Sanitary Inspector & Member
20.	Sri P.V.Satyanarayana	Sanitary Inspector & Member
21.	Sri K.A.Kondala Rao	Sanitary Inspector & Member
22.	Smt. P. Vijaya Bharathi	Town Level Fedaration & Member
23.	Sri Subba Rao	President, Hotels Association & Member
24.	Dr. D. Krishna Rao	Head of the Dept., Science & Humanities , C.R.R. Collage, Eluru & Member
25.	Sri Jagadish	Manager, Eluru Chandana Brothers & Member

CSTF Notification:

GOVERNMENT OF ANDHRA PRADESH MUNICIPAL ADMINISTRATION DEPARTMENT

O/o. the Director Municipal Administration Andhra Pradesh, Guntur : CIRCULAR:

Roc. No. 2708 /2015/M3

04/09/2016

Sub: Municipal Administration Department – Sanitation– GIZ

NUSP Phase II –

Technical Review of draft City Sanitation Plan (CSP)

Submitted by

10 ULBs and submission of final revised CSP as per the

detailed

Feedback provided – Instructions issued - Regd.

Ref: 1. G.O.RT.NO. 243, MA&UD (B2) Department, Dt: 18.04.2015

- 2. This office Procgs. No. 8807 /2014(Coordination), Dt: 26.06.2015
- 3. Circular Roc. No 2708/2015/M3, Dt: 19.08.2015
- 4. This office Procgs.No.12427/2015 (Coordination), Dt: 10.10.2015
- 5. Circular Roc. No. 2708/2016/M3, Dt. 2/06/2016
- 5. Letter from Mr. Dirk Walther, Program Director, NUSP Dt. 24.8.2016

<<<>>>

The Commissioners of the Urban Local Bodies mentioned in the address entry are aware the Government of Andhra Pradesh have launched the Swachh Bharat- Swachh Andhra - Mission and have committed to achieve the above vision of making all cities of Andhra Pradesh Open Defecation Free by 2019 ensuring proper hygiene, waste management and sanitation across the Urban Local Bodies of the State. Without proper City Sanitation Plan (CSP), comprehensive

planning cannot be developed. The City Sanitation Plan is also mandated under the National Urban Sanitation Policy and Swachh Bharat Mission (SBM) to achieve the overall sanitation goal.

- 2. In this context, GIZ is supporting C & DMA, Government of Andhra Pradesh in conducting Training and handholding process for 10 selected ULBs in Preparation of City Sanitation Plans under the technical cooperation agreement with the MoUD, GoI. As part of this initiative and under the phase-II, staff from 10 selected ULBs in the state was trained at Engineering Staff College of India (ESCI), Hyderabad from 1st to 3rd July 2015 and the 2nd training on Preparation of City Sanitation Plan (part-2) was organized at Vijayawada from 14th -16th October,2015. The 3rd part of the training was organized from 11th to 13th April 2016 at Vijayawada in coordination with German International Cooperation to prepare City Sanitation Plans on their own.
- 3. In continuation to the above, vide this office Circular (Roc. No.2708/2016/M3, Dt. 2/06/2016) all the 10 ULBs were requested to undertake the following actions for preparation of City Sanitation Plan (CSP).
 - ULBs to organize City Sanitation Task Force (CSTF) Meetings for sharing the key Issues and Goals of their respective CSPs and for jointly designing the Action Plan with the CSTF and collecting inputs for the final CSP.
 - ULBs to prepare the Final CSP Report based on the Status Report and Draft CSP according to the given template (Annexure-A)
 - ULBs to submit the Final CSP Report to DMA and GIZ for technical vetting before putting it to the Council for final approval.
- 4. In pursuance to the above instructions, the nominated 10 ULBs have submitted the draft City Sanitation Plan to C & DMA and GIZ in the month of July -August 2016 for technical review.
- 5. The GIZ team has technically reviewed the City Sanitation Plans submitted by the 10 ULBs on behalf of C & DMA.

6. The overall review has shown that further revision is of utmost necessity since the majority of cities has made only minor improvements since earlier submissions and have not prepared the required last sections of a CSPs, such as **Goals**, **Act ion Plan**, **IEC activities and financial plans**. The detailed review/Feedback sheet for each ULB to improve further is herewith attached with this Circular.

7. In view of the above, the Commissioners of the 10 ULBs are directed to comply with the above observations made by GIZ and submit the **revised final City Sanitation Plan (CSP) as per the detailed feedback including due approval of Council** to O/o C & DMA and GIZ by **23.09.2016** without fail.

8. It is also informed that upon completion of this process successfully, there would be a concluding event with award ceremony for the best performing ULB in October 2016.

9. For any further clarification, it is advised to contact Mr. Mavuduru Manoj Kumar, Technical Expert, GIZ Environment Cell, A.P., Mobile:9133331821(e-mail: mavuduru. Kumar @giz.de) positioned in the O/o C & DMA, AP Guntur.

Encl: Individual Review/Feedback Sheet for each ULB.

DIRECTOR

To.

The Commissioners of Anantapur, Nellore, Kakinada and Eluru Municipal Corporations through the concerned RDMAs.

The Commissioners of Nandayal, Narasaraopeta, Chilakaluripeta, Kadari,

Bhimavaram, and Amalapuram Municipalities through concerned RDMAs.

The Regional Director-cum-Appellate Commissioners of MA Guntur,

Rajahmundry, Anantapur for information and to pursue the matter.

Copy Submitted to the Principal Secretary to Govt, MA&UD Department,

Govt of AP, Hyderabad, for favour and kind information.

Copy to Managing Director, Swachha Andhra Corporation, Hyderabad.

Copy to Mr. Dirk Walther, Project Director, Support to National

Urban Sanitation Policy (NUSP), GIZ, New Delhi.

File No.CDMA-12057/5/2016-M SEC-CDMA

CSTF Meeting's Photographs:





Figure 2: CSTF Meeting

3. CITY PROFILE

3.1 LOCATION:

Eluru (erstwhile HELAPURI) is located 160-14' north latitude and 81°- 05' eastern longitude on the globe. It is situated on alluvial terrain in between the Krishna and Godavari deltas. It is a Class I town with a population of 2.17 lakh in 2011 covering an area of 11.52 sq.km, with 50 municipal Divisions. Eluru is the district headquarters of West Godavari District located along the rail and road route connecting Kolkata and Chennai cities.

3.2 HISTORICAL IMPORTANCE:

From 3rd century BC, West Godavari region has been hub of various activities. Many kings ruled over the region. Helapuri (Eluru) was part of the Buddhist kingdom of Vengi. Guntupalli near Kamavarapukota was the place of a Buddhist monastery of the 3rd century BC during the regime of Satavahanas. Later Ikshwakhs, Bruhatyalayanas, Salayankas, etc. established their Kingdoms. Peda vegi near Eluru had been their capital for long and more over it was centre of learning in those days. Denduluru near Eluru was the capital for Vikramendra Varma's empire during the 6th century A.D. Historical evidence can be found at the villages of Pedavegi and Guntupalli (Jilakarragudem). Raja Raja Narendra who patronized great poets and scholars such as Nannaya, Narayana Bhattu and Mallana belonged to this dynasty. Chalukya Veerabadhadra, husband of Rudrama Devi was the ruler of Nidadavole in West Godavari district.

Eluru then became a part of the <u>Kalinga Empire</u> until 1471. Later it fell into the hands of the <u>Gajapathis</u>.

In 1515 <u>Srikrishnadevaraya</u> captured it. After the fall of the Vijayanagara Kingdom, it was taken by the <u>Sultan of Golkonda</u>, <u>Kutub Shah</u>. After the British established control over South India, Eluru and surrounding areas were merged into the Madras Presidency.

During the division of Northern Cirkars into districts, Eluru was made a part of Eluru district. Later, it was included in the Godavari District in 1859. Subsequently, Eluru was made part of the Krishna District. Finally, in the year 1925, West Godavari District was formed with Eluru as its Headquarters and all the district offices and regional offices were set up in Eluru city.

3.3 HERITAGE:

The Kolleru Bird Sanctuary is around 15 km away from Eluru town in the West Godavari District of Andhra Pradesh. This sanctuary is spread across 673 sq. km of wetland and marshes that surround the famous Kolleru Lake.

The important birds seen in this sanctuary are open bill stork, grey-heron, painted stork, tern, coot, duck, reef heron, egret, cormorant, glossy ibis, jacana and common moorhen. The ideal time to visit this sanctuary is from October through May.

Dwaraka Tirumala, also known as the Chinna Tirupathi, is situated near Eluru. This temple is dedicated to Lord Venkateswara Swamy and is located on Seshadri Hill. The self-manifested idol of Sri Venkateswara Swamy was unearthed by a saint named Dwaraka and hence, the temple is called the Dwaraka Tirumala.

Eluru Ashram, also known as the Nam Datta Natha Kshetra, is associated with the Datta Peetham. There is a small temple in the ashram which has idols of Lord Dattatreya and Anagha Devi. The ashram also has idols of Lord Ganesha, Navagrahas and Lord Hanuman. There is a spacious prayer hall and a Guru Nilayam inside the ashram.

3.4 SPECIAL FEATURES OF THE CITY:

Sir CR.REDDY Institutions KG to PG established in Eluru City was founded by Alluri Bapinedu. The CRR College is famous for the birth place of National Leaders and film actors. Now, the town became a Corporation in the year 2005 having the population of 217876 as per the 20011 census and its area is 11.52 Sq.Km.

3.5 DEMOGRAPHY:

The percentage of growth of population in Andhra Pradesh is 14.59 percent. The percentage of growth of urban population is 7.68 whereas the rural areas are only 2.41 as per 2011 census. When the population growth of Eluru is observed it is recorded as 20000/- during the year 1866 by the then the newly formed Eluru Municipality. In 1901 there is a growth of 13521 and the total population is 33521. From 1911 the population data of Eluru is available and the details are given in the below table.

Table 5: - Decadal growth of population in Eluru 1901- 2047

Year	Population (nos)	Decadal growth	Growth rate %
1866	20000	0	0
1901	33521	13521	67.60
1911	37819	4298	12.82
1921	45862	8043	21.27
1931	57342	11480	25.03
1941	64911	7569	13.20
1951	87213	22302	34.36
1961	108321	21108	24.20
1971	127023	18702	17.27
1981	168154	41131	32.38
1991	212866	44712	35.19
2001	215804	2938	1.38
2011*	217876	2072	0.96
2017*	234213	16337	7.49
2032*	318260	84047	35.88
2047*	429793	111533	35.04

Note: - * Population figures as projected by Eluru Municipal Corporation (Source: EMC Status Report, Town Planning and Engg. Sections, report)

The decadal growth of Eluru when analyzed since 1901 the population growth % started from a minimum of 12.82% and touched a maximum of 67.30% in the year 1911 with a little drop to 17.27% in 1971. By 1991 the growth of population almost saturated with a negligible growth % of 1.36 in 2001, 0.95 by 2011, to take the growth of population 7.49 in 2017, 35.88% in 2032 and finally 35.04% in 2047.



Figure 3: Growth Rate

The City had fluctuation in the growth rate since decades due to many factors of influence. The present growth rate of the city is showing negative trend and the out migration is observed for many reasons stated in the table. The fluctuating growth rate is also indicative of the strong linkages the city has with its hinterlands. To name a few major instances, out migration due to development of Vishakhapatnam in 1726, outmigration due to draught in Guntur from 1832-34 & also due to development of Chennai port. Being a coastal region prone to cyclones, natural calamities have also played a significant role in the growth dynamics of the city. The high fluctuation in the growth rate indicates the resilience of the city.

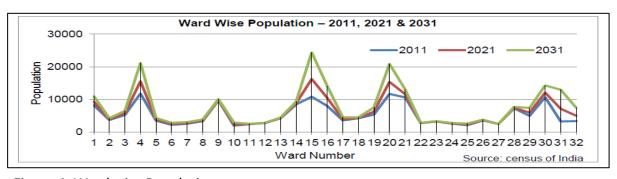


Figure 4: Ward wise Population

- i. This graph shows the projected population growth, it is indicating the growth trend of population by 2032.
- ii. Division numbers 9,10,23,50,40,1,15,21,14,24,28,27,30,31 having ability to expand and increase Division population by 2021.
- iii. Division numbers 16, 17, 11, 18, 33,43,32,34 are having very less growth of

population and remaining Divisions are having moderate growth.

iv. The same growth trend will be continued by 2032 .This growth trends shows the increase and usage of density and FSI.

v. 12, 28, 36,38,39,40 Divisions are having highest growth of population.

3.6 MUNICIPAL TIME LINE:

Notable residents

- Kommareddi Suryanarayana Rajya Sabha and Lok Sabha member in Indian Parliament,
 Indian freedom activist and
- Murali Mohan is an Indian film actor, Lok Sabha member in Indian Parliament from Rajamundry, film producer, politician and a business executive from Chataparru in Eluru Mandal.
- Sekhar Kammula is a Telugu film director whose family originally was from Eluru.
- Vedantam Prahlada Sarma was an expert Kuchipudi actor and dancer. moved to Kalakshetram, the leading Kuchipudi centre in Eluru, where he taught disciples like Raja and Radha Reddy.
- **Duvvuri Subbarao** is an Indian Economist, Central Banker and Civil Servant. He was the 22nd Governor of Reserve Bank of India, served under Prime Minister Dr.Manmohan Singh.
- Silk Smitha was an Indian film artiste who worked predominantly in the South Indian languages. She became the most sought-after erotic actress in the early 1980s. In a career spanning 17 years, she appeared in over 450 films in Telugu, Tamil, Malayalam, Kannada and Hindi languages.
- L. V. Prasad was an Indian film producer, actor, director, cinematographer and businessman. He was one of the pioneers of Indian cinema and is the recipient of the Dadasaheb Phalke Award, the highest Award for films in India. In 1980, he was awarded the Raghupathi Venkaiah Award, for his contribution to Telugu cinema. He founded Prasads Group in 1956, which include the Prasad Art Pictures, Prasad Studios, Prasads IMAX and L V Prasad Eye Institute.

• Naga Shourya is a Telugu film actor who acted in movies like Oohalu Gusagusalade, Dikkulu Choodaku Ramayya, etc., born in Eluru.

3.7 TOPOGRAPHY OF THE CITY:

The city is situated on the border of the Kolleru Lake. The Tammileru River passes through the city. The Eastern part of Tammileru borders the entire North of the city, while the Western Tammileru flows to the West of the city. The Krishna – Eluru canal passes through the heart of the city from South – West towards North – East.

The Godavari - Eluru canal, The Krishna - Eluru canal and the Tammileru River and join together at the border of Eluru in a village called Malkapuram (Palagudem) on their way to Kolleru Lake.

Tammileru River

It originates from the reserve forests near Palvancha in Khammam district. It traverses a distance of almost 200 km (120 mi) through Khammam, Krishna and West Godavari Districts before emptying itself into the Kolleru Lake. Tammileru divides into two streams near FCI godowns and joins the lake at two different points — Mondikodu and Pedayadlagadi.

3.7.1 LAND USE PATTERN:

Due to rapid urbanization of the town and steep rise in real estate values in and around Eluru town, the following projected land use pattern has been considered, as per master plan development.

Table 6: - Zone Wise Land Use Details

	Coefficient of runoff	Area in Ha.			
Type of land Use		ZONE I	ZONE II	ZONE III	ZONE IV
RESIDENTIAL	70%	27	55	20	12
COMMERCIAL	80%	8	12	4	2
INDUSTRIAL	80%	18	28	13	7

PUBLIC & SEMI PUBLIC	80%	24	35	5	2
TRANSPORTATION	80%	16	40	9	5
AGRICULTURAL/VACANT	15%	36	95	34	15
HILLS/FOREST	15%	0	0	0	0
WATER BODIES/RIVER	50%	8	28	6	4
TOTAL		137	293	91	47
Weighted of runoff					
Coefficient		59.20%	54.18%	51.54%	54.15%

As per contract Run-off coefficient should be taken as minimum of 0.59, 0.54, 0.51 and 0.54 respectively for each Zone.

3.7.2 SOIL CHARACTERISTICS:

The soils of the district are mainly 'Block cotton soil's' comprising loany silt, sandy loans and sandy clay loans. In the areas of flat topography and along sides of thammiler canal and Krishna canal and its tributaries, regur or black cotton soil is found.

3.8 ECONOMY:

The city is known the world over for its Persian carpets. It is also noted for hand rolled agarabathis or incense sticks as well as the local hair and jute industries. The upland areas of West Godavari District including Jangareddigudem and Chintalapudi amongst others are now harnessing groundwater and becoming financially sound due to the cultivation of rich commercial crops such as tobacco, palm oil and cocoa. Eluru acts as the major commercial centre for all these activities. It is also home to many wood industries

ELURU CARPETS AND ELURU HANDLOOMS:

Eluru is noted for its thriving woolen pile carpet industry. The Persians who migrated to this part of the world during the Muhammaddin regime developed the carpet industry. Most of the carpets produced here are exported. These industries are based in Tangellamudi, Eluru. Moody Carpets,

Eluru, Hafeez Carpets is one of the best known among carpet industries; they export their handmade woolen carpets mostly to Australia and USA.

AMBICA GROUP OF INDUSTRIES:

The corporate office of the Ambica Group of Industries is at Eluru. This group manufactures Ambica Agarbathi (incense sticks), cosmetics, and other aromatic products, ships to all places in the country and exports them as well. This group has also entered film production and distribution, hospitality industry, wind energy and software development. Directly or indirectly around 5,000 people are dependent on this group.

JUTE INDUSTRY:

East India Commercial Co. Ltd.'s also known as Sri Krishna jute mill Jute Industry is one of the major industries in Eluru and Kotturu City. This industry buys locally grown jute as well as imports raw jute from other States and manufactures varied jute products which are then transported and sold in different parts of the state and the country. Close to 10,000 people are dependent on this industry.

GUPTA GROUP:

The Gupta Group is mainly an export-oriented industry. They export human hair, cattle horn-tips, and carpets to different countries. Many people are dependent on this Industry too. M/S. Gupta Enterprises has been receiving the Top Exporters Award from the Govt. of India for the past 19 Years consecutively. The hair collected all over India is processed at Eluru and is exported to over 35 Countries. Mr. M. M. Gupta the founder Chairman has also founded the Gupta Foundation which does many Social service and Charity oriented products including Medical Help, Educational Assistance etc. A Bi-Annual award the "Gupta Award" is also presented to distinguished personalities and eminent people from Various Fields.

OTHERS:

Eluru has many human hair exporting companies and also large quantities of sweet water fish nearly 300 trucks every day from Eluru to various places like Bengal, Assam and north east states. Green chilies are exporting to Maharashtra, coconuts and water coconuts mainly to all over state every day. There are many paddy dealers who export paddy to all over India, which is

bought from farmers from nearby villages like kovvali, Denduluru, Palagudem etc.

3.9 ENVIRONMENTAL ISSUES:

3.9.1 CLIMATE:

Eluru city falls in the hot humid region of the country and it is less than 40 miles (64 km) from Bay of Bengal. The climate of the city is very hot in the summers and it is pleasant during the winter. The hottest day falls in the month of May with shift to June during some years. The maximum temperature observed is 51.7 C and the minimum temperature observed is 12.9 C.

3.9.2 RAIN FALL:

The average rainfall in the district is 772 mm. 71% of the annual rainfall is received by the district during south west monsoon (i.e June to September). September is the rainiest month. During summer and retreating monsoon season some amount of rainfall is received in the form of thunder showers. The variation in the annual rainfall in the district from year to year is large. On an average there are 46 rainy days. (i.e days with rainfall of over 2.5mm or more)

3.10 URBAN POOR:

There are 62 poor settlements with a population of 1,05,111 constituting 48.71% of total population of town as per 2001 census. Of the 62 poor settlements, 59 are notified and 3 are non-notified. It is an oldest Municipality established in the year 1866 is not having Roads, drainage, health and livelihoods to the urban poor. The BPL survey indicates the unemployment ratio is high which 1/3 of total population is

The Eluru is headed by the Commissioner with Six departments under him. The departments, and the services provided by them are as follows.

Table 7: Eluru area - Institutions responsible for urban service delivery

Sl. No	Service	Department
1	Water supply- bulk & distribution	Engineering Department
2	Storm water drainage system	Engineering Department

3	Sewerage	Engineering Department
4	Sanitation (liquid waste)	Engineering Department
5	Solid waste management	Engineering Department
6	Roads	Engineering Department
7	Community / Public toilets	Engineering & Sanitation Department
8	Slum up gradation	Poverty Alleviation Department
9	Primary education	Education department
10	Primary health	Public Health Department
11	Town planning	Town Planning Department

3.11 AMRUT

Thrust Areas

The Mission will focus on the following Thrust Areas:

- i. Water supply,
- ii. Sewerage facilities and septage management,
- iii. Storm water drains to reduce flooding,
- iv. Pedestrian, non-motorized and public transport facilities, parking spaces, and
- v. Enhancing amenity value of cities by creating and upgrading green spaces, parks and Recreation centers, especially for children.



The components of the AMRUT consist of capacity building, reform implementation, Water Supply, sewerage and septage management, storm water drainage, urban transport and development of green spaces and parks. During the process of planning, the Urban Local Bodies



Figure 5: AMRUT

(ULBs) will strive to include some smart features in the physical infrastructure components. The details of the Mission components are given below.

Water Supply

- i. Water supply systems including augmentation of existing water supply, water treatment plants and universal metering.
- ii. Rehabilitation of old water supply systems, including treatment plants.
- iii. Rejuvenation of water bodies specifically for drinking water supply and recharging of ground water.
- iv. Special water supply arrangement for difficult areas, hill and coastal cities, including those having water quality problems (e.g. arsenic, fluoride)

Sewerage

- i. Decentralized, networked underground sewerage systems, including augmentation of existing sewerage systems and sewage treatment plants.
- ii. Rehabilitation of old sewerage system and treatment plants.
- iii. Recycling of water for beneficial purposes and reuse of wastewater.

Septage

- i. Faecal Sludge Management- cleaning, transportation and treatment in a cost-effective manner.
- ii. Mechanical and biological cleaning of sewers and septic tanks and recovery of operational cost in full.

Storm Water Drainage

i. Construction and improvement of drains and storm water drains in order to reduce and eliminate flooding.

<u>Urban Transport</u>

- i. Ferry vessels for inland waterways (excluding port/bay infrastructure) and buses.
- ii. Footpaths/walkways, sidewalks, foot over-bridges and facilities for non-motorized transport (e.g. bicycles).
- iii. Multi-level parking.

iv. Bus Rapid Transit System (BRTS).

Green space and parks

i. Development of green space and parks with special provision for child-friendly components.

Reforms management & support

- i. Support structures, activities and funding support for reform implementation.
- ii. Independent Reform monitoring agencies.

Capacity Building

- i. This has two components- individual and institutional capacity building.
- ii. The capacity building will not be limited to the Mission Cities, but will be extended to other ULBs as well.
- iii. Continuation of the Comprehensive Capacity Building Programme (CCBP) after its realignment towards the new Missions.

Indicative (not exhaustive) list of inadmissible components

- i. Purchase of land for projects or project related works,
- ii. Staff salaries of both the State Governments/ULBs,
- iii. Power,
- iv. Telecom,
- v. Health,
- vi. Education, and
- vii. Wage employment programme and staff component.

3.11.1 AMRUT Works Sanctioned to Eluru for year 2015-16

Total Amount Sanctioned for F.Y 2015-16 - 3.46 Cr

Water Supply

Amount Sanctioned-2.96 Cr

Nature of work- Providing House Service Connections in Eluru

Number of House Service Connections-6487 connections

Status of work – **Tender Stage**

Parks

Amount Sanctioned-50 lakhs

Nature of Work--Development of Postal Colony Park

Status of work- In progress

2016-17 Sanctioned Works Report

- Draft DPR for 10MLD STP was prepared by AECOM, Asia
- TEC committee conducted meeting in Rajahmundry to verify the DPR's Prepared by AECOM remarks by TEC are yet to be given
- Resident Engineer from AECOM for End to End Support was placed in EMC
- 10MLD STP and Water Supply amount 4.20cr sanctioned for the year works were prioritized and are being mapped for the AECOM to survey and prepare a DPR for Water Supply
- Survey for preparation of DPR for **Remodeling of I town UGD** is in progress.

Table 8: AMRUT - Details of Projects SAAP 2016 - 17

			AMRU	JT - Detai	ls of Proj	ects SAAI	201	6 - 1	7			
					Proportiona te	Balance	Propo	attern	Cost of the			
SI. No.	38.4	Name of the ULB	Sector	Cost propose d in SAAP	Special assistance from APPCB @ 25% of STP cost	Allocation of Rs.100.00 Cr. under budget for Sewerage/S	CONTRACTOR OF THE PARTY OF THE	Gol	State Share	ULB share	Total	projects for which tenders to be invited in 2016-17 (*)
1	2	3	4	5	6	7	8	9	10	11	12	
_		Water	4.20	0.00	0.00	4.20	2.10	0.84	1.26	4.20	4.20	
1	ELURU	Sewerag e/Septag	14.21	1.88	4.55	7.79	3.89	1.56	2.34	7.79	14.21	
1		Storm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	
		Parks	0.5	0	0	0.5	0.25	0.1	0.15	0.5	0.5	
		Total	18.91	1.88	4.55	12.49	6.24	2.5	3.75	12.5		

OVERVIEW:-

Living environment in the poor settlements is characterized by the absence of basic infrastructural services like roads, drains, water supply, street lighting and proper sanitation affecting the quality of life of the urban poor. Recognizing this fact, the Municipal Corporation, Eluru making efforts to provide these basic services with municipal funds and with other scheme funds such as APUSP, HUDCO, UIDSSMT, NFDB (National Fisheries Development Board) scheme, etc.

Table 9: - Ward data (Administrative Boundary Map-Annexure I)

Ward. No.		Area (Hectare)	No. of Households	Populat Total		Female	Density (persons / - Hectare)
1	Mrc Colony Jangareddy Gudem Road (PART Arundhathi pet Pension line	1.10	1560	5484	2726	2757	
2	Laxmivarapu Pet Part Gun Bazar Part Panduranga Puram Old Bus Stand Area Railway Station Goods Shed Road	0.50	1357	5064	2478	2586	
3	Bavisettivari Pet Komadavolu Road Nalladibba	0.28	1279	4394	2140	2254	
4	Satyanarayana Pet Navab Pet Yesupadapuram (Part)	0.17	1194	4387	2119	2268	
5	Vennavallivari Pet Lambadi Pet Teachers Colony	0.20	1200	4768	2502	2264	

6	Benarjee Pet Main Bazar Katthepu Street	0.22	1048	4979	2474	2505	
7	Panta Kaluva Road Kummarla Veedhi Chataparru Road Vivars Colony	0.18	1122	4440	2165	2275	
8	Yusuf Doctor Veedhi Karicherla Vari Veedhi Uppu Vari Veedhi Mothevari Old Building Road	0.12	1048	4016	1986	2030	
9	Pilas Pet Pichukagunta	0.11	1054	3957	1949	2008	
10	Mekaraju Veehi Kottha Gudem Kikaluru Road Veeramusti Colony	0.10	1201	4514	2213	2301	
11	Venkanna Cheruvu Road Pallapu Veedhi Dudekulavari Veedhi Nukala Satyam Veedhi Markandeya Swamy Temple Veedhi (Part)	0.14	1027	3777	1951	1826	
12	Marvadi Temple Street Ponangi Road (Part) Southern Street (Part)	0.08	1393	4650	2308	2342	
13	Krishna Canal Street Agraharam Peruguchettu Centre Main Bazar (Part) Tower Clock Centre Nallamandu Sandhu Kotadibba	0.35	1210	3549	1745	1804	

14	Verusanagakkaya Factory Road Jwalaprahameswara Colony Kikaluru Bypass Prasanthi Nagar Ponangi Road (Part) Vaddera Gudem	0.13	1263	3915	1923	1992	
13	Brahmamgari	0.14	1033	3430	1719	1711	
16	Sanagapappu Bazar Kandakam Road 5 Dukanala Centre Ponangi Road	0.09	952	4373	2164	2209	
17	Gandhi Midhanam Krishna Canal Road Bommala Gudi Veedhi Singara Appala Swamy Temple	0.11	1163	3917	1913	2004	
18	Ganganamma SchoolKobbari Thota (Part)Pedapadu Road (Part)Jogimeda Veedhi	0.08	972	4558	2298	2260	
19	Kobbari Thota (Part) Arundathi Pet Kikaluru Bipass Road	0.07	777	4860	2419	2441	
20	Amudala Appalaswamy Colony Gandhi Colony Nerellaraja Colony Vangayagudem Centre Pedapadu Road Ramalayam Veedhi	0.25	1032	3874	1871	2003	

21	GL.		T	$\overline{}$		1	
21	Subramanyam Colony Baptist Pet Laxmamma Tank Gulabi Thota Head Water Works Road	0.83	1218	4428	2191	2237	
22	Ramakrishna Puram Vijaya Gardens Postal Colony 4th Class Employees Colony	0.53	927	3630	1796	1834	
23	Santhi Nagar 1-7 Roads	0.36	1292	4713	2374	2339	
24	Santhi Nagar 7th Road Part Santhi Nagar 8-13 Roads	0.46	1089	4935	2456	2470	
25	Ameena Pet Rtc Depot Ameen Pet Church T.D.P Office	0.63	1297	3690	1872	1818	
26	Narasimha Rao Pet New Rtc Bus Stand	0.50	976	3351	1590	1761	
27	Ameena Pet	0.30	952	3211	1529	1682	
28	Ashok Nagar	0.00	1347	5320	2616	2704	
29	Chandra Guptha Colony Tapi Mesthri Colony Provident School Tytas Nagar	0.25	1133	4468	2222	2246	
30	Patthebadha -1 Mothevari Thota Manchineella Thota	0.23	1536	5926	2968	2958	
31	Sanagapappu Bazar Kandakam Road 5 Dukanala Centre Ponangi Road	0.16	957	3198	1539	1659	

	- 11 : 3 <i>E</i> : 11			$\overline{}$			
32	Gandhi Midhanam Krishna Canal Road Bommala Gudi Veedhi Singara Appala Swamy Temple		1069	3558	1729	1829	
33	Ganganamma School Kobbari Thota (Part) Pedapadu Road (Part) Jogimeda Veedhi (Part) Kammula Appanna Bangla Veedhi	0.15	894	3764	1875	1889	
34	Kobbari Thota (Part) Arundathi Pet	0.17	1195	3885	1892	1993	
35	Amudala Appalaswamy Colony Gandhi Colony Nerellaraja Colony Vangayagudem Centre Pedapadu Road Ramalayam Veedhi	0.18	1086	3856	1880	1976	
36	Subramanyam Colony Baptist Pet Laxmamma Tank Gulabi Thota Head Water Works Road	0.13	1150	5203	2551	2652	
37	Ramakrishna Puram Vijaya Gardens Postal Colony 4th Class Employees Colony	0.06	992	3974	1891	2083	
38	Santhi Nagar 1-7 Roads	0.18	857	5284	2592	2692	
39	Santhi Nagar 7th Road PartSanthi Nagar 8-13 Roads	0.31	1298	6479	3215	3264	

	Ameena Pet		T	$\overline{}$			
40	Ameena Pet Rtc Depot Ameen Pet Church T.D.P Office	0.18	1082	5896	2881	3015	
41	Vimala Devi School Ganugula Pet Road Dasari Vari Street Tagoor Centre	0.08	825	4404	2136	2268	
42	12 Pampula Centre Bosu Sibiram Centre	0.07	883	4405	2136	2269	
43	Power Pet (Part-I) Power Pet Gate –New Flyover	0.15	899	4668	2444	2224	
44	Kankanala Vari Street Chodi Dibba Rahmath Street Narni Viresalingam Vari Street Gadi Vari Street Sekhar Street	0.00	1015	3744	1809	1935	
45	Sekhar Street Part Sabbavarapu Vari Street Chodi Dibba Part	0.15	1077	4107	1983	2109	
46	Sabbavarapu Vari Street Part Gilakla Gate Karvi Vari Street	0.07	916	4427	2141	2286	
47	Relli Peta Gun Bazar Part Nookalamma Temple Service Resorvoir No.3	0.07	892	3808	1873	1935	
48	Adivarapu Pet Gun Bazar Part Laxmivarapu Pet Part-Ii	0.10	997	4070	2011	2059	
49	Chodi Dibba Adivarapu Pet Part-Ii	0.11	1223	4751	2325	2426	

50	Jangareddy Gudem Road Part Kabadigudem Mala Pet	0.15	1055	3817	1842	1975	
TOTAL:		10.98	55014	217876	107422	110427	

Table 10: Slum Data

		Loc atio	Category (Notified,	Area	No. of	Popula	tion		Dens ity
Sr. No.	Slum Name	n / War d	Recognized, Identified)	(Hectar e)	Househ olds	Total	M	F	(pers ons / Hect
1	Arundathi peta in Jangreddy gudem road	1	Notified	3.52	124	557			
2	Pension line	1	Notified	4.69	71	319			
3	Gawarapeta in Tangellamudi	1	Notified	0.44	494	2225			
4	Bapuji colony	1	Notified	0.39	81	365			
5	Pandurangapuram	2	Notified	1.86	60	269			
6	Bavisettivari street	3	Notified	3.9	92	413			
7	Navsabipet Bit No.	4	Notified		706	3177			
8	Satyanarayanapeta Phase 1	4	Notified	3.22	245	1104			
9	Yesupadapuram	4	Notified	7.91	644	2896			
10	Lambadi peta	5	Notified	1.56	86	387			
11	Site between Chattaparru Road & PWD	6	Notified	8.45	100	448			
12	Weavers colony	7	Notified	1.42	638	2870			
13	Philospeta	9	Notified	1.71	77	345			
14	Seven channels	9	Notified	2.1	362	1628			
15	Kathepu street area	10	Notified	1.51	304	1368			
16	Jalapahareswara colony in Dakshina veedi	14	Notified	2.75	308	1385			

17	Area Behind Katta subba rao oil mill	14	Notified	0.8	282	1271	
18	Upparagudem	15	Notified	3.35	211	949	
19	Kobbari thota	18	Notified	40.57	197	885	
20	Amudala appalaswamy Riksha pullers colony	20	Notified	1.95	291	1310	
21	Nerella Raja colony	20	Notified	1.01	163	732	
22	Gandhi colony	20	Notified	2	428	1925	
23	Arundahti peta (vangagudem)	21	Notified	0.69	138	620	
24	Vangayagudem	21	Notified	6.32	457	2057	
25	Maheswari colony (vangayagudem)	21	Notified	2.09	188	844	
26	Gollaigudem	21	Notified	2.45	131	590	
27	Ramakrishnapuram	22	Notified	4.8	299	1346	
28	Area on west side of C.R.R.College	23	Notified	2.02	253	1138	
29	Piranguladibba	24	Notified	25.03	198	890	
30	N.R.Pet area in between railway line and over bridge	26	Notified	5.91	412	1854	
31	Area Behind Govt.Hospital	27	Notified	1.51	318	1433	
32	Ameena pet	28	Notified	1.07	121	544	
33	Sekhar Nagar	28	Notified	3.85	165	742	
34	Titus nagar (kandrikagudem)	29	Notified	3.82	196	884	
35	Sunnapubati area	29	Notified	1.41	159	717	

36	Tapimastry colony	29	Notified	2.02	38	172	
37	Tammileru band(near mothey vari thota)	30	Notified	11.98	244	1099	
38	Kanukuri vari that	30	Notified	3.85	402	1810	
39	Pathebad	31	Notified	4.37	468	2105	
40	Chittivalasa pakalu	33	Notified	0.83	194	875	
41	Site behind SESDMH school	34	Notified	4.17	246	1106	
42	Scavengers aea Gandhi nagar	37	Notified	1.64	204	919	
43	Rani nagar	38	Notified	10.57	419	1885	
44	Kummari revu	39	Notified	0.24	770	3467	
45	Pushpa leela nagar	39	Notified	3.24	53	240	
46	Burial ground tangellamudi	39	Notified	5.34	658	2960	
47	Sivagopalapuram tangellamuid	39	Notified	1.83	65	292	
48	Site between chintalapudi &	39	Notified	1.71	368	1654	
49	Area near vasudevalayam	43	Notified	3.63	222	998	
50	Gandhi nagar 3	44	Notified	0.63	720	3240	
51	Gandhi nagar 1	45	Notified	0.48	435	1956	
52	Gandhi nagar 2	45	Notified	1.27	1338	6019	
53	Gun bazar	48	Notified	2.23	364	1640	
54	Chodidhibba	49	Notified	6.8	311	1398	
55	Arundhathi pet in (TangellamudiBit No-2)	50	Notified	3.27	156	700	
56	Kabadigudem	50	Notified	0.84	308	1388	

57	Harizanavada Abuting Jangareddy gudem	50	Notified	3.27	94	424		
58	Harizanavada in tangellamudi	50	Notified	2.28	154	692		
59	Ambedkar nagar Tangellamudi	50	Notified	1.29	248	1118		
60	Vijaya gardens	22	Non Notified	NA	0	0		
61	Yettigattu (behind DSP Bunglow)	1	Non Notified	NA	0	0		
62	Basava Tarakam colony (behind venugopala swamy temple)		Non Notified	NA	0	0		
TOTAL:					17476	78644		

Ground water table data



Figure 6: Ground water table data

4. WATER SUPPLY:-

There are two Summer Storage Tanks. One at Eluru Head Water Works (Krishna Water) and the other at Malkapuram Water works (Godavari Water) of capacity together 33MD.

Fourteen numbers of ELSLs of at three different places namely at Kotadibba, Chodidibba, RR Pet, Ashoknagar, Santhoshnagar, Navabpet, Kabadigudem, Chanakyapuri colony, Ganugulapet, Tapimestry colony, Ameenapet, Lankapet, Kothapet, Chenchula. The details of Assets are given in Table:

Table 11: Details of Assets of Water Supply in Eluru

	Immovable assets								
Sr. No.	Asset Description	Location	Area / Length Sqm/Mtrs						
1	Head Water Works & Summer Storage Tanak-Krishna Water	Head Water Works	70 Acres						
2	Summer Storage Tank Godavari Water	Malkapuram	130 Acres						
3	Water Tank	Amudala Appalaswami Colony	1937.33 Sqm						
4	Water Tank	Gajjalavari Cheruvu	2579.90 Sqm						
5	Water Tank	Shanthinagar	4726.44 SQM						
6	Water Tank	Near ASR Stadium	836.44 SQM						
7	Water Tank	Jwalapahareswara Colony	1890.40 SQM						
8	Water Tank	Weavers Colony	2458.20 SQM						
9	Water Tank	Postal Colony	7158.18 SQM						
10	ELSR -1	Kotadibba							
11	ELSR	Chodidibba							
12	ELSR	Kothapet	2507.31SQM						
13	ELSR	Navabpet	780.30						

14	ELSR	Kabadigudem	1823.30 SQM
15	ELSR	Old Bus Stand (Chenchula Colony)	0.48 CENTS
16	ELSR	Rajivgandhi Park (Ashok Nagar)	
17	ELSR	Chanakyapuri colony	
18	ELSR	Vimaladevi (Ganugulapet)	
19	ELSR	Lankapeta	
20	ELSR	Tapimestry Colony	
21	ELSR	Santhoshnagar	
22	ELSR	RR Pet	
23	ELSR	Ameenapet	
24	ELSR	NR Pet	
25	ELSR	Kotadibba II	

Table 12: Water Supply Coverage

	Dry Season	Wet season
Percentage with house connections	_	60%
Percentage served by stand posts	_	4%
Total with piped water supply	_	98%
Percentage served by tankers	_	2%
Average supply time per day	_	2 hr./day
Average per capita supply	_	135 LPCD
Average percentage losses in system (NRW, UFW)	_	54%

Table 13: Water Demand Forecasting

Т	Parameter	Calculation	Remarks
1	Current population of city with piped water supply	227000	
2	Current treatment capacity of WTP/Treated water supplied to the city (MLD)	44.82/35.00	
3	Current technical/distribution losses (MLD)	3.00	
4	Hence actual treated water supplied (MLD)	32.00	
5	Hence per capita water supply	141.00 LPCD	
6	Water requirement of the city	135.00LPCD	
7	Hence current required treatment capacity/water demand.	No gap in demand for treatment plant	

Table 14: Zonal Level Water Supply

	Table 14. Zonat Level Water Supply											
Zon	Zone name	Reser	Cap	Wards	No. of	No.	Wate	Per	Frequ	Но	Pressure	Re
e		voir	acit	served	HH	of	r	capita	ency	urs	Adequate/Ina	m
No		Type	у			conn	Quali	supply(A	of	of	dequate	ar
			(KL			ectio	ty	dequate,	water	sup		ks
)			ns		Inadequa	suppl	ply		
								te)	у			
1	2	3	4	5	6	7	8	9	10	11	12	13
Zon e I	J P Colony	Intaze	100	6,7,8 &9	3253	1432	Good	Adequate	Daily Twice	2	Adequate	
Zon e I	Weavers colony	Intaze	800	10,11, 12,14, &15	2530	1462	Good	Adequate	Daily Twice	2	Adequate	
Zon e I	Kotadibba	Recta ngular	682	10,11, 12,13,	4623	2823	Good	Adequate	Daily Twice	2	Adequate	
Zon e I		Intaze	113 2	16&1 7			Good	Adequate	Daily Twice	2	Adequate	

Zon e I		Intaze	800				Good	Adequate	Daily Twice	2	Adequate	
Zon e I	AA colony	Intaze	682	15,19, 20&2 1	2252	1161	Good	Adequate	Daily Twice	2	Adequate	
Zon e I	RGK colony	Intaze	500	18&2 1	1552	896	Good	Adequate	Daily Twice	2	Adequate	
Zon e I	Gajjala vari cheruvu	Intaze	500	6,7,& 8	2032	828	Good	Adequate	Daily Twice	2	Adequate	
Zon e I	Navab peta	Intaze	800	3,4,& 5	3673	1456	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Old bus stand	Intaze	100	1,2,33 ,&43	3773	1328	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	RR peta	Intaze	682	26,31, 32,34, &35	2115	922	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	NR peta	Intaze	700	25,26, 27&2 8	2332	1089	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Santosh Nagar	Intaze	500	35,36, 37,&4 1	2038	1086	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Vimaladev i School	Intaze	800	37,41, 42,&4 4	2532	1023	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Chanakyap uri colony	Intaze	500	30,31, 32,&3 4	1923	926	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Amena peta	Intaze	500	25,27, &28	1532	736	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Rajiv Gandhi Park	Circul ar	180	27,28, &31	244	129	Good	Adequate	Daily Twice	2	Adequate	
Zon e II	Police Quarters.	Circul ar	40	25	480	89	Good	Adequate	Daily Twice	2	Adequate	
Zon e III	Lanka peta	Intaze	500	29,38, 39&4 0	1638	868	Good	Adequate	Daily Twice	2	Adequate	
Zon e	Kotha peta	Intaze	136 2	44,45, 46,47, 48,&4	3131	1263	Good	Adequate	Daily Twice	2	Adequate	

III				9								
Zon e III	Chodi dibba	Recta ngular	140	41,42, 44,45, 49	3628	1228	Good	Adequate	Daily Twice	2	Adequate	
Zon e III	Kabadi Gudem	Intaze	550	1,40, &50	2523	1083	Good	Adequate	Daily Twice	2	Adequate	
Zon e III	ASR stadium	Intaze	500	1,2,48 ,&49	1543	864	Good	Adequate	Daily Twice	2	Adequate	
Zon e III	Tapi maistry colony	Intaze	500	29&3 8	1462	689	Good	Adequate	Daily Twice	2	Adequate	
Zon e IV	Santhi Nagar	Intaze	120	23,24, &25	3278	1643	Good	Adequate	Daily Twice	2	Adequate	
Zon e IV	Postal colony	Intaze	500	22	927	568	Good	Adequate	Daily Twice	2	Adequate	
					55014	2559 2						

Table 15: Non Revenue Water Supply

Cost Recover y	2014	2013	2012	2011	2010
Operating Expenses (Rs.)	4,24,56,413	4,34,34,752	3,60,55,887	2,38,84,944	2,40,52,748
Operating Revenues (Rs.)	2,18,08,081	1,60,36,213	1,94,43,940	1,35,14,401	1,75,71,314
Cost Recovery (%)	51.37	36.92	53.93	56.78	73.05

TABLE 16: EXISTING DISTRIBUTION SYSTEM

DISTRIBUTION:

Details of Bore Water Pumps pumping from Collection Wells to 8 ELSRs

S.No	Location of ELSR and Collection Well	Capacity of Pump HP	No. of Motors	
			Working	Standby
1	Shanti Nagar	20 HP	2	1
2	Ameena Peta	15 HP	2	1
3	Chanakyapuri Colony	15 HP	2	1
4	Tapi Maistry Colony	15 HP	2	1
5	Kabadi Gudem	15 HP	2	1
6	Navab Peta	15 HP	2	1
7	Gajjala Vari Cheruvu	15 HP	2	1
8	AA Colony	15 HP	2	1

Details of Sub Zones of Existing Distribution System

Zone Nos.	Area in Hec.
Zone 1A	NA
Zone 1B	NA
Zone 1C	NA
Zone 2A	NA
Zone 2B	NA
Zone 3	NA

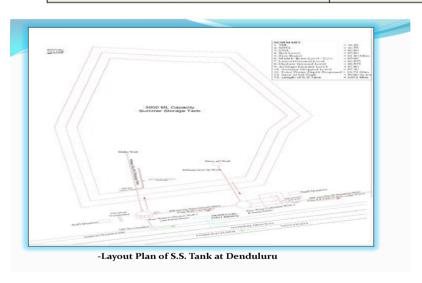


Figure 7: Layout plan of S.S. Tank at Denduluru

Figure 8: Head -Water Work



4.1 HISTORY OF WATER SUPPLY:

The protected water supply scheme for this City was contemplated and introduced in 1919. This system was protected water supply comprises raw water storage tanks, suction wells, pumping station, two Jewel Mechanical Horizontal Filters and a reservoir with two compartments with storing capacity.

The principal source of water is from Krishna River drawn through Eluru Canal (Vijayawada – Eluru) and Godavari River drawn through Eluru canal (Tadepalligudem – Eluru) via Good water channel. Raw water is being drawn to the two raw water storage tanks by 24" C.I. main and then the raw water is being drawn by 14" C.I. main from storage tanks into setting tanks known as coagulation tanks. After necessary treatment, the water was

pumped by 22 H.P. motor from suction well to the mechanical Jewel Horizontal pressure Filters.

4.2 EXISTING WATER SUPPLY SYSTEM:

Present water supply network the source of water supply to the city is Good water channel which is a part of Eluru Canal which is a distributed from the Krishna and Godavari Rivers. The location of the collection point at which the water is collected is near Head water works and Malkapuram than it is transported and stored at the storage reservoir of 3680 MLD capacity at Head Water Works

(Head Water works 680MLD and Malkapuram 3000 MLD)Compound through pipelines.

There are two filtration plant of capacity 44 MLD (30 MLD+8 MLD+4.1 MLD+2.72 MLD). After the filtration process water is supplied to the 23 Elevated Level Service Reservoirs in Eluru Municipal Corporation. Currently the 33 MLD Raw water drawn from the Krishnha and Godavari Canals and to supply the required Demand 30 MLD at the rate of 135 LPCD domestic water supply (Municipality is able to distribute 135 LPCD of potable water).

Table 17: Capacities of SS Tanks, Treatment Plants and ELSR's

STO	RAGE	TREATMEN	NT PLANT	ELEVATED STORAGE		Total
Location Of S.S	Capacity (In ML)	Location	In MLD	Location	In MLD	In MLD
Head Water Works Compound	680 at Old Head Water	Head Water Works	30	Head Water Works Compound	30	30
Compound	Works 3000 New Water	Compound at Pampula cheruvu		J P Colony Weavers colony	0.8	
	Storage Tank at Malkap uram			Kotadibba	0.682 1.136	
				AA colony	0.5	
				RGK colony	0.5	
				Kotadibba	0.8	
				Gajjala vari cheruvu	0.5	

Total	3680	1	33	23	16.642	46.642
				Rajiv Gandhi Park	0.18	
				Tapi maistry colony	0.5	
				Amena peta	0.5	
				Chanakyapuri colony	0.5	
				Postal colony	0.5	
				Santhi Nagar	1.2	
				ASR stadium	0.5	
				Kabadi Gudem	0.5	
				Vimaladevi School	0.8	
				Chodi dibba	0.5	
				Kotha peta	1.362	
				Lanka peta	0.5	
				Santosh Nagar	0.5	
				NR peta	0.7	
				RR peta	0.682	
				Old bus stand	0.5	
				Navab peta	0.8	

4.3 LIST OF WATER SUPPLY COMPONENTS WITH THEIR CAPACITY:

In total, 23 storage reservoirs with capacity 16.642 MLD are present in Eluru Municipal Corporation. Eluru Municipal Corporation is the body which 135 LPCD provides and

maintains water supply system in the municipal Corporation area. The frequency of the water supply is Twice in a day for Two hours.

The existing length of the distribution mains is 158.14 km provided. The 98% of the distribution line cover the whole municipal Corporation area. Due to the absence of distribution lines in certain areas sufficient water is not being supplied few parts of the City. Supplied 2% of the water through the tankers. Leakages are there in the old distribution lines.

4.4 CONNECTION AND CHARGES:

There are 23795 household connections against the 55019 number of households. The total no. of tap connections in the city is 23904 out of which only 109 are metered connections. There are 1271 public stand posts spread across the entire municipal Corporation area. The monthly charge is INR 120 per connections for both domestic consumers and non-domestic consumers.

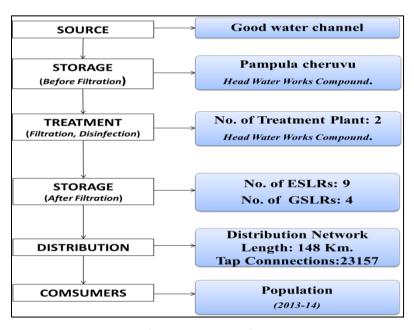


Figure 9: Water supply system at a glance

Water supply zones

For the convenience of coverage, distribution and maintenance of the water supply network is distributed into 4 zones. These zones are delineated on the basis of coverage areas of the Elevated Service Reservoirs.

Table 18: Zone delineation with Divisions and serving reservoirs

Zone	Included Division	Serving ELSRs
1	23,24,2526,27,28	Head Water Works Compound
		Santhinagar
2	3,4,5,2,32,50,1,35,29,30,47,22,	Navabpet
	31,33,34,36,37,38,39,40,41,42, 43,44,45,46,48,49	Oldbusstand
	13,11,13,10,10,17	RR Pet
		Santhoshnagar
		Lankapet
		Kothapet
		Kabadigudem
3	6,7,8,9,10,11,12,13,16,17,18	Weavers Colony
		Kotadibba I
4	14,15,19,20,21	AA Colony

5. ACCESS TO TOILETS:

Table 19: Coverage of Toilets (Individual & Community)

			No. of	HHs		No of urb	oan poor HHs		D 1
Ward	Total HHs	Urban poor HHs	Having individ ual toilets	Depende nt on communi ty toilets	Practicing open defecation	Having individual toilets	Dependent on community toilets	Practicing open defecation	Remark s
1	1560	770	1520	30	0	730	40	0	
2	1357	60	1327	0	0	30	30	0	
3	1279	92	1269	10	0	82	10	0	
4	1194	1105	1194	0	0	1105	0	0	
5	1200	86	1200	0	0	86	0	0	
6	1048	100	1039	9	0	100	0	9	

7	1122	638	1122	0.	0	638	0	0	
8	1048	0	1048	0.	0	0	0	0	
9	1054	439	1044	10	0	429	10	0	
10	1201	304	1201	0	0	304	0	0	
11	1027	0	1027	0	0	0	0	0	
12	1393	0	1393	0	0	0	0	0	
13	1210	0	1210	0	0	0	0	0	
14	1263	590	1263	0	0	590	0	0	
15	1033	211	1033	0	0	211	0	0	
16	952	0	952	0	0	0	0	0	
17	1163	0	1163	0	0	0	0	0	
18	972	197	972	0	0	197	0	0	
19	777	0	777	0	0	0	0	0	
20	1032	882	1032	0	0	882	10	0	
21	1218	914	1208	10	0	904	10	0	
22	927	299	917	10	0	288	10	0	
23	1292	253	1292	0	0	253	0	0	
24	1089	198	1079	10	0	188	10	0	
25	1297	0	1297	0	0	0	0	0	
26	976	412	976	0	0	412	0	0	

28 1347 286 1347 0 0 286 0 0 29 1133 393 1133 0 0 393 0 0 30 1536 646 1536 0 0 646 0 0 31 957 468 957 0 0 468 0 0 32 1069 0 1069 0 0 0 0 0 33 894 194 884 10 0 194 0 0 34 1195 246 1195 0 0 246 0 0 35 1086 0 1086 0 0 0 0 0 36 1150 0 1150 0 0 0 0 0 38 857 419 857 0 0 194 10 0 39 1298 1058 1288 10 0 1048 10 0 40	27	0.52	210	0.50	0		210			
29 1133 393 1133 0 0 393 0 0 30 1536 646 1536 0 0 646 0 0 31 957 468 957 0 0 468 0 0 32 1069 0 1069 0 0 0 0 0 33 894 194 884 10 0 194 0 0 34 1195 246 1195 0 0 246 0 0 35 1086 0 1086 0 0 0 0 0 36 1150 0 1150 0 0 0 0 0 37 992 204 982 10 0 194 10 0 38 857 419 857 0 0 419 0 0 40 1082 0 1052 30 0 0 0 0 41 825<	27	952	318	952	0	0	318	0	0	
30 1536 646 1536 0 0 646 0 0 31 957 468 957 0 0 468 0 0 32 1069 0 1069 0 0 0 0 0 33 894 194 884 10 0 194 0 0 34 1195 246 1195 0 0 246 0 0 35 1086 0 1086 0 0 0 0 0 36 1150 0 1150 0 0 0 0 0 37 992 204 982 10 0 194 10 0 38 857 419 857 0 0 419 0 0 39 1298 1058 1288 10 0 1048 10 0 40 1082 </td <td>28</td> <td>1347</td> <td>286</td> <td>1347</td> <td>0</td> <td>0</td> <td>286</td> <td>0</td> <td>0</td> <td></td>	28	1347	286	1347	0	0	286	0	0	
31 957 468 957 0 0 468 0 0 32 1069 0 1069 0 0 0 0 0 33 894 194 884 10 0 194 0 0 34 1195 246 1195 0 0 246 0 0 35 1086 0 1086 0 0 0 0 0 36 1150 0 1150 0 0 0 0 0 37 992 204 982 10 0 194 10 0 38 857 419 857 0 0 419 0 0 39 1298 1058 1288 10 0 1048 10 0 40 1082 0 1052 30 0 0 0 0 41 825	29	1133	393	1133	0	0	393	0	0	
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45 1077 435 1077 0 0 435 0 0	43	899	222	889	10	0	212	10	0	
	44	1015	720	1015	0	0	720	0	0	
	45	1077	435	1077	0	0	435	0	0	
46 916 0 916 0 0 0 0	46	916	0	916	0	0	0	0	0	

47	892	0	892	0	0	0	0	0	
48	997	364	997	0	0	364	0	0	
49	1223	311	1213	10	0	301	10	0	
50	1055	960	1045	10	0	950	10	0	
TOTA L	55014	14794	54775	239	0	14614	180	0	

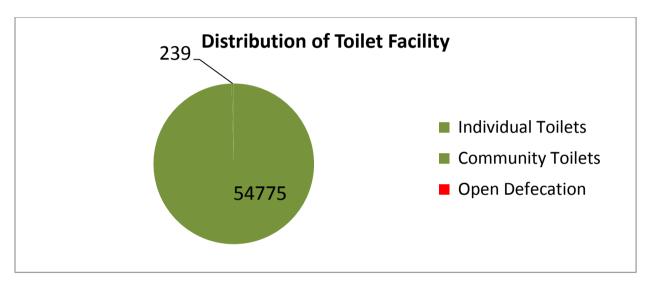


Figure 10: Distribution of Toilet Facility

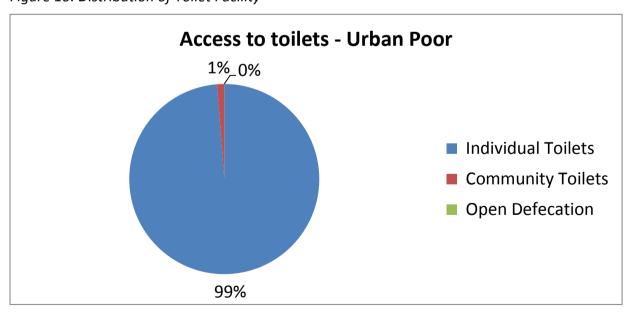


Figure 11: Access to toilets- Urban Poor

Table 20: Community Toilets Blocks

S r.	Location	No. of dep end	No Sea S	o f at	No of Urina ls		Waste disposal arrange ment (septic	status	Des ign con side rati	Is compl aint syste	Ow ned & by	User (Rs)	Co st (%)	R e m
N o	/ Ward	ent Pop ulati on	M	w	M	W	tank, sewered	etc	on for men & Yes / No	m redres sal availa ble?	Ma inta ine d	char ges	Re cov ery	a r k s
1	Chittivala sapakalu 33 Division	360	6	6	0	0		Function ing	Yes	Yes	Maintai ned EMC	No	0	
2	Yetigattu 37 Division	360	6	6	0	0		Function ing	Yes	Yes	Maintai ned EMC	No	О	
3	Pamuladi bba 34 Divison	720	12	12	0	0		Function ing	Yes	Yes	Maintai ned EMC	No	О	
4	RR Peta Park 32 Division	360	6	6	0	0		Function ing	Yes	Yes	Maintai ned EMC	No	O	
5	Titus Nagar 29 Division	720	12	12	0	0		Function ing	Yes	Yes	Maintai ned EMC	No	О	
7	Titus Nagar 29 th Division	720	12	12	0	0		Function ing	Yes	Yes	Maintai ned EMC	No	O	

	Table 21	l: Public 1	Toil											
Sr.	Locatio	No. of	No)	No	of	Waste	Functi	Desig		Maint	User	Cost	Re
No	n /	floating	of		Ur	ina	disposal	onal(n	mpl	ained	charges	Recov	m
	Ward	depende	Sea	a	ls		(sewere,	water,	consid	aint	Owne d &	(Rs)	ery	ar
		nt	4				arrange	status	eratio	redr	by		(%)	ks
		populati	M	W	N	W	ment			esse				KS
		on					etc)	etc)	n for	r				
							open	lightin	men &	avai				
							drains,	g,	Yes /	labl				
							septic		No	e				
							tank,		(priva	syst				
									cy)-	em				
									wome					
									n					
									11					
	Fish										Mainta			
	market 6							Availab			ined	charge		
1	Division	360	6	6	0	0	septic tank	le	Yes	Yes	Private	S		
								10			Agenc	Collectin		
											у	g Private		
	D 11													
_	Budda	150	4	1			septic tank	Availab	Yes	Yes	Mainta			
	park ^	130	4	1			septic tank	le	1 es	res	ined	charge		
	Divison										Private	S		
	NS										Mainta	User		
3	Market	210	5	2	0	0	septic tank	Availab	Yes	Yes	ined	charge		
	13						F	le			Private	S		
	Division										Agenc	Collectin		
	YMHA										Mainta			
4	Hall 13	150	4	1	0	0	septic tank	Availab	Yes	Yes		charge		
	th	150	+	1	U	U	septic talik	le	1 68	1 68	Private	s		
	Division													
	-									+	Mainta	Collectin User		
	Opp Municin											charge		
	Municip	150		1		_	,· , •	Availab	3 .7	177	ined			
5	al Office	150	4	1	0	0	septic tank	le	Yes	Yes	Private			
	13										Agenc	Collectin		
	Divison										у	g Private		
										-		A gapay		
											Mainta	User		
	Dmho										ined	charge		
6	Office	450	10	5	0	0	septic tank	Availab	Yes	Vac	Private	S		
0	Road 2	430	10)	U	U	sepue tank	le	168	168		Collectin		
	Division										Agenc	g Private		
											У	Agency		
												rigency		
	1	I .			1		<u>I</u>	1	1	1	1	l .		

				1			Ī	1			1	
7	Godds Shed Road Near Old Bus Stand 2 Division	150	4	1	0	0	septic tank	Availab le	Yes	Mainta c ined s Private Agenc y g l	User harge ollectin Private gency	
8	Over bridge Side road 27 Division	120	2	2	0	0	septic tank	Availab le	Yes	Mainta c ined s Private Agenc y	User harge ollectin Private gency	
9	Near Court Center 25 Divison	120	2	2	0	0	septic tank	Availab le	Yes	Mainta c ined s Private Agenc v g l	User harge ollectin Private gency	
10	RR Pet Park	150	4	1	0	0	septic tank	Availab le	Yes	Mainta c ined s Private Agenc v g l	User harge ollectin Private gency	

5.1 ODF Certification by QCI

Eluru Municipal Corporation was awarded Open defecation free by Quality control of India on $24^{\rm th}$ October 2016.

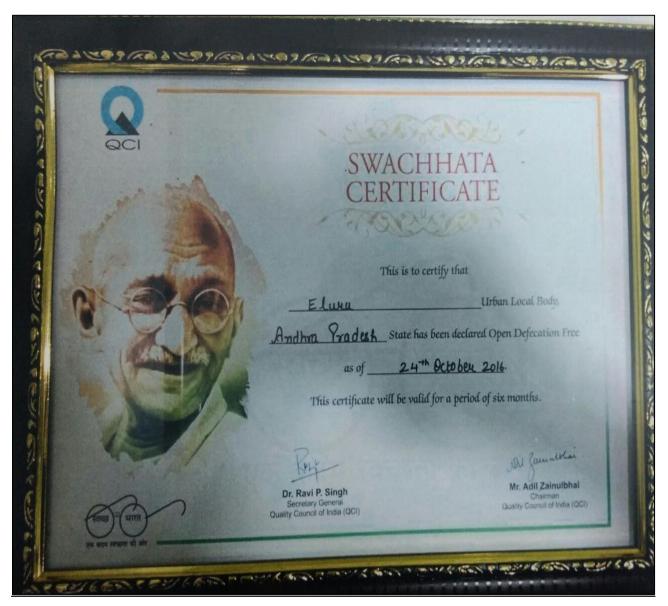


Figure 12: Swachhata Certificate

6. WASTE WATER MANAGEMENT:

6.1 COVERAGE OF DRAINAGE:

The performance of the existing drainage network in eluru as seen from profile of the city, the undulations are severe at present there are no separate storm water drains exist. Street drains designed for sullage are carrying storm water flows upto certain extent. The present sullage drains 55% of length are pucca, 20% of length of kutcha drains and 30% of drains are unserved.

The present system of existing drainage fall under three categories in general

- a) Minor sullage drains
- b) Natural flow drainage channels
- c) Ponds/low lying water bodies

There is already some drainage system is existing, however it is not properly integrated and also the levels are not matching to suit the final disposals. Hence the section of these drains are redesigned and integrated to the new system, the DPR and Proposals are Under Progress.

Table 22: Coverage of Drainage

Percentage households with sanitary latrines	90%
Percentage households connected to sewers	NA
Percentage households with unsanitary latrines	3%
Percentage households with no facility	7%

INTRODUCTION

The Sewerage network is covered partially in one town area towards southern side of the Railway Track i.e Vijayawada to Visakhapatnam. This system is also very old and there is no proper treatment. Recently the remodeling of the existing system along with the treatment is taken up. The II Town area i.e Northern side of Railway Track there is no sewerage system existing and at present the sewage and sullage is flowing into storm water Drains finally into Tammileru River which flows to kolleru lake. Due to untreated sewage entering into kolleru lake from this City and spoiling the Hydrology and Ecology of Kolleru Lake.

6.2 HIERARCHY OF DRAINS:

☐This hierarchy of drains is generally present in all areas whereas in Eluru the hierarchy is absent.

□□This is one of the main reasons for water logging and flooding issues since the capacity varies.

☐ ☐ There are only 5 main/major storm water drains in the entire municipal area.

- Collector Bunglow area Drain
- Jangareddy gudem road both sides
- Near ASR Stadium
- Near Indoor Stadium
- Pushpaleela Nagar Drain

Analysis

The five drains are designed for the carrying capacity of storm water runoff and the sullage from household is also mixed/ connected to these drains which pollute the storm water drainage system which is getting mixed to Tammileru River since it is not treated before letting it into the drain.

Table 23: At Glance

Existing Length of Drains in kms	228.43 Kms
Number of Main /Major Drains	5
Total No. of Basins	4
Existing NO. of Pumping Stations	Nill
Existing length of Jalipudi Drain	6 kms
Existing length of Roads in Kms	211 kms
Existing lenth of Storm water Drains	6 Kms
Proposed length of Storm water Drains	36 kms

Table 24: Total Eluru divided into four basins based on topography and major drains existing

BASINS	LENG	THS IN (Kms)		Total
	Major	Pucca	kutcha	
BASINS 1 to 4	3.0 Kms	98.0 Kms	66.44 Kms	167.44 Kms

Analysis:

Table 25: Length of Roads

Sl No	Nature of Road	Length in Km
1	CC ROADS	68.00
2	BT ROADS	192.00
3	METAL ROADS	55.00
4	KUTCHA AND EARTHERN ROADS	23.00
5	R & B ROADS	38.00
	TOTAL	376.00

- Kutcha drains are directly connected to the creeks in the basin 3 without any treatment.
- People facing contaminated diseases because absence of pucca drains, water staggering in those (basin-4) areas,
- Absence of pucca drains in Basin 4 which can be classified under not covered.

Table 26: Zone Wise Land Use Details

S.NO	Type of Land use	CO	Zone I	Zone II	Zone III	Zone IV
		EFF.	(Area in	(Area	(Area in	(Area in
1	Residential	70%	27	55	20	12
2	Commercial	80%	8	12	4	2
3	Industrial	80%	18	28	13	7
4	Public & Semi Public	80%	24	35	5	2
5	Transportation	80%	16	40	9	5
6	Agricultural/Vacant	15%	36	95	34	15
7	Hills/Forest	15%	0	0	0	0
8	Water Bodies/River	50%	8	28	6	4
9	Total		137	293	91	47
10	Weighted of runoff Coefficient		59.20%	54.18%	51.54%	54.15%

As per contract Run-off coefficient should be taken as minimum of 0.59, 0.54, 0.51 and 0.54 respectively for each Zone.

Table 27: Waste Water Disposal Arrangements

	Table 27. Traste Tratel Disposar Arrangements								
Ward	No. of	Waste water disposal arrangement for toilets (No.)							No. of
		Sewerage Septic tank		k	Soak	Pit	Open		Insanitary latrines
		_	Connected to soak pit	Connected to open	pit	Latrines	drains	Outel	idimes
1 to 50	55014	_	Connected to soak pit	-	_	Nill	Open Drains	Nill	5800

Table 28: Sewage Treatment Plants

Sr. No.	Name of STP	Treatment process / technology	Installati on year	Capacit y (MLD)	Sludge Treatment facility available	Quantity of treated sewage / sludge reuse
1	Nill	Nill	Nill	Nill	Nill	Nill

Table 29: Division wise sewage Generation

Division No	POPULATION	SEWAGE GENERATED IN LPCD
1	5484	0.59227
2	5064	0.54691
3	4394	0.47455
4	4387	0.4738
5	4768	0.51494
6	4979	0.53773
7	4440	0.47952
8	4016	0.43373
9	3957	0.42736
10	4514	0.48751

11	3777	0.40792
12	4650	0.5022
13	3549	0.38329
14	3915	0.42282
15	3430	0.37044
16	4373	0.47228
17	3917	0.42304
18	4558	0.49226
19	4860	0.52488
20	3874	0.41839
21	4428	0.47822
22	3630	0.39204
23	4713	0.509
24	4935	0.53298
25	3690	0.39852
26	3351	0.36191
27	3211	0.34679
28	5320	0.57456
29	4468	0.48254
30	5926	0.64001
31	3198	0.34538
32	3558	0.38426
33	3764	0.40651
34	3885	0.41958
35	3856	0.41645
36	5203	0.56192
37	3974	0.42919
38	5284	0.57067

39	6479	0.69973
10	0.77	0.50.50
40	5896	0.63677
41	4404	0.47563
42	4405	0.47574
43	4668	0.50414
44	3744	0.40435
45	4107	0.44356
46	4427	0.47812
47	3808	0.41126
48	4070	0.43956
49	4751	0.51311
50	3817	0.41224
	Total Sewage	
	generated in	23.5306
	LPCD	

6.3 Proposed sewerage network and treatment:

The proposed sewerage network given by the PBS consultant the proposed maps of the sewerage network for Eluru, block wise for 1 town area and the whole map of 2 town area are in folder "Block-1, Block-2, Block-3, Proposed Sewerage network - Town 1 of Eluru, II town sewerage network, Plan & Longitudinal Section of Pumping Maim-Town 1 of Eluru"

Regarding the treatment procedure a 10MLD STP is being set up in Ponangi as a part of AMRUT and also UGD for 1 town is proposed for mission period 2016-20. Survey is in progress for preparation of final DPR.

7. SOLID WASTE MANAGEMENT:

Introduction

The Municipal Corporation, having a total number of 55,014 households consisting of 50 Divisions apart from shops and other places suffers lack of scientific disposal of waste. On an average a total number of 82 tones is generated every day in the vicinity of the Municipal Corporation which is without segregation is being dumped in about a 19 acres of land located

at Ponangi Village 7 kms away from the city.

7.1 MAJOR PROBLEMS PREVAILING IN SWM SECTOR:

Partial segregation at household level is being practiced by the house holds in
spite of many sensitization efforts made by the sanitation wing of the Municipal
Corporation.
Door to door collection is being carried out by four bin trolleys, two bin trolleys,
try-cycles auto trolley and tractor driver along with two workers where the rich
materials like the plastic, metals, etc., are taken away by them.
The waste collected by these tractors and autos is directly dumped at the compost
yard which is situated 7 kms away from the city.
There are 13 dumper bins in the city with one dumper placer vehicle, bins are place
at the markets and Government Hospital areas only.
Market waste and slaughter house waste converted to vermin compost and bio
composting treatment process is going on in the existing compost unit at ponangi
village. Rest of the collected waste is directly dumped in the compost yard.
No collection of user charges by the Municipal Corporation.
No accurate data for calculating the amount of waste generated in the city as there is
no weigh bridge left in the compost yard.

The growth of a town or a city is characterized by an increase in its economic and developmental activities that are typically driven by the production and consumption patterns. The improved standards of living and the extent of commercialization in the cities have significantly changed the consumption patterns and thereby the waste composition. The inability to fully grasp the problems of waste generation and characterization have resulted in transforming Solid Waste Management as one of the most compelling problem of urban environmental degradation. Municipal solid waste management has become a serious problem because of rapid urbanization and improved economic activities. The insufficient collection and inappropriate disposal of solid wastes leads to water, land and air pollution, and pose risks to human health and environment.

7.2 FUNCTIONAL ELEMENTS OF SOLID WASTE MANAGEMENT:

The activities associated with the management of municipal solid wastes from the point of generation to final disposal can be grouped into the six functional elements: (a) waste generation; (b) waste handling and sorting, storage, and processing at the source; (c) collection; (d) sorting, processing and transformation; (e) transfer and transport; and (f) disposal.

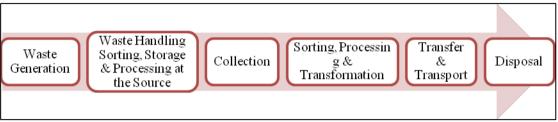


Figure 13: Functional Elements of Solid Waste Management

Source: Manual on municipal solid waste management_ MoUD_GOI_2000

a. Waste Generation:

Waste generation encompasses activities in which materials are identified as no longer being of value (in their present form) and are either thrown away or gathered together for disposal. Waste generation is at present an activity that is not very controllable.

b. Waste Handling, Sorting, Storage, and Processing at the Source:

Waste handling and sorting involves the activities associated with management of wastes until they are placed in storage containers for collection. Handling also encompasses the movement of loaded containers to the point of collection.

Sorting of waste components are an important step in the handling and storage of solid waste at the source. For example, the best place to separate waste materials for reuse and recycling is at the source of generation. Households are becoming more aware of the importance of separating newspaper and cardboard, bottles/glass, kitchen wastes and ferrous and non-ferrous materials.

On-site storage is of primary importance because of public health concerns and aesthetic consideration. The cost of providing storage for solid wastes at the source is normally borne by the household in the case of individuals, or by the management of commercial and industrial properties. Processing at the source involves activities such as backyard waste composting.

c. Collection:

The functional element of collection includes not only the gathering of solid wastes and recyclable materials, but also the transport of these materials, after collection, to the location where the collection vehicle is emptied. This location may be a material processing facility, a transfer station, or a landfill disposal site.

d. Sorting, Processing and Transformation of Solid Waste:

The recovery of sorted materials, processing of solid waste and transformation of solid waste that occurs primarily in locations away from the source of waste generation are encompassed by this functional element.

Sorting of commingled (mixed) wastes usually occurs at a materials recovery facility, transfer stations, combustion facilities, and disposal sites. Sorting often includes the separation of bulky items, separation of waste components by size using screens, manual separation of waste components, and separation of ferrous and non-ferrous metals.

Waste processing is undertaken to recover conversion products and energy. The organic fraction of Municipal Solid Waste (MSW) can be transformed by a variety of biological and thermal processes. Waste transformation is undertaken to reduce the volume, weight, size or toxicity of waste without resource recovery.

e. Transfer and Transport:

The functional element of transfer and transport involves two steps: (i) the transfer of wastes from the smaller collection vehicle to the larger transport equipment and (ii) the subsequent transport of the wastes, usually over long distances, to a processing or disposal site. The transfer usually takes place at a transfer station.

f. Disposal:

Today the disposal of wastes by land filling or uncontrolled dumping is the ultimate fate of all solid wastes, whether they are residential wastes collected and transported directly to a landfill site, residual materials from Materials Recovery Facilities (MRFs), residue from the combustion of solid waste, rejects of composting, or other substances from various solid waste-processing facilities. A municipal solid waste landfill plant is an engineered facility used for disposing of solid wastes on land or within the earth's mantle without creating nuisance or

hazard to public health or safety, such as breeding of rodents and insects and contamination of groundwater.

7.3 EXISTING PROCESS OF SOLID WASTE MANAGEMENT:

7.3.1 WASTE GENERATION:

- Major solid waste generation sources in the Municipal Corporation are Residential,
 Commercial, Markets, Road Sweeping and Hospital.
- The waste generated from all these sources include various types of wet and dry, bio degradable and non-bio degradable waste.
- Wastes generated in the Municipal Corporation include:
 - Biodegradable waste: food and kitchen waste, green waste (vegetables, flowers, leaves, fruits), dead animals and paper.
 - Recyclable material: paper, glass, bottles, cans, metals, certain
 plastics, etc. inert waste: construction and demolition waste, dirt,
 rocks and debris.
 - Composite wastes: waste clothing, tetra Packs, waste plastics such as toys.
 - Household hazardous waste: medication, e-waste, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish, etc.

There are 50 Divisions in Eluru Municipal Corporation are divided into 9 Circles for the convenience of executing the solid waste management process. Each Circle contains the following Divisions:

Table 30: Divisions Covered under each Circle

Circle	Divisions
1	3,4,5,6,7,8
2	9,10,11,12,13,14
3	15,16,17,18,19,20,21
4	22,33,43,2part
5	23,24,25,26,27,28
6	30,31,32,34,35,36
7	37,41,42,44,45,46
8	47,48,49,1part,2part
9	29,38,39,40,50,1part

7.3.2 SORTING AT SOURCE:

- Wastes from residential and commercial activities are sorted by the owner or the resident.
- The wastes that are recyclable are collected by rag pickers with certain price or for exchange of other items.

Intermediate storage:

- The waste from all the sources except hospital is collected to intermediate storage which includes road side dust bins and dumper bins.
- These places become unhygienic as the waste once littered around these bins creates lot of nuisance by attracting dogs and other animals.
- There are 13 dumper bins of 1 ton capacity each located at different parts of the Markets, rythu bazar, government hospital etc.

7.3.3 DIRECT COLLECTION:

- The wastes from intermediate storage, wastes from house-holds, wastes from commercial establishments and wastes from road sweeping are all collected into trolleys, rickshaws, autos and tractors by the municipal workers.
- Biomedical waste is collected by M/s. Safe environ, Vijayawada which charges Rs.2
 - to 2.50 per kg, 5.30 am 10.30 am & 2 pm 5 pm are the collection timings.
- There are 47 one manned rickshaws that are used for the collection purposes based on the requirement.
- Autos of capacity 0.70 tonne employ 2 persons (one driver and two workers) to collect the waste.
- Tractors of 1.5 tonne employ 5 persons (one driver and 4 workers) in total for collection.
- There is 1 dumper placer for 6 dumper bins.
- On a whole there are 23 tractors, 5 autos, 100 four bin trolleys, 42 two bin trolleys and 47 rickshaws for collecting the solid waste.

Table 31: Total number of vehicles used in each zone

	imber of verneres used in each zor
Circle1	4 T
Circle2	2T+1A
Circle3	3T+1A
Circle4	2T
Circle5	3 T
Circle6	3 T
Circle7	2T+1A
Circle8	2T+1A
Circle9	2T+1A

Note: T - Tractor, A - Auto

7.3.4. TRANSPORT:

- The waste collected from trolleys, rickshaws is transferred to tractors.
- Autos, tractors and dumper placers are used for the transport of waste from intermediate storage and direct collection.
- Hospital wastes are transported to M/s. Safe environ, Vijayawada unit at Chinakakani(v), Mangalagiri(M), Guntur district for treatment.

7.3.5 DISPOSAL:

- 19 acres of owned land at ponangi village is used as dumping site since 8 years for all the waste collected from the Municipal Corporation.
- There are no special treatment methods adopted in the complete solid waste management process.

7.3.6 SOLID WASTE GENERATION:

Domestic waste: Generation

According to CPHEEO guidelines, for a population of One lakh to Five lakh, the per capita generation as domestic waste is 0.21kg/capita/day.

Table 32: Division wise generation of domestic waste

Division No	POPULATION	Waste generated kg/day
1	5484	1151.64
2	5064	1063.44
3	4394	922.74
4	4387	921.27
5	4768	1001.28
6	4979	1045.59
7	4440	932.4
8	4016	843.36
9	3957	830.97
10	4514	947.94
11	3777	793.17
12	4650	976.5
13	3549	745.29
14	3915	822.15
15	3430	720.3
16	4373	918.33
17	3917	822.57
18	4558	957.18
19	4860	1020.6
20	3874	813.54
21	4428	929.88
22	3630	762.3
23	4713	989.73
24	4935	1036.35
25	3690	774.9
26	3351	703.71

27	3211	674.31
28	5320	1117.2
29	4468	938.28
30	5926	1244.46
31	3198	671.58
32	3558	747.18
33	3764	790.44
34	3885	815.85
35	3856	809.76
36	5203	1092.63
37	3974	834.54
38	5284	1109.64
39	6479	1360.59
40	5896	1238.16
41	4404	924.84
42	4405	925.05
43	4668	980.28
44	3744	786.24
45	4107	862.47
46	4427	929.67
47	3808	799.68
48	4070	854.7
49	4751	997.71
50	3817	801.57
Total	217876	45723.96 Kgs

Total Domestic Waste Generated in	45.72 MTs	
MT's as per the CPHEEO		
guidelines		

Table 33: Circle Wise Solid Waste generation

Circle	Population	Waste Generation in Tonnes / day According to CPHEEO guidelines
1	26969	5.66
2	24347	5.11
3	29440	6.18
4	14594	3.06
5	25220	5.29
6	25626	5.38
7	25061	5.26
8	17933	3.76
9	28686	6.02
Total	217876	45.72

Composition of municipal solid waste

The graph below shows the percentage of solid waste generated for different uses in a day during the year 2011, by Eluru Municipal Corporation.

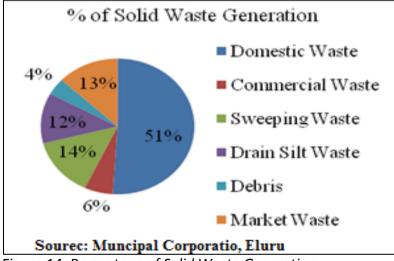


Figure 14: Percentage of Solid Waste Generation

Table 34: Solid waste generated from different sources in tonnes/day

Source	Percentage	Waste generation in tonnes/day
Domestic Waste	51	40.29
Commercial Waste	6	4.74
Sweeping Waste	14	11.06
Drain Silt Waste	12	9.48
Debris	4	3.16 .34
Market Waste	13	10.27
Total	100%	79

So the total amount of waste generated from different sources in the Municipal Corporation is 79 tonnes per day.

Solid Waste Collection

- The total amount of solid waste collected is calculated using the capacities of the vehicles and the number of units available.
- o Solid waste collected from autos and tractors.

Table 35: Quantity of Solid waste collected from autos and tractors with Double trip per day

Circle	Tractors	Autos	Quantity collected by tractors (in tonnes/day)	Quantity collected by autos (in tonnes/day)	Total Quantity collected (in tonnes/day)
1	4	0	4.5	0	4.5
2	2	1	3.0	1.4	4.5
3	3	0	4.5	0	4.5
4	2	0	3.0	0	3.0
5	3	0	4.5	0	4.5
6	3	0	4.5	0	4.5
7	2	1	3.0	1.4	4.5
8	2	1	3.0	1.4	4.5
9	2	1	3.0	1.4	4.5
DUMPER PLACER	1	0	6.0	0.0	6.0
Total	23	4	69	7	79

7.4 ANALYSIS OF DUMPER BINS:

- 13 dumper bins are registered
- These metallic dumper bins with double sided flexible opening as shown in the image below.

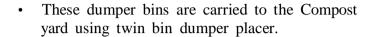




Figure 15: Dumper Bins



Figure 16: Dumper bins are carried to the Compost yard

- The distance between two bins should not exceed 500 meters.
- The distance between the bins can be changed on the basis of the load of garbage/refuse that is likely to be received at the container.
- The map below shows the areas that are covered within 500 m buffer of the dust bins.
- From the analysis of the map with a buffer of 500 m from the dust bins it is observed that
 - Divisions 1, 2, 3, 19, 29, 31, 32 have no dust bins.
 - Divisions 4, 15, 16, 20, 21 are 25% covered
 - Divisions 5, 8, 14, 28, 30 are 50% covered
 - Divisions 9, 10, 13, 17, 27 are 75% covered

Table 36: Division Wise Waste Generation

Division No.	Population	Waste generation kg/day	Coverage
1	5484	1151.64	Covered
2	5064	1063.44	Covered
3	4394	922.74	Covered
4	4387	921.27	Covered
5	4768	1001.28	Covered
6	4979	1045.59	Covered

7	4440	932.4	Covered
8	4016	843.36	Covered
9	3957	830.97	Covered
10	4514	947.94	Covered
11	3777	793.17	Covered
12	4650	976.5	Covered
13	3549	745.29	Covered
14	3915	822.15	Covered
15	3430	720.3	Covered
16	4373	918.33	Covered
17	3917	822.57	Covered
18	4558	957.18	Covered
19	4860	1020.6	Covered
20	3874	813.54	Covered
21	4428	929.88	Covered
22	3630	762.3	Covered
23	4713	989.73	Covered
24	4935	1036.35	Covered
25	3690	774.9	Covered
26	3351	703.71	Covered
27	3211	674.31	Covered
28	5320	1117.2	Covered
29	4468	938.28	Covered
30	5926	1244.46	Covered
31	3198	671.58	Covered
32	3558	747.18	Covered
32	3558	747.16	Covered

33	3764	790.44	Covered
34	3885	815.85	Covered
35	3856	809.76	Covered
36	5203	1092.63	Covered
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40	5896	1238.16	Covered
41	4404	924.84	Covered
42	4405	925.05	Covered
43	4668	980.28	Covered
44	3744	786.24	Covered
45	4107	862.47	Covered
46	4427	929.67	Covered
47	3808	799.68	Covered
48	4070	854.7	Covered
49	4751	997.71	Covered
50	3817	801.57	Covered
Total	217876	45753.96	

7.5 SOLID WASTE COLLECTION ROUTE ANALYSES:

- The routes for the whole Municipal Corporation are allotted as per Divisions.
- Each route has starting point, intermediate points and ending point.
 Few Divisions are covered by 4bin Trolley & 2bin Trolleys
- Few Divisions are covered by Try- Cycles.
- Few Divisions are covered by Autos.
- Few Divisions are covered by Tractors.
- When the vehicle gets filled up it goes directly to the Compost yard for disposal of waste.

- This process of collection and transportation results in more consumption of fuel and energy.
- To avoid more energy consumption the routes are to be optimized and secondary collection points should to be introduced.

7.6 PROJECTED SOLID WASTE GENERATION:

- From the population projection it is found that in 2017 the population will be 234213, 2032 population will be 318260 lakhs and 2047 Population will be 429793 Lakhs.
- For an existing population of 217876 the estimated solid waste generated per day is 79 Metric Tonnes.
- Using the existing values of population and solid waste generation the projected solid waste generation is calculated as 88.06 tonnes per day, 119.66 tonnes per day and 161.60 tonnes per day for 2017, 2032 and 2047 respectively.

Table 37: Projected Solid Waste Generation

79.00
77.00
88.06
119.66
161.60

7.7 BEST PRACTICES:

A study of various cities SWM is done and the most suitable methods of disposal and treatment of solid waste in Eluru are found to be Mechanical Aerobic Bio-composting, Pelletisation, Vermi Culture and Biogas Production and Energy Consumption. These methods are then compared in various aspects of economy, efficiency and suitability. A table for comparison of these best practices is given in Appendix B, table 6.

7.8 PROPOSALS:

As per the Manual of Municipal SWM_MOUD_GOI_2000 the solid waste generated in a Municipal Corporation contains 17% of recyclable material, 54% percentage of compostable material, 14% of combustible material and 15% of rejects.

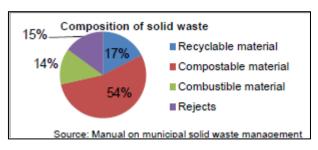


Figure 17: Composition of Solid Waste

From the above composition of solid waste, for the year 2032 if 119.66TPD solid waste gets generated then 20.34 TPD will be recyclables, 64.61TPD will be compostable material, 16.75TPD will be combustible material and 17.94TPD will be rejects.

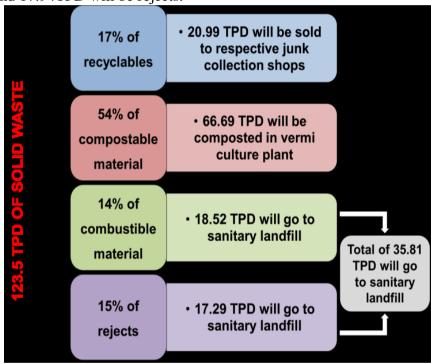


Figure 18: Segregation at source

By providing two types of dust bins/ containers

• One for WET WASTE which includes organic/ bio degradable/ compostable waste and • another for DRY WASTE which includes paper, metals, glass, plastics etc.

The table below gives the details of dust bin location, person responsible to throw waste in dust bin, location of bin, size of bin/ container.

Table 38: Specifications for dust bins at different sources

Source type	Person Responsible for storage and segregation	Dust bin	Location for storage of waste for collection	Remarks
Household/ Residential (for a family of 5 members)	Resident	Wet waste/ food/ bio-degradable waste: Non- corrosive container of capacity 15 litre (0.015m ³) with lid Dry waste/ recyclable waste:	Residence/ Intermediate collection point/ Designated spotby local body	Larger containers or more than one container should be used to store the waste
Private society/ Association of flats/multistoried buildings etc.	Resident – responsible to deposit the waste in community bin	Wet and dry waste – Different community binslarge enough to hold the waste generated by the	Designated spot by local body	Collection of waste from community binis done by the local body
Slums	Resident	Community bins of suitable sizes ranging from 40 to 100 litre (0.04m ³ to 0.1m ³) capacity	Suitable locations by the urban local body	People in these areas are directed to put their waste into community bins before
Shops/ Offices/ Institutions/ Workshops etc.	Owner/ Maintenance person	Container should be adequate to hold the waste, they normally generate in 24	On site/ commercial unit / establishment	In matter of excess waste due to any situations the local body is to be
Hotels and Restaurants	Owner/ Maintenance person	Containers of not more than 100 litre (0.1m ³)capacity	Designated spot by urban local body	Container should have appropriate handle or handles on the top or

		Largercontainers	As	rim at the bottom for ease of Separate
Large hotels and restaurants	Owner/ Maintenance person	which match with the primary	mentioned by the	system is provided by
Vegetable/ Fruit market waste	Owner/ Maintenance person	Largesize containers with lid or skips — depending on the size of market and waste generated	Designated spot by urban local body	Deposit the waste at source and then put in the container provided before the clearance
Meat and Fish Markets	Shopkeeper/ Maintenance person	containers (of size not exceeding 100 litres/ 0.1m ³) having lid, handle on the top or on the sides and rim at the bottom of the container	Designated spot by urban local body	Slaughter housewastes should behandled as per the guidelines
Street Food Vendors	Owner/ Vendor	Bins or bags - as per requirement	On site	Waste should either be thrown in the nearby bin or it should be given to the waste
Marriage Halls/Kalyanmandaps/Comm unity halls etc.	Owner/ Maintenance person	Suitable containers with lidswhich may match with the primary collection	As mentioned by the urban local body	Cost for this is to taken up by the establishment On-site biodigesters for food waste should be encouraged

Note:

100% spare capacity should also be maintained to meet unforeseen delay in clearance or unanticipated extra loads.

Refrain from throwing their dry and wet solid waste/sweepings on the footpath, streets, open spaces or drains.

Hazardous waste from all the sources to be disposed separately as per directions

Facilitating Intermediate Storage

The existing condition of intermediate storage and transportation is in a bad situation. So it is necessary to provide intermediate transfer station over the city.

Table 39: Proposed route with vehicular way (Circle wise route lengths)

	· ·	
Circle	Existing route length in Sq.Kms	Proposed route length in Sq. Km
1	1.3346	1.06768
2	1.3561	1.02436
3	1.5985	1.90624
4	1.28045	1.08488
5	2.3828	0.87576
6	1.0947	0.33288
7	0.4161	1.2788
8	0.77755	0.62204
9	1.2792	1.02336
Total	11.52	9.216

Gap between existing and Proposed route length = 11.52-9.216 = 2.304 Sq.kms

- From all the route points waste is collected either through trolleys, autos, or rickshaws and then transported to intermediate points.
- From the intermediate point the waste is transferred to bigger vehicles like tractors and then transferred to proposed sanitary landfill and vermi culture plant. Vehicles should have proper arrangement so that the waste segregated at source will not get mixed and thereby reducing the manpower required.

Recyclables The recyclables generated from a Municipal Corporation can be plastics, glass, scrap metal etc. From the segregated dry waste the recyclables can be separated at source or at the intermediate point. This waste can be processed before selling it to junk shops, or before using it to any other purposes.

Vermi culture plant

A Vermi culture plant of handling capacity 100 TPD with an area of 5 hectors are proposed next to the sanitary landfill site. Compost can be sold to city gardens and fertilizer companies. The details of vermi culture are explained along with different best practices.

Sanitary landfill

From the Manual on Municipal SWM for input capacity of 300 TPD, the area required for a Sanitary Landfill including Gas-to-Energy recovery is 36 hectares. This area required can be more for coastal areas.

If 300TPD requires 36 hectares with a life of 15 years, then 79 TPD requires 9 hectares with a life of 15 years. Existing 7 hectares can be used for dumping of different wastes.

Existing Dumping yard

The existing dumping yard has been utilized since 2010 onwards 19 acres are procured by utilizing Twelth Finance Commission Grants at Ponangi village, Eluru Mandal and 5 Kms far from the municipal Boundary.

Table 40: Proposed Route Maps of the Vehicles Transportation

Circle	No. of route points	No. of dust bins covered	Frequency of collection	Proposed route description
1	12	1	Once	Route Starting point Bavisettivari pet - Ambedkar statue centre - teachers colony – weavers colony – chataparru road – Gajjalavari cheruvu – fish market – krishnadevaraya school – venugopalaswami
2	12	1	Once	Route starting point Gowri devi temple road – pandurangaswami temple area – gupta godowns – ravi chettu centre – amam imam streets –kothagudem road – kaikalur road kabela centre – kathepu street – clock tower centre – jain temple –
3	14	0	Once	Route Starting point is Gandhi Gnanamandir – Ambica theatre – Kasturba high school – kundi centre – senagapappu bazar – ganganamma temple – pala thumu centre – vangayya gudem centre – chiranjeevi bus stop –
4	8	0	Once	Route Starting point is Panduranga puram – old bus stand – power pet – vasudevalayam street – GNT road – chittivalasa pakalu – jute mill centre – Ramakrishna puram – vijayagardens –via mini
5	12	1	Once	Route Starting point is Satrampadu vanthena – yadav nagar – shanthi nagar –xavier nagar – phiranguladibba –ttd kalyanamandapam – janmabhoomi park – collectorate – sbi main branch – fire centre –

	1		1	
6	12	2	once	Route starting point is Manchineella thota – pathebad – sivalayam streets – tobacco godown street – chanakyapuri colony – RMS colony – Balayogi vanthena – pamuladibba – subbamma devi scholl road – chinta chettu centre – trinadh
7	12	0	once	Route starting point is Nukalamma temple to 5 th lt – gowridevi temple – ramalayam street – etigattu – tangellamudi road – 12 taps centre –
8	10	1	once	Route starting point is Tangellamudi centre – adivarapu pet – etigattu – pension line – nukalamma temple – davood hotel – csi scholl – veterinary hospital – irrigation bunglow – R & B bunglow – railway station –
9	10	0	once	Route starting point is old compost yard – electrical sub station – MRC Colony – Allanani Colony – Kabadi gudem – tangella mudi – sivagopalapuram – venugopalaswami temple – tobacco works centre – dada palav centre – rani nagar – tytus

The final proposed SWM map contains the details of location of dust bins, proposed solid waste collection route with vehicular way, location of vermin culture plant and sanitary landfill.

Table 41: Calculation for Solid Waste Generation

No	Par	Calculation	Remarks
	am		
1	Current population of	2.17	
2	Total waste generated	79 TPD	
3	Hence, per capita waste generation	362 gm	

Table 42: Primary Collection of Solid Waste

				Household etion syste			Door			If Hou Door t collect system availal	o Door tion t is not	r	
Ward No. & Name	No. of HHs	otal waste	No. of HH s cov ere d	Qty. of waste collect ed (MT/d	(37 /	e	Waste collection charges	Exist ing manp ower (No s.)	ments used (Nos.	hod of disp osal	y	Loc atio n of D is p	Remarks
1 to 50	550 14	79	5501 4	79Yes	Yes	Daily	Nil	380	4 Bin Trollys - 159	Nil	Nil	Nil	

Table 43: Secondary Collection of Solid Waste

			If Con second	Community bins are available for econdary collection					If Community		
Ward No. & Name	Ward population	Waste generated	No. of community	Location of bins	Capacity of bins	Collection frequency	System of collection (type and number of vehicle used)	Reason for unavailability of bins	Disposal arrangement	Location of Disp osal	Remarks
6			1	Fish market	1	Daily	Dumper Placer	Nil	Nil	Nil	
10			1	Slaughter House Near	1	Daily	Dumper Placer	Nil	Nil	Nil	
18			1	Near Vehicle Shed	1	Daily	Dumper Placer	Nil	Nil	Nil	

43	2	Pedda Medara Metta, 3 rd LT Road	1	Daily	Dumper Placer	Nil	Nil	Nil	
23	1	Santhi Nagar Main Road	1	Daily	Dumper Placer	Nil	Nil	Nil	
24	1	Opp Boys Convent	1	Daily	Dumper Placer	Nil	Nil	Nil	
26	1	Railway Track Road	1	Daily	Dumper Placer	Nil	Nil	Nil	
27	1	Dist HQ Hospital	1	Daily	Dumper Placer	Nil	Nil	Nil	
28	1	Ashok Nagar Main Road	1	Daily	Dumper Placer	Nil	Nil	Nil	
30	1	Mothevari Thota	1	Daily	Dumper Placer	Nil	Nil	Nil	
32	1	3 Temple Road Raghava Chari Street	1	Daily	Dumper Placer	Nil	Nil	Nil	
49	1	Adivarapu Market Road	1	Daily	Dumper Placer	Nil	Nil	Nil	

7.9 Brief Note on G.O.MS.No. 279

Swachh Bharat Mission, launched at the National Level by the Government of India, stipulates clean, neat and totally sanitized Cities that are aesthetic, and environmentally healthy and livable. In line with this Mission, Government of Andhra Pradesh had set up Swachh Andhra Corporation to manage the Swachh Andhra Pradesh Programme in a mission mode. The State has a vision of transforming Cities and Towns in Andhra Pradesh into neat, clean and litter-free areas for bestinclass livability; health standards; environment, tourism and investment attractiveness. The Municipal Solid Waste (M&H) Rules, 2000 are applicable to every Urban Local Body. The Municipal Solid Waste Rules, 2000 clearly stipulate the roles and duties of different stakeholders in the entire chain of solid waste management. Non-compliance with the rules by ULBs and not adhering to the time lines are strictly monitored by the Hon'ble National Green Tribunal, which has powers to impose penal actions on the State and Central machineries. Furthermore, the Ministry of Environment, Forest and Climate Change, Government of India, has notified the draft Solid Waste Management Rules, 2015. With this background, after consultation with the relevant experts and discussions in the workshops, the Director of Municipal Administration, Andhra Pradesh, Hyderabad has submitted draft Operational Guidelines for Micro Planning, Work Rationalization and Outsourcing of Work Packages and three draft RFPs i.e., (1) for Commercial & Bulk Waste, (2) Mechanical Sweeping and Residential Micro Pockets Management, and (3) Road Sweeping & Drain Cleaning in thereference 3rd read above for approval, stating that issuance of new Operational Guidelines for shifting from Manpower Outsourcing (Worker) to Work Outsourcing System is required to guide the ULBs for effective implementation of Solid Waste Management (M&H) Rules

2000, NGT recent directives and other relevant regulations in a systematic manner, with reference to Source Segregation, Collection, and Transportation of Solid Waste. The Director of Municipal Administration has therefore requested the Government to issue Operational Guidelines for Micro Planning, Work Rationalization and Outsourcing of Work Packages and approve three RFPs. Government after careful examination of the proposals of Director of Municipal Administration vide reference 3rd read above, hereby approve and issue the Operational Guidelines for Micro Planning, Work Rationalization and Outsourcing of Work Packages & three RFPs, in supersession of all Government Orders, Circular Instructions, etc., issued previously on entrustment of works and outsourcing maintenance of sanitation in the ULBs of AP, to enable Urban Local Bodies in the State to implement the above guidelines with immediate effect.

8. STORM WATER MANAGEMENT

8.1 GENERAL TERMINOLGIES:

COMBINED SEWAGE = sanitary sewage + storm water (with or without industrial waste) CRUDE SEWAGE = sewage which is not treated

DILUTE OR WEAK SEWAGE = sewage containing less suspended solid matters

DOMESTIC OR SANITARY SEWAGE = sewage from residential which may or may not contain storm water SEPTTIC SEWAGE = sewage which is undergoing treatment.

DRY WEATHER FLOW = flow during the dry season

There is no perfect storm water drainage system in Eluru Municipal Corporation area mainly the embankments of the City is just like a sasar means the city area is in between many embankments such as Thammileru bunds, Railway Tradck Embankments, Highway Embankments and Krishna and Godavari River Bunds. It causes the town get immediate rain water until the Thammileru flow retains. To relief from the above problem the Comprehensive drainage study is regard and it is proposed in APUSP. Accourding to local observations there is necessity to provide two under tunnels or aqueducts across the Krishna and Godavari canals of Eastern and Western locks. During rainy season the storm mixed with domestic waste stagnates in low lying areas promoting unsanitary conditions besides polluting the Ground water leading to outbreak of epidemics.

There are five major Storm water drains within the City those are:

- Pushpaleela Nagar Drain
- Collector Bunglow area Drain
- Jangareddy gudem road both sides
- Near ASR Stadium
- Near Indoor Stadium

The entire rain water and Sullage water from the town, is collected through Kutcha&Pucca drains which are connected to the above outfall drains and finally discharges in to the Tammileru River which is passing at periphery of the City and joins the Kolleru Lake.

The existing outfall drains are insufficient to take the total storm discharge generated in the City during rains and the areas are inundated which causing damage to the habitants and the properties. Due to very flat slopes the Sullage water is also not properly disposed of from the City area.

The Indoor Stadium and Collectorate area drains enter the IItown at northeast point and runs

along the combined flow discharges in to another major channel flowing from western side before outfall in to Tammileru River.

The Pushpaleelanagar, Asr Stadium, Jangareddygudem road bothside drains receive the Sullage discharge of the City and also storm water of the nearby area and finally joins into Jalipudi drain near its outfall into Tammileru River.

Analysis:

- This chart gives a clear idea that there is no existence of sewerage network established in the past or there is no proposal of sewerage network.
- There are no public toilets in the main commercial areas.

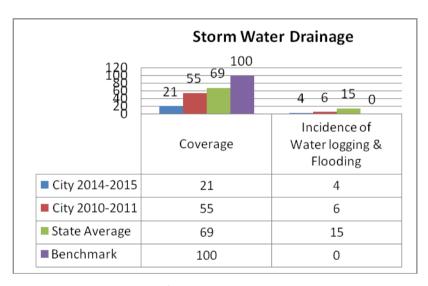


Figure 19: Strom Water drainage

Analysis

□ The chart showing the drainage coverage is about 21% in (2014 - 2015) whereas in the 2011 SLB's it is stated as 55 %. Moreover more than 70 % of drainage work is been in proposed stage. With this we analyze that the city's coverage in terms of drainage is just 21% through primary survey.

Water logging happens mainly in low lying areas and main roads of Eluru where drains are temporarily covered with slabs.

The absence of proper system for disposal of storm water results in the stagnation in many

areas of the city and these areas become the centers for mosquitoes to breed. So, for keeping up better sanitary conditions in addition to the proper sewerage it is also necessary to provide proper system for the disposal of storm water.

Table 44: Low Lying Areas

DIVISION NO.	LOW-LYING AREA NAME							
1	MRC Colony, Allanani Colony							
2	Pandurangapuram, chenchucolony							
5	Teachers Colony							
7	Weavers colony							
14	Jwalapahareswara colony							
15	Upparagudem							
20	Nerellaraja colony & Ghandhi colony							
21	Lakshmammacheruvu							
22	Postal colony, vijayagardens							
28	Etigattu							
29	Tapimetstry colony, Chandraguptha colony & Kummari revu							
35	Pamuladibba							
38	Raninagar							
39	Pushpaleelanagar							
40	Sivagopalapuram							
43	Powerpet							
50	Kabadigudem							

Analysis

- Nearly 45 % topography of Eluru falls under the category below 1m mean sea level.
- The area is about 518 hectares.
- In the south east part these low lying areas have been converted to aquaculture practices.
- Whereas in the North West and north east some settlements have been residing in these areas

Table 45: Storm Water Drainage System

Zone / Catch	Length of	Construc	ted Drains			Natural Drains			
ment			II Abc	Functional status	Disposal arrangemen t	Len gth (k m)	Functiona 1 status	Disp osal arrang ement	Remarks
	211.17	6.80	Surface	Working	Nil	Nil	Nil	Nil	

8.2 EXISTING STROM WATER AND SULLAGE DRAINAGE SYSTEM:

As seen from profile of the town, the undulations and severe at present there are no separate storm water drains exist. Street drains designed for sullage are carrying storm water flows upto certain extent. The present sullage drains 55% of length are pucca, 20% of length of kutcha drains and 30% of drains are unserved.

The present system of existing drainage fall under 3 categories in general:

- a) Minor sullage drains
- b) Natural flow drainage channels
- c) Ponds/low lying water bodies

There is already some drainage system is existing, however it is not properly integrated and also the levels are not matching to suit the final disposals. Hence the section of these drains are redesigned and integrated in the new system.

Table 46: Showing Densities in Various Divisions Corresponding To Low-lying Areas

DIVISION POPULATION		AREA (IN HECTARES)	DENSITY (IN PPH)
1	5484	49.16	111.5541
2 5064		49.79	101.7072
3	4394	21.32	206.0976
4	4387	23.14	189.5851
5	4768	21.22	224.6937
6	4979	25.04	198.8419
7	4440	21.32	208.2552
8	4016	21.42	187.4883
9	3957	21.34	185.4264
10	4514	22.38	201.6979
11	3777	21.32	177.1576
12	4650	22.4	207.5893
13	3549	24.55	144.5621
14 3915 23		23.62	165.7494
15	3430	24.01	142.8571
16	4373	23.54	185.7689
17	3917	23.29	168.1838
18	4558	21.58	211.2141
19	4860	21.56	225.4174
20	3874	22.29	173.7999
21	4428	23.58	187.7863
22	3630	61.21	59.30404

23	4713	29.55	159.4924	
24	4935	42.06	117.3324	
25	3690	61.02	60.47198	
26	3351	51.21	65.43644	
27	3211	28.87	111.2227	
28	5320	25.57	208.0563	
29	4468	36.21	123.3913	
30	5926	23.42	253.0316	
31	3198	16.34	195.716	
32	3558	19.55	181.9949	
33	3764	24.57	153.195	
34	3885	17.89	217.1604	
35	3856	18.93	203.6978	
36	5203	13.34	390.03	
37	3974	3974 6.51		
38	5284	17.03	310.276	
39	6479	24.51	264.3411	
40	5896	16.26	362.6076	
41	4404	8.14	541.0319	
42	4405	7.64	576.5707	
43	4668	17.37	268.7392	
44	3744	7.56	495.2381	
45	4107	4.29	9 957.3427	
46	4427	7.47	592.6372	
47	3808	6.73	565.8247	
48	4070	10.42	390.595	

49	4751	11.13	426.8643
50	3817	9.33	409.1104
Total	217876	1152	189.1285

8.3 ECO SANITATION

- Ecological sanitation (Ecosan) is a new concept in handling substances that have so far been termed wastewater or water carried waste for disposal.
- It is a hygienic system of human waste disposal to retrieve and re-use the nutrients like nitrogen, phosphorus and potassium from human waste, and to economize the use of water.



Figure 20: Eco Sanitation

CONCEPT

☐ The idea that urine, faeces and water are resources in an ecological loop and, recycling of nutrients helps ensure food security.

AIM

- □ to promote the development, implementation and dissemination of socially and culturally acceptable and sustainable sanitation approaches
- ☐ To maintain hygienically safe and environmentally sound

OBJECTIVES

- ☐ To reduce the health risks associated with sanitation, water contamination and waste disposal
- ☐ To prevent the pollution of surface and underground water

	To reduce, through recycling of grey water, wastewater discharged to sewers
	To prevent the degradation of soil fertility optimizes the management of nutrients and water resources for agricultural purposes, by recovering nutrients from urine and fecal.
ADVA	ANTAGES
	To provide affordable sanitation options for all; covers a wide range of design and technique for the collection and treatment of human waste; can be dry and/or water based system.
	To provides appropriate solutions adapted to the local situation; suitable both for rural and urban settings; allows for centralized and decentralized management.
	To promote health, protects environment, conserves water, and minimizes the pollution of the water system.
	To promotes safe and hygienic recovery and use of nutrients, organics, trace elements, water, and bio-energy.
	To preserves soil fertility; improves agricultural productivity and food security.
	To help conserve resources through substitution of mineral fertilizer, and lower water consumption.

Table 47: Water Logging / Flooding

Zone	Location /wards	Frequency (No. peryear)	Reasons	Remarks
I	30	2	Due To Heavy Rains	

Table 48: Institutional Arrangements for All Water and Sanitation Services

Urban Services	Institutions in charge of planning	Institutions in charge of implementatio	Institutio ns in charge of O&M	Institutions in charge of collecting user charges
Water Supply	PH Eng Dept	PH Eng Dept	Municipal Engineering Section	Municipal Revenue Section
Sewe rage	NA	NA	NA	NA
Septage Manage ment	_	_	_	_
Storm Water Drainag e	Municipal Engineering Section	Municipal Engineering Section	Municipal Engineering Section	Na
S W M	Municipal Health Section	Municipal Health Section	Municipal Health Section	NA
Public Toilets	Municipal Engineering Section	Municipal Engineering Section	Private Assuring	Private Assuring

8.4. SFD (Sanitation/Shit Flow Diagram) Description:

A Sanitation (or Shit) Flow diagram presents a clear picture of how excreta flows are managed within the city. The diagram clearly depicts how excreta flows from user interface to the final disposal. It has the following stages:

8.4.1 CONTAINMENT:

- The city has an existing coverage of Underground drainage (UGD) in 'one town' part of the city. The UGD network was constructed in 1962 and is currently in a dilapidated state.
- > Approximately 350 households (Revenue Department, EMC) in 'one town' area are connected to the UGD network
- > Containment in the city other than the UGD has mostly lined pits (ring structure) with an open/closed bottom in individual households (known as "Vara" locally)
- ➤ The size and no. of rings installation are based on the space available and affordability of the households. Generally, pit rings are cast in 3 different sizes i.e. 2.0 ft., 2.5 ft., and 3 ft. diameter. 6 to 10 number of rings placed one over the other to provide required depth of 5 ft to 10 ft
- > The pits are installed at the site by the labor of pit manufacturer
- The newly constructed house and multi-storey buildings have septic tanks with proper baffle walls (Key Informant Interviews, 2016)
- > Types of on-site containments observed during field visit: -
 - Lined pit with open bottom with effluent pipe connected to open drain (nearly 38% population dependent on such a system)
 - o Lined pit with open bottom without outlet (37% population)
 - Septic tank/ Lined pit with closed bottom with an effluent pipe connected to the open drain (25% population)
- > Supernatant (SN) generated from onsite systems comes from 22% population (9% from pits connected to open drain and 13% from septic tanks)
- ➤ FS not contained comes from 78% population, out of which FS of 28% seeps into the ground as infiltrate
- Lined pit with the closed bottom with an effluent pipe connected to the open drains are prevalent in the Individual Household Toilets (IHHTs) provided under Swacch Bharat Mission (SBM). The containment systems provided under IHHTs have rudimentary lining at the bottom. It was learned from the key

informant interviews (KII) that the bottoms of pits are lined with a base of construction wastes like bricks without plastering.



Figure 21: Casting of pits of different sizes



FIGURE 22: LINED PITS WITH OPEN BOTTOM WITH EFFLUENT PIPE CONNECTED TO OPEN DRAIN



FIGURE 23: LINED PIT WITH OPEN BOTTOM WITHOUT OUTLET



FIGURE 24: TOILET CONSTRUCTED UNDER SBM, WITH SEPTIC TANK/ LINED PIT WITH CLOSED BOTTOM WITH AN EFFLUENT PIPE CONNECTED TO THE OPEN DRAIN

8.4.2 EMPTYING:

- Emptying of containment of on-site sanitation systems is done by the 8 private emptiers in the city (V. Surya Rao, MHO, EMC)
- ➤ The emptiers advertise and market their services using beguiling wall paintings, hoardings and distribution of visiting cards
- Emptying is done all day long, and they empty 4-5 onsite sanitation systems per day per truck
- ➤ Desludging frequency is 6 months to 2 years for pits with or without open drain and 4 to 6 years for septic tanks
- There are no zones which have been divided for operations
- > During emptying operation, the emptiers do not use any safety equipment
- The emptying is usually carried out by 5 people (1 driver + 4 laborers).
- ➤ Before emptying the containment systems, kerosene oil is poured into the containment to suppress the septic odor.
- > FS of 45% population is emptied (17% from pits with open bottom and no outlet, 17% from pits with open bottom and outlet connected to open drain and 11% from septic tanks)
- ➤ FS of 33% population is not contained and not emptied; it includes 28% of infiltration and 5 % that remains in the tank.



FIGURE 25: ADVERTISEMENT OF VACUUM TANKERS TO CALL FOR EMPTYING SERVICE

8.4.3 TRANSPORTATION:

- ➤ The Under-Ground Drainage is connected to the sewage pumping station (SPS) at Venkana Cheruvu, which then furthers pumps the sewage to an adjoining low lying area or pond at Venkana Cheruvu. Sewage is then carried in the open drains from there to the Tamilleru Canal
- ➤ SN of 22% population is transported via open drains to Tamilleru canal

- There are a total of 8 vacuum tank machines available in the city owned by individual owners. The capacity of each vacuum tank is 5000 litres. The vacuum tanks are truck or tractor mounted vehicles. Mostly vehicles are pre-owned and the vacuum machines are assembled at Autonagar Rajamundry area in Andhra Pradesh
- > FS of 45% population is transported to low lying areas in and around the city.
- For the private vacuum tankers, average distance per trip is 5 km, as informed by the private emptier.



FIGURE 26: SEWAGE PUMPING STATION AT VENEKA CHERUVU



FIGURE 27: TRUCK MOUNTED VACCUM TANKER

8.4.4 TREATMENT AND DISPOSAL:

- There is no treatment of sewage and septage generated in the city.
- A rundown Sewage Treatment Plant exists in the outskirts of the city at Ponanki Compost Plant. At present the STP is not functioning as it was constructed during 1960's and has passed its design period.
- > Sewage is conveyed through Tamilleru Canal and is eventually disposed at Kolleru Lake.
- The city is surrounded with agriculture lands where the sewage from the Tammilleru canal is withdrawn to be used for irrigation purpose, as required.
- The private emptiers dispose the faecal waste at the low lying area at Veneka cheruvu or directly to the Tamilleru canal wading through the city.



FIGURE 28: LOW LYING AREA AT VENEKA CHERUVU ONE OF THE DISPOSAL POINT OF SEPATGE AND INTERMEDIATE DISPOSAL OF SEWAGE FROM UGD

8.4.5 SUGGESTIONS:

8.4.5.1 SHORT TERM GOALS:

- Recognize the private emptiers and issue them license to operate
- Buy more vacuum trucks, if there is a shortfall
- Identify 2-3 suitable disposal sites (so that the distance traveled by the trucks is optimized). The land could be taken on lease or could be a vacant plot in the nearby industrial area
- Develop DPRs for FSTPs (faecal sludge treatment plants) at these identified disposal sites

8.4.5.2 MEDIUM TERM GOALS:
Demarcate land for STPs/FSTPs in the master plan
Enforce scheduled desludging
 Improve bylaws, to enforce proper design of septic tanks
• Implement decentralized waste water treatment systems at several locations to treat supernatant and grey
water

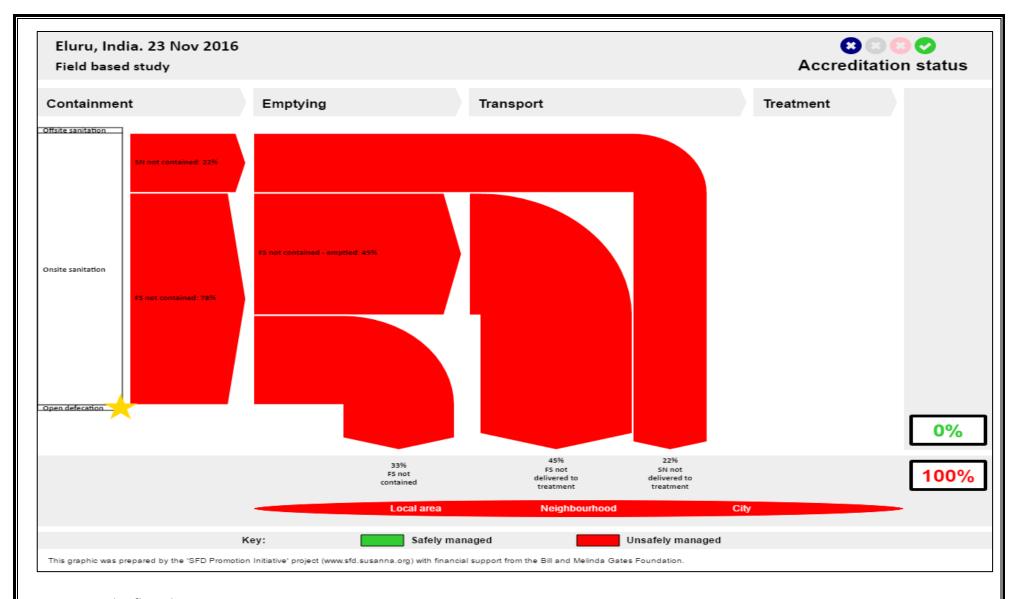


Figure 29: Shit flow diagram

9. EMC ORGANIZATION SETUP

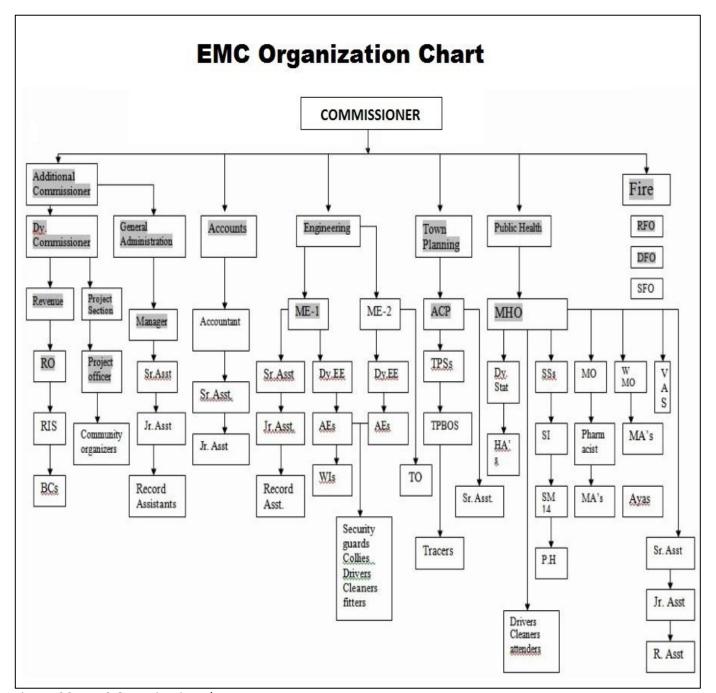


Figure 30: EMC Organization chart

10. INSTITUTIONAL FRAME WORK:

Table 49: Staffing Pattern

SL.NO.	Designation	No.Of Posts Sanctioned	No.Of Staff Working
	Gazetted		
1	Commissioner	1	1
2	Additional Commissioner	1	0
3	Deputy Commissioner	1	1
4	Superintending Engineer	1	1
5	Executive Engineer	1	1
6	Dy Executive Engineers	4	4
7	Asst. Engineers	6	6
8	Health Officer	1	1
9	Examiner of Accounts	1	1
10	Asst. Examiner of Accounts	1	0
11	Asst city planners	2	2
	Non-Gazetted		
1	Engineering	9	8
2	Health	360	210
3	Town Planning	14	7
4	Establishment (Office Administration)	101	85
5	Revenue	23	21
6	Education	440	440
7	Out Sourced Employees		270

11. MUNICIPAL FINANCE:

Table 50: Financial Analysis

Income &Expenditure	2012-13	2013-14	2014-15	CAGR%
OWN INCOME -TAXES				
Property Tax & Vacant land Tax	1060.85	1017.97	1187.61	
TOTALTAXES	1060.85	1017.97	1187.61	
OWNI	NCOME – NON	TAX		
D & O Trades, Market Fees, Encroachment Fees	60.45	52.59	74.87	
Betterment Charges and Building Perm Fees	43.73	62.72	70.00	
Miscellaneous receipts	1116.55	1210.73	1206.12	
Water Supply and other Charges	209.64	236.20	201.66	
Total Non-Taxes	1430.37	1562.24	1552.65	
ASSIGNEDREVENUES				
Entertainment Tax	113.02	21.29	58.50	
Surcharge on Stamp duty	263.00	265.00	304.52	
Assigned Revenue Total	376.02	286.29	363.02	
Total Revenue income	2867.24	2866.50	3103.28	
Other Non-Plan & Plan Grants	283.41	452.38	1239.89	
Total Revenue Income (including Grants)	3150.65	3318.88	4343.17	

Table 51: Revenue Expenditure

	Particulars		Amount (Rs. in Lakhs) 2012-13 2013-14 2014-15 2015-16			
	1 at ticulars		2013-14	2014-15	2015-16	
A. Revenue Income						
1	Income from Taxes	1085.91	1018.01	1211.43	1289.93	
2	Income from Non-Taxes	1405.31	1562.20	1528.83	1542.65	
3	Income from Assigned Revenue	376.02	286.29	363.02	348.84	
	Total Revenue Income	2867.24	2866.50	3103.28	3181.42	
	B. Capital Income					
4	Grants and Loans	283.41	452.38	1239.89	865.16	
	Total Capital Income	283.41	452.38	1239.89	865.16	
	Total Income	3150.65	3318.88	4343.17	4046.58	
C. Revenue Expenditure						
5	General, Establishment and Other Revenue Expenditure	1613.12	1726.69	1798.45	2237.89	
6	O&M of Sanitation including SWM	356.59	301.41	392.17	588.63	
	Total Revenue Expenditure	1969.71	2028.10	2190.62	2826.52	
	D. Capital Expenditure					
7	Capital Expenditure	1159.82	728.20	690.75	1157.86	
	Total Capital Expenditure	1159.82	728.20	690.75	1157.86	
	Total Expenditure	3129.53	2756.30	2881.37	3984.38	
	Revenue Surplus/Deficit	897.53	838.40	912.66	354.90	
	Capital Surplus/Deficit	876.41	275.82	549.14	292.70	
	Overall Surplus/Deficit	21.12	562.58	1461.80	62.20	

Table 52: Property tax DCB

Property tax	2011-12	2012-13	2013-14	2014-15
No of Assessments	32288	34472	38456	37754
Demand				
Arrears	136.10	159.00	187.00	136.14
Current	774.00	1035.40	1036.94	1059.10
Total	910.40	1194.40	1223.94	1195.24
Collection				
Arrears	125.00	145.00	173.20	136.00
Current	712.12	952.54	964.35	1023.49
Total	837.12	1091.54	1137.55	1164.49
Balance				
Arrears	11.10	14.00	14.00	0.14
Current	61.88	82.86	72.59	30.61
Total	72.98	96.86	86.59	30.75

Table 53: Water Supply DCB

Water Supply	2011-12	2012-13	2013-14	2014-15
No of Assessments	18162	20250	21780	24119
Demand				
Arrears	485.40	645.33	767.10	920.95
Current	295.74	317.00	312.31	320.20
Total	781.14	962.33	1079.41	1241.15
Collection				
Arrears	35.11	79.36	44.90	78.62
Current	100.70	115.87	113.56	130.17
Total	135.81	195.23	158.46	208.79
Balance				
Arrears	450.29	565.97	722.20	842.33
Current	195.03	201.13	198.75	190.03
Total	645.33	767.10	920.95	1032.36

12. CAPACITY AND ENHANCEMENT:

Conducting special training classes from the base level i.e., PH worker to Supervisory staff on their roles and responsibilities on timely intervals (Once in 3 months).

13. HEALTH AND HYGIENE:

This Municipality has taken care of precautionary measures to prevent epidemic related diseases since last more than 5 years. Further no water borne diseases are noticed and for which this office is implementing awareness camp distribution of pamphlets, spreading of Bytex and other chemicals to eradicate mosquitoes. As such since more than five years there is no hazardous diseases are noticed in Eluru Municipal Corporation.

However seasonal measures are being adopted for preventing health hazardous diseases by way of spreading of Gambosiya fish in water stagnant ponds laying of oil balls on the surface of water, special drive are also taken up as and when required.

14. CITY-WIDE KEY ISSUES:

Of all the issues identified in Chapter 4 to Chapter 13, following key issues with respect to sanitation have been identified for Eluru town.

Table 54: City-Wide Key Issues

Key Issue 1	Lack of inefficient and unscientific solid waste management leading to unclean and unhealthy city
Rationale for this key issue	Dumping of waste in Ponangi is the present scenario of ULB no effective technique for SWM is in place.

Key Issue 2	Waste-water is not properly managed (i.e. there is no proper collection, conveyance & treatment of waste-water), leading to unhygienic conditions & pollution of water bodies
Rationale for this key issue	As the STP in Ponangi is defunct ULB is unable to treat waste water however under AMRUT, STP is proposed though build will not treat 100% waste water generated in ULB.

Key Issue 3	Insufficient and inefficient Storm water management leading to unhealthy towns
Rationale for this key issue	SWD not fully covered only 6.80km stretch is built.

V av. Ia	1	Prevalence of insanitary toilets and improper maintenance of Public and Community
Key Is	ssue 4	Toilets, leading to detrimental environmental and health hazards

Rationale for	
this key issue	

Key Issue 5	Poor cost recovery and collection efficiency in water supply related services leading to poor services to the citizens / users
Rationale for this key issue	

Key Issue 6	Lack of skills / capacities (technical and managerial) with the Municipal staff in all departments makes it challenging for the Municipality to perform day to day functions and keep pace with the increasing demand in services and developments in sanitation sector.
Rationale for	
this key issue	

15. GOALS CORRESPONDING TO CITY WIDE KEY-ISSUES:

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

Table 55: Goals Corresponding to City Wide Key-Issues

Sr.	Key Issue	Goal
No.	1203 25540	
1	Lack of inefficient and unscientific solid waste	Achieve Service Level Benchmarks (as defined by
	management leading to unclean and unhealthy	MoUD) in Solid waste management by 2020
	city	
2	Waste-water is not properly managed (i.e. there	Ensure proper waste-water (sewage & septage)
	is no proper collection, conveyance & treatment	management (collection, conveyance, treatment &
	of waste-water), leading to unhygienic	disposal) by 2020
	conditions & pollution of water bodies	
3	Insufficient and inefficient Storm water	Ensure comprehensive and efficient Storm water
	management leading to unhealthy towns	management by 2019
4.	Prevalence of insanitary toilets and improper	Ensure all existing and new toilets (IHHT, PT & CT)
	maintenance of Public and Community Toilets,	are sanitary and properly maintained (to cover the
	leading to detrimental environmental and health	current and future demand) by 2019

	hazards	
5.	Poor cost recovery and collection efficiency in	Achieve at least 90% cost recovery and 90%
	water supply related services leading to poor	collection efficiency in water supply related services
	services to the citizens / users	by 2020
6.	Lack of skills / capacities (technical and	Take-up up gradation of skills of all municipal staff
	managerial) with the Municipal staff in all	as mainstream and regular activity, aimed at
	departments makes it challenging for the	achieving better competency and efficiency
	Municipality to perform day to day functions	
	and keep pace with the increasing demand in	
	services and developments in sanitation sector.	

16. Action Plan:

Table 56: Action Plan

Sr.No.	Key	Goal		Actions							
	Issue										
			Short term (within 2	Responsible	Mid tame (2.5 years)	Responsibl	Long term	Responsib			
			year)	Agency	Mid-term (3-5 years)	e Agency	(5-10 years)	le Agency			
1	Lack of inefficient	Achieve Service	a. Timely implementation	Commission	a. Ensure 100% source	ULB					
	and	Level	of GO 279	er Council	source segregation in	ULD					
	unscientifi	Benchmarks	-Definition of	Council	phased manner						
	c solid waste	(as defined by MOUD)	micro pockets -Identification		b. Involve PoliceDept. for	ULB					
	manageme	in Solid	of works to be	Council	exercise/enforce	CLB					
	nt leading	waste	carried out by		ment of bye-						
	to unclean and	management by 2020	municipal health workers	Health	laws/Municipal Act						
	unhealthy		and works	inspector	c. Ensure proper	ULB					
	city		which need to be outsourced	Council	management of plastic waste						
			-Tendering &	CSTF	d. Initiate steps for						
			selection of	CSTI	extended	ULB					
			private parties for collection		responsibility of manufactures of						
			and		disposal						
			transportation		products						
			b. Identification & possession of	ULB	e. Plan for up scaling of	ULB					
			land for landfill		decentralized	CLB					
			facility,		organic waste						
			processing facility and		management for Gated Colonies,						
			material	ULB	Apartments,						

recovery facility (if applicable) c. Provide bins for source segregation to poor households d. Eliminate open dumping points in a phased manner e. Ensure personal protection equipments (uniforms, hand gloves, boots, masks, etc.) to workers handling solid waste f. Frame bye-laws for -controlling littering & open dumping (spot fines) -banning of plastic carry bags as per the provision of plastic waste management	ULB ULB	Commercial establishments and Institutions, etc. f. Initiate steps for improving the cost recovery & collection efficiency for SWM services	ULB	
plastic carry bags as per the provision of	ULB			
-banning burning of solid waste	ULB			
-managing waste generated in public	ULB			

	gatherings	ULB		
		CLD		
	(marriages,			
	etc.)implementa			
	tion of			
	SWM			
rules	,2016			
	g. Plan for			
	3. I lali 101			
	material			
	recovery facility	ULB		
	for sorting of			
	recyclable			
	material			
	n. Set up E-waste			
	collection			
		III D		
	centres	ULB		
	. Set up C&D			
	waste collection			
	centres			
	. Prepare strategy			
	for managing			
	disposable	ULB		
		ULB		
	waste (eg.			
	discouraging			
	disposal waste,			
	involve			
	disposable			
	waste			
	generators, etc.)			
	x. Initiate steps to	III D		
	make unused /	ULB		
	inefficient			
	compost plant			
	fully functional			
	. Try and test			
	decentralized			
	management of			
	organic waste			
		III D		
	within premises	ULB		

	of Govt.			
	institutions			
	n. Explore support			
	from NBCC (as			
	per the request			
	from SBM-			
	MoUD) for			
	Bio-mining /	*** 5		
	Bio-remediation	ULB		
	or capping of			
	old and			
	abandoned			
	dump site	ULB		
r	. Explore			
	possibility of			
	cooperation			
	between ULBs			
	& BSNL as per	ULB		
	MoU between			
	BSNL &			
	MoUD for	ULB		
	providing	022		
	eSBM platform			
	for SWM in	ULB		
	ULBs.	CLD		
	master plan has			
	land provisions			
	for setting up			
	processing			
	facility &	III D		
	landfill site	ULB		
I I				
	system to			
	recognize			
	organizations of			
	waste pickers &			
	waste dealers &			

facilitate their		
participation in		
effective SWM		
q. Initiate		
registration of		
waste pickers &		
waste pickers & ULI		
r. Fix user charges		
for all non-		
residential users		
(Commercial		
establishments,		
Institutions and		
Industries)		
s. Fix user charges ULI		
for residential		
users		
t. Organize		
rigorous IEC		
activities for all		
stakeholders.		
u. Take support		
from NGOs / ULI		
CBOs/ SLFs,		
Ward Sabhas /		
Area Sabhas,		
RWAs, SLFs /		
TLFs, Industry		
and Commerce		
associations,		
NCC / NSS,		
Schools, town		
clubs and local		
Eminent		
personalities for		
IEC activities		
and regular		
monitoring		

			v. Formalize partnership with local academic and professional institutes (Colleges, ITIs, etc.) for supporting the ULBs in achieving improved sanitation (WW&SWM) w. Ensure consistent improvement in all subsequent Swachh Sarvekshan ranking exercises. Bottom line being to be in the first 150 towns in the upcoming round. x. Mainstream Swachhata App rolled out by SBM, MoUD in the ULB / city			
2	Waste- water is	Ensure proper	a. Explore (through study)		a. Construction & Commissioning	a. Initiate project for
	not properly managed (i.e. there	waste-water (sewage & septage) management	if UGD system is feasible & practical for the city.	AMRUT & ULB	of Septage Treatment Plant (if applicable) b. Initiate project	treatment for grey water & overflow

is no	(collection,	b.	Explore		for treatment for	(effluent)
proper	conveyance,		possibility of		grey water &	from septic
collection,	treatment &		refurbishment	AMRUT	overflow	tanks in
conveyanc	disposal) by		of existing	&ULB	(effluent) from	entire town
e &	2020		defunct STPs &		septic tanks in	(in phased
treatment			Sewer network		selected areas	manner)
of waste-			(if any)	ULB and		b. Ensure
water),		c.	Repair &	Concerned		reuse and
leading to			Restoration of	contractor		recycle of
unhygienic			existing defunct	• • • • • • • • • • • • • • • • • • • •		atleast 20%
conditions			STPs & Sewer			of waste-
&			network (if any)			water
pollution		d.	Ensure fully			c. Ensure no
of water		u.	segregated			untreated
bodies			municipal			waste-
			budget heads			water
			related to			enters the
			waste-water	ULB		environmen
			services	OLB		t (water
		e.	Identification			bodies /
		C.	and nomination			land) –
			of Nodal			100% safe
			department for			manageme
			Septage	ULB with the		nt of waste-
			Management in	help of		water
			the ULB	consultants		Water
		f.	Explore	Constituits		
		1.	feasibility for			
			setting up a			
			Septage Septage	ULB		
			Treatment Plant	OLB		
			including			
			identification of			
			land & project	ULB-		
			design	Sanitation		
		g.	Building	Department		
		ج.	capacities	Department		
			within ULB for			
L	1				<u> </u>	

Septage management h. Organize a registry/ association of informal / private desludging operators i. Prepare SOP / Operation Manual for septic tank emptying private operators j. Prepare bye- laws for consultants j. Prepare bye- laws for disposal of septage by private desludging operators k. Regularize user charges for emptying of septage by private desludging operators k. Regularize user charges for emptying of septic tanks l. Explore options (study) for treatment of grey water & overflow (effluent) from septic tanks m. Explore reuse and recycle					
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septic tanks m. Explore reuse					
m. Explore reuse					
	m				
			1	L	

3 Insufficien Ensure	opportunities n. Organize rigorous IEC activities for all stakeholders o. Organize citizen care unit for septage management within the ULB a. Prepare Master	ULB and	a. Augmentation		
t and comprinefficient ve and Storm efficie water Storm manageme manageme	water t management water b. Mapping of ement existing Storm	Consultant assigned ULB	of storm water drainage network b. Ensure zero incidences of	ULB	
nt leading to unhealthy towns	water drainage network c. Identification of funds for retrofitting & augmentation of storm water drainage network d. Prepare DPR	ULB and Council ULB and Consultant assigned ULB with	water logging in the town c. Upscale ground water recharges systems in Gated Colonies, Apartments, Commercial establishments, Institutions, etc.	ULB with the co- operation of Colony and apartment associations	
	for retrofitting & augmentation of storm water drainage network	approval of Council ULB	d. Initiate steps for ground water recharge at town level (i.e. roads & streets)	ULB	
	e. Retrofiting of major drains f. Identification & Mapping of illegal Encroachment areas near	ULB	e. Eliminate illegal untreated effluent outflows from local industries in storm water drains with	ULB ULB	

			$\overline{}$
drains	ULB	support from	
g. Plan and initi		PCB	
steps for		f. Ensure all	
clearing of		surface water	
illegal		bodies	
Encroachmer		(Cheruvus,	
areas near	it	streams, rivers)	
drains			
	TH D	are pollution	
h. Frame bye-la		free	
for controllin	g		
littering in			
drains			
i. In order to			
ensure that			
sweepers do i	not		
dispose solid			
waste into	ULB		
drains, same			
staff that is			
responsible for	or		
cleaning stree	et		
to be made			
responsible fo	or ULB		
cleaning			
adjacent surfa	nce		
drains (upto a			
depth of 45-6			
cm)			
j. Establish a	ULB		
j. Establish a monitoring			
system for			
cleaning &			
desilting of			
storm water			
storm water drains			
	. III Did		
(especially pr			
monsoon)	Council		
k. Ensure regula	ır approval		

de-clogging of			
bottleneck			
points			
1. Procurement of	ULB		
additional	-		
equipments /			
tools / vehicles			
(only if	ULB		
required) for	CLD		
desilting & de-			
clogging of			
storm water			
drains	ULB		
m. Ensure fully	OLD		
segregated			
Municipal Municipal			
budget for			
proper maintenance of			
Storm water			
	ULB		
drainage network	ULB		
n. Identification &			
Mapping of			
water-logging			
areas in the			
entire town			
o. Plan and initiate			
steps for	III D		
eliminating	ULB		
incidences of			
water-logging			
in the entire			
town			
p. Initiate ground			
water recharge			
measures (eg.			
rainwater			

			harvesting) in Govt. Institutions Explore (through study) options for ground water recharge (Source control options, Rain water harvesting, permeable pavements, retention & detention zones, etc) Identification of illegal untreated effluent outflows from local industries in storm water drains					
4 Prevalence of insanitary toilets and improper maintenan ce of Public and Communit y Toilets, leading to detrimenta 1 environme	Ensure all existing and new toilets (IHHT, PT & CT) are sanitary and properly maintained (to cover the current and future demand) by 2019	a. b.	Carryout out an independent study to understand the environment and health hazards to the city due to improper wastewater management Ensure 100% enforcement of 'The	ULB	a. Ensure all existing Gated colonies, Apartments, Commercial establishments , Institutions and Bus & Taxi stands upgrade to safe sanitation systems. b. Try and test alternate safe	ULB with support of	a. Plan & Initiate steps for reuse / recycle of treated waste- water in Public / Community Toilets, Apartments, Commercial establishment s, Institutions	ULB

ntal and	Prohibition of		sanitation		
health	Employment as		systems		
hazards	Manual		(DRDO Bio-		
	Scavengers and		digester,		
	their		Aerobic Bio-		
	Rehabilitation		tanks,		
	Act, 2013	ULB	Decentralized		
	c. Ensure	OLD	Treatment		
	provision of		units, etc.) in		
	safe sanitation		Govt.	ULB	
				ULB	
	services for		institutions		
	labourers as per		c. Plan for up		
	'The Andhra		scaling of		
	Pradesh		alternate safe		
	Municipalities		sanitation		
	Act, 1965'		systems in		
	d. Prepare bye-	ULB	Public /		
	laws for		Community		
	ensuring all		Toilets, Gated		
	upcoming		Colonies,		
	Gated colonies,		Apartments,		
	Apartments,		Commercial		
	Commercial		establishments		
	establishments,		, Institutions		
	Institutions and		d. Upgradation		
	Bus & Taxi		of all	ULB	
	stands plan for	ULB	insanitary		
	independent		sanitation		
	safe sanitation		systems to		
	systems		sanitary		
	e. Ensure ULB to		sanitation		
	give building		systems		
	permission only		e. Involve Police	ULB	
	for all		department for	OLD	
	upcoming		lawful		
	Gated colonies,		exercise /		
	- T		exercise / enforcement		
	Apartments,				
	Commercial	ULB	of bye-laws /		
			<u> </u>		

establishments,		Municipal Act	
Institutions and		F	
Bus & Taxi			
stands with			
plans for	ULB		
independent			
safe sanitation			
systems.			
f. Formation of	ULB		
committee /	CLD		
task force for			
ensuring proper			
operation &			
maintenance of			
public and			
community	III D		
toilets	ULB		
g. Ensure all			
community and			
public toilets			
have safe			
sanitation	ULB		
systems	CLD		
h. Ensure			
dedicated			
Municipal			
budget for	ULB		
proper O&M of			
Public and			
Community			
Toilets			
i. Procurement of			
mobile toilets			
by ULB for	ULB		
public during	OLD		
open public			
gatherings			
j. Plan and initiate			

steps (eg. spot fines) for			
controlling / discoursing open urination	ULB		
especially in public areas k. Prepare bye- laws for standardization	ULB		
& design of septic tanks (as per AP Building rules, 2012) for upcoming new constructions.	ULB		
1. Ensure septic tanks are planned & constructed as per bye-laws before allocating building permission by the ULB	ULB		
m. Prepare registry (at ULB) of plumbers & masons skilled for construction of septic tanks n. Conduct	ULB		
training programmes for plumbers and masons regarding	ULB		

scientific designing of septic tanks o. Formation of dedicated committee / ,NGO's task force for ensuring safe sanitation in
slum areas p. Identification of all insanitary sanitation ULB
systems (single pit latrines, damaged / defunct / ill constructed septic tanks, pit latrines / soak pits in high ground water table areas etc.) in the city q. Explore
possibility (through study) of upgradation of all insanitary sanitation systems to sanitary sanitation systems r. Explore CSR funding possibilities
from Industry

and Trade & Commerce associations for conversion of insanitary sanitation systems to safe sanitation systems to safe sanitation system so safe rigorous IEC activities for all stakeholders. 1. Take support from NGOs / CBOs/SLFs, Ward Sabhas / Area Sabhas, RWAs, SLFs / TLFs, Industry and Trade & Commerce associations, NCC /NSS, Schools, town clubs and local Eminent personalities for IEC activities and regular monitoring u. Formalize partnership with local academic and professional institutes (Colleges, ITIs, etc.) for		
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(Colleges, ITIs, etc.) for	institutes	
etc.) for	(Colleges, ITIs,	
	etc.) for	
I		

		supporting the ULBs in achieving improved sanitation (waste-water & solid waste management)					
Poor cost recovery and collection efficiency in water supply related services leading to poor services to the citizens / users	Achieve at least 90% cost recovery and 90% collection efficiency in water supply related services by 2020	a. Ensure fully segregated municipal budget heads related to water supply services b. Accounting practice enables proper monitoring (including clear identification of collection against specific bills) of billing and collections	ULB	a. Initiate steps for controlling NRW to 15-20 % especially reducing Apparent water losses (illegal water connections, water theft, metering inaccuracies)& Real water losses (leakages in the distribution	ULB	a. Initiate schemes / incentive s for reducing water usage, reuse of treated waste- water & practicing rainwater harvestin g	ULB
		for each connection within the ULB c. Ensure the operating revenues are collected in the same financial year, without allowing for dues to get accumulated as arrears (less than 10 %)	ULB & TCE	networks) b. Ensure procurement of energy efficient (eg. solar) electro- mechanical equipments (pumps, motors) for future Govt. works c. Initiate steps for making WTP (Water	ULB ULB with		

d. Carry out Water & Energy Audit for Water supply services e. Carry out a study for Assessment of	ULB & TCE	Treatment cooperation Plant) more from gated energy efficient d. Promote use of Water efficient fixtures especially in
Non-Revenue Water (NRW) and developing strategy and implementation plans for	ULB	PT/CT, Gated Colonies, Apartments, Commercial establishments, Institutions, etc
reduction of NRW f. Initiate practice of using Water efficient fixtures in future	ULB	e. Preach & practice use of waterless urinals in Pubic urinals, Commercial establishments,
procurement for Govt. works g. Identify innovation schemes (incentives, rebate) for payment of dues for water supply charges	ULB	Institutions, Bus & Taxi stands f. Plan and initiate punitive measures for non-cooperation for water supply related services g. Explore g. Explore feesibility and ULB if there is an initiation from Elected representativ es ULB if there is an
h. Mandatory installation of water meters for all non- residential users (Commercial establishments, Institutions and	ULB	initiation from Elected representativ es (except slums) h. Installation of water meters in residential areas (except slums) ULB with Council approval

	Industries)			in phased		
i.	Ensure			manner (if	ULB with	
	volumetric rate			possible)	Council	
	is charged for	ULB with the	i.	Incrementally	approval	
	water supply	approval of		revise water		
	services to all	council		supply user		
	non-residential			charges to		
	users			improve cost	ULB	
	(Commercials	ULB		recovery to 60%		
	establishments,		j.	Incrementally		
	Institutions and		J.	revise water		
	Industries)			supply user		
j.	Prepare bye-law	ULB		charges to		
	for differential	CLB		improve cost	ULB	
	rate for water			recovery to 90%		
	usage and		k.	Achieve atleast		
	ensure adequate		к.	90 % collection		
	safeguards are			efficiency from		
	included to take			residential users		
	care of the		1.	Achieve nearly		
	interests of the		1.	100 %		
	vulnerable			collection	ULB	
k.				efficiency from	ULB	
K.	for revision of	ULB		non-residential		
		NCO		users		
	user charges for all users (non-	NGO,		(Commercial		
	residential and	Student		`		
		Organization		establishments, Institutions and		
	residential) Ensure atleast	Organization		Institutions and Industries)		
		S		,		
	60% collection		III.	If possible &		
	efficiency			viable,		
m.	If Municipal			outsource the		
	staff is			activity of		
	insufficient for			collecting water		
	collection,			supply related		
	explore			charges to		
	possibility of			private operator	ł	
	outsourcing the			for entire town	1	l

	ı						T	I
			activity of collecting water supply related charges to private operator through appropriate business model Organize IEC campaign requesting cooperation from citizens for reducing wastage of water and payment of user charges			in phased manner		
Lack of skills / capacities (technical and managerial) with the Municipal staff in all department s makes it challengin g for the Municipali ty to perform day to day functions and keep pace with	Take-up upgradation of skills of all municipal staff as mainstream and regular activity, aimed at achieving better competency and efficiency	a.	Establish a system for inventory (Documentation) of capacity building activities (trainings, workshops, conferences, exposure visit, etc.) undertaken / planned for all municipal staff including elected representatives Identification & nomination of Nodal officer	ULB	a.	Monitor the progress with respect to capacity building & take appropriate actions as required	ULB	

the	for maintaining
increasing	and regularly
demand in	updating the
services	above system ULB
and	b. Identify staff
developme	members
nts in	responsible for
sanitation	
	filing updating
sector.	all data sets ULB
	collected under
	CSP, SLIP,
.	Swachh
	Survekshan,
	GO 279, DPR ULB
	c. Conduct
	Training Needs
	Assessment for
	the Municipal
.	staff ULB
	d. Explore
	avenues for
	capacity
	building with
	State under
	various
	SBM, AMRUT,
	etc.
	e. Conduct regular
	review meetings
	with new ULB
	sanitary
	workers on their
	challenges and
	achievements
	every 3 months
	f. Identify all new
	skills required ULB
<u> </u>	

of ULB staff members for new DPRs to be implemented g. Identify local NGO to
conduct training programme on community participation for ULB staff members
h. Establish an internship/traine e programme for local Youth in the municipality.
i. Introduce incentives for municipal staff to achieve implementation of CSP action points (award, participation in training, newspaper article)
j. Launch a competition for local Youth/IT College/Start- up to design online application for ULB and train municipal staff

17. COST ESTIMATES AND INVESTMENT PLAN FOR CSP:

Budget Projections of ULB

Table 57: Budget Projections

#	Particulars	Amount (Rs. in Lakhs)		
	Paruculars	2016-17	2017-18	2018-19
A	A. Revenue Income			
1	Income from Taxes	1418.92	1560.81	1732.50
2	Income from Non-Taxes	1696.91	1866.60	2071.92
3	Income from Assigned Revenue	383.72	422.09	468.51
	Total Revenue Income	3499.55	3849.50	4272.93
B. Capital Income				
4	Grants and Loans	951.67	1046.83	1161.98
	Total Capital Income	951.67	1046.83	1161.98
	Total Income	4451.22	4896.33	5434.91
C	C. Revenue Expenditure			
	General, Establishment and Other			
5	Revenue Expenditure	2461.67	2707.83	3005.69
6	O&M of Sanitation including SWM	647.49	712.23	790.57
	Total Revenue Expenditure	3109.16	3420.06	3796.26
D. Capital Expenditure				
7	Capital Expenditure	1273.64	1401.00	1555.11
	Total Capital Expenditure	1273.64	1401.00	1555.11
	Total Expenditure	4382.80	4821.06	5351.37
	Revenue Surplus/Deficit	390.39	429.44	476.67
	Capital Surplus/Deficit	321.97	354.17	393.13
	Overall Surplus/Deficit	68.42	75.27	83.54

18. Information, Education & Communication

Table 58: Preparing an external campaign

CAMPAIGN OBJECTIVE	STOP LITTERING IN PUBLIC SPACES		
Possible location	Markets, Commercial Roads, Residential areas, Slums		
Target audience	Families, women and children		
Current behavior	Throwing waste into the open areas, drains and vacant lands		
Desired behavior	No littering in the areas and segregation of waste and handing over the waste to sanitary worker		
Partners for campaign	Vendors, market associations, ULB, RWA,NGO		
Communication Actions	Display messages, organize street theatre at the market, organize, clean-up actions with children, Rally's, Distribution of pamphlets by playing "Burra Katha "and stage shows.		
Communication Channels	Board at shops, Personal interaction, Banners, Pamphlets etc.,		
Monitoring systems	Appointing special teams to monitor day to day activities		
Sustainability	Strict implementation of SWM rules and fines		

ఆర్.ఒ.సి. నెం. ఎఫ్2/3932/2015

జనరల్ బాడీ ప్రియాంబులు

ఏలూరు నగరమును స్వచ్ఛ భారత్/స్వచ్ఛ ఆంధ్ర కార్పోరేషన్ వారి యొక్క సూచనల మేరకు ఏలూరు నగరమునందు పూర్తి స్థాయి పారిశుద్ధ్య కార్యక్రమములు నిర్వహించుటకు GIZ (Germen International Corporation) వారు ఈ నగరపాలక సంస్థ అధికారులకు శిక్షణ ఇచ్చి సర్క్యులర్ ఆర్.ఒ.సి. సెం. 2708/2015/M3, తేది 19.08.2015 ద్వారా ఆంధ్రప్రదేశ్ రాష్ట్ర పురపరిపాలనా సంచాలకులు వారు ప్రణాళిక (City Sanitation Plan – CSP) తయారు చేయుటకు కొన్ని సూచనలు ఇచ్చియున్నారు.

కావున, జర్మన్ ఇంటర్నేషనల్ కార్పోరేషన్ వారు ఇచ్చిన శిక్షణ అనుసరించి, ఏలూరు నగరమును పూర్తి స్థాయి పరిశుభ్ర నగరముగా తీర్చిదిద్దుటకు తయారు చేసిన ప్రణాళిక (City Sanitation Plan – CSP)ను ఆమోదించు నిమిత్తం కౌన్పిలు వారి ముందుంచడమైనది.

> కమీషనర్, నగరపాలక సంస్థ, ఏలూరు ముడ్డిగుము ముడ్డిగుము

9 BR-NO-64. DF 7-12-2016 NEE WARDER GATTES DOTT JAJE 208 GALDES EN WE TWO THE STORE TO SEE FOR

Municipal Corporation
ELURU