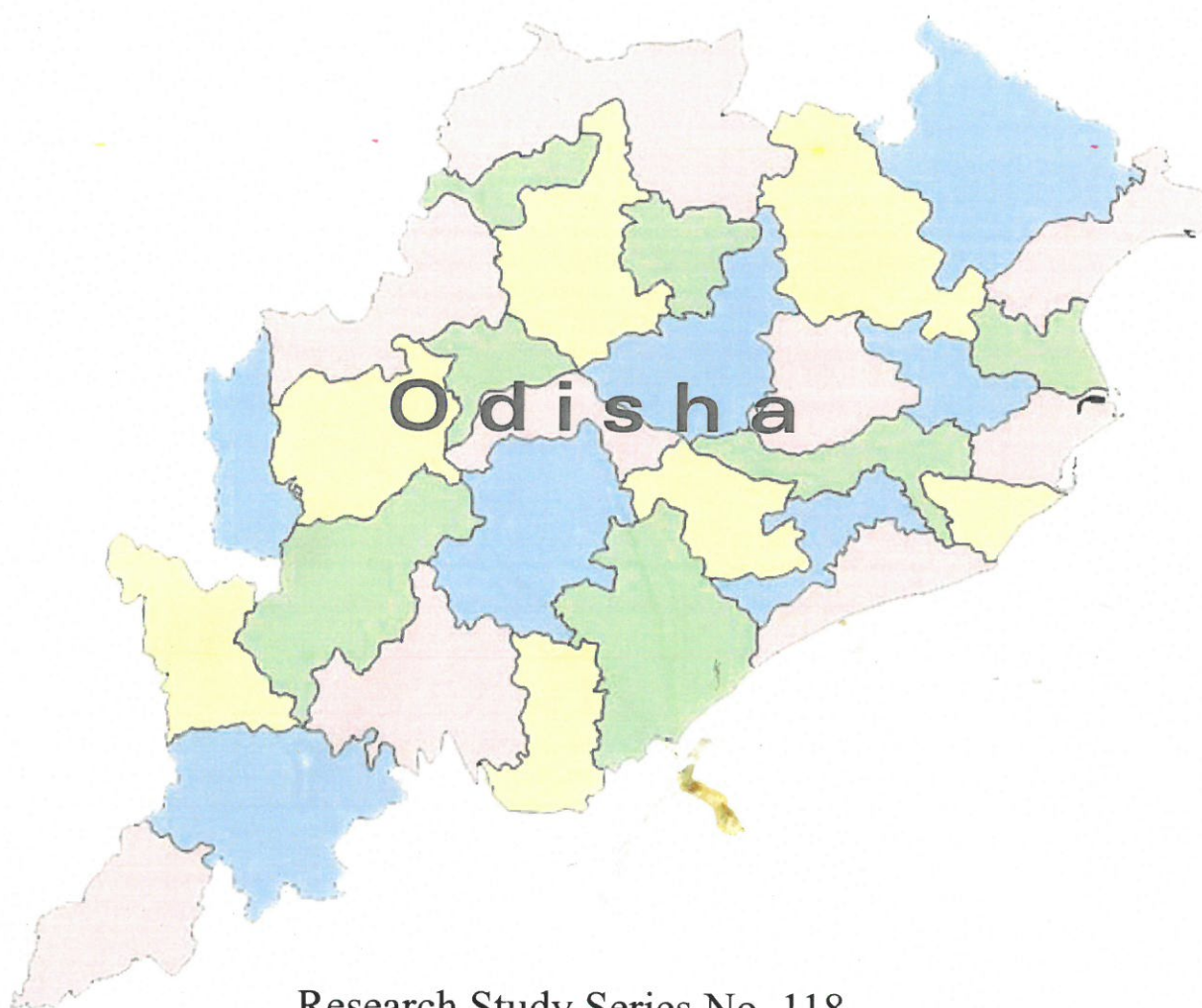


City Sanitation Plan

BERHAMPUR



Research Study Series No. 118

June 2012



National Institute of Urban Affairs
New Delhi , India

City Sanitation Plan

BERHAMPUR

OP&HS In association with
OP&HS (infra)

Research Study Series Number 118

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New Delhi


PREFACE

The overall goal of the National Urban Sanitation Policy (NSUP) is to transform Urban India into community-driven, totally sanitized, healthy and livable cities and towns. Each state needs to formulate its own sanitation strategy and their respective cities should prepare sanitation plan in conformity with the NUSP.

In this context, the Government of Odisha (GoO) selected eight cities/towns to prepare City Sanitation Plans (CSPs) viz. Bhubaneshwar, Cuttack, Berhampur, Sambalpur, Rourkela, Puri, Balasore, Baripada. These cities/towns were selected on the basis of (i) geographical representation; (ii) emerging demand and interest of ULB to take-up initiative; and (iii) poor sanitation conditions that require urgent attention. GoO has also prepared a State Urban Sanitation Strategy in 2011, which served as guidelines for the selected cities/towns to prepare CSP.

GoO has identified National Institute of Urban Affairs (NIUA), New Delhi, as a technical coordinator to carry out the work. Subsequently, NIUA has undertaken the work in association with All India Institute of Local Self Government - Planning and Resource for Urban Development Affairs (AIILSG-PRUDA) and OP& HS (infra).

Out of the eight CSPs, five have been prepared by AIILSG-PRUDA viz. Bhubaneshwar, Puri, Cuttack, Balasore and Baripada and three by OP&HS (infra) viz. Sambalpur, Raurkela and Berhampur. NIUA is thankful to the above agencies for carrying out the work. NIUA would like to thank officials of Department of Urban Development, GoO, selected cities/towns and Ministry of Urban Development, Government of India for their continued guidance and support. Special thanks are due to Dr. M.P.Mathur, Mr. Ajay Nigam and Mr. Naveen Mathur who have overseen the in-house work, visited the cities, attended meetings and provided their valuable comments.



Chetan Vaidya

Director, NIUA

June 2012

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Executive Summary

Provision of universal access to safe drinking water and sanitation facilities is a prime need to enhance quality of life in any community. The Government of Orissa (GoO) has formulated the *Odisha Urban Sanitation Strategy* (OUSS) on the lines of, *National Urban Sanitation Policy* (NUSP) that was announced by, the Ministry of Urban Development, in December 2008. As a first step in implementing the OUSS, the GoO has undertaken to assist some 8 cities/towns in developing City Sanitation Plans (CSP) with funding support from Government of India with National Institute of Urban Affairs as the central coordinating agency.

OPHS is appointed as the consultant for assisting the three cities of Berhampur, Sambalpur and Rourkela in the preparation of CSPs for the respective towns and had earlier submitted the Inception Reports. In line with the methodology of NUSP, the consultant has carried a structured survey and focused group discussions for undertaking the Situation Analysis of the sanitation status in the city covering the three key areas of wastewater, solid waste and the storm water drainage.

This Draft Report on City Sanitation Plan provides an insight on the present sanitation practices/situation in the city, sanitation deficiencies and further provides a detailed planning for city wide sanitation for attaining the goal of open defecation free city. A structured sample survey was conducted throughout the city on various attributes that concern the sanitation facilities in its vicinity and analysis of the same is carried out to assess its present sanitation situation.

The following methodology was adapted to selection of samples for the field survey:

- The city was divided as per its administrative wards. The sample size in each ward is fixed in proportion to the ward population and the sample households were selected duly taking in to account the geographical spread and ensures good representation of the characteristic of the ward.
- Separate survey questionnaires for sample survey and the focused group discussions were developed and the drafts discussed with the city administration and amended based on feedback and used in collecting the data.
- The survey team was trained and sensitized on the fundamental aspects of sanitation and were provided with sufficient background knowledge on the theme and objectives of CSP.
- The community and public toilets existing in the city were physically inspected by the survey team on walk in and walk around method and also by interaction with the users present during the walk around.

Demography

The population of the city for the census year 2001 was 307726, and the current population as of 2011 is said to be 355823 with the slum population of 117541(33%). The total number of households as of 2011 is 66812 in which 26270 are slum households. The city divided into 37 administrative wards is spread over 80sqkm sloping west to east and has a total road network of 385 km. Due to its importance of trading, about 50000 people visit the town from the region for sale, purchase or exchange of goods in the local markets.

Situation Analysis

Access to Water Supply

Water supply and wastewater services are provided by the Public Health Engineering Organisation and the city receives only one hour of water supply per day. The daily water production is close to 35 MLD with water scarcity during summer due to source problem. The water supply coverage is about 34% where in there are 23451 water supply connections out of 66812 households. As against 385km road length the water network is available in about 228km only. The remaining population depends upon some 1772 public stand posts and 1158 hand pumps.

Access to Toilets

According to the survey about 60% of the total households in the city have individual toilets and the remaining population, either use the community toilets or share with other households or resort to open defecation. However, it is very likely that as in the case of most of small towns in India, many households share toilets therefore, out of 39% people who have no toilet in the house; some 10% - 15% of the households might be sharing a toilet with the house owner or with other tenant in the same premises.

At the same time, it was noticed during the site visit some of the elders in the households with toilet facility still prefer to use the open area at the traditional ponds.

In light of above it is alarming that over 25% population are openly defecating and hence the solving the wastewater management requires a multi-pronged approach of supporting the community with provision of individual toilets and simultaneously ensuring behavioral changes in the aspects of personal hygiene and practice of sanitation.

According to the survey data some 26219 households are located in the slums and some 26403 households have no access to individual toilets indicating that the most of the HHs in the slums have no individual toilet facility. But an analysis of ward wise distribution of availability of toilets indicates a different picture that there are many households in the non-slum areas also have no toilets while the slum households do have some level of individual toilets as depicted in the following chart.

There are 18 community toilets with about 190 seats out of which 5 units are leased out by BMC to a local maintenance operator and the remaining are maintained by the BMC. Over half of the toilets have defunct water facilities and the users either carry water from near by ponds or hand pumps or clean themselves back at home after usage.

There are 4 public toilets with three being operated by Sulabh International and one being managed by Berhampur Development Authority in the city. The Sulabh Toilets have bathing facility also and they charge Rs.2 for toilet usage and Rs.3 for usage of bath. On an average some 150 – 200 people use the facilities and hence the maintenance of the same is relatively better than the community toilets.

Wastewater Management

The city has no concept of wastewater management. About 53% of the residents have onsite sanitation facilities and the remaining population depends upon the few community toilets but predominantly resort to open defecation, hence, it has resulted in unhygienic conditions, with the highly polluted sewage ponds in the vicinity of the habitat serving as breeding ground, especially for mosquitoes, poses a great threat to the public health and welfare of the community. Even the households with onsite sanitation, there is no sanitary disposal of sludge

and the residents hire local contractors with suction machines who dispose the sludge in open pits/nallahs located outside the town limits.

Thereby, the entire city's wastewater disposal needs a complete changeover in order to achieve a safe sanitized environment.

Solid Waste Management

BMC introduced door to door collection of garbage by private contractors and some 17000 households in 14 wards are covered by the facility. The average cost of the collection and transport is said to be Rs.13.16laksh per month working out to Rs.77 per month per household. In the remaining 23 wards the solid waste is currently dumped at common collection point mostly an open site, from where it is hauled to the disposal site by the Municipal Corporation. The total solid waste generated per month amounts to 4,589 tons of which only 3,402 are collected and disposed at a 10.3acre land located at Chandania Pahad which is at about 10km from the city. The average ward-wise collection efficiency of the garbage is about 74%.

The entire wards in the city are covered by street sweeping for about 6 days, a week. The ward numbers 10,13,14,18, 21 to 26, 28, 29, 30 and 32 are managed by a private body whereas; in the remaining 23 wards the municipality engages its staff for solid waste management. The waste collected by street sweeping is about 608 tons per month, which is about 13% of the total waste generated. BMC is planning to extend the private management to all the wards.

There are few villages that have been added to the municipal area in recent times. The cattle wastes from these villages also require a safe and scientific disposal. The following figure shows the percentage-wise breakup of solid waste generation sources. The waste generated from street sweeping suggests the lack of proper infrastructure in collection and disposal of solid waste in the city. It can be seen above that while the waste collected in most of the wards is around 2 – 2.25kgs/day while in case of wards 5, 6, 12, 18, 21, and 27 it is over 3.5kgs/day indicating possibility of markets or high commercial activities generating more waste. It could also be a case that in these wards the local waste collection could be relatively more efficient which need field conformation. While waste collection is more or less consistent across all the wards but the availability of street vats is skewed in some of the wards. For example the in ward 14 there are over 16 vats per 1000 households and in wards 5 and 6 the vats are available are about 9 and 6 respectively as against the much higher waste generation in these two wards. BMC can easily rationalize the availability of street vats in proportion to the waste generated.

Storm Water Management

The drains are in a state of disrepair and the situation is further aggravated by clogging by plastic. The municipal conservancy staff are said to be de-silting the drains on a daily basis.

Basic Services to Urban Poor

Berhampur has total 137 numbers of slums out of which 114 are authorized and 23 are unauthorized slums. The slum population total to 1,17,541 with 26,270 households. Nearly 33% of the total population of the town comprises of the slums. The slums in the city are scattered all around the city and increasing over time. Population density has been the major bottleneck in providing of basic service.

Financial Status

The own source revenues are a meager 7% and the city depends almost on grant devolutions from the state government. Also the expenditure on salaries is about 41% and some portion of the expenditure on development works also relates to salaries of the field work charged staff.

The key component of own source revenue is the municipal tax on properties the details of which are shown below.

Details of Taxes in Berhampur

Holding Tax	5%
Water Tax	6%
Drain Tax	4%
Light Tax	4%
Latrine Tax	6%
Total	25%

Tax Demand and Collection in Berhampur

Subject	2007-08	2008-09	2009-10
Demand	28,702,575	28,443,806	31,132,565
Collection	17,568,290	15,490,866	17,776,895
Balance	11,134,285	12,952,940	13,355,670
Collection Efficiency	61%	54%	57%

Key Issues

Water supply

- Low coverage; inequality of distribution;
- wastage and theft of water; illegal connection and high system loss
- Lack of proper maintenance of infrastructure

Sewerage

- No sewage collection, transmission and treatment facility
- Lack of proper septage management
- Inadequate community toilets; High degree of open defecation
- Raw sewage being disposed to water bodies leading to health hazards

Solid waste

- Lack of proper a scientific land fill site or even a proper dump yard
- River and ponds are widely used for dumping solid waste
- ULB lacks a waste management plan

Drainage

- Inadequate carrying capacity of drains leading to flooding
- Encroachment into drain; choking of drains due to garbage dumping
- Lack of comprehensive drainage master plan

Others

- Low level of awareness more so in the slum area
- Inadequate monitoring and enforcement mechanism
- Unhygienic condition in slum area
- Lack of coordination between various institutions responsible for urban services and development
- Inadequate staff strength
- Inadequate initiative on reforms
- Ring fencing of expenditure not practiced
- E-governance has not yet been implemented leading to manual method which results requirement of large man power and delay in working.

City Sanitation Plan

Population Projection

The population projection was arrived using graphical progression with 2012 as the base year and 2027 as the intermediate year and 2042 as the design year. The population projected are 3,63,092, 4,64,520 and 5,65,949 respectively.

Waste Water Management

Option analysis has been done for various components of the waste water management such as household level sanitation, collection, treatment and disposal of waste water. The options of recycle and reuse have also been explored.

The strategy adopted in the planning process focuses on augmentation of water supply system with additional capacity of production, increased coverage and improved management resulting in low NRW.

The waste water management has been formulated with the concept of providing 100% access to toilets to all residents and floating population. As far as possible individual toilets are to be promoted with subsidy support, shared toilets being the next best option followed by community & public toilets. The institutional sanitation in schools, colleges & offices also needs to be addressed simultaneously. The sewer zoning has been adopted based on the topography of the area. The collection have been considered with prioritization of sewer network system considering the fact that most of the septic tanks are under designed leading to poor effluent quality. Also the service level benchmark suggests for 100% collection efficiency as one of the indicators. Small bore system have been adopted where ever applicable. Considering the constraints and land availability and local resistance for treatment facility in the neighborhood, decentralized system with bigger zoning has been proposed.

The base year is taken as 2012 and the design year has been considered as 2042 with implementation period being six years i.e. 2012 to 2018. The sewage generation is computed at 56.6 MLD for the design year considering 100 LPCD sewage generation at 80% of water supply. A comparative statement of different construction of pipes shows that RCC pipes are the most suitable for the collection system. The additional infrastructure required includes

- 10015 individual toilets for both slum and non slum area
- 5344 shared toilets being shared by two households
- 250 community toilet seats in 25 toilets suitably located within accessible distance of the targeted slum
- 105 public toilet seats in 21 toilets suitably located in the public places
- 40 public urinals with provision of two urinals in each facility
- 45744 new household connection
- 298 Km sewer collection network with small bore collection in one zone (district 3) and conventional network in two zones (District 1 & 2)
- 3 treatment facilities totaling to 47 MLD. One oxidation pond of 3MLD capacity and two STP adopting ASP technology of 28 & 16 MLD is proposed.

The total subsidized capita cost is proposed as 167.00 crores to be implemented in time frame of six years.

Solid Waste Management

The solid waste management proposal has been developed with the objective of proper and effective collection, segregation, transportation, processing and disposal of municipal solid waste. Protection of public health, minimize environmental and occupational hazards are the other primary goal.

The approach taken to conclude the planning process is ensure 100% collection with segregation at source. Easy access of service to every citizen is priority. There has to be a eco friendly transfer and transportation system. A feasible processing facility has to be adopted to ensure optimal utilization of waste for productive output. A scientific land fill is also proposed.

The base year is taken as 2012 and the design year has been considered as 2015 for collection & transportation and 2030 for treatment & landfill. The collection and transportation infrastructure designed for 2015 itself has a over loading capacity of 10% which can take care of next 7- 10 years upto 2022 and also the addition of infrastructure required for this component are in small modules which can be added at intervals of 5 years. The treatment and landfill are designed for 15 years since the construction of these infrastructures are a long term process and are economical with size. The ULB already has good number of equipments for collection and transportation of solid waste with a available land fill site.

The waste generation in base year is 161 MT per day. It is projected that the generation will increase to 175 MT per day during 2015 and 231 MT per day during 2030. The water generation projection is based on the study conducted for similar cities in Odisha and confirmed by sample verifications. The characteristics waste suggests that it contains 63% organic component, 13% recyclable components and 24% inert components.

The additional infrastructure consists of primary collection system, street sweeping, transportation vehicle, secondary transfer station, recovery centers, composting unit,

mechanical & electrical equipments, bio-methanation plant, land fill site, bio medical waste handling and cost of land acquisition.

The total project cost is arrived at Rs. 26.92 crores to be implemented in a time horizon of three years i.e. 2010 to 2015.

Storm water Drainage

Proper drainage & disposal of storm water and prevention water logging are very vital component of a good sanitation system and improved public health. A properly networked drainage system of proper design standards is required to achieve the required goal.

All the roads need to have a drain well networked with the primary drains and finally disposal to the natural drains or water bodies. The drains have to be covered type. It is assumed that 50% of the roads would be required to have drains on both side. Total road length of the is city is 385 Km. A total of 578 Km of drains are proposed out of which 142 Km of pucca drains are in existence. The additional infrastructure required is 436 Km out of which 44Km main drain, 131 Km secondary drain nad 261 Km tertiary drain are proposed.

The total cost of additional infrastructure is calculated at Rs. 87.90 crores to be implemented over a period of 4 years i.e. 2012 to 2016

IEC and Institutional Strengthening

Awareness generation, promotion of cultural & social shifts are the major component for success of planning process. The required objective can only be achieved when the citizens are educated, conscious, responsive and adaptive. These should be supported by a strong institutional reform including capacity building and a equally strong enforcement mechanism.

It is proposed to adopt various medium for awareness generation with delivery in next four years. However this process should continue on a annual basis to continue the momentum. The process can be categorized as design phase, implementation phase and review phase. Midterm correction should be adopted for effectiveness of the programs. Simultaneously the capacity as well as the structure of the institution needs to be strengthened.

The total IEC cost is arrived at Rs. 3.70 crores to be implemented over a period of 4 years i.e. 2012 to 2016.

Abstract

The abstract of the capital outlay for achieving city wide sanitation is as follows

Description	Amount in Lakh Rs.
Waste Water Management	16,700.00
Solid Waste Management	2,692.00
Storm Water Drainage	8,790.00
IEC & Capacity Building	370.00
Total	28,552.00

The total investment plan for the city sanitation plan is computed at **Rs. 285.52 crores**

Acronyms

CSP	-	City Sanitation Plan
DTDC	-	Door to door collection
GoI	-	Government of India
GoO	-	Government of Orissa
HH	-	Household
LPCD	-	Liters per Capita per Day
MoUD	-	Ministry of Urban Development
MSW	-	Municipal Solid Waste
MSWM	-	Municipal Solid Waste Management
NUSP	-	National Urban Sanitation Policy
SWD	-	Storm Water Drainage
SWM	-	Solid Waste Management
ULB	-	Urban Local Body
OUSS	-	Odisha Urban Sanitation Strategy
CSP	-	City Sanitation Plan
SAR	-	Sanitation Analysis Report
PPP	-	Public Private Partnership
BMC	-	Berhampur Municipal Corporation
EMD	-	Earnest Money Deposit
SD	-	Security Deposit

1. Introduction

Provision of universal access to safe drinking water and sanitation facilities is a prime need to enhance quality of life in any community. The State of Orissa is taking several steps to improve the quality of life of its urban population. This vision of providing basic facilities for all is driven by Orissa's remarkable progress in several areas in the recent past. The Government of Orissa (GoO) has formulated the *Odisha Urban Sanitation Strategy* (OUSS) on the lines of, *National Urban Sanitation Policy* (NUSP) that was announced by, the Ministry of Urban Development, in December 2008. By implementing the strategy, the state is planning to drive itself towards total sanitation, thereby, enhancing the standard of living across the cities and towns.

As a first step in implementing the OUSS, the GoO has undertaken to assist some 8 cities/towns in developing City Sanitation Plans (CSP) with funding support from Government of India with National Institute of Urban Affairs as the central coordinating agency. For ensuring inclusive development approach, the CSP, as envisaged in NUSP, will be prepared by taking into consideration ground realities, local conditions, and an up-to-date assessment of the situation. It shall be prepared through consultations with all relevant stakeholders in each of the sectors covered.

OPHS is appointed as the consultant for assisting the three cities of Berhampur, Sambalpur and Rourkela in the preparation of CSPs for the respective towns and had earlier submitted the Inception Reports. In line with the methodology of NUSP, the consultant has carried a structured survey and focused group discussions for undertaking the Situation Analysis of the sanitation status in the city covering the three key areas of wastewater, solid waste and the storm water drainage.

This City Sanitation Plan comprises of two parts. First the situation Analysis and second the planning for city wide planning. The Situation Analysis Report provides an insight on the present sanitation practices/situation in the city. Proper analysis of the situation provides inputs for preparing a effective and implementable strategy which finally translated into a detailed city sanitation plan.

2. summary of NUSP and OUSS

Before presenting the findings of the Situation Analysis and planning for city wide sanitation, we would like to quote the key elements of the NUSP which forms basis for the situation assessment and further development planning for improving the sanitation in the city.

2.1 National Urban Sanitation Policy

The vision of National Urban Sanitation Policy 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 woman". The key objectives of NSUP are:

- Awareness generation and behavior change
- Cities must be free of open defecation
- They must eliminate the practice of manual scavenging and provide adequate protective equipment that ensures the safety of sanitary workers.

- Proper disposal of municipal wastewater and storm water drainage should be arranged
- Recycle and reuse of treated wastewater for non-portable applications should be implemented wherever, possible
- Solid waste should be fully collected and safely disposed off
- Basic services to the poor should be provided adequately and maintained properly
- Measures for improved public health and environmental standards should be taken

2.2 Odisha Urban Sanitation Strategy

The main objective of the State Urban Sanitation Strategy is to develop citywide sanitation plans and implement them by integrating all aspects of sanitation in an effective way. The programme implementation strategy is based on the following principles:

- Develop sanitation facilities in the urban areas with special emphasis on the slums, through active participation of the communities, especially women.
- Eradicate the practice of open defecation in the city by providing household toilets, community toilets and public toilets.
- Safe disposal of human excreta, solid and liquid waste, including institutionalizing and provisioning the implementation of policy guidelines of Government of India on Management of Municipal Solid Waste and Management of Biomedical Waste.
- Improve the 'quality of life' of the sanitation workers.
- Engage civil societies and communities (women in particular) in awareness generation, hygiene education, creation of sanitation infrastructure and its maintenance.
- Strengthen institutional set up and build the capacity of the municipal staff for effective program implementation and meeting the challenges of technology and management.
- Encourage Public Private Partnerships (PPPs) to ensure generation of funds and sustainable program implementation.
- Ensure inter-departmental coordination and integration of various relevant projects/schemes/program for their optimum use and outcome.

2.3 National Rating Scheme for Sanitation

In order to rapidly promote sanitation in Urban areas of the country (as provided for in the National Urban Sanitation policy and Goals, 2008), and to recognize excellent performance in this area, the Government of India has instituted an annual rating and award scheme for cities. The award (Nirmal Shahar Puskara) is based on the premise that improved public health and environment standards are two key outcomes that cities must seek to ensure for their citizens. In doing so, government in states and urban areas will need to plan and implement holistic citywide sanitation plans, thereby putting in place processes that help achieve outputs

pertaining to safe collection, confinement and disposal (including conveyance, treatment, and/or reuse without adverse impacts on the environment in and around the cities).

The first rating of cities with regards to their performance in sanitation improvement based on a set of objective indicators of outputs, processes and outcomes, was carried out in 2010 to set the baseline ranking. Cities are expected to undertake an objective self-assessment from time to time. The NUSP document on ratings states that those in the red category are "Cities on the brink of Public health and environmental 'emergency' and needing immediate remedial action". The city sanitation rating methodology is provided at **Annexure 18**.

2.4 Objectives of the City Sanitation plan

The City Sanitation Plan is being prepared after carrying out a situation analysis and after a structural consultation with stakeholder. The plan will attempt to achieve the following objectives:

- To adopt locally suitable methods, technology and material, and provide necessary facilitation support to BMC.
- To encourage community and private participate and define their role in creation and maintenance of sanitation infrastructure, thereby ensuring a sense of ownership.
- To ensure coordination between various department working in the field of water supply and sanitation, such as departments of health education, public health and engineering, industry, environment, transport, pollution control board etc.
- To ensure an option use of funds allocated by the 12th and 13th Finance Commissions for solid waste management and other sanitation-related projects.
- To coordinate various externally aided projects for their optimum results.
- To promote novel ideas in mobilization of funds, including reforms in tax regime, public private partnership, exploring the private markets, user charges, beneficiary contribution

Overview of the Scope of Work

The following are the broad tasks included in the scope of work; the current status is also mentioned:

- Task 1 – Formation of City-level Implementation task force

A City-level committee consisting of government and private sectors stakeholders has been formed for the purpose of overseeing preparation and implementation of the City Sanitation Plan. Refer **Annexure 1**

- Task 2 – Conduct 1st Consultation

A first consultation has been conducted to orient the city stakeholders on the objectives of the NUSP and OUSS, and on the process and methodology of preparing the City Sanitation Plan. **Annexure 2**

- Task 3 – Reconnaissance Survey & Focused Group Discussion

A reconnaissance survey has been conducted to authenticate the secondary data. This survey includes information on the following, which has been reviewed and used as part of the situation analysis:

- Field Survey of Public Latrines in Wards and Slums
- Field Survey of Surface Drains
- Field Survey of Solid Waste Arrangement
- Sample survey of slum and non slum households
- Focused group discussion with elected representative and officials

Refer Annexure 3

○ Task 4 – Preparation of Situation Analysis

The situation analysis report, has been prepared which details out existing household sanitation arrangement, public sanitary conveniences, waste water disposal, solid waste management and water supply. It highlights the deficiencies in sanitation facilities. The analysis also provides the strategy to address the deficiencies.

○ Task 5 – Conduct 2nd Consultation

A second consultation workshop was held with the city implementation task force to present the findings of the situation analysis for feedback and suggestions. Refer **Annexure 14**

○ Task 6 – Preparation of Draft City Sanitation Plan

A draft city sanitation plan is presented incorporating assessment of strategies and technology options for safe collection, transportation, treatment and disposal of both solid and liquid waste in the city.

○ Task 8 – Conduct 3rd Consultation

The draft City Sanitation Plan and implementation plan will be presented to the city-level implementation task force. The recommendations of the committee and other stakeholders will be documented for their incorporation into the final version of the City Sanitation Plan. Refer **Annexure 17**

○ Task 9 – Final City Sanitation Plan

The final version of the City Sanitation Plan will be prepared after appropriately addressing all comments and suggestions of the 3rd consultation meeting.

Sanitation Components

The CSP needs to include a comprehensive plan for the following:

- ✓ Safe disposal of human excreta and liquid waste at household level.
- ✓ Safe disposal of Human excreta and liquid waste at public sanitary conveniences.
- ✓ Safe collection, conveyance, treatment and disposal of liquid waste from individual communities (like wards and slums) and the city.
- ✓ Safe disposal of storm water drainage from communities and city.
- ✓ Safe collection, transport, treatment and disposal of solid waste.
- ✓ Safe collection, treatment and disposal of hazardous wastes.

Improvement and Management of Sanitation facility

3. Situation Analysis

"We lost our latrine to the park" – an old lady in tears

The city ranks at 107 in the city sanitation ranking conducted during 2010 by MoUD.

3.1. Background

To determine the gravity of the current sanitation facilities in the Berhampur, the Situational Analysis report is prepared so as to address all the issues like: coverage of individual toilets, status of public toilets, transport and disposal of liquid and solid wastes, and other key issues pertaining to sanitation.

The base line data collection covered the following aspects.

- Base maps, and available secondary data on the city's demographics, service levels of water and sanitation
- Information on water supply, wastewater generation, collection and disposal, including initiatives which are being implemented or planned.
- Information on solid waste (collection, transportation and disposal)
- Data on municipal finances especially demand and collection of water and sewerage/sanitation charges, including connection fees and user charges; and capital costs and operation and maintenance costs for water and sewerage/sanitation services, and solid waste.

3.2. Field Survey

The assessment of sanitation situation is further determined through a structured field survey covering three groups; (i) reasonable sample of households covering non-slum and slum areas; (ii) focused group discussion with the corporators and (iii) focused group discussion with the municipal managers and operational staff.

The following methodology was adapted to selection of samples for the field survey:

- The city was divided as per its administrative wards. The sample size in each ward is fixed in proportion to the ward population and the sample households were selected duly taking into account the geographical spread and ensures good representation of the characteristic of the ward. 5% of non slum and 10% non slum House hold were selected for survey
- Separate survey questionnaires for sample survey (**Annexure-4**) and the focused group discussions (**Annexure-7&8**) were developed and the drafts discussed with the city administration and amended based on feedback and used in collecting the data.
- The survey team was trained and sensitized on the fundamental aspects of sanitation and were provided with sufficient background knowledge on the theme and objectives of CSP.
- The community and public toilets existing in the city were physically inspected by the survey team on walk in and walk around method and also by interaction with the users present during the walk around (**Annexure 11**)

The data analysis is undertaken to determine the status by application of appropriate statistical analytical tools and the resultant trend was further confirmed through a feedback discussion with the operational staff through a test of reasonableness of the findings. The findings are annexed to this report. Refer **Annexure 6, 7, 8 & 11**

3.3. Berhampur City

Berhampur (or old name Brahmapur), nicknamed "Silk City", is located in the eastern coastline of Ganjam district in the state of Orissa, about 200 kilometers south of state capital, Bhubaneswar very close to the border with state of Andhra Pradesh. It is one of the oldest and largest cities of southern Orissa. The city is well known for its silk, temples and commerce with the access to east coast and due its strategic location on the National Highway No.5 and east coast railway line connecting Chennai and Kolkata .



The presence of Bay of Bengal makes the city conditions extremely humid. The maximum temperature during summer is 40^o c, whereas the minimum temperature reaches 22^oc during winter. The region receives an average annual rainfall of 1250 mm, about 70% of the rainfall is received during June-September, with the onset of South-West monsoon.

Berhampur Municipality was established in the year 1867. It is the third largest city of Orissa and has been declared as a Class-I Town as per 2001 census.

3.4. Demography

The population of the city for the census year 2001 was 307726, and the current population as of 2011 is said to be 355823 with the slum population of 117541(33%). The total number of households as of 2011 is 66812 in which 26270 are slum households. The city divided into 37 administrative wards is spread over 80sqkm sloping west to east and has a total road network of 385 km. Due to its importance of trading, about 50000 people visit the town from the region for sale, purchase or exchange of goods in the local markets.

Table 1 : Ward-wise estimated population in Berhampur as on 2011

Ward Number	Total Population	Total Households	Slum Population	Slum Households
1	11353	1420	4845	1160
2	8819	2061	4382	929
3	8502	1765	6559	1360
4	11281	1850	4683	969
5	7091	1915	3434	690
6	8957	1867	1724	387
7	10636	1743	8553	1794
8	7567	1810	6568	1430
9	11309	1867	7365	1545
10	12060	1895	2600	555
11	9557	1758	904	236
12	12467	1631	7106	1294
13	8980	1851	5821	1373
14	13480	2177	3225	774
15	8153	1622	1158	278
16	11945	2030	1250	346
17	10051	1954	5086	1329
18	8895	1883	907	222
19	7522	1667	2921	676
20	10538	2175	1429	307
21	11461	2193	2757	646
22	8524	1622	3821	846
23	9585	1660	3536	737
24	8833	2092	2822	592
25	10167	1798	1508	351
26	6542	1893	583	132
27	9142	1494	165	45
28	13509	1934	741	160
29	11598	1893	2472	613
30	8575	1648	1153	277
31	10995	2240	0	0
32	7213	1492	627	135
33	8446	1595	4515	994
34	10527	1815	6208	1499
35	9964	1589	3631	1003
36	6079	1032	1060	240
37	5500	1881	1422	346
Total	355823	66812	117541	26270

The ward wise observation of sanitation and services as inferred from the focused group discussions and field survey is summarized at **Annexure 5**. The slum status is detailed at **Annexure 9**

3.5. Access to Water Supply

Water supply and wastewater services are provided by the Public Health Engineering Organisation and the city receives only one hour of water supply per day.



The water service indicators and the targets proposed are shown in the following table.

Table 2 : Water Supply Service Indicators

Performance Indicator	Benchmark	As on 31.03.2009	As on 31.03.2010	As on 31.03.2011	Target for 2011-12
Coverage	100%	29%	31.58%	34.75%	40.00%
Per Capita Supply of Water(lpcd)	135	68.85	89.25	92	110
Extent of Metering	100%	0	0	0	3.00%
Extent of Non-Revenue Water	15%	34%	31%	25.19%	24.00%
Continuity of water supply	24x7	1 hr	1 hr	1 hr	1hr
Eff. in redressal of customer complaints	80%	73.30%	77%	91.47%	92%
Quality of Water Supplied	100%	100%	100%	100%	100%
Cost Recovery	100%	49%	49%	49%	49%
Eff. In Collection of Water Charges	90%	50.80%	100.00%	85.30%	90%

The service level indicators based on the data provided by PHEO, Berhampur suggests that the water supply coverage is about 35% where in there are 21769 water supply connections serving approximately 23,384 households out of total 66812 households. As against 385km road length the water network is available in about 228km only. The remaining population depends upon some 1772 public taps and 1158 hand pumps.

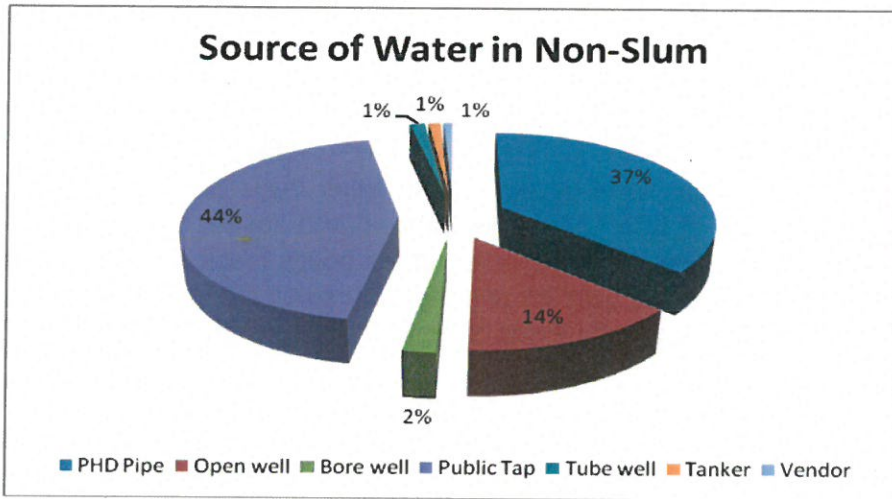


Figure 1 : Water source in non slum area

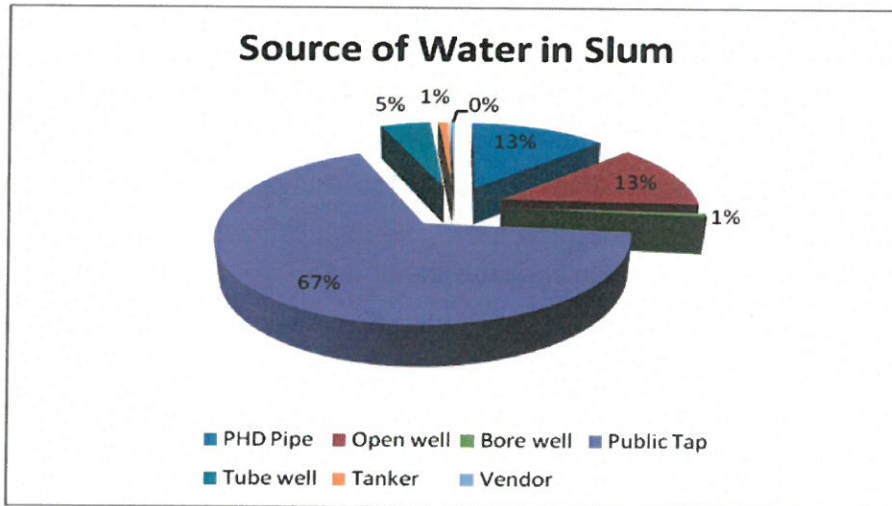


Figure 2 : Water source in slum area

It is observed from the primary survey that more than 50% of population depend upon public stand post which is justified by the large number of stand post in the city. On an average 30% households have access to direct piped connection. Balance depend on open well, tube well and bore wells.

Ground Water

The city being situated near to the sea, the water table is very high but the quality of ground water is saline in nature and is not suitable for drinking purpose. Though the slum area is heavily dependent on hand tube wells, the quality of water is not suitable.

Water Bodies

River Risikulya flows quite close to Berhampur but the surface water cannot be used since the river encounters high tide brackish flow. Ponds and other still water bodies are useful domestic sources for people residing in water scarcity areas. It is no different in Sambalpur town where residents depend upon such water bodies due to either inadequate or irregular access to potable water. There are 44 water bodies in the town and are used for variety of purposes including bathing and drinking. After renovation of the ponds these are used for bathing and daily use. These waters are also used for drinking purpose by the slum dwellers. Due to poor maintenance post renovation, there is threat of hygiene problems and mosquito breeding.

Key issues

- The city does not have adequate water and on top of it water theft and use of suction pumps is rampant.
- There is reduction production during summer due to low production of ground source collector well.
- Coverage is low due to inadequate distribution network.
- There is large wastage and theft of water due to lack of metering and proper surveillance.
- Illegal connections, suction from distribution line and system leakages are a matter of concern
- Inadequate maintenance of the existing infrastructure
- There is increase in contamination of ground water improper sewage collection and treatment.
- Open defecation is common practice near the ponds leading to unhealthy and unhygienic conditions.

3.6. Access to Toilets

Table 3 : Ward wise household accessibility to toilets in Berhampur city

Ward Number	Total HHs	Slum HHs	HH connected to soak pit/ septic tank	HH Connected to drain	HH without access to toilet	Community Toilets	% of Slum HHs	% of HH without individual toilets
1	1420	1160	842	112	414	2	81.7%	29.2%
2	2061	929	1130	151	761	0	45.1%	36.9%
3	1765	1360	1100	147	421	0	77.1%	23.9%
4	1850	969	1047	139	629	1	52.4%	34.0%
5	1915	690	1010	135	778	0	36.0%	40.6%
6	1867	387	918	122	875	0	20.7%	46.9%
7	1743	1743	1191	160	230	0	100.0%	13.2%
8	1810	1430	1136	151	417	2	79.0%	23.0%
9	1867	1545	1188	158	402	2	82.8%	21.5%
10	1895	555	970	129	822	1	29.3%	43.4%
11	1758	236	834	111	878	1	13.4%	49.9%
12	1631	1294	1025	137	373	0	79.3%	22.9%
13	1851	1373	1112	148	514	1	74.2%	27.8%
14	2177	774	1145	153	889	0	35.6%	40.8%
15	1622	278	784	104	785	0	17.1%	48.4%
16	2030	346	980	131	982	0	17.0%	48.4%
17	1954	1329	1176	157	538	0	68.0%	27.5%
18	1883	222	888	118	951	0	11.8%	50.5%
19	1667	676	896	119	646	1	40.6%	38.8%
20	2175	307	1035	138	1080	0	14.1%	49.7%
21	2193	646	1122	150	950	2	29.5%	43.3%
22	1622	846	917	122	552	0	52.2%	34.0%
23	1660	737	908	121	617	1	44.4%	37.2%
24	2092	592	1064	142	917	0	28.3%	43.8%
25	1798	351	879	117	851	0	19.5%	47.3%
26	1893	132	869	116	994	0	7.0%	52.5%
27	1494	45	674	90	807	0	3.0%	54.0%
28	1934	160	895	119	1006	1	8.3%	52.0%
29	1893	613	980	132	799	0	32.4%	42.2%
30	1648	277	795	106	799	0	16.8%	48.5%
31	2240	0	992	132	1242	0	0.0%	55.4%
32	1492	135	693	92	771	0	9.0%	51.7%
33	1595	994	938	125	476	1	62.3%	29.8%
34	1815	1499	1154	154	395	0	82.6%	21.8%
35	1589	1003	939	125	469	0	63.1%	29.5%
36	1032	240	514	69	473	2	23.3%	45.8%
37	1881	346	915	122	900	0	18.4%	47.8%
Total	66812	26219	35655	4754	26403	18	39.2%	39.5%

According to the survey about 60% of the total households in the city have individual toilets and the remaining population, either use the community toilets or share with other households or resort to open defecation. The following figure shows the availability / access to toilets for the current population of Berhampur.



However, it is very likely that as in the case of most of small towns in India, many households share toilets i.e., a house with two or three portions would share a common toilet. Applying this practice, it would be possible that out of the balance 39% people who have no toilet in the house, some 10% - 15% of the households might be sharing a toilet with the house owner or with other tenant in the same premises.

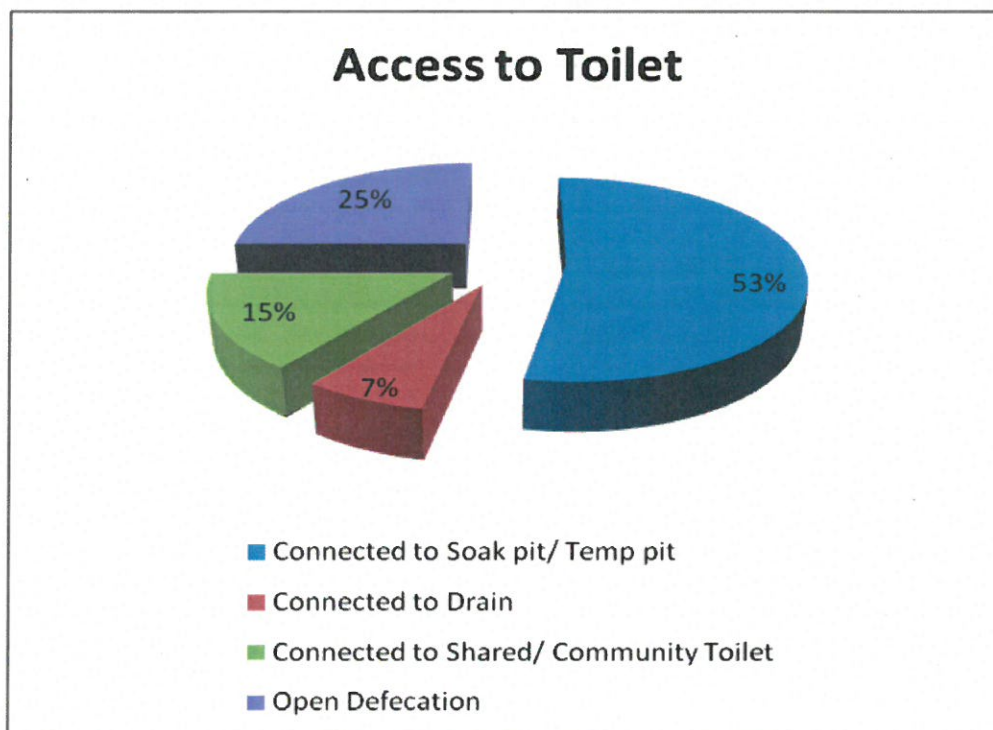


Figure 3 – Access to Toilets in Berhampur

At the same time, it was noticed during the site visit some of the elders in the households with toilet facility still prefer to use the open area at the traditional ponds.

In light of above it is alarming that over 25% population are openly defecating and hence the solving the wastewater management requires a multi-pronged approach of supporting the community with provision of individual toilets and simultaneously ensuring behavioral changes in the aspects of personal hygiene and practice of sanitation.

According to the data collected from BMC some 26270 households are located in the slums and some 16527 households have no access to individual toilets indicating that the majority of the HHs in the slums have no individual toilet facility. The detail slum sanitation status is provided at **Annexure-9**. But an analysis of ward wise distribution of availability of toilets indicates a different picture that there are many households in the non-slum areas also have no toilets while the slum households do have some level of individual toilets as depicted in the following chart.

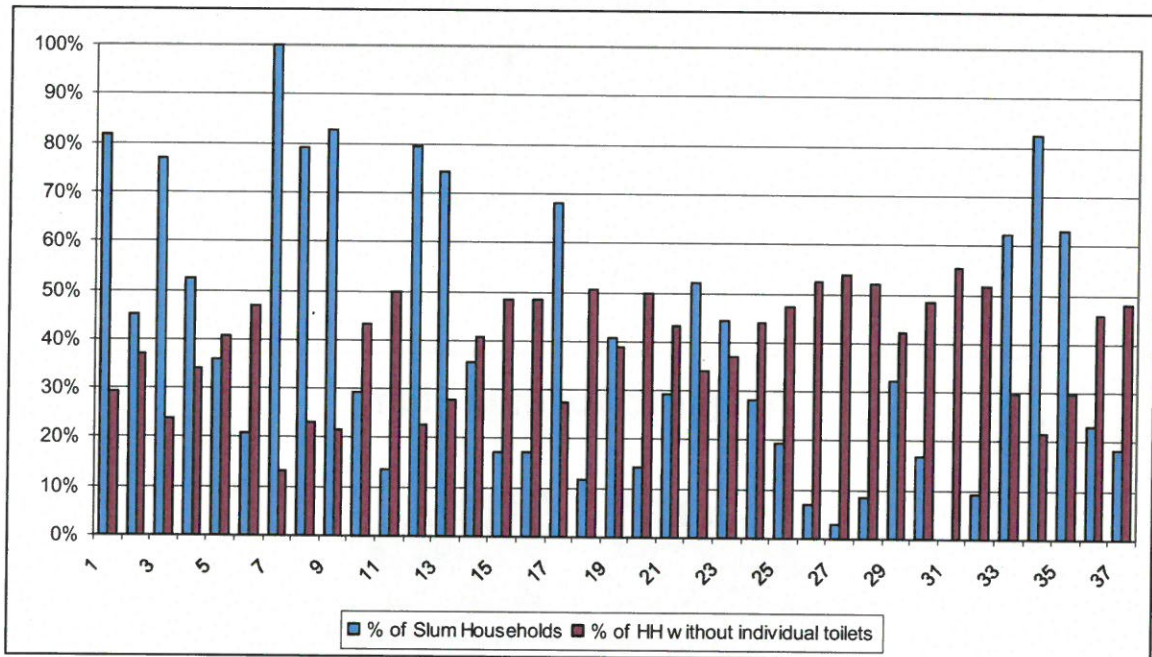


Figure 4 – Distribution of households in slums and households without individual toilets

The primary survey analysis also is quite close to the secondary data except the toilets connected to drain. The non slum areas do have good access to toilets and have on site sanitation. While conducting the walk through survey also it is observed that many houses have directly connected the outlet of their toilet to the drain.

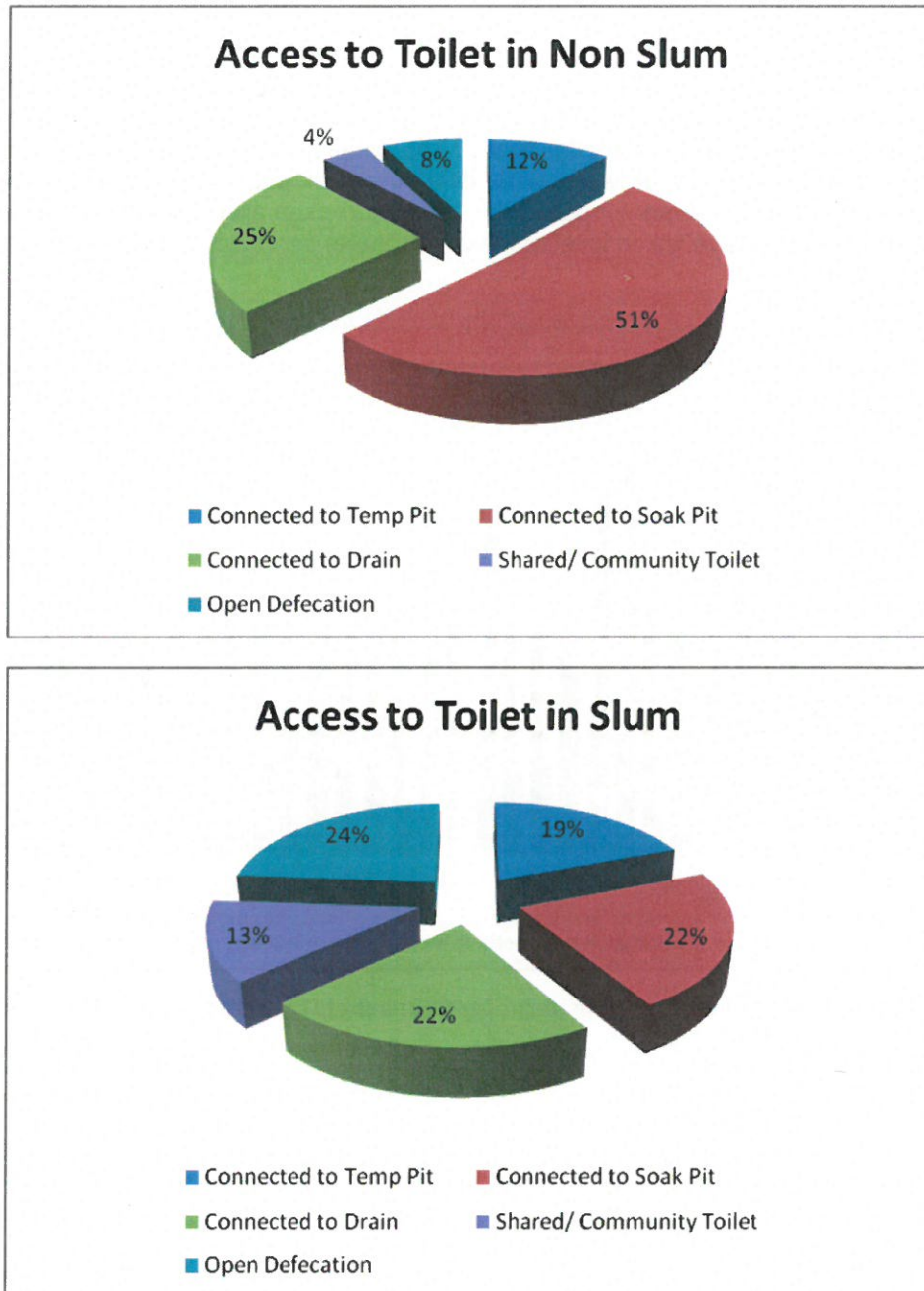


Figure 5 – Access to Toilets in non slum and slum area

3.6.1. Condition Assessment of Community/Public Toilets

There are 18 community toilets with about 180 seats out of which 5 units are leased out by BMC to a local maintenance operator and the remaining are maintained by the BMC. Over half of the toilets have defunct water facilities and the users either carry water from nearby ponds or hand pumps or clean themselves back at home after usage.

Traditionally a significant population in the region have been habituated to open defecation near the local water bodies and there are socially demarcated open areas for women, men and sometimes caste divisions also exists in sharing the area surrounding the ponds.

As there is no user fees prescribed, the toilets maintained by the local service contract also are in state of no maintenance as it is reported that the payments to the contractor are erratic and are not sufficient to cover realistic maintenance costs. The condition assessment survey report of community & public toilet is provided at **Annexure 11**

BMC as part of beautification of city has undertaken development of one such pond in Ward No.13 (see picture below) and converted the pond into public park with gardens and boating facility which was well appreciated and the municipal corporation have won an award for the development effort.

But as the pond was traditionally used as an open toilet by over 250 families in the neighborhood, the residents lost their community sanitation space and are now left with no such facility. Being one of the oldest areas of the town where the housing is so dense with very minimum space for adding a toilet, the residents have been protesting and particularly women have been forced to use the open conservancy lane between houses as a dry toilet. Some of the local residents are said to have contributed for constructing a wall for privacy needs and local authorities have claimed that none of the residents are willing to part with a piece of land for constructing a community toilet.



There are 4 public toilets with three being operated by Sulabh International and one being managed by Berhampur Development Authority in the city. The Sulabh Toilets have bathing facility also and they charge Rs.2 for toilet usage and Rs.3 for usage of bath. On an average some 150 – 200 people use the facilities and hence the maintenance of the same is relatively better than the community toilets.

3.6.2. Wastewater Management

The city has no concept of wastewater management. About 53% of the residents have onsite sanitation facilities and the remaining population depends upon the few community toilets but predominantly resort to open defecation. The critical factors for such a status are both local traditional practice of using local water bodies for ablution and pressure on urban space in highly dense old residential areas. Such a scenario has resulted in unhygienic conditions; with the highly polluted sewage ponds in the vicinity of the habitat serving as breeding ground, especially for mosquitoes, poses a great threat to the public health and welfare of the community.

Even the households with onsite sanitation, there is no sanitary disposal of sludge and the residents hire local contractors with suction machines who dispose the sludge in open pits/nalas located outside the town limits. The ward wise existing sanitation status is provided at **Annexure 10**

Thereby, the entire city's wastewater disposal needs a complete changeover in order to achieve a safe sanitized environment.

3.6.3. Key Issues

- There is no proper sewerage collection system in the town except for a small localised network inside medical campus without proper treatment and disposal
- Though a large proportion of households have access to toilets but there is no sewerage collection and treatment plant. Septage management is not practiced by the ULB
- There is wide spread practice of open defecation creating unhygienic conditions and health problems. It is alarming that average 25% population is openly defecating.
- The sewage is drained out in the open drains ultimately which goes in the natural drain, open spaces and water bodies leading to contamination.
- There are no awareness campaigns run by the municipality for the slum dwellers.
- Populations residing in slums are facing unbearable unhygienic conditions.
- It was noticed during the site visit some of the elders in the households with toilet facility still prefer to use the open area at the traditional ponds.
- Though a large population does not have access to toilet, the numbers of community toilets are inadequate which are not functioning to full capacity.

3.7. Solid Waste Management

The current service levels in the city in regard to solid waste management are shown in the following table.

Table 4 : Solid Waste Management Indicators

Sl.No.	Indicator	Benchmark	March 2011	Target 2011-12
1	Household Level Coverage of SWM Services (%)	100	35	40
2	Efficiency of Collection of MSW (%)	100	90	95
3	Extent of Segregation of Solid Waste (%)	100	0	0
4	Extent of Municipal Solid Waste Recovered (%)	80	0	0
5	Extent of Scientific Disposal of Solid Waste (%)	100	0	0
6	Efficiency in Redressal of Complaints (%)	80	70	75
7	Extent of Cost Recovery in SWM Services (%)	100	0	10
8	Efficiency in Collection of SWM Charges (%)	90	0	50

Orissa state introduced commendable initiatives managing the urban solid waste and the ULBs with the lessons learnt are trying to extend the services to cover entire cities/towns.

BMC introduced door to door collection of garbage by private contractors and some 17000 households in 14 wards are covered by the facility. The average cost of the collection and transport is said to be Rs.13.16 lakhs per month working out to Rs.77 per month per household. In the remaining 23 wards the solid waste is currently dumped at common collection point mostly an open site, from where it is hauled to the disposal site by the Municipal Corporation. The total solid waste generated per month amounts to 4,589 tons of which only 3,402 are collected and disposed at a 10.3acre land located at Chandania Pahad which is at about 10km from the city. The average ward-wise collection efficiency of the garbage is about 74%.

The entire wards in the city are covered by street sweeping for about 6 days, a week. The ward numbers 10,13,14,18, 21 to 26, 28, 29, 30 and 32 are managed by a private body whereas; in the remaining 23 wards the municipality engages its staff for solid waste management. The waste collected by street sweeping is about 608 tons per month, which is about 13% of the total waste generated. BMC is planning to extend the private management to all the wards.

There are few villages that have been added to the municipal area in recent times. The cattle wastes from these villages also require a safe and scientific disposal.



- Reforms in Solid Waste Management in Berhampur

The following figure shows the percentage-wise breakup of solid waste generation sources. The waste generated from street sweeping suggests the lack of proper infrastructure in collection and disposal of solid waste in the city.

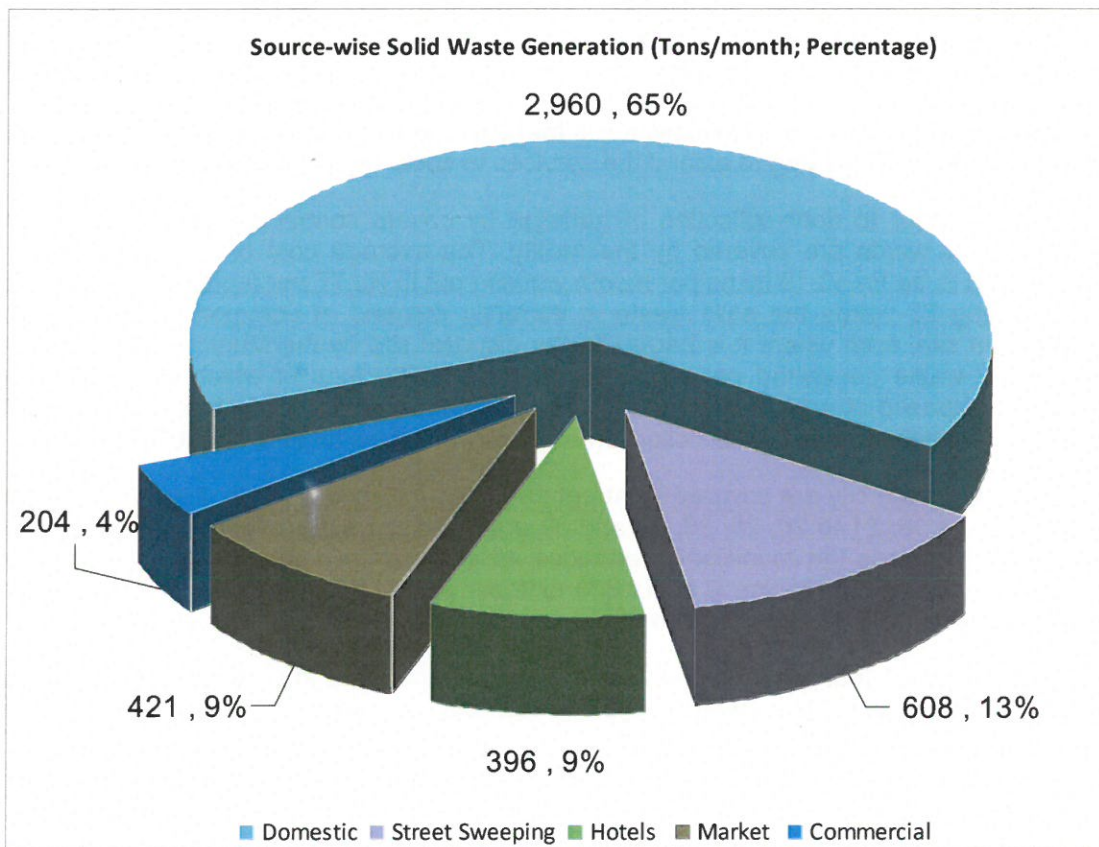


Figure 6 - Source- wise Solid Waste Generated

Table 5 : Solid Waste Generation and Collection Details

Ward Number	Total Population	Total Households	Street vats Available	Total waste Generation	Waste Collected & transferred	Average street vats per 1000 households	Average waste collected per household	Average waste collected per person
	Persons	Number	Number	Tons/month	Tons/month	Ratio	kg/day	kg/day
1	11353	1420	16	92	68	11.27	2.12	0.27
2	8819	2061	27	123	92	13.10	1.96	0.46
3	8502	1765	22	106	80	12.46	1.97	0.41
4	11281	1850	12	110	81	6.49	1.95	0.32
5	7091	1915	17	199	148	8.88	3.41	0.92
6	8957	1867	11	197	145	5.89	3.46	0.72
7	10636	1743	13	107	79	7.46	2.01	0.33
8	7567	1810	12	109	80	6.63	1.97	0.47
9	11309	1867	14	114	84	7.50	2.00	0.33
10	12060	1895	19	113	84	10.03	1.96	0.31
11	9557	1758	15	106	79	8.53	1.98	0.36
12	12467	1631	17	184	136	10.42	3.70	0.48
13	8980	1851	14	127	94	7.56	2.25	0.46
14	13480	2177	36	148	109	16.54	2.23	0.36
15	8153	1622	11	97	72	6.78	1.96	0.39
16	11945	2030	25	132	97	12.32	2.13	0.36
17	10051	1954	19	117	87	9.72	1.96	0.38
18	8895	1883	21	197	146	11.15	3.43	0.73
19	7522	1667	16	103	78	9.60	2.03	0.45
20	10538	2175	22	136	101	10.11	2.05	0.42
21	11461	2193	22	222	164	10.03	3.32	0.64
22	8524	1622	24	97	73	14.80	1.96	0.37
23	9585	1660	23	100	74	13.86	1.98	0.34
24	8833	2092	15	129	96	7.17	2.02	0.48
25	10167	1798	23	109	80	12.79	1.99	0.35
26	6542	1893	21	116	86	11.09	2.01	0.58
27	9142	1494	11	174	129	7.36	3.82	0.62
28	13509	1934	10	116	86	5.17	1.97	0.28
29	11598	1893	15	113	84	7.92	1.96	0.32
30	8575	1648	10	100	74	6.07	1.99	0.38
31	10995	2240	10	135	101	4.46	1.98	0.40
32	7213	1492	21	92	69	14.08	2.02	0.42
33	8446	1595	16	95	70	10.03	1.95	0.37
34	10527	1815	14	109	80	7.71	1.97	0.34
35	9964	1589	10	94	69	6.29	1.94	0.31
36	6079	1032	10	60	45	9.69	1.91	0.32
37	5500	1881	13	111	82	6.91	1.93	0.66
Total	355823	66812	627	4589	3402	9.38	2.25	0.42

An analysis of availability of street vats is shown in the following figure.

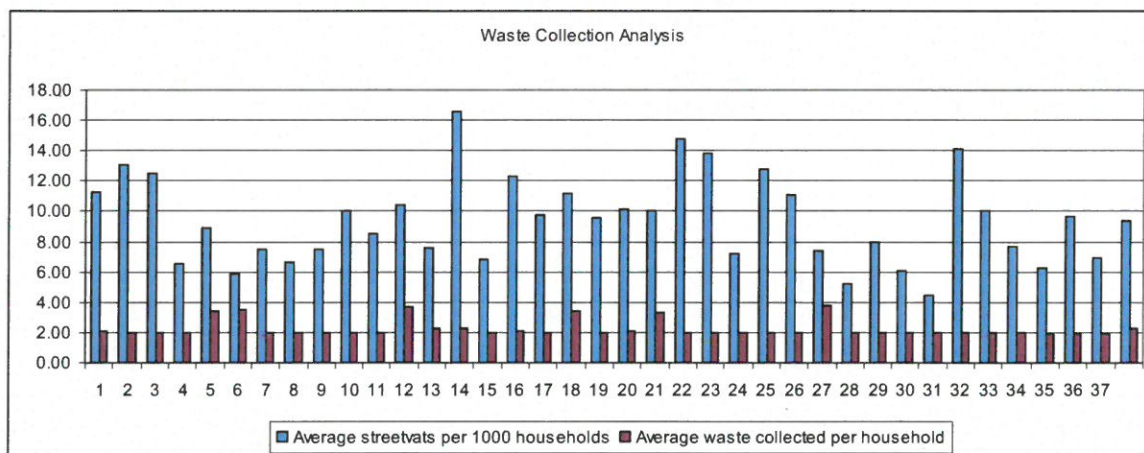


Figure 7 – Analysis of availability of street vats

It can be seen above that while the waste collected in most of the wards is around 2 – 2.25kgs/day while in case of wards 5, 6, 12, 18, 21, and 27 it is over 3.5kgs/day indicating possibility of markets or high commercial activities generating more waste. It could also be a case that in these wards the local waste collection could be relatively more efficient which need field conformation. While waste collection is more or less consistent across all the wards but the availability of street vats is skewed in some of the wards. For example the in ward 14 there are over 16 vats per 1000 households and in wards 5 and 6 the vats are available are about 9 and 6 respectively as against the much higher waste generation in these two wards. BMC can easily rationalize the availability of street vats in proportion to the waste generated.

Key Issues

- The ULB lacks a solid waste management plan
- There is no scientific landfill site. Also there is lack of identified disposal site resulting indiscriminate spreading of solid waste
- Road side and water body are widely used to dump garbage leading to water contamination and hygiene issues
- Almost 25% of the waste cannot get disposed due to collection problem
- Low level of awareness amongst the citizens on solid waste handling

3.8. Storm Water Management



The city has approximate 470 Km of drains which are connected to two main natural drains namely Bahana Nallah and Sapua Nallah. The natural nallah find their way into the bay of Bengal through a creek.

Table 6 : Ward wise existing drainage facilities in Berhampur City.

Ward Number	Drainage length in Km		
	Primary	Secondary	Tertiary
1	0	1.28	8.3
2	0.5	1.86	12.04
3	0.2	1.59	10.32
4	0.6	1.66	10.81
5	0.1	1.72	11.19
6	0	1.68	10.91
7	0	1.57	10.19
8	0	1.63	10.58
9	0	1.68	10.88
10	0	1.71	11.08
11	0.5	1.58	10.27
12	0.6	1.47	9.53
3	0.8	1.66	10.82
14	1.2	1.96	12.72
15	0.9	1.46	9.47
16	1.35	1.82	11.87
17	1.21	1.75	11.41
18	0	1.69	11
19	0	1.5	9.74
20	1.35	1.69	12.72
21	1.5	1.97	12.81
22	1.6	1.46	9.47
23	3.46	1.49	9.7

Ward Number	Drainage length in Km		
	Primary	Secondary	Tertiary
24	1.54	1.88	12.22
25	1.02	1.61	10.5
26	0	1.7	11.06
27	1.38	1.34	8.74
28	0	1.74	11.3
29	0.85	1.7	11.06
30	0.92	1.48	9.63
31	3.6	2.01	13.09
32	2.65	1.34	8.72
33	1.06	1.43	9.32
34	0	1.63	10.6
35	0	1.43	9.28
36	4.5	1.14	6.04
37	3.8	1.69	10.99
Total	37.19	60	390.38

The drains are in a state of disrepair and the situation is further aggravated by clogging by plastic. The municipal conservancy staff are said to be de-silting the drains on a daily basis.

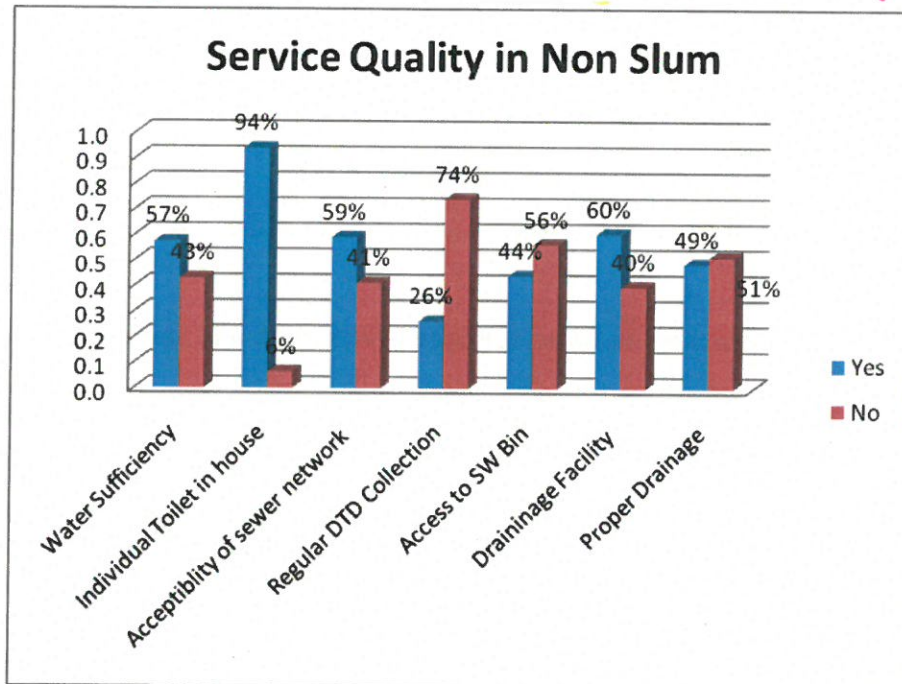
Key Issues

- Comprehensive storm water system is not present in the city. Natural storm water drains are presently acting as the conveyance channels for the untreated sewage into river Mahanadi
- The condition of the drains presently is not up to the mark. Majority of the drains are choked due to the dumping of the solid waste
- The main natural drains Bahana nallah and Sapua nallah are choked due to encroachment of slum dwellers and growing weeds and plants so the city is prone to flooding and water logging.
- It is also important to conduct awareness programs at the city level to cover all classes of the residents to highlight the function of storm water drains, prevention of encroachment of the storm water drain areas, prevention of dumping of solid waste and discharge of sewage/sullage from households and other related issues

3.9. Overall Citizen satisfaction on Basic services

The citizen perception on urban basic services as analysed from the primary survey is depicted below. It is observed that the slum areas are more deprived of the basic services. There is a huge scope for improvement in the service levels.

- 48% of non slum and 52 % of slum residents complain about the sufficiency of water.
- 75% of residents feel that door to door collection is not regular
- More than 50% of the residents complaint about easy access to municipal bins
- Almost 50% of citizens fell that the drainage facility is inadequate and disposal of storm water is not proper



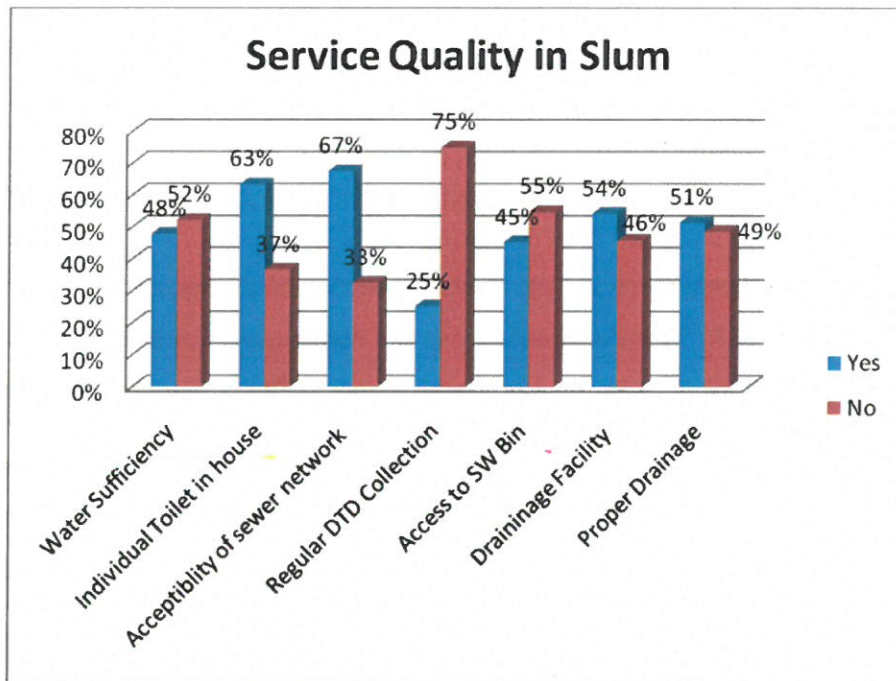


Figure 8 – Citizen Satisfaction on basic services in non slum and slum area

3.10. Basic Services to Urban Poor

Berhampur has total 137 numbers of slums out of which 114 are authorized and 23 are unauthorized slums. The slum population total to 1,17,541 with 26,270 households. Nearly 33% of the total population of the town comprises of the slums. The slums in the city are scattered all around the city and increasing over time. The slums are facing difficulties due to deficiency in various infrastructure facilities like roads, water supply, drainage, street lighting, solid waste management etc. The slum sanitation status is provided at **Annexure 9**

Table 7 : Literacy rate of Berhampur

Category	2001	
	City	Slum
Average Literacy Rate	82.2	57
Male Literacy Rate	88.0	62
Female Literacy Rate	75.7	41

The slum areas are deprived of the basic services due to land tenure problem and accessibility issues. The population density has been the major bottleneck in providing of basic service. The result of primary survey reveals the following

Table 8 :Service status in slum

Service	Status
Housing	As high 42 % are with Kuchha houses
water supply	67% of slum population depends on public taps
Access to toilet	68% of the houses do not have individual toilets resulting in open defecation; there only 8 community toilets in the town
Solid waste Collection	DTD collection is not operational in slum areas; also the frequency of garbage lifting is very less;
Drainage	As high as 51% of slum area do not have proper drainage facility

Corporation is taking up a number of slum improvement and poverty alleviation programs with assistance from state govt. and central Govt. Few to mention are SJSRY, NSDP, RAY, IHSDP, ILCS etc.

3.11. Institutional Framework

Table 9 :Legislatives governing Institutions

Names of Institution	Governing Institutions
Berhampur Municipal Corporation	Orissa Municipal Act –1950
Berhampur Development Authority BDA	Orissa Development Authorities Act, 1982
Orissa Water Supply and Sewerage	Section 67 of OWSSB 1991
Board	
Public Health and Engineering	Formed by Government of Orissa
Organisation	
Orissa Pollution Control Board	Section 4 of the (water prevention and control of pollution) amendment act 1975

Table 10 :Institutional framework and roles

Sl. No	Name of the Institution	Responsibilities and Functions	Remarks
1	Berhampur Municipal Corporation	<ul style="list-style-type: none"> • Responsible for basic services within the town such as SWM, road, drainage, street lighting, • Responsible for city sanitation, preventive health care • Responsible for implementation of slum development and poverty alleviation programs • Birth and death registration • Parking, plantation, markets 	<ul style="list-style-type: none"> • As per 74th CAA ULB is responsible for 18 basic functions
2	Berhampur Development Authority	<ul style="list-style-type: none"> • Preparation and implementation of Area Development plans and projects for ensuring scientific land use pattern • Working as coordinating agency between various Government and other agencies for development activities. • Determining and phasing development. 	<ul style="list-style-type: none"> • All functions pertaining to Master plan and development plan Preparation. Preparation of development schemes and its implementation
3	Public Health Engineering Organisation	<ul style="list-style-type: none"> • Responsible for planning, design and engineering of water supply schemes • Responsible for construction, operation and maintenance of city water supply system and sewerage system • Responsible for internal water supply, plumbing and sewerage system of Govt. buildings 	<ul style="list-style-type: none"> • This function needs to be transferred to ULB as per 74th CAA • Currently the power devolution has been done through a tripartite MoA
4	Orissa Water	<ul style="list-style-type: none"> • Responsible for planning, 	

Sl. No	Name of the Institution	Responsibilities and Functions	Remarks
	Supply and Sewerage Board (OWSSB)	design and construction of city sewerage system	
5	State Pollution Control Board, Orissa	<ul style="list-style-type: none"> Responsible for pollution control and environmental protection. Deal with environmental monitoring and pollution control in the state Also undertakes environmental planning studies for the entire State 	<ul style="list-style-type: none"> This institution should continue to act as a monitoring agency for environmental aspects of the city
6	Directorate of Town Planning, GoO	Advises the GoO on matters pertaining to urban planning	This Department should provide advisory services on matters pertaining to urban planning.

Presently the Public Health Engineering Organisation is the service provider and plans, executes, operates and maintains the Urban Water Supply and Sewerage System of the State. The Orissa Water Supply and Sewerage Board execute major / mega water supply and sewerage projects and after completion, hands over the projects to Public Health Engineering Organisation for operation and maintenance.

The Public Health Engineering Organization has a committed work force of 7742 persons consisting of 323 Engineering Personnel, 807 Ministerial Staffs assisting day to day office administration, 3304 wages staff and 3308 Temporary Field Staff.

The PHEO for Berhampur water supply operation and maintenance consists of 17 technical and 303 non technical staff.

As per the provisions of the OM Act, 1950 the apex body is the 'General Body' of Berhampur Municipality headed by the honorable Mayor. The Act provides for four authorities in a Corporation as indicated below

- Council
- Mayor & Dy. Mayor;
- Council Committees
- Commissioner.

Various functional departments under the Municipality are

- Accounts Section
- Cash section
- Establishment section
- Tax section
- Law section
- UBS section
- Vehicle section
- Works section
- Health section
- Stores section
- Lighting section

The Municipality is facing shortage of manpower which is affecting effective delivery of services. Currently the ULB has 182 vacant posts against the sanctioned posts. The detail of staff position is annexed to this report at **Annexure 12**.

Key Issues

- There is a Lack of coordination between the Berhampur Development Authority and Municipality.
- The Berhampur Development Authority and Municipality have less number of employees leading to capacity problem
- Most of the Reforms like e-governance, E-Sewa, Water harvesting, asset Management, double entry accounting have not yet being started

3.12. Financial Status of BMC

The financial status of BMC is summarized in the following tables.

Table 11 : Financial Receipts and Expenditure in Berhampur Municipal Corporation

Sl. No.	Subject	2007-08	2008-09	2009-10	Proportion
	RECEIPTS	Rupees	Rupees	Rupees	%
1	Total Income from own source	28,622,481	27,336,911	31,975,158	7%
2	In lieu of Octroi compensation grant	89,955,083	108,790,979	116,101,348	25%
3	Govt. grants for development work	138,339,137	105,396,805	307,289,956	67%
4	Other source of Income	5,582,383	1,963,158	3,830,440	1%
	Total	262,499,084	243,487,853	459,196,902	100%
	EXPENDITURE				
1	Salary, wages & other allowances	49,439,542	62,633,261	97,714,458	41%
2	Development works	176,088,750	128,450,595	136,871,667	58%
3	Miscellaneous	3,080,403	2,659,676	2,181,276	1%
	Total	228,608,695	193,743,532	236,767,401	100%

It can be seen above that the own source revenues are a meager 7% and the city depends almost on grant devolutions from the state government. Also the expenditure on salaries is about 41% and some portion of the expenditure on development works also relates to salaries of the field work charged staff. The key component of own source revenue is the municipal tax on properties the details of which are shown below.

Table 12 : Details of Taxes in Berhampur

Holding Tax	5%
Water Tax	6%
Drain Tax	4%
Light Tax	4%
Latrine Tax	6%
Total	25%

The demand and collection of the taxes is shown in the following table.

Table 13 : Tax Demand and Collection in Berhampur

Subject	2007-08	2008-09	2009-10
Demand	28,702,575	28,443,806	31,132,565
Collection	17,568,290	15,490,866	17,776,895
Balance	11,134,285	12,952,940	13,355,670
Collection Efficiency	61%	54%	57%

The details of revenue and expenditure as per the municipal budget are enclosed at **Annexure 13**.

Having initiated reforms under JNNURM in the city of Bhubaneswar, the Government of Orissa has extended the reform principles to all other corporations including Berhampur. The status of the accounting reforms undertaken in Berhampur are listed below.

- A state-level municipal accounting manual has been prepared in conformity with the national accounting manual.
- M/s. Sahoo & Company, Chartered Accountants was appointed by the ULB to: a) prepare opening balance as on 01.04.2007, b) prepare books of accounts of the ULB under the accrual-based double entry accounting system for FY 2007-08, and c) prepare a final balance sheet as on 31.3.2008.
- M/S Manas Das & Co has been appointed for preparation of accounts and M/S MIR Associates as auditor for FY2008-09 and FY2009-10.

4. Population Projection

Year	Population	Increase in population		% increase in population	Incremental increase in population
		Per decade	(X)	(IG)	(Y)
1971	117662				
1981	162550		44888	38.15	
1991	210418		47868	29.45	2980
2001	307792		97374	46.28	49506
2011	355823		48031	15.61	-49343
		Avg	59540	30.01	1048

4.1) Arithmetic Progression Method

$$(P_n = P_o + nX)$$

Year	Population
2012 =	3,61,777
2021 =	4,15,363
2027 =	4,51,087
2031 =	4,74,904
2041 =	5,34,444
2042 =	5,40,398
2051 =	5,93,984

4.2) Geometrical Progression Method

$$\{ P_n = P_o (1 + IG/100)^n \}$$

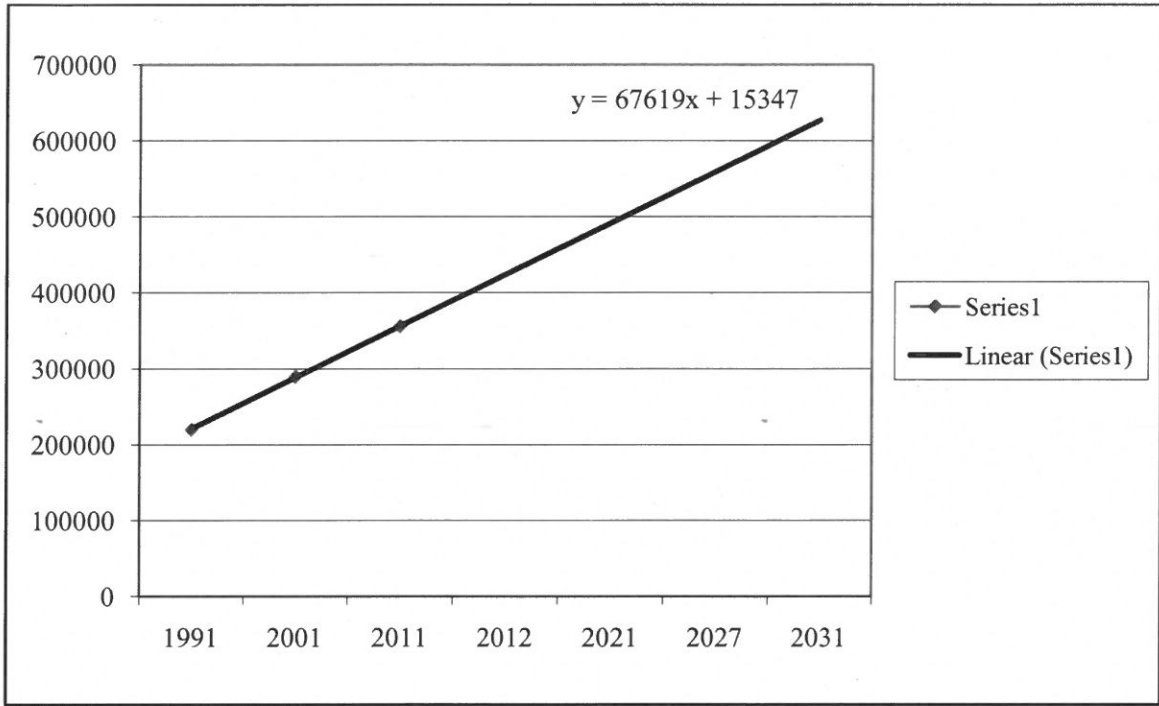
Year	Population
2012 =	3,65,285
2021 =	4,62,612
2027 =	5,41,511
2031 =	6,01,451
2041 =	7,81,959
2042 =	8,02,753
2051 =	10,16,640

4.3) Incremental Increase Method

$$\{ P_n = P_o + nX + (n(n+1)/2) \times Y \}$$

Year	Population
2012 =	3,61,835
2021 =	4,16,411
2027 =	4,53,267
2031 =	4,78,047
2041 =	5,40,730
2042 =	5,47,056
2051 =	6,04,461

4.4) Graphical method



Year	Population
2012	= 363092
2021	= 423949
2027	= 464520
2031	= 491568
2041	= 559187
2042	= 565949
2051	= 626806

5. Waste Water Management

5.1 Waste water effluent standard

Sl	Parameter	Unit	Standard	
			Inland Surface	Land for Irrigation
1	Biological Oxygen Demand	mg/l	30	100
2	Chemical Oxygen Demand	mg/l	250	250
3	Suspended Solids	mg/l	100	600

5.2 Sanitation Options

5.2.1 Household Sanitation

Toilet Access Options

A toilet facility can be provided in one of four possible ways:

- Individual household toilets,
- Shared toilets for more than one households (say 2 to 5 households),
- Public toilets, or
- Community toilets.

Relative advantages of each are analyzed below

Sl. No.	Parameters	Options of Toilets		
		Individual	Shared	Public or Community
1	Feasibility of construction	Depends on availability of land	Possibility of land with one of the beneficiaries is better	Depends on availability of public plot
2	Cost	Depends on the design, but more for comparable design	Less than individual toilet	Least per seat, but may increase with a dedicated water supply
3	Cost Sharing	By Individual	Shared by Beneficiaries	Individual household not burdened
4	Acceptability	Maximum if affordable	Acceptable if individual toilet not affordable	May be preferred, as no burden of cost
5	Sense of ownership	Maximum	Less	Does not exist
6	O&M	Individual household	Depends on will capacity and cooperation of beneficiaries	Needs separate organization
7	Sustainability	Maximum	Depends on will capacity and cooperation of beneficiaries	Depends on capacity of organization (better, if pay and use type)
8	Desirability	Most desirable, if affordable	Next choice, if affordability is an issue	Least desirable
9	Suitability	Most suitable	Suitable in low-income households (like slums)	Should be adopted only when no other option available

Choice

It is desirable to choose an alternative, which is affordable, sustainable and likely to be most used and well maintained. It is recommended to provide individual toilets to most of the households. Where individual households cannot afford, have no suitable land for construction, and are willing to share a facility, shared toilets should be promoted. Surveys also reveal that, in a few cases, households with individual toilets may be defecating in the open. A considerable effort of creating awareness and change in attitude is called for.

5.2.2 Options for collection, treatment & Disposal of Waste Water

Domestic waste water generated at the household level, including the waste from toilets, can be disposed of either on-site or off-site or a combination of both. Possible options are:

- Fully on-site disposal (septic tanks or soak pits)
- Local sewer network (small-bore sewerage or decentralized waste water treatment system),
- Centralized or decentralized full-scale sewerage system
- Combined system

a. Fully on Site sanitation system

Fully on site sanitation arrangements will involve on-plot treatment and disposal of all domestic waste water. This is achieved by using on-plot sanitation technologies--- septic tanks and soak pits--- to receive and treat the entire waste water flow from the household. However, it is recommended that the septage (sludge from septic tank) is removed and transferred to another location for further treatment and final disposal.

Septic tank with soak pits

In this option, all discharge of domestic waste water resulting from bathing, washing, cooking, cleaning and usage of toilets is treated in the septic tank. The septic tank effluent is disposed in dispersion trenches or soak pits. Septage is periodically cleared and taken away to a common treatment facility.

Twin soak pits (Leach pits)

Wastewater from the latrine is discharged into soak pit in this option. Waste water from domestic use, such as domestic waste water from bathing, washing, cooking, cleaning, etc. is also disposed into another soak pit. For an uninterrupted and proper functioning, it is recommended to use a set of two pits.

Septage Management

It will be necessary to set up an effluent septage collection system, operated by either the Municipality Corporation or a private agency. Appropriate regulation and monitoring mechanisms, in respect of septic tanks and septage handling and disposal, need to be introduced. Suggested septage treatment consists of septage drying beds consisting of sand filters for dewatering the sludge. This requires low capital and has low O&M and technical requirements; thus, it can be operated easily. The dried sludge cakes can be used as fertilisers.

Fully On-site Sanitation: Benefits and Challenges	
Benefits	Challenges
<ul style="list-style-type: none"> ✓ Low public investment (less demanding on public resources) ✓ Can be easily set-up ✓ Will not lead to wastage of the private investment already made in septic tank construction ✓ Citywide sanitation can be achieved faster 	<ul style="list-style-type: none"> ✓ Risk of groundwater pollution will have to be evaluated as the HNPP draws groundwater for municipal water supply ✓ Finding place for constructing soak pits in all households will be a challenge ✓ HNPP will need to institute septage management system ✓ New rules and regulations relating to septage management will have to be introduced

b. Small-bore sewerage system

In a small-bore sewerage system, all internal waste water, including the toilet usage water, is diverted to an on-plot septic tank. Households constructing new individual sanitation facilities should be encouraged to construct septic tank/ interception chambers. Some households could continue to use pit latrines. Only their other household waste water (gray water) may be connected to sewers. The septage (sludge from septic tanks) is removed for treatment and final disposal.

A small diameter sewer pipe (<200 mm) is laid at a flatter gradient to carry the effluent from the septic tanks. Since the sewer pipes do not carry solids, the flatter gradient and smaller diameter are sufficient. The flatter gradient also allows laying of sewer lines at shallower depths, resulting in same cost reduction.

Disposal of septage

It will be necessary to set up an efficient septage collection system, operated by either the Municipal Corporation or a private agency. Appropriate regulation and monitoring mechanisms, in respect of septic tanks and septage handling and disposal, need to be introduced.

Conveyance of septic tank effluent

The septic tank effluent is disposed into a network of small-bore sewer pipes for centralized or decentralized treatment and final disposal.

Treatment of waste water

Effluent from the septic tanks is partially treated, but still is not safe for discharge into public water bodies. Prior to final disposal, the collected waste water should be adequately treated to meet effluent discharge standards.

Settled (small bore) Sewerage: Benefits and Challenges	
Benefits	Challenges
<ul style="list-style-type: none"> ✓ Add on to the existing system rather than creating a complete new system ✓ Demand on public resources is high compared to fully-on-site system ✓ No risk of groundwater contamination ✓ Can easily achieve NRCP objectives 	<ul style="list-style-type: none"> ✓ Households end up paying for wastewater conveyance and treatment as well as septage clearance ✓ New rules and regulations relating to septage management will have to be introduced ✓ Convincing households to modify/ upgrade existing toilets and plumbing system

c. Sewerage system

This alternative includes a proposal for a regular sewerage network (either a local simplified network or an elaborate citywide network) to collect the waste water from the households. The network is normally laid through most of the town. Waste water is collected at different locations in the decentralized systems and is treated before final disposal or reuse. In a centralized system(s), the waste water is collected at a central location(s) for treatment and final disposal or reuse (like land irrigation).

Whether a series of decentralized system is feasible depends on land availability. Otherwise, a centralized treatment plant for the whole (or major) part of the city may be proposed. A detailed topographical and land availability survey will be necessary to determine the feasibility and required number of decentralized waste water treatment plants. In the area covered with a sewerage network, efforts should be made to connect all households to the sewerage network. Even in this alternative, there is a possibility that a few households will still be served by on-site sanitation systems – mainly pit latrines. Under this option, the following household/ public sanitation and waste treatment and disposal arrangements will be possible.

The choice of between decentralized vs. centralized mainly depends on feasibility in terms of availability of land for decentralized systems, their acceptability to the people and cost (both capital and O&M).

d. Decentralized systems

Decentralized systems are feasible and desirable in areas that are isolated and have space to accommodate small multiple waste water treatment plants and disposal systems. Since these systems are localized small systems, they will be simpler for operation and maintenance. It may be also possible to form local committees or co-operative societies, which may take up the O&M of these plants. A substantial community effort, of course, will be necessary. If this is not feasible and achievable, the alternative is to outsource the O&M to a private party. A third alternative is for the Municipal Corporation to take over this responsibility. However the O&M cost and manpower requirement is high. The biggest constraint is the availability of land.

Decentralized waste water treatment systems (DEWATS) technology has been developed and promoted by BORDA (Bremen Overseas Research and Development Association). The system provides treatment for waste water from both domestic and industrial sources, especially from small and isolated areas. The capacity ranges from 1 to 500 cum per day. It works without electrical energy, guarantees permanent and continuous operation, with occasional fluctuation in effluent quality, and is best suited where skilled and responsible operation and maintenance cannot be guaranteed.

DEWATS is based on four treatment systems:

- Sedimentation and primary treatment in sedimentation ponds, septic tanks or imhoff tanks (septic tanks being more familiar in cities like Berhampur)
- Secondary anaerobic treatment in fixed bed filters or baffled septic tanks (baffled reactors).
- Secondary and tertiary aerobic/ anaerobic treatment in constructed wetlands (subsurface flow filters).
- Secondary and tertiary aerobic/ anaerobic treatment in ponds.

Combination of primary treatment (a) with any of the other systems at (b), (c), or (d) is done in accordance with the quality of the waste water influent and desired effluent quality

Decentralised Wastewater Treatment: Benefits and Challenges	
Benefits	Challenges
<ul style="list-style-type: none"> ✓ Most of the wastewater is treated off-site ✓ No need to augment a water supply ✓ Low maintenance ✓ No risk of groundwater contamination ✓ No dependence on power supply for operation ✓ Simple operation and maintenance 	<ul style="list-style-type: none"> ✓ Both capital intensive system ✓ High O&M cost ✓ Management is difficult ✓ Households will have to invest substantial amount in upgrading ✓ Convincing households to modify/ upgrade existing toilets and plumbing system

e. Centralized systems

In areas, like the core city wards, density of population is high, open plots are not likely to be available, and people may not accept multiple treatment and disposal systems within the vicinity. Hence, localized dispersed systems may not be feasible. A centralized system, which collects the waste water from a large city area through a sewer network and conveys it to a central, large-size treatment plant and disposal system, may become imperative. Such a system will be more expensive than the decentralized systems for the same area, but may be better for unitary control over its O&M. The responsibility will be taken over by Municipality Corporation and participation of the beneficiary population will be limited.

Sewerage treatment plants have, basically, three stages of treatment:

- Pre-treatment for removal of large floating, suspended and settlement inorganic solids in screens and grit removal chambers.
- Primary treatment for removal of organic and inorganic settleable solids.
- Secondary biological treatment for conversion of organic matter into settleable bio-floc and stable inorganic matter (like in aerobic processes) or into methane gas, carbon dioxide and stable organic residue (as in anaerobic processes)

Centralised Sewerage: Benefits and Challenges	
Benefits	Challenges
<ul style="list-style-type: none"> ✓ All of the wastewater is treated off-site ✓ Initial investment of individual resident is very low ✓ Low user fee ✓ Demand on public resources is high compared to fully-on-site system ✓ Less risk of groundwater contamination 	<ul style="list-style-type: none"> ✓ Both capital and O&M intensive option ✓ Convincing households to modify/ upgrade existing toilets and plumbing system ✓ High on operation and maintenance Power outages may interrupt wastewater treatment

f. Combined system description

Under this option, a combination of all options is promoted, assuming that all households have access to improved sanitation facilities and human excreta and community liquid wastes are treated and safely disposed. The combination includes both on-site sanitation arrangements (septic tanks with soak pits and twin pit latrines in section 8.5.1) and off-site sanitation systems (small-bore sewerage system or regular sewerage with centralized or decentralized wastewater treatment systems, as described in sections 8.5.2 and 8.5.3 above).

Disposal of Septage

For households served by an on-site sanitation system, i.e., septic tanks, it is necessary to set up an efficient septage collection system that can be operated by the Municipal Corporation or a private agency. Appropriate regulation and monitoring mechanism need to be set up to ensure that septic tanks are properly built, that septage is cleared regularly, and safely treated and disposed. The septage can be treated at a separate septage treatment facility, in the form of sludge drying beds of sand filters for dewatering/ sun drying.

Waste water conveyance and treatment

Domestic waste water, disposed into the sewerage network, is transported to the waste water treatment site(s) for treatment and final disposal. Treatment will meet the disposal standards.

Mixed Sanitation Arrangements: Benefits and Challenges	
Benefits	Challenges
<ul style="list-style-type: none"> ✓ No need to augment a water supply ✓ Low maintenance ✓ Improvements can be implemented incrementally- allows better financial planning based on availability ✓ No dependence on power supply for operation ✓ Very low operation and maintenance cost- hence low burden on users. ✓ Simple operation and maintenance 	<ul style="list-style-type: none"> ✓ Capital intensive system, especially for wastewater treatment facilities. However, an overall balance is struck with a mixed approach ✓ Households will have to invest substantial amount in upgrading

5.2.3 Evaluation of options of waste water disposal

Four options for disposal of domestic waste water, discussed above, are evaluated on various parameters for the purpose of recommending options for different areas of the city.

Sl. No.	Parameters	Waste water Disposal Systems			
		On-site Disposal (A)	Local Small-bore System (B)	Sewerage (C)	Combined System (D)
1	Public investment	Least	Low	Highest	High
2	Ease of implementation	Can be achieved faster; depends on user response	Easy and fast	Most difficult	Easier than (C)
3	Ease of O&M	Easy, as user responsible	Easy, as less complex, but multiple schemes	Most difficult and expensive	Easier than (C)
4	Use of existing household facility	Maximum	Maximum	Septic tanks will be	More use than in (C)
5	Septage management	Separate system required	Separate system required	Not for household septage	Require to some extent
6	Land availability	Problem in core city and developed area	Problem in core city and developed area	Land for pumping stations and treatment plant	Choice as per land availability feasible
7	Impact on ground water	maximum	Less than (A)	Least	Much Less
8	Willingness to connect and pay	Not applicable, as it is own initiative	Less	More, as household does not need a septic tank	Depends on type of disposal
9	Suitability	Suitable in small isolated areas; not suitable in large urban places	Suitable in isolated and peripheral areas; but not suitable for integration in central sewerage	Suitable in core and developed areas	Suitable depending on land use

5.2.4 Waste Water from Industries

The major industries have their own water sources and waste water collection and treatment plants. Only small, scattered industries, which may be generating small quantities of waste water, will discharge to a municipal sewer. Good control and monitoring by the State Pollution Control Board is necessary to ensure that the waste water being discharged to the municipal drains is safe as per the standards.

5.2.5 Waste Water from Other Public Institutions

Other public institutions include educational institutions, hospitals and other institutions like offices, police quarters, agriculture produce markets, etc. The liquid waste generated in these institutions is currently being treated in septic tanks and the effluent disposed to nearby drains. When a new sewerage network is created, the waste water from these institutions will be discharged into these networks, as the quality of the waste water is acceptable for discharge into a municipal sewer.

5.2.6 Treatment Technology Options

Sewage Treatment Technology Option	Application Suited For		
	large, urban locations	medium, urban locations	smaller, more rural zones
ASP (single stage)	(✓)	✓	✓
ASP (two-stage)	✓	(✓)	X
SBR	(✓)	✓	✓
TF (single stage)	(✓)	✓	✓
TF (two-stage)	✓	(✓)	X
UASB + ASP	(✓)	✓	✓
UASB + TF	(✓)	✓	✓
UASB + WSP	X	X	(✓)
WSP	X	X	(✓)
FAL	X	X	(✓)
KT	X	X	(✓)
Biofilm reactors	(✓)	(✓)	(✓)
CW	X	X	✓
Covered Anaerobic Ponds	X	X	(✓)
FSTP	(✓)	(✓)	(✓)
Low cost sewerage	X	(✓)	✓

✓ Highly Recommended

(✓) Recommended only under specific condition

X Not Recommended

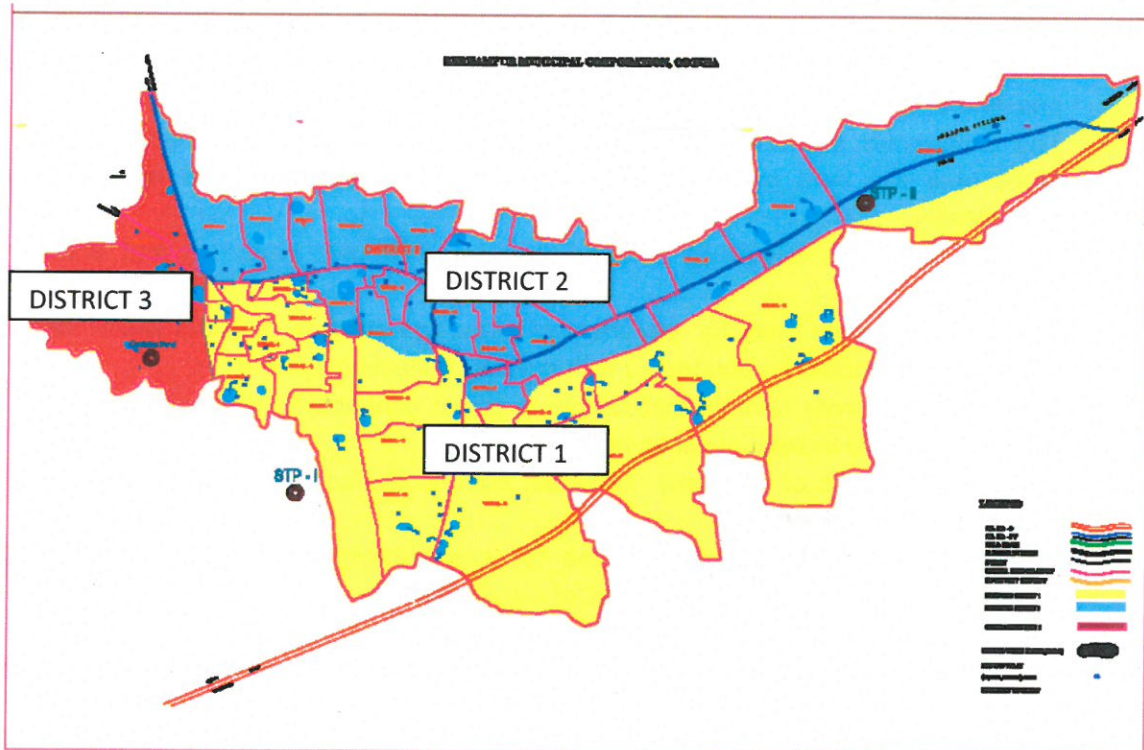
The above table provides suitability of various treatment options for different categories of cities/towns. A small scale town is considered with population less than one lakh, a medium scale town is considered with population between one lakh to one million and a large scale city is considered with population more than one million.

5.3 Strategy

5.3.1 Water Supply

Water supply coverage has to be increased along with equitable distribution. The service provider is increasing the treatment capacity by another 20 MLD which would increase the production level to 55 MLD sufficient to meet the intermediate demand. A DPR is being prepared for revamping the distribution network and also for increasing the treatment capacity. In view of the water scarcity during summer it has become important for implementation of a planned distribution system to best utilise the available capacity.

5.3.2 Sewerage Zoning



The municipal area have been divided into three sewerage districts based on the topography and area contour. District 1 consists of ward no 5-11, part 14, 21-24, 29, 33-35, part 37 with present population of 1,55,605, District 2 consists of ward no 3, 4, 12, 13, part 14, 15-20, 25-28, 30-32, 36, part 37 with present population of 1,80,046, and District 3 consists of ward no. 1 & 2 with present population of 20,172.

5.3.3 Household sanitation

- Objective is to achieve 100% access to sanitary toilets to all residents
- Provide incentives for encouraging individual toilets to people who can afford and available space
- Support subsidies for individual toilets for low income households
- Provide shared or community toilets for slum clusters where individual toilets are not feasible
- Ensure adequate toilet facility in institutions like schools, colleges, offices, shopping complex etc.
- Public toilets at all public places (markets, bus stand, etc.)

- Structured communication for regular usage and maintenance of toilets
- Encourage community management of community/public toilets and encourage cost recovery

5.3.4 Collection and Treatment system

The treatment option to be adopted in the context of Odisha has been considered with the following issues in the background

- There is no regulatory framework, policy or guideline for on site sanitation system
- Most of the cities in Odisha have more than 30% slum population which are highly unorganised settlements
- Due to lack of strong building by law and monitoring mechanism, most of the houses constructed in cities across Odisha cover 90% of the plot area without much space. This leads to construction of under designed septic tank or discharge to drain. The possible exception could be Bhubaneswar after 2008 building Bylaw.
- The Govt. lands available within the municipal limits are few in numbers and small. More over the land ownership lies with revenue department and not with the municipality.
- All the apartments are being directed to install their own treatment and drainage facility
- The National bench mark for 'coverage of sewerage network' is 100% which means the entire city should be connected with a sewer collection system
- The primary survey reveals that residents prefer connectivity to sewerage network even if they have individual septic tank
- Going by the logic of economy of scale, community facility is always cheaper for operation and maintenance
- **Odisha water works rules provides for compulsory connection to available sewerage network and phasing out of septic tank**

In view of the above situation the sanitation strategy adopted for developing CSP is as follows

- Utmost priority is given for network collection system based on the feasibility. The factors influencing the feasibility in a area are number of individual toilets, feasibility of laying sewer pipe line, growth potential etc.
- Areas where collection network is not feasible or the utility corridor is very narrow, small bore system should be adopted
- On site sanitation should be promoted where new colonies are developing or community toilets are not within close proximity of the proposed/available network, provided adequate space is available within the property
- Adequate measures are taken in terms of regulatory frame work for implementation of properly designed system and a proper septage management policy is in place.
- Increase coverage of sewerage network and connections to achieve national benchmark
- In view of the constraint of land availability, resident's objection and increased cost of O&M, a centralized system is more preferable to decentralized system within a gravity zone.
- Decentralized system shall be preferred in areas of uneven terrain which might call for a number of pumping stations or the gravity flow demands higher depths

- Off site treatment and disposal coupled with onsite septage management for existing community/individual septic tanks to manage the sanitation system as a intermediate arrangement before transiting to full fledged collection network. This would also support phasing of investment and improve financial feasibility position.
- Adopt natural bio-degradation technologies economically feasible and locally suitable and minimise energy requirement in transport and treatment of sewage
- Citizen's aspiration is provided the maximum importance
- Importance has to be attached to critical issues of sludge management, odour control and mosquito menace
- Encourage recycled and reuse of treated effluent water for non portable purpose

5.4 Option Analysis

Various treatment options are analysed based on the topography of the area, existing infrastructure, socio-economic status and implementation feasibility. The situation analysis reveals that the old Berhampur area is highly dense area with very narrow and congested roads. Since the area is unplanned, the houses there hardly any open area and all the houses have common walls. The other parts of the city are better off with wider lanes and by lanes. The field survey and discussion with the officials suggests that most of the septic tanks and soak pits are under designed due to space constraint. At many places the overflow effluent is discharged to the open drain. This leads to ground water contamination. The factor affecting choice of treatment options for the various zones are as follows

District 1 & 2

- Many of the colonies are well planned
- Roads are wider
- Adjacent area of these zones are potential growth centres and the land prices are quite high
- Availability of land is a issue
- Strong public opinion not to have sewerage treatment within the residential area
- Shortage of operational manpower with the ULB

Hence sewerage collection network with centralised Sewerage Treatment Plant is proposed for these zones. ASP treatment process is proposed for these zones.

District 3

- Mostly populated by slum dwellers
- % of individual toilet with septic tank is quite high
- Roads are narrow and the adjacent houses are with common wall
- No space in the rear side of the house or conservancy lane
- Adequate Govt. land is available within this zone

Hence a small bore system with oxidation pond with mechanical aerator is proposes for this zone

5.5 Policy Framework

- City sanitation should be fore seen in the light of NUSP and OUSS
- The ULB needs to take care to prevent any kind of increase or growth of slums
- The vision for slum free city needs to be drawn up and implemented
- Building by laws should be adequately strengthened and strictly implemented
- Strict regulatory frame work should be embedded into the existing system in respect of sanitation issues
- Adequate steps needs to be taken for addressing the housing need of EWS/LIG and migrating population
- Ensure a systematic long term awareness drive attaching social stigma to sanitation offences

5.6 Planning

5.6.1 Assumptions & Data

The City Sanitation Planning is based on a set of data and certain assumptions which very much city specific and are based on the following factors

- Available data
- Citizen need and aspirations
- Field survey findings
- Need assessment
- Stakeholder consultations
- Existing situation and limitations
- Service providers priority

Base year	: 2012
Design Year	: 2042
Sewerage network Design	: 2042
STP design	: 2027
Target Year	: 2018
Implementation period	: 2012 – 2018
Average Per capita water demand	: 120 LPCD
Sewage Generation	: 100 LPCD (80% of water supply)

Description (District 1 & 2)	Unit	Non slum	Slum	Sub total
Number of households	Households	39370	23961	63331
Number of community toilets	Number			16
Number of seats in community toilets	Number			160
Households with individual toilets	Households	29274	8900	38174
Households practicing open defecation	Households	10096	14361	24457
% Household practising open defecation	Households	26%	60%	39%
Slum households using community toilets	Households			700
Average Household size	persons	6	5	5.5
Number of community toilets under construction	Toilets			0
Number of community toilet seats under	Seats			0

Description (District 1 & 2)	Unit	Non slum	Slum	Sub total
construction				
Total Road length	Km			361
Bituminous road length	Km			150
Cement concrete	Km			89
Metal road length	Km			45
Pucca road length	Km			284
Kacha road length	Km			77

Description (District 3)	Unit	Non slum	Slum	Sub total
Number of households	Households	1392	2089	3481
Number of community toilets	Number			2
Number of seats in community toilets	Number			20
Households with individual toilets	Households	1392	843	2235
Households practicing open defecation	Households	0	1158	1158
% Household practising open defecation	Households	0%	55%	33%
Slum households using community toilets	Households			88
Average Household size	persons	8	4	6
Number of community toilets under construction	Toilets			0
Number of community toilet seats under construction	Seats			0
Total Road length	Km			24
Bituminous road length	Km			10
Cement concrete	Km			6
Metal road length	Km			3
Pucca road length	Km			19
Kacha road length	Km			5

Description (Total)	Unit	Total
Number of households	Households	66812
Number of community toilets	Number	18
Number of seats in community toilets	Number	180
Households with individual toilets	Households	40409
Households practicing open defecation	Households	25615
Slum households using community toilets	Households	788
Average household size	persons	5.75
Individual toilets under construction	Toilets	3202
Number of community toilets under construction	Toilets	0
Number of community toilet seats under construction	Seats	0
Total Road length	Km	385
Pucca road length	Km	303
Kacha road length	Km	82

Assumptions	Unit	Value	
Road length with possibility for laying sewers in pucca roads	%	90%	
Road length with possibility for laying sewers in kucha roads	%	50%	
Toilets connected to sewers	%	81%	Computed
Toilets connected to soak pits	%	19%	Computed
No. of households sharing one toilet in a shared toilet	Number	2	
Number of seats per public toilet	Number	5	
Number of seats per community toilet	Number	10	
Number of users for community toilet per seat	Number	35	
Number of users for public toilet per seat	Number	60	
		Zone 3	Zone 1 & 2
Non Slum road length based on HH density	%	40%	62%
Slum road length based on HH density	%	60%	38%
Road cutting and restoration required	%	70%	70%
Cost			
Cost of individual toilet connected to sewer	Rs.	8,000.00	Per no.
Cost of individual toilet connected to soak pit	Rs.	10,000.00	Per no.
Cost of community toilet connected to septic tank (10 Seater)	Rs.	6,60,000.00	Per no.
Cost of community toilet connected to sewer(10 Seater)	Rs.	2,40,000.00	Per no.
Cost of pumping station	Rs.	25,00,000.00	Per no.
Cost of STP	Rs.	75,00,000.00	Per MLD

5.6.2 Sewage Generation

Zone	1	2	3
Population 2011	155605	180046	20172
%	44%	51%	6%

Year	Population	Water supply (MLD)	Total Sewage generation (MLD)	Zone 1 (MLD)	Zone 2 (MLD)	Zone 3 (MLD)
2012	363092	43.6	36.3	15.9	18.4	2.1
2027	464520	55.7	46.5	20.3	23.5	2.6
2042	565949	67.9	56.6	24.7	28.6	3.2

5.6.3 Pipe Cost Comparative statement

Sl. No.	Dia mm	Cost of GSW with CM joints and Labour/m	Cost of RCC with Rubber joints and Labour/m	Difference
1	100	142	264	122
2	150	217	272	55
3	200	450	286	-164
4	225		313	313
5	250	627	338	-289
6	300	1035	479	-556

5.7 Infrastructure Need

Description	Unit	Dist 3			Dist 1 & 2		
		Base	Target	BoQ	Base	Target	BoQ
Sanitation development							
Open Defecation	%	33%	0%		39%	0%	
Individual toilet coverage	%	64%	80%		60%	80%	
HH covered under Community toilet coverage	%	3%	4%		1%	4%	
HH Shared toilet coverage	%	0%	16%		0%	16%	
Coverage of sewer connection	%	0%	95%		0%	95%	
Number of individual toilets	Number	2509	2874	365	41102	50752	9650
Total Number of shared toilets	Number	0	278	278	0	5066	5066
Number of community toilet seats	Number	20	30	10	160	400	240
Number of community toilets	Number	2	3	1	16	40	24
Public Toilets	Number	0	4	4	3	20	17
Number of Public Toilets seats	Number	0	20	20	41	100	85
Number of Public Urinals	Number	0	3	3	0	37	37
Number of sewer connection	Number	0	2449	2449	0	43295	43295
Construction of sewerage networks	Km	0	19	19	0	279	279
STP/ Oxidation pond	MLD	0	3	3	0	44	44

The details of sanitation infrastructure need is provided in **Annexure 16A and 16C**

5.8 Implementation & Investment Phasing
5.8.1 Implementation

District 1 & 2

Sanitation development	Unit	Base	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	BoQ
Individual toilet coverage	%	60%	64%	67%	70%	73%	77%	80%	
HH covered under Community toilet coverage	%	1.1%	1.6%	2.1%	2.6%	3.0%	3.5%	4.0%	
HH Shared toilet coverage	%	0%	3%	5%	8%	11%	13%	16%	
Coverage of sewer connection	%	0%	16%	32%	48%	63%	79%	95%	
Number of individual toilets (incl. ongoing)	Number	41102	42710	44319	45927	47535	49144	50752	9650
Total Number of shared toilets	Number	0	844	1689	2533	3378	4222	5066	5066
Number of community toilet seats	Number	160	200	240	280	320	360	400	240
Number of community toilets	Number	16	20	24	28	32	36	40	24
Public Toilets	Number	3	6	9	12	14	17	20	17
Number of Public Toilets seats	Number	41	51	61	71	80	90	100	85
Number of Public Urinals	Number	0	6	12	19	25	31	37	37
Number of sewer connection	Number	0	5634	11898	18796	26329	34495	43295	43295
Construction of sewerage networks	Km	0	47	93	140	186	233	279	279

District 3

Sanitation development	Unit	Base	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	BoQ
Individual toilet coverage	%	64%	67%	69%	72%	75%	77%	80%	
HH covered under Community toilet coverage	%	2.5%	2.8%	3.0%	3.3%	3.5%	3.8%	4.0%	
HH Shared toilet coverage	%	0%	3%	5%	8%	11%	13%	16%	
Coverage of sewer connection	%	0%	16%	32%	48%	63%	79%	95%	
Number of individual toilets	Number	2509	2570	2631	2691	2752	2813	2874	365
Total Number of shared toilets	Number	0	46	93	139	186	232	278	278
Number of community toilet seats	Number	20	22	23	25	27	28	30	10
Number of community toilets	Number	2	2	2	3	3	3	3	1
Public Toilets (5 seater)	Number	0	1	1	2	3	3	4	4

Sanitation development	Unit	Base	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	BoQ
Number of Public Toilets seats	Number	0	3	7	10	13	17	20	20
Number of Public Urinals (2 unit)	Number	0	1	1	2	2	3	3	3
Number of sewer connection	Number	0	339	706	1100	1522	1972	2449	2449
Construction of sewerage networks	Km	0	3	6	10	13	16	19	19

5.8.2 Investment

District 1 & 2

Rate in Rs.	Component	Unit	Non Slum			Slum				
			scope	Sub Total Cost Rs. Cr	Subsid y %	Net Cost Rs. Cr	Scope	Sub Total Cost Rs. Cr	Subsid y %	Net Cost Rs. Cr
8,000	Individual toilets connected to sewer	Each	4888	3.91	0%	0.00	2975	2.38	90%	2.14
10,000	Individual toilets connected to septic tank	Each	1111	1.11	20%	0.22	676	0.68	90%	0.61
8,000	Shared toilets with sewer connection	Each	2566	2.05	20%	0.41	1562	1.25	90%	1.13
10,000	Shared toilets with septic tank	Each	583	0.58	20%	0.12	355	0.36	90%	0.32
6,60,000	Community toilets(10 Seat) into septic tank	Each	0	0.00		0.00	20	1.32	100%	1.32
2,40,000	Community toilets(10 seater) into sewer	Each	0	0.00		0.00	4	0.10	100%	0.10
1,20,000	Public toilets (5 seater) connected to sewer	Each	17.00	0.20	100%	0.20	0	0.00	100%	0.00
30,000	Public urinals of 2 units	Each	37.00	0.11	100%	0.10	0	0.00	100%	0.00
Estimate	Cost of Sewerage Networks	Km	173	32.00	100%	32.00	106	20.00	100%	20.00
Estimate	Sewer Connections	Number	26914	24.00	50%	12.00	16380	13.00	100%	13.00
25,00,000	Pumping stations	Number	4	1.00	100%	1.00		0.00	100%	0.00
Estimate	Trunk Sewer			9.65	100%	9.65		0.00	100%	0.00
75,00,000	STP	MLD	44.00	33.00	100%	33.00		0.00	100%	0.00
LS	Renovation & Repair of existing system							1.00	100%	1.00
25,00,000	Trenchless crossing	Number	12	3.00	100%	3.00				
	Sub-total			107.62		91.71		40.09		39.62

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District 3

Rate in Rs.	Component	Unit	scope	Non Slum			Slum			
				Sub Total Cost Rs. Cr	Subsidiy %	Net Cost Rs. Cr	Scope	Sub Total Cost Rs. Cr	Subsidiy %	Net Cost Rs. Cr
8,000	Individual toilet connected to sewer	Each	119	0.95	0%	0.00	178	1.42	90%	1.28
10,000	Individual toilets connected to septic tank	Each	27	0.27	20%	0.05	41	0.41	90%	0.37
8,000	Shared toilets connected to sewer network	Each	91	0.73	20%	0.15	136	1.09	90%	0.98
10,000	Shared toilets connected to septic tank	Each	21	0.21	20%	0.04	31	0.31	90%	0.28
6,60,000	Community toilets(10 Seat) into septic tank	Each	0	0.00		0.00	0	0.00	100%	0.00
2,40,000	Community toilet(10 seater) into sewer	Each	0	0.00		0.00	1	0.24	100%	0.24
1,20,000	Public toilets (5 seater) into sewer	Each	4	0.48	100%	0.48	0	0		0
30,000	Public urinals of 2 units	Each	3	0.09	100%	0.09	0	0		0
Estimate	Cost of Sewerage Networks	Km	8	1.28	100%	1.28	11	1.93	100%	1.93
Estimate	Sewer Connections	Number	979	0.76	50%	0.38	1470	1.20	100%	1.20
Estimate	Pumping stations and TS		0	0.00	100%	0.00	0	0.00		0
LS	Oxidation pond	MLD	3	0.09	100%	0.09	0	0.00		0
LS	Renovation & Repair of existing Units	LS	0	0.00		0.00	0	0.25	100%	0.25
25,00,000	Trenchless crossing	Number	0	0.00		0.00	0	0.00		
	Sub-total			4.86		2.56		6.84		6.53

Management Improvements

Item No.	Assumptions	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1	Engineering and Customer Survey	Nos.	66812	50	33,40,600.00
2	Communications	Nos.	10	10000	1,00,000.00
3	Training for Staffs	Nos.	40	10000	4,00,000.00
4	Sewer cleaning machine	LS			30,00,000.00

Item No.	Assumptions	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5	Safety equipments	LS			30,00,000.00
6	Misc and Unforseen Items	LS			9,400.00
Total Cost (Rs.)					98,50,000.00

5.8.3 Investment Abstract

Component	Total (Cr. Rs.)	Subsidised cost (Cr. Rs.)	Contingency	Grand Total (Cr. Rs.)	Grand Net subsidised Cost (Cr. Rs.)
Individual toilets with sewer connection	8.67	3.42	5%	9.10	3.59
Individual toilets with soakpits	2.47	1.25	5%	2.59	1.31
Shared toilets with sewer connection	5.12	2.67	5%	5.37	2.80
Shared toilets with soak pits	1.46	0.76	5%	1.54	0.80
Community toilets(10 Seat) connected to septic tank	1.32	1.32	10%	1.45	1.45
Community toilets(10 seater) connected to sewer	0.34	0.34	10%	0.37	0.37
Public toilets (5 seater) connected to sewer	0.68	0.68	5%	0.71	0.71
Public urinals of 2 units	0.20	0.20	5%	0.21	0.21
Cost of Sewerage Networks	55.21	55.21	5%	57.97	57.97
Sewer Connections	38.96	26.58	5%	40.91	27.91
Pumping stations and TS	10.65	10.65	0%	10.65	10.65
Oxidation pond/ STP	33.09	33.09	0%	33.09	33.09
Renovation & Restoration of existing infrastructure	1.25	1.25	10%	1.38	1.38
Trenchless crossing	3.00	3.00	10%	3.30	3.30
Sub-total	162.42	140.42		168.65	145.54
Management Improvements					0.985
Project management fee 1.5%					2.154
Cost escalation 5% per annum					18.315
Miscellaneous Items					0.006
Total Sewerage project cost is Rs. 167.00 Crores			Total		167.00

6.0 Solid Waste Management

6.1 Objective:

- Scientific management of MSW of the Berhampur City.
- Ensure proper segregation, collection, transportation, processing and disposal of MSW generated in the townships.
- Upgrade the existing facilities to minimize contamination of soil and water from the MSW
- Protection of public health and environment from hazardous effect of MSW
- Development of environmentally sustainable and economically feasible solid waste management system
- Minimize occupational (adverse) exposure to the waste handlers.

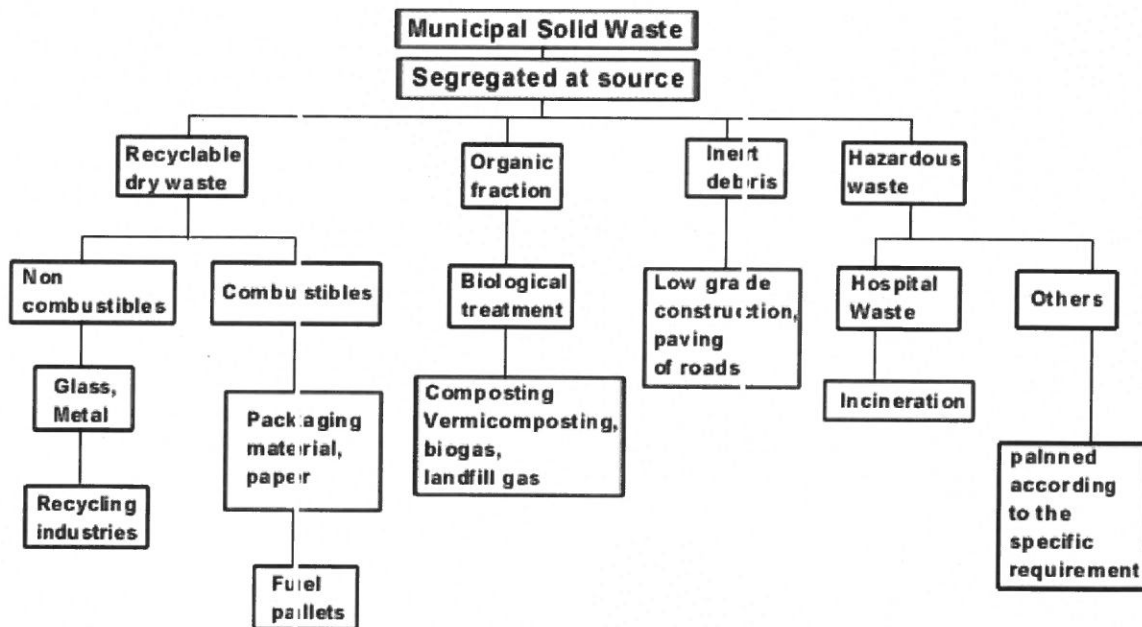
6.2 Strategy:

The basic approaches of the proposed SWM system would be:

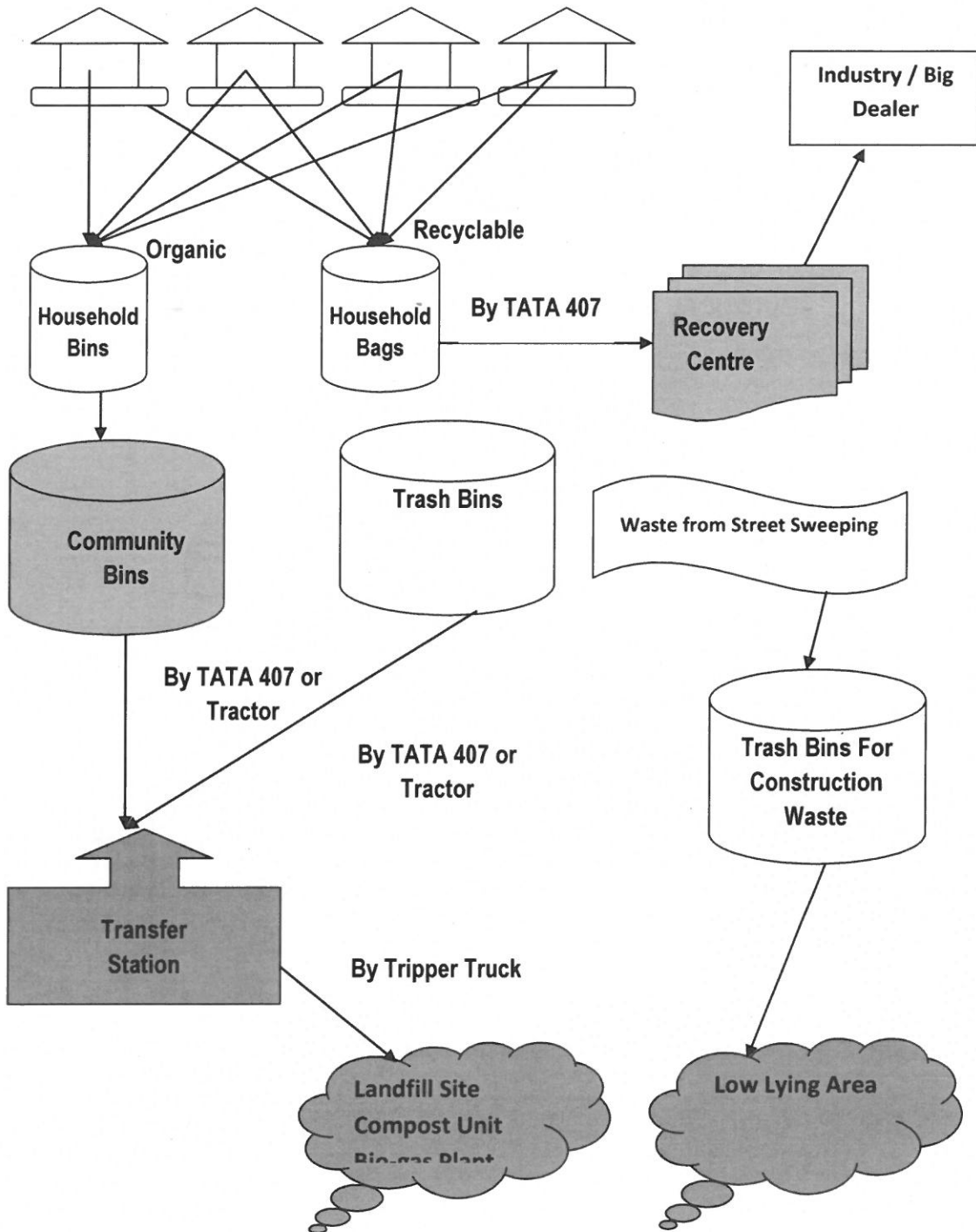
- 100% waste collection
- Segregation of waste at source
- No accumulation of waste in the streets and lanes
- Accessibility of service to every citizen
- Elimination of road side open dumps
- Setting of optimum number of transfer station
- Economic and eco-friendly transport system
- Elimination of multiple handling of waste
- Institutionalization of recycling system
- Category wise treatment and disposal
- Sound personnel management
- Immediate introduction of Containerization of solid waste from storage to disposal.
- Engagement of NGOs/Private Firms for door to door collection.
- Popularization of 'Segregation at source' practice through proper awareness campaign with effective IEC materials and group discussions.
- All organic waste including market waste may be used for composting (Preferable semi-mechanical). Compost plant should be located near by the land fill site.
- Market mechanism for segregated recyclable wastes must be developed for proper management of the said waste and for revenue generation to be used for welfare purposes.
- Training of all level of staff associated with SWM to be imparted by recognized institute/personnel.
- Awareness and motivation campaigns must be given adequate emphasis to get support from the community for effective operation of the system

- Preparation of Action Plan for Solid Waste Management under City Sanitation Programme for the City
- SWM practices for Present Level Generation of SW and up to the end of the design period i.e. up to the Year 2030
- Implementation year 2012-2015
- The action plans for the City are being formulated within the legal framework of rules of Ministry of Environment and Forests, Govt. of India.

MUNICIPAL SOLID WASTE PROCESSING PRINCIPLES



Principles of solid waste management



6.3 Generation and characteristics of waste

6.3.1 Type of Waste

Sl. No.	Establishment	Type of Wastes
1	Residence	Food Wastes (animal, vegetable and fruit residues) ; Garden trimmings; Combustible rubbish- Paper; cardboard; plastics; polythenes; Leather; Rubber; Rags and Cloths; Noncombustible rubbish- Metal foils; Tin cans; glass and glass bottles; crockery;
2	Commercial establishments	Combustible and noncombustible rubbishes are main constituents but a small amount of food wastes are also generated
3	Market	Vegetables, Fruits and animal residues (Garbage) are mainly generated but a small amount of rubbish is also generated.
4	Restaurant/ Food Establishment	Food Wastes are mainly generated
5	Health care establishment (Hospital, Nursing Homes etc;)	Infectious and hazardous waste are the main concerned. A significant amount of food waste and rubbish is also generated

6.3.2 Waste Generation Rate

In almost all growing urban cities of India having population more than 2 lakhs, the average generation of waste is 350 gms/cap/day and the generation of solid waste is estimated in the range of 300-600 gms/capita/day for residential house holds.

It is proposed that the individual houses will be covered with house to house collection and the slums will be covered by Community bins collection.

For the city of Berhampur the quantity of generation is calculated on the basis of preliminary data collected from Municipal authorities and on assumption of per capita generation rate of 400gm/c/day in house holds & 300 gm/cap/day in slum pockets.

6.3.3 Characteristics

The characteristics of municipal solid waste is more or less similar in the urban areas of the state of Odisha as per various survey conducted in the different parts of the state. The percentage of different components of waste generated are tabulated below

Component	Percentage by weight
A. Organic	
1. Food waste, vegetables waste, Garden trimmings and dry leaves.	63.00
B. Recyclables	
1. Paper	4.00
2. Plastics/polythenes	4.00
3. Rubber, leather	1.00
4. Glass & ceramics	1.50
5. Textile/cottons	0.50
6. Earthen wares	1.00
6. Metal	Negligible
7. Coconut shells	1.00
Total	13.00
C. Inert, dirt, sand, dust, soil etc.,	24.00
Total	100.00

The waste composition indicates amount of compostable waste is 63%, which may be of residential and animal waste matter. Paper and plastic comprises 8% of the waste generated & these form the re-usable items and are being picked up regularly by innumerable rag pickers. Apart from these waste, one of the growing concern is construction waste, which is about 24 percent. This construction waste generation will increase in coming days since construction activity is growing and will increase the pressure on solid waste management.

The density of mixed solid waste has been taken as 425 Kg/cubic metre and the calorific value as 900.00 (approx) Kcal/Kg. However, density of recyclables was taken as 200Kg/Cubic metre

The basic character of the waste reveals that it has a low combustible value but has a high compostable value.

6.3.4 Waste generation

Description	2011	2015	2030
Population			
Non Slum Population	238282	256863	324820
Slum Population	117541	126515	159986
Total Population	355823	383378	484806
Commercial & Inst. establishments	15000	16000	25000
Generation per day			
Non Slum (MT)	95.3	102.7	129.9
Slum (MT)	35.2	37.9	48.0
Commercial Establishment (MT)	30.0	32.0	50.0
Others (MT)	0.5	2.4	3.1
Total Generation (MT)	161	175	231
Organic Waste (MT)		110	146
Inert Waste (MT)		42	55
Recyclable waste (MT)		23	30

The detailed calculation of solid waste generation is provided at **Annexure 15**

6.4 Design Parameters for SWM

It is expected that the implementation of Solid Waste Management system would take three years time altogether for completion including development public awareness towards handling of solid waste. Therefore the different parameters for solid waste management system under this City Sanitation Plan have been designed taking into consideration of waste generated upto the year ending 2015. However the design of disposal site, i.e Landfill area have been designed taking the waste generation upto the year ending 2030.

6.4.1 Storage

As the basic mandate in the Rules is to segregate waste at the point of generation, it is proposed to segregate the waste at the household level broadly into two parts, Organic (decomposable) and Inorganic (recyclables). There will be two systems of collection for the above collection and the frequency of collection will differ. While for organic (biodegradable) waste the collection frequency will be Daily, the same for recyclables will be **once in a week**. Segregation of waste at source is proposed to be practiced by households and establishments. The following measures should be taken on to residential and commercial areas that

- a) No one should throw solid waste in the open areas, streets, and neighbourhood.
- b) They shall store both biodegradable waste & non-biodegradable waste in plastic containers with lid. Metal containers can also be used for storage of biodegradable waste but they become corroded within a short period therefore, is not recommended. A standard design and size of the containers will be prescribed by the department to facilitate the activities.

System	Description	Advantages	Disadvantages
Shared Residents can bring waste at any time			
Shared container	Residents and other generators put their waste inside a container which is emptied or removed at definite time interval	Low operating cost and convenient for the pedestrians and market places.	There is every possibility that occasionally the waste will spill out from the containers. Placement of containers will be difficult in a busy and narrow streets and lanes. Adjacent residents and shopkeepers may complain about the smell and appearance.
Individual In these systems the generators need a suitable container and must store the waste on their property/premises until it is collected.			
Block collection	Collector sounds horn or rings bell and waits at specified locations for residents to bring waste to the collection vehicle.	Economical. Less waste on streets. Staff requirement is less though the standard of service is satisfactory.	If family members are not present during time of collection, the accessibility of the service reduces.
Kerb side Collection	Waste is left outside property in a container and picked up by passing collection vehicle, or swept up and collected by conservancy worker	Convenient for the households. No permanent storage point is required in the streets or lanes	Waste that is left out may be scattered by animals, children and waste pickers. Vacant area outside the premises for keeping the container may not be available in many cases.
Door to door collection	Waste collector knocks on each door and waits for waste to be brought out by resident.	Convenient for resident. Little waste on street	Residents must be available to hand waste over. A large number of workers is required as much time will be needed by each worker to attend every house.

As mentioned earlier that each family will be provided with two separate storage facilities. They shall store biodegradable waste and non-biodegradable waste in plastic containers with lid. Shared container (community bins) system is proposed for collection of organic waste as well as inorganic waste for slum area. It will be difficult for the vehicles to wait in some of the narrow but busy lanes. Community bins are proposed in those areas.

The number and size of household bins and community bins are estimated as follows

6.4.1.1 Household Bins

Door-to-door **daily** collection is proposed for collection of organic waste. Door-to-door collection is also proposed for collection of inorganic recyclable waste with frequency of collection, **once in a week**.

CATEGORY	MATERIAL	NUMBER REQUIRED	SIZE	FREQUENCY OF COLLECTION
HOUSEHOLD BINS(Organic Waste)	PLASTIC	70,000	8 LITRES	DAILY
HOUSEHOLD BINS(Recyclable Waste)	PLASTIC / METAL	70,000	10 LITRES	ONCE IN A WEEK

6.4.1.2 Community bins for slum area

It is assumed that a community bin will serve 25 families or 125 persons. Organic waste will be collected daily & recyclable waste will be collected once in a week.

CATEGORY	MATERIAL	NUMBER REQUIRED	SIZE	FREQUENCY OF COLLECTION
COMMUNITY BIN (ORGANIC)	FIBRE GLASS	1000	100 LITRES	DAILY
COMMUNITY BIN (RECYCLABLE)	FIBRE GLASS	1000	200 LITRES	ONCE IN A WEEK

6.4.1.3 Bins for Commercial Establishments/Shops

It is assumed that one bin will serve 25 shops. Organic waste will be collected daily & recyclable waste will be collected once in a week.

CATEGORY	MATERIAL	NUMBER REQUIRED	SIZE	FREQUENCY OF COLLECTION
BIN FOR ORGANIC MATTER	FIBRE GLASS	720	100 LITRES	DAILY
BIN FOR RECYCLABLE MATTER	FIBRE GLASS	720	300 LITRES	ONCE IN A WEEK

6.4.1.4 Bins for Institutions

It is assumed that two trash bin will be placed in each institution. Both Organic waste & recyclable waste will be collected daily.

CATEGORY	MATERIAL	NUMBER REQUIRED	SIZE	FREQUENCY OF COLLECTION
TRASH BIN	FIBRE GLASS	200	200 LITRES	DAILY

Locations of such bins shall be decided by the Administration based on the convenience of placement in consultation with the Institution Authority.

6.4.1.5 Bins for Marriage Hall & Kalyan Mandap

It is assumed that one trash bin will be placed in each marriage mandap. Both Organic waste & recyclable waste will be collected daily.

CATEGORY	MATERIAL	NUMBER REQUIRED	SIZE	FREQUENCY OF COLLECTION
TRASH BIN	FIBRE GLASS	40	5000 LITRES	DAILY

6.4.1.6 Bins for Hotel and Restaurant

In addition to the above bins for storing of commercial waste, **200 nos of trash bins each of 2000 litres capacity** will be placed at each hotels and restaurant for collection of bulk generation of organic waste.

CATEGORY	MATERIAL	NUMBER REQUIRED	SIZE	FREQUENCY OF COLLECTION
TRASH BIN	FIBRE GLASS	200	2000 LITRES	DAILY

6.4.2 Primary Collection Vehicles

Common types of primary collection vehicle are

- The handcart, which is pushed by the operator as he/she walks along,
- The pedal tricycle with containers/box in front of or behind the operator.

It is proposed that 40% Of the waste will be collected through hand carts having 4 nos. of 30 lit. Capacity container and 60% of the waste will be collected by pedal tricycles having 8 nos. of 30 lit. Capacity container.

It is considered that one sweeper will make 3trips/day from the household/community to the primary transfer stations.

Carrying capacity of hand cart /day = $3 \times 4 \times 30 \text{lit.} = 360 \text{lit.}$ or 0.360cum.

No. required= $133 \text{MTx} .40 = 61 \text{MTx} 1000/425 = 125.17 \text{ cum}/.360 = 347.71$ **or say 350**

Carrying capacity of pedal tricycle/day = $3 \times 8 \times 30 \text{lit.} = 720 \text{ lit.}$ or 0.720cum.

No. required= $133 \text{MTx} .60 = 91.2 \text{MTx} 1000/425 = 187.76 \text{ cum}/.0.720 = 259.70$ **or say 260**

ITEM	Capacity	Number
Hand Cart	4 container	350
Pedal Tri cycle	8 container	260
Container	30 Litres	3480

6.4.3 Transfer and transportation

Main objectives of the proposed solid waste transportation system are

- Optimum Utilization of the transport vehicles.
- Avoid Multiple Handling of Solid waste
- Environment friendly and hygienic system

1. Primary Transfer Station

The method of transferring waste from the primary transport cum collection vehicle to Primary transfer stations should be chosen with care, in order to avoid environmental pollution and occupational health risk of the workers.

Calculation of Dumper Placer Container

Total Road length of 37nos of ward of Berhampur City = 385 km.

Average road length per ward = $385/37 = 10.40 \text{ km.}$

Total Area of Berhampur city = 80.00 Sq km.

Average area per ward = $80/37 = 2.16 \text{ Sq km.}$

Taking into consideration of average road length & area of a ward it is proposed to have 2 no of dumper placer containers of 2 Cum capacity in each ward at suitable locations for organic waste, 1 no of dumper placer container of 2cum capacity in each ward for recyclable waste. As the Berhampur city is very congested & thickly populated with narrow lanes, it is proposed to place 2 cum Capacity dumper placer containers.

- a) In addition to this it is proposed to place one no of dumper placer container of 3 cum Capacity in each ward at suitable locations for waste from street sweeping.
- b) 20 nos. of 4.5 cum capacity dumper placer containers at major commercial area
- c) 10 nos. of 4.5 cum capacity at vegetable markets (2 each in Ward No-2,8,13,21 & 23)

Considering generation of 2015 total dumper placer container required

Total no of 2 cum capacity container= 37x3	= 111
Total no of 3 cum capacity container	= 37
Total no of 4.5 cum capacity container	= 30

2. Container Lifting Vehicles

These container lifting vehicles will engage to transport the waste from primary transfer stations to secondary transfer stations.

Considering 4 numbers of containers can be lifted & transported per vehicles per day, the number of Dumper Placer required = $178/4 = 44.50$ or say 45 nos. Add 10% extra = $45+5 = 50$ nos.

Out of the above, **32 nos.** will be of Auto transported dumper placer and rest **18 nos.** will be Tractor/Mini truck carried dumper placer.

3. Secondary Transfer Stations

Split-level transfer is proposed for the town. Split level transfer can be of three types as mentioned below

Method Description	Advantages	Disadvantages
Ramp: The collection vehicle is moved up a slope until it is high enough for the waste to fall by gravity into the secondary transport vehicle	Rapid and hygienic transfer	It requires considerable space to provide a desirable slope for the motor vehicles. That much of free space may not be available in most areas.
Pit: The secondary transport vehicle is driven into a pit, so that the waste can be tipped from a primary transport vehicle into it.	No restriction imposed on the size of the Primary transport vehicle	If the pit is not well drained and regularly cleaned, it may become filled with water or waste, or both.
Using natural ground level allow split level transfer	Problems of Ramp and Pit do not arise	Some special construction arrangements have to be made sometimes, if the land where transfer will take place is uneven.

For the Berhampur City 2 numbers of Two level transfer stations (Ramp type) are proposed at the following locations

- i- Ward No-21
- ii- Ward No-34

For the above purpose land area of 2500 Sq.mt. (approximately 80mt.x30mt) is required at the above two locations. These transfer stations should be within 10-15 km distance from the Landfill Site at Chandania Pahad. The waste collected through dumper placer from the city will be transferred to prime movers (Truck attached with hydraulically operated tippers) and the waste will be transported to Landfill/Waste processing site from these transfer stations.

4. Prime Movers Required

Total solid waste to be transported to disposal site = 110 MT per day

Capacity of each Prime Mover = 5 MT

No. of Prime Mover required = $110 / (5 \times 3 \text{ trips}) = 7.33$ say 8 nos.

Provide 10% extra as stand by unit.

Total No. of Prime Mover = $8+1 = 9$ nos.

5. Transportation of Construction Material/Inert Waste

It is proposed that the construction waste will be kept by the waste generator in their premises or at road side and it will be lifted directly from the construction site by Berhampur Municipality. These materials will be disposed at low lying area of the city or in the river bank through Tractors or Mini truck. It should be ensured that such waste should be free from any type of organic waste & recyclable waste otherwise it will create environmental or river pollution.

Calculation of no. of vehicle required/day for disposal of Construction Waste

It is assumed that one vehicle will run 20 km/trip and 5 trips/day.

Capacity of one Tractor = 1cum x 5 trips/day = 5 cum.

Density of Inert waste is considered as 1000kg/cum.

Inert Material is **42 MT/day**

No. of vehicles to be engaged for lifting of 42 cum = 8.4 or say 9 nos.

Add 10% extra = $9+1 = 10$ nos.

6. Street sweeping

Total length of the road of Berhampur City = 385km.

The width of the roads are different. Considering 20% of road length having 10 Mt. width, 30% of the road length having 7 Mt. width & 50% of road length having 3 Mt. width, the length of the roads of different width are as follows-

10 Mt. width road = 77km; 7 Mt. width road = 115km; 3 Mt. width road = 193km

Considering one sweeper can sweep 2500 Sqmt. of road/day and also be allotted the duty for primary collection of waste from road side to dumper placer container.

The no of sweeper required

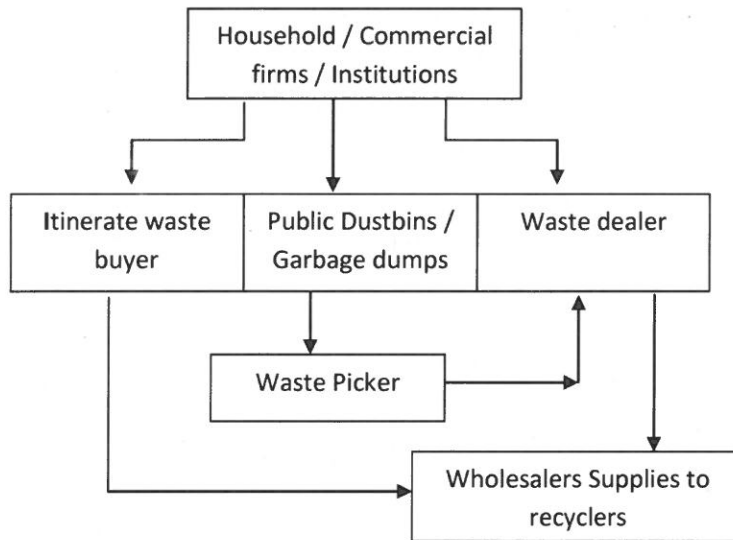
For 10Mt.width road	= (10x77000)/2500	= 308nos.
For 7Mt.width road	= (7x115000)/2500	= 322 nos.
For 3Mt.width road	= (3x193000)/2500	= 232 nos.
Total		= 862 nos.

6.4.4 Treatment & Disposal

1. Recycling or resource recovery

Each family of the City will be provided with metal/plastic bins for storing of recyclables generated in the house. As these wastes are not biodegradable, seven days storing inside the house will not pose problem. The waste will be handed over to the waste collectors who will collect the waste at doorsteps once in a week. These materials will be taken to Recovery Centers.

Recyclable waste that would be collected from residences, commercial establishments and markets, needs to sort. For that two recovery centers are proposed to be constructed just adjacent to the secondary transfer stations. It would be a simple enclosure with a boundary wall, where individual components of recyclables will be sorted and stored separately so that selling of the articles will be effective. There will be weighing machines in the center for regular stock checking and quantification of items. Workers who will be engaged for material sorting must be protected from health hazards associated with waste handling by providing Personal Protective Equipments (PPE). A piece of land of **40Mt.x 30 Mt.** size will be adequate for one recovery center.



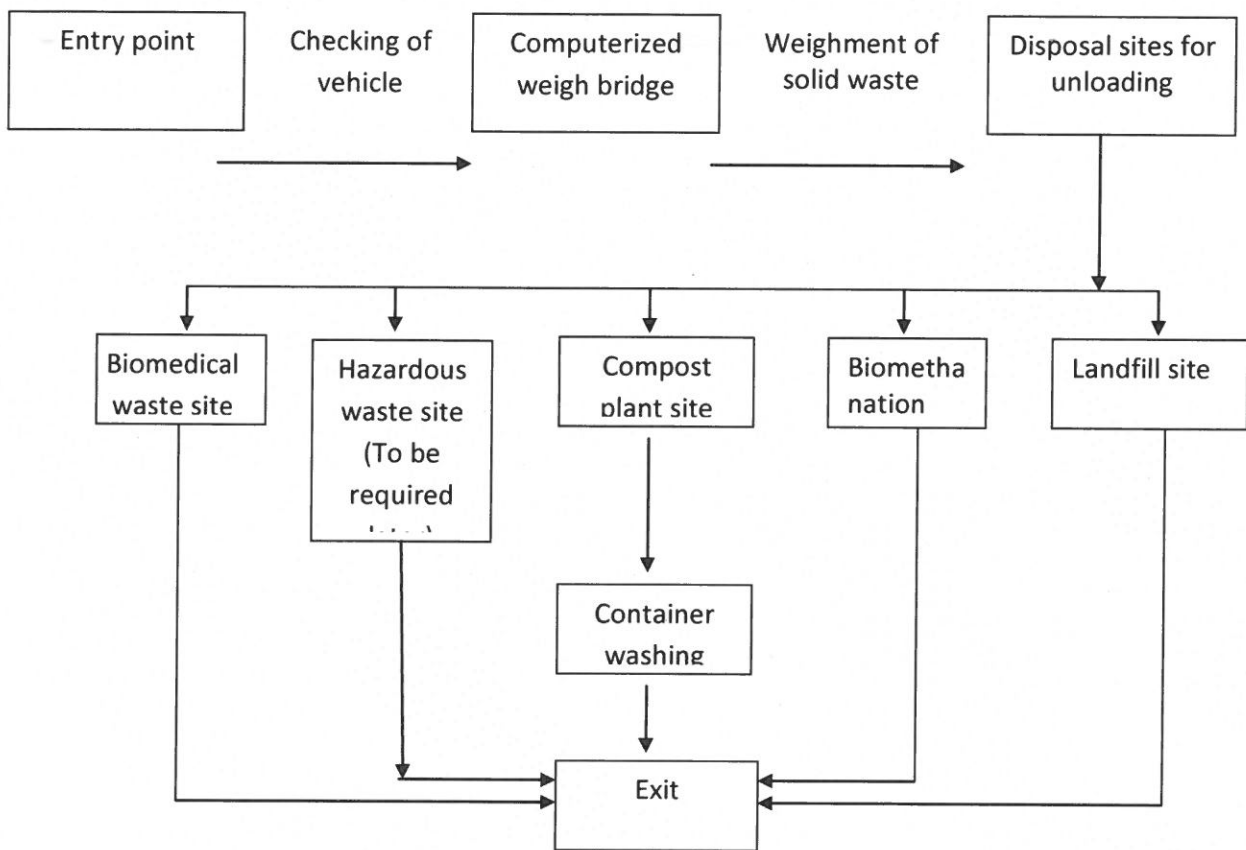
The schematic representation of recovery

2. Disposal

The disposal of solid waste is proposed to be carried out in a combination of three methods:

1. Composting
2. Biomethanation
3. Land filling

As it is already proposed that most inorganic waste will be taken care by recycling system, the organics and mixed waste will be disposed off. According to the Rules organic waste must be used for production of compost & for energy recovery. On that basis flow sheet of disposal operation to be practiced is depicted below



Flow Sheet of Disposal Operation by the Transport Vehicles

3. Compost unit

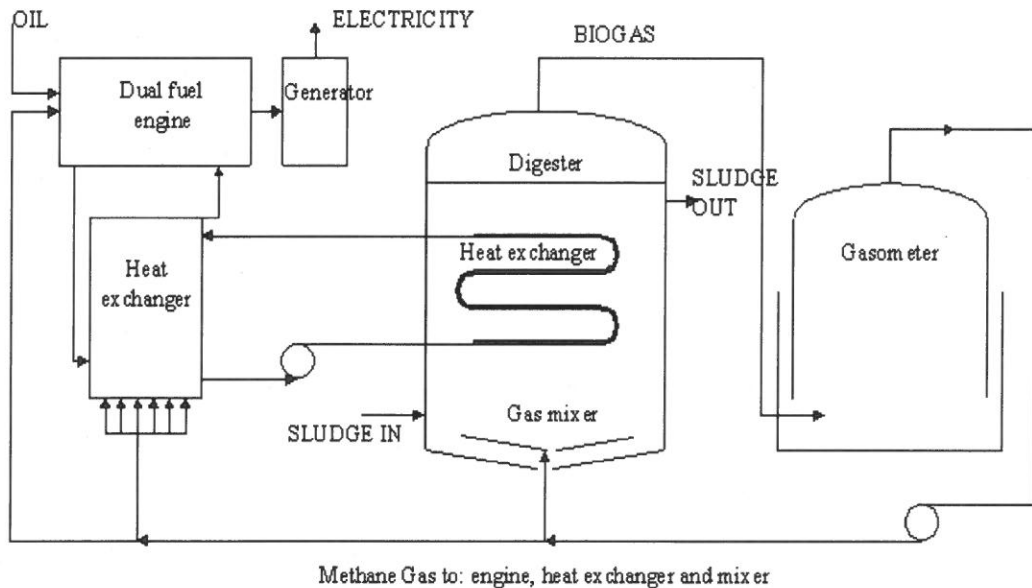
Composting cannot be effectively carried out without an integrated waste management policy, where recycling, composting, anaerobic digestion and land filling are given equal importance.

Quantity of Solid Waste to be utilized for compost plant

$$= 50\% \text{ of the organic waste} = 110 \times 50 = \mathbf{55 \text{ MT.}}$$

It is proposed to construct **2 nos.** of separate unit of compost yard of **30 MT** capacities each, near the land fill site at Chandini Pahad. Land area required for each unit is around 2500 sq. mt.

4. Biomethanation/Anaerobic Digestion(AD)



The flow diagram of low solid AD

The following types of low-tech anaerobic digesters (AD) can be implemented

- TEAM digester (developed by Energy and Resource Institute (TERI))
- ASTRA digester (Centre for Sustainable Technologies): this type of biogas plants are built by TIDE (Technology Informatics Design Endeavour)
- ARTI digester (Appropriate Rural Technology Institute)
- SPRERI digester (Sardar Patel Renewable Energy Research Institute)
- BARC digester (Bhabha Atomic Research Institute)

Quantity of Solid Waste to be utilized for anaerobic digestion by installation of Digester Plant is 30% of the organic waste= $110 \times 30 = \mathbf{33 \text{ MT.}}$

It is proposed to install **3 nos.** of separate unit of Digester Plant of **10 MT** capacities each, near to the land fill site at Chandini Pahad. Land area required for each unit is around 1000 sq. mt.

5. Modified sanitary land fill (MSLF)

The basic criteria for site selection for land fill are

1. The landfill site shall be large enough to last for 20-25 years and preferably within 5 km from present city limits.
2. The site shall be at least 0.5 km away from habitation clusters, forest areas, monuments, National parks, wetlands and places of important cultural, historical or religious interest.
3. Landfill site shall be at least 20 km away from airport including airbase. Implementing authority shall obtain approval of airport/airbase authorities prior to the setting up of the landfill site.
4. 500 meters, wide buffer zone of no-development is to be maintained around landfill site and shall be incorporated in the City Planning Department's land-use plans.

The land fill site has to be designed for 2030 projection. The site at Chandania Pahad fulfils all the criteria. Considering 20% of organic waste will be disposed off in the modified sanitary landfill (MSLF) , 50% will be utilized in the compost plant and 30% will be utilized for anaerobic digestion for production of bio-gas.

The total land area should be approximately 15% more than the area required for land filling to accommodate all infrastructure and support facilities as well as to allow formation of a green belt around the landfill.

A landfill is operated in phase because it allows the progressive use of the landfill area, such that at any given time a part of the site may have a final cover, a part being actively filled, a part being prepared to receive waste, and a part undisturbed. Each phase is typically designed for a period of 365 days.

Waste generation by 2015(Organic Waste)	:	110 tonnes / day
Waste generation by 2015(Organic Waste)	:	146 tonnes / day
Design Life	:	Active period = 15 years
Average total rainfall	:	1200 mm per year

Land Fill Area

- i) Waste to be disposed at landfill site by 2015
@ 20% of 110MT (organic waste) = 22.0 tonnes / day
- ii) Waste to be disposed at landfill site by 2030
@ 20% of 146MT (organic waste) = 29.2 tonnes / day
- iii) Total waste to be disposed in 15 years $(0.5 \times (22 + 29.2) \times 365 \times 15) = 1.40 \times 10^5$ tons
- iv) Total volume of the waste, (considering density of the waste 0.85 ton/cum
Volume of Waste $V_w = \frac{1.40 \times 10^5}{0.85} = 1.65 \times 10^5$ Cum

- v) Volume of daily cover $V_{de} = 0.1 \times 1.65 \times 10^5$ Cum
- vi) Volume of liner and cover system $V_e = 0.125 \times 1.65 \times 10^5 = 0.206 \times 10^5$ Cum
- vii) Volume likely become available within 30 days due to settlement of biodegradable waste and inert waste @ 7.5%
- $$V_s = 0.075 \times 1.65 \times 10^5 = 0.123 \times 10^5 \text{ cum}$$
- viii) Estimate of landfill volume
- $$C_i = V_w + V_{de} + V_e - V_s$$
- $$= (1.65 + 0.165 + 0.206 - 0.123) \times 10^5$$
- $$= 1.898 \times 10^5 \text{ Cum}$$
- ix) Proposed L:B ratio = 1:1
- x) Proposed landfill height = 3.50mt
- x) Land area required = $(1.898 \times 10^5 / 3.5)$ Sqm
- $$= 54,228 \text{ Sqm}$$
- $$= 13.55 \text{ Acre or say } \mathbf{14 \text{ Acre}}$$

The land available at Chandini Pahad is around 10.3 acre. Out of which 1.3 acre of land is proposed to be utilized for compost unit and 1.00 acre to be utilized for setting up digester plant. Thus only 8 acre of land is available at present for land filling. Hence the available land will meet land area demand for the present. However the future requirements of land will be another 6 acre which are to be acquired by the Municipal Authority during the implementation period.

Land fill Infrastructure

- a) Site Entrance and Boundary Wall.
- b) Administrative and Site Control Offices
- c) Access Roads
- d) Waste Inspection and Sampling Facility
- e) Equipment Workshops and Garages
- f) Signs and Direction
- g) Water Supply
- h) Lighting
- i) Vehicle Cleaning Facility
- j) Fire Fighting Equipment

Landfill equipment

The following equipment is required at a landfill site

- a) Dozers – for spreading waste and daily cover -**2 Nos**
- b) Landfill Compactors – for compaction waste - **2 Nos**
- c) Loader– for loading of Waste (internal movement) – **2 Nos**
- d) Tractor trailers –for internal movement of waste/daily cover soil – **2 Nos.**
- e) Soil compactos – sheep foot rollers and smooth steel drum rollers – **2 Nos.**
- f) Water tanker - **1 No.**

6.4.5 Bio-medical Waste

Bio-medical Waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biologicals and including categories mentioned in Schedule-I of the Rules.

Bio-medical waste treatment facility

A facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment or disposal is carried out and includes common treatment facilities.

The Municipal Bodies can only pick-up and transport duly treated bio-medical wastes for disposal at the municipal dump site (Rule 6). The main responsibilities of collection and segregation bio-medical waste are with the hospital authority.

Categories of Health Care Waste

General Waste	Biomedical Waste		
	Anatomical Waste	Infectious non-sharp Waste	Sharp Waste
Food Waste, Paper, Cardboard, Floor sweeping, earthen vessels, woods, rags, etc.	Placenta, human tissue, tumours, etc.	<p><u>Soiled Waste :</u> Waste contaminated with blood, body fluid (cotton, dressing, soiled plaster cut, linen, etc.)</p>	Needles, syringes, scalpel, blade, broken glass, nails and any other items that may cause puncture and cuts.
		<p><u>Solid Waste :</u> Disposable items other than waste sharps (rubber gloves, plastic tubing, catheters, IV sets, etc.</p>	

Colour Coding for different Categories of Waste

Waste Category	Colour of Bag	Colour Bin
General Waste (Non-hazardous)	Black	Black
Anatomical Waste	Yellow	Yellow
Infectious Non-sharp Waste	Red	Red
Sharp Waste	Blue	Blue

Need for the Segregation of BMW at Source

- If the proper segregation of the waste is not done at source then the bio-medical waste might get mixed up with the municipal waste of the hospital.
- This will jeopardize the entire process of the bio-medical waste treatment.
- Besides, this will endanger the human and the animal lives.
- Therefore, it is vital that all the health care units – both in the Government and in the Private Sector – strictly follow the segregation of bio-medical waste at source.

The bio-medical waste is segregated into Yellow, Red and Blue bags, containers and bins

Generation of Medical MSW & treated BMW

Total No of Bed- MKCG Medical College	- 800
Other Primary Hospitals & Nursing Homes (20 Nosx 30 bed average)	<u>-600</u>
Total -	1400 beds.

Considering the waste generated @1.5 Kg/cap/day

The total waste generated = 2.10 MT/Day

Out of which the municipal solid waste is considered as 75%, = 1.58MT

and the Bio- Medical Waste is considered as 25% i = 0.52 MT

6.5 Infrastructure, Investment & Implementation

budgetary provision for solid waste management							
Sl. No	Details of items / Equipments / Tools	Capacity	Quantity required by 2015	Quantity Available 2011	Net Quantity Required	Cost per Unit (Rs.)	Total Estimated Cost (Rs.) by 2015
Cost Estimate For Primary Collection System							
1	House Hold Bins(For Organic Waste)	8 Lit.	70000	0	70000	100.00	70,00,000.00
2	House Hold Bins(For Recyclable Waste)	10Lit	70000	0	70000	150.00	1,05,00,000.00
3	Community bins (For Organic)	100Lit.	1000	0	1000	1,000.00	10,00,000.00
4	Community bins (For Recyclable)	200Lit.	1000	0	1000	2,000.00	20,00,000.00
5	Bins For Commercial Estt.(For Organic)	100Lit.	720	220	500	1,000.00	5,00,000.00
6	Bins For commercial Estt. (For Recyclable)	300Lit.	720	0	720	3,000.00	21,60,000.00
7	Bins For Institutions	100Lit.	200	50	150	1,000.00	1,50,000.00
10	Container For Marriage Mandap	4.5 Cum.	40	10	30	50,000.00	15,00,000.00
11	Container For Hotels, Restaurant	2 Cum	200	0	200	20,000.00	40,00,000.00
12	Containers For Hand Cart & Tri Cycle	30Lit.	3480	0	3480	500.00	17,40,000.00
13	Hand carts	4 container	260	0	260	6,000.00	15,60,000.00
14	Pedal tricycle	8 container	350	0	350	10,000.00	35,00,000.00

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Sl. No	Details of items / Equipments / Tools	Capacity	Quantity required by 2015	Quantity Available 2011	Net Quantity Required	Cost per Unit (Rs.)	Total Estimated Cost (Rs.) by 2015
15	Dumper placer containers	2 Cum	160	0	160	60,000.00	96,00,000.00
16	Do	4.5 Cum	30	30	0	2,00,000.00	-
						Total	4,52,10,000.00
Street Sweeping							
17	Sweeping tools (Metal tray & metal plate, long handled brooms, shovels and protective gears)		Lump Sum				50,00,000.00
18	Street Vat	8 Ltr.	650	630	20	100.00	2,000.00
						Total	50,02,000.00
Transportation Vehicles							
19	Small vehicle for congested places / AutoCarried Dumper Placer	0.3Cum	32	32	0	2,50,000.00	-
20	Tractors fitted with hydraulic trolleys with equipments for dumper placer	1 Cum.	18	10	8	12,00,000.00	96,00,000.00
21	Prime Movers with hydraulic tripper	4.5 MT	9	9	0	30,00,000.00	-
22	Tractors fitted with hydraulic trolleys for construction waste	1 Cum.	10	10	0	10,00,000.00	-
						Total	96,00,000.00

Cost Estimate for Secondary transfer station							
Sl. No	Details of items / Equipments / Tools	Capacity	Quantity required by 2015	Quantity Available 2011	Net Quantity Required	Cost per Unit (Rs.)	Total Estimated Cost (Rs.) by 2015
23 I	Boundary Wall		2	0	2	10,00,000.00	20,00,000.00
II	Raised Platform		2	0	2	30,00,000.00	60,00,000.00
III	Administrative Office		2	0	2	10,00,000.00	20,00,000.00
IV	Approach Road		2	0	2	10,00,000.00	20,00,000.00
V	Electrification & W/S		2	0	2	5,00,000.00	10,00,000.00
						Total	1,30,00,000.00
Cost Estimate for Recovery Center							
24 I	Boundary Wall		2	0	2	5,00,000.00	10,00,000.00
II	Concrete Yard		2	0	2	10,00,000.00	20,00,000.00
III	Administrative Office		2	0	2	5,00,000.00	10,00,000.00
IV	Approach Road		2	0	2	5,00,000.00	10,00,000.00
V	Electrification & W/S		2	0	2	3,00,000.00	6,00,000.00
						Total	56,00,000.00
Cost Estimate for Compost Units							
25	Civil Items						
I	Construction of boundary wall all around the waste processing site.		1	0	1	15,00,000.00	15,00,000.00
II	Concrete Yard		1	0	1	20,00,000.00	20,00,000.00
III	G.I. Sheet Roof over the Yard		2	0	2	20,00,000.00	40,00,000.00
IV	Approach Road		1	1	0	5,00,000.00	-
V	Administrative Office		1	0	1	10,00,000.00	10,00,000.00
VI	Storage Yard		1	0	1	10,00,000.00	10,00,000.00

Sl. No	Details of items / Equipments / Tools	Capacity	Quantity required by 2015	Quantity Available 2011	Net Quantity Required	Cost per Unit (Rs.)	Total Estimated Cost (Rs.) by 2015
VII I	Surface Drains		2	0	2	2,00,000.00	4,00,000.00
VII I	Leachate Tanks		1	0	1	5,00,000.00	5,00,000.00
						Total	1,04,00,000.00
26. Other Mechanical & Elect. Items							
I	Weigh Bridge	20MT	1	0	1	10,00,000.00	10,00,000.00
II	Screens	1,2,3,10 mm	40	0	40	10,000.00	4,00,000.00
III	Mechanical Tools For handling					L.S.	20,00,000.00
	Electrification & W/S						10,00,000.00
						Total	44,00,000.00
Cost Estimate for Bio-methanation Plant							
27	Package anaerobic digester plant					L.S.	3,00,00,000.00
Cost Estimate for Land Fill Sites							
28 Civil Items							
I	Construction of boundary wall all around the Land Fill site.					L.S.	20,00,000.00
II	Shed for equipments workshop					L.S.	20,00,000.00
III	Approach Road & Internal access road					L.S.	40,00,000.00
IV	Administrative Office					L.S.	15,00,000.00
V	Surface Drains					L.S.	40,00,000.00
VI	Leachate Tanks					L.S.	1,50,00,000.00
VII	Sedimentation Tank					L.S.	10,00,000.00
VII I	Treatment Unit for Leachate					L.S.	2,00,00,000.00

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Sl. No	Details of items / Equipments / Tools	Capacity	Quantity required by 2015	Quantity Available 2011	Net Quantity Required	Cost per Unit (Rs.)	Total Estimated Cost (Rs.) by 2015
IX	Landfill gas recovery arrangements					L.S.	2,00,00,000.00
						Total	6,95,00,000.00
29. Other Mechanical & Elect. Items							
I	Weigh Bridge	20MT	1	0	1	L.S.	8,00,000.00
II	Mechanical Tools & Equipments for Works					L.S.	20,00,000.00
III	Loader(2nos)		2	2	0	30,00,000.00	-
IV	Compactors (4nos)		2	0	2	40,00,000.00	80,00,000.00
V	Dozer(2 nos)		2	2	0	25,00,000.00	-
VI	Water Tanker (1 no)		1	0	1	10,00,000.00	10,00,000.00
VII	Tractor Trailer (2 nos)		2	0	2	8,00,000.00	16,00,000.00
30	Gas Flaring Arrangement					L.S.	20,00,000.00
31	Environmental Monitoring Units					L.S.	50,00,000.00
32	Leachate Collection Pipe					L.S.	60,00,000.00
33	HDPE Geo Membrane Liner					L.S.	1,50,00,000.00
34	Under Drainage Arrangements					L.S.	1,00,00,000.00
35	Taking up plantation all around the disposal / processing site					L.S.	50,00,000.00
36	Plantation over the completed phase of Land Fill					L.S.	1,00,00,000.00
						Total	6,64,00,000.00

Cost Estimate for Medical MSW and treated BMW							
37	Cost towards collection, transportation, treatment & disposal of waste from Medical at Municipal hospitals						L.S 50,00,000.00
Land Acquisition							
38	Cost towards land acquisition required if any, for different sites						L.S 50,88,000.00
GRAND TOTAL						Rs.	26,92,00,000.00
Total SWM project cost						SAY Rs.	26.92 Crores

6.6 Private Sector Participation in SWM

Private sector participation or public private partnerships may be encouraged / attempted by the Berhampur Municipality.

Some of the areas where private sector participation can be considered are as under

- Door to door collection of domestic waste,
- Door to door collection of commercial waste
- Collection of hospital waste
- Collection of construction waste
- Collection of Market waste
- Setting up of waste disposal facility with its operation and maintenance.
- Setting up of waste treatment plants with its operation and maintenance.
- Supplying vehicles on rent
- Supplying vehicles on lease
- Repairs and maintenance of vehicles,
- Transportation of waste on contractual basis etc.
- Processing of MSW
- Awareness programs on community participation in solid waste management.

6.7 Recommended Measures

1. Household residents should be encouraged to segregate recyclables and non-recyclables organics and inert wastes at the source through public awareness campaigns
2. Door to Door collection systems in all residential area and Community bin collection systems in the slums
3. Collection of non-recyclables organics and inert wastes daily and recyclables once in a week by container carrier hand cart/ Pedal Tricycles
4. NGOs/Private Firms will be engaged for Primary collection systems by hand cart/pedal tricycles
5. Replacement of existing handcarts by containerized handcart to avoid double handling and less productivity
6. Involvement of market committees and participation of NGOs to be encouraged in managing the collection system within the market. Market mechanisms of the recyclables should be totally controlled by NGOs/Private Firm.
7. To fix sweeping Norms for different type of areas as well as different categories of roads according to population, commercial activities, length & width of the roads
8. Monitoring by routine visits to areas by the ULB representatives. Submission of daily report cards by NGOs engaged
9. Containers should be placed in locations (Transfer stations) where vehicles can access properly and loading and unloading operation can be comfortably made.
10. Recyclables should be totally managed by NGOs and the transportation of solid wastes may be given as contracts to private agencies under supervision of ULB.
11. Compost Units & Anaerobic digester plant should be outsourced to Private agencies
12. Consultancy support and specific recommendations of subject experts should be availed for effective management
13. Capacity building activities and training should be taken up regularly
14. It is possible to make SWM a people's programme by launching comprehensive IEC activities for awareness generation

6.8 Estimation of manpower requirement

Sl.	Position	Sanitation workers	Drivers
1	Street sweepers for street sweeping	862	--
2	primary collection of waste through hand cart & pedal cycle	700	--
3	For Auto carried Dumper placers	32	32
4	For tractor /minitruck carried Dumper placers with tipping arrangement	18	18
5	For tractor /mini truck for lifting of construction waste/debris	10	10
6	For Tipper with hydraulic arrangement	18	9
7	For bulldozer and excavators for landfill site	4	2
08	Labour at landfill site	40	--
09	Labour at Bio-Gas Plant site	30	--
10	Labour at Compost Plant site	20	--
11	Labour at Recycling Centre	20	
11	Tractor trailer at landfill site	4	2
12	Loader, Compactor & water tanker for landfill site	10	5
13	Labour required for 2 Nos. of secondary transfer station	20	--
	Total	1788	85
14	Weekly off relievers /Leave Reserve @ 10%	179	9
	Grand Total	1967	94

Note : The above manpower requirement will be reduced based on private sector participation

7.0 Storm Water Drainage

Drainage system of a city is best judged by the coverage of the drainage network and the number and frequency of water logging in the city during heavy rains. Water logging is defined as the inundation of water within an area for a depth of more than six inches for a period greater than four hours. The city should have a drainage network which should be well connected with proper slope and of adequate capacity to carry storm water. The drains should be connected to the main drains and then to the nearest water body. An improvised system can also explore the possibility of a cost-effective method of water harvesting.

7.1 Strategy

The city should have the drainage master plan which needs to be synchronous with the road network master plan of the city. The implementation of the drainage system could be taken up in a phased manner by following the master plan.

Storm water disposal can be taken care of through either a combined sewer system, which provides common collection and disposal of domestic waste water (sewerage) and storm water, or a separate system, in which storm water will be disposed through a separate collection, conveyance and disposal system. Looking to the rainfall pattern, with rainy days mainly in the period June to October and with other months largely dry, a combined system will prove to be expensive, besides being grossly under-utilized in dry months. The separate storm water disposal system is likely to be the preferred option. Also the combined system is not a preferred option for project proposals.

The tertiary and secondary drains, which will discharge into the primary drains, may be in the form of surface drains, with appropriate size and shape and constructed in locally available materials or pre-cast sections.

The design of the storm water drains should be done by using appropriate meteorological and hydraulic parameters. The Indian Meteorological Department (IMD) supplies data on rainfall pattern from which it is possible to develop the relationship between the return period, duration of rainfall and intensity of rainfall, and develop charts useful for design of tertiary, secondary and primary drains. IMD also publishes monographs, which provide charts of rainfall intensity and duration for different return periods for the entire country. Suitable design parameters can be generated by using these charts.

Natural drains, which are the primary drains in a storm water drainage system, are likely to be adequate for accommodating the storm water generated in the city. But they will need some improvements like training, removal of blockages due to vegetation, lining in certain critical locations, etc. The resultant design needs to identify the improvements, based on field observations.

The existing drains need renovation and all the drains are necessary to be covered type with provisions for grit traps for cleaning.

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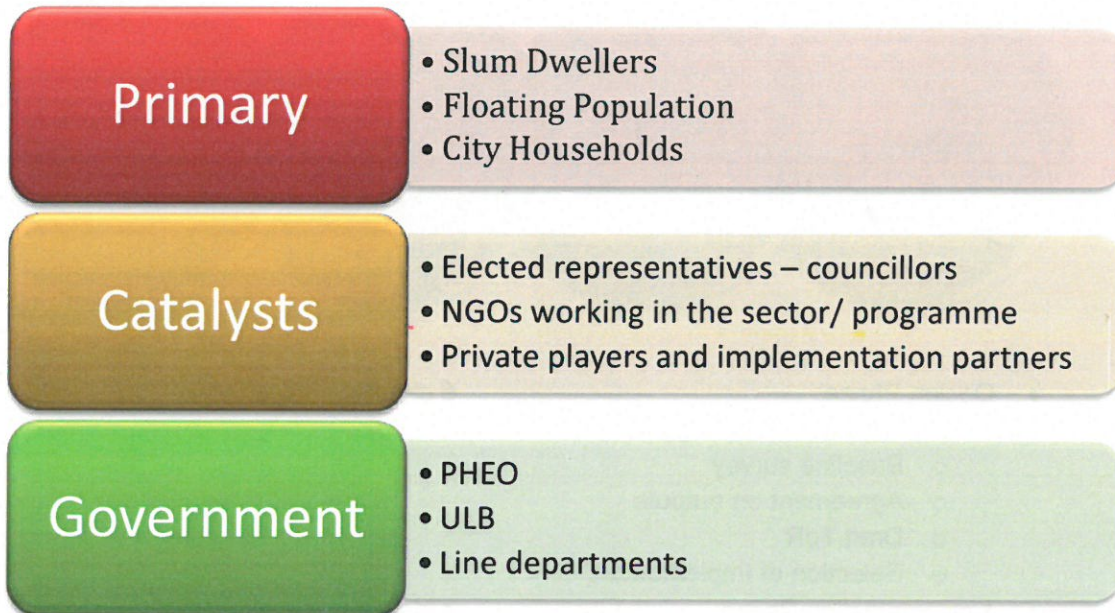
Description	Berhampur
DATA	
Road Length	385
Length of available Pucca Drain	142
TARGET	
Target for coverage	100%
ASSUMPTIONS	
Drain Length per Km of Road	1.5
Cost per Km for Main drain	Rs. 60.00 Lakh /Km
Cost per Km for secondary drain	Rs. 27.00 Lakh /Km
Cost per Km for tertiary drain	Rs. 8.50 Lakh /Km
INFRASTRUCTURE	
Main Drain (Km) 10%	44
Secondary Drain (Km) 30%	131
Tertiary drains (Km) 60%	261
CAPEX	
New Construction (Crores Rs.)	83.62 Cr.
Repair & Renovation (Crores Rs.)	4.26 Cr.
	87.88 Cr.
Total Cost (Crores Rs.)	Say 87.90 Cr.
IMPLEMENTATION	
Period	2012 to 2016

7.2 Investment

Description	Unit	Quantity	Rate (Lakh Rs.)	Cost (Lakhs Rs)
DATA				
Road Length	Km	385		
Length of available Pucca Drain	Km	142		
Drain Length per Km of Road		1.5		
Total Drain Length	Km	578		
Balance Drain to be executed	Km	436		
Target for coverage		100%		
INFRASTRUCTURE				
Main Drain (Km) 10%	Km	44	60.00	2,613.00
Secondary Drain (Km) 30%	Km	131	27.00	3,527.55
Tertiary drains (Km) 50%	Km	261	8.50	2,221.05
			Sub Total Rs.	8,361.60
Repair & maintenance of existing drains	Km	142	3.00	426.00
			Total	8,787.60
			SAY	8,790.00

8.0 IEC & Capacity Building

8.1 Stakeholders



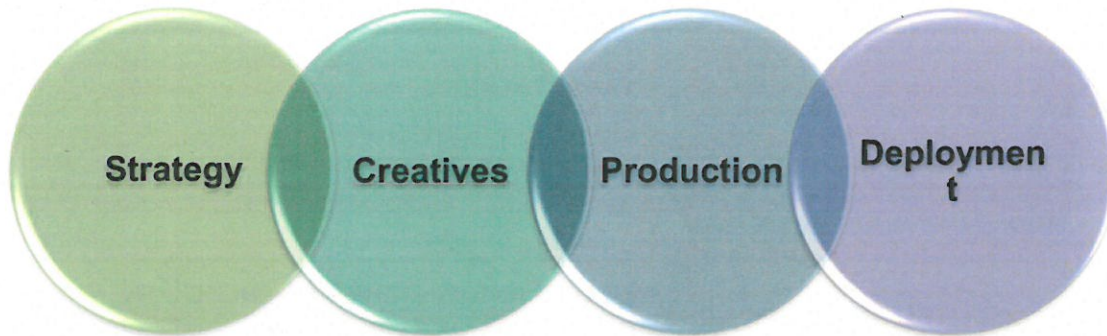
8.2 Approach

- Generating awareness about sanitation
- Promoting sanitation linking with personal health
- Use a range of media vehicles and messages
- Target external, internal and intermediary stakeholders
- Underpin high level commitment of government
- Backed by robust enforcement mechanism
- Periodic review for effective implementation of strategy

8.3 Message

- Better city sanitation means better personal health
- Improved sanitation means healthier and happy family
- Access to facilities for better sanitation is easy i.e clear signage; there is a toilet around the corner
- It costs next to nothing to adopt better sanitation practices
- Benefits far outweigh user fees
- Cost of non compliance is high

8.4 Implementation components & Phasing



- Design Phase *6 months*
 - Approval of strategy
 - Baseline survey
 - Agreement on outputs
 - Draft ToR
 - Selection of Implementers
- Implementation Phase 4 Years
 - Roll out of campaign
 - Production of output
 - Deployment & dissemination
 - Monitoring & review
 - Mid course corrections
- Review Phase 4 months
 - Impact assessment survey
 - Next phase action plan
 - Case studies and documentation

8.5 Effective Mix & Media Planning

- Media relations
- Self sticking posters
- Print media advertisements
- Radio Spots
- Street play
- Direct Mailers
- Project meetings

8.6 Institutional Strengthening

- ULB shall be the obligated entity for ensuring clean sanitation
- Capacity building to ULB staff in the aspects of contract management needs to be enhanced
- The ULB needs to be trained on Service Level Benchmarking which supports measurement of the city sanitation health.
- Governance reforms shall have to be implemented in the city. All fixed assets and infrastructure needs to be owned by ULB
- Movable infrastructure/equipment shall be partially owned by ULB or provided by private sector
- Management and service provision shall have to be outsourced to private sector
- New infrastructure could be developed on Design, Build and Operate contracts
- Operational cost recovery to be ensured through direct and indirect user fee/tax regimes

8.7 Investment

Description	Cost in Lakhs Rs.
Strategy finalisation	5.00
Personal contact drive	30.00
Print advertisements	72.00
Radio spots	30.00
Posters and flyers	30.00
Events and workshops	40.00
Media relations	10.00
Street theatre	20.00
Audio visual for promotion in fairs	10.00
Flex boards and hoardings	40.00
Supervision	36.00
Documentation and surveys	15.00
Creatives	5.00
Training & Capacity Building	27.00
Total	370.00

Capital Cost Summary

Description	Amount in Lakh Rs.
Waste Water Management	16,700.00
Solid Waste Management	2,692.00
Storm Water Drainage	8,790.00
IEC & Capacity Building	370.00
Total	28,552.00

Rupees 285.52 Crores

Annexure 1 - City Level Committee

BRAHMAPUR MUNICIPAL CORPORATION, BRAHMAPUR.

Letter No. 547/F1-IV/4/11

Date 15/1/2011

Mayor has been pleased to constitute City Level Implementation Committee taking following members to aid & advise the Agency for preparation of City Sanitation Plan (CSP) of Brahmapur Municipal Corporation, Brahmapur.

1. Hon'ble Mayor, Chairman
2. Hon'ble Dy. Mayor, Member
3. Municipal Commissioner, BMC, Member
4. City Engineer, BMC, Member
5. Executive Engineer, BMC, Member
6. Dy. Commissioner, Member
7. Executive Engineer, (P.H), Member
8. Secretary, Vedic, NGO, Gajapati Nagar, Member,
9. Er. Jagannath Pattnaik, Asst. Engineer, Member
10. Sri N. Appa^{RPO} Corporator
11. Smt. Gitanjali Samantroy, C.O, Member
12. Health Officer, Convener.

The 1st consultation meeting will be held on 18-11-2011 at 12.00 Noon in the Conference Hall of Guest House of BMC, Brahmapur.


You are requested to attend the meeting on the date, time & venue fixed to give your valuable suggestion.


Municipal Commissioner
Brahmapur Municipal Corporation.

Memo No. 548

Date 15/1/2011

Copy submitted to the Mayor/ Dy. Mayor/City Engineer/Executive Engineer/Dy. Commissioner/Executive Engineer, (P.H)/ Secretary Vedic/Er. J. Pattnaik, A.E./Sri N. Apparao, Coporator/Smt. G. Samantroy, C.O/H.O. BMC, Brahmapur for information & necessary action.


Municipal Commissioner
Brahmapur Municipal Corporation.

Annexure 2 - 1st Consultations



1st consultation meeting on 18.11.2011

Annexure 3 - Data Collection & Consultation



House hold survey in ward no.-3



Discussion with public in ward no. - 22



Discussion with slum dwellers



Focused Group Discussion with officials



Focused Group Discussion with Corporators



Walk through survey with Mayor

Annexure 4 - Primary Survey Questionnaire

INFORMATION SHEET

Date of Survey		Name of Surveyor	
----------------	--	------------------	--

1 GENERAL

Ward No	Plot No.	Type	Govt. / Pvt.	Area
Holding No.	Name			Street
No of floors	Structure	1)Kucha / 2)Pucca / 3)RCC		No. of families in the plot

2 PERSONAL

Family size	Employment	1) Govt	2) Private	3) Self	4) Retired	5) Labour
Years of stay	Income/month			Economic Status		BPL/MIG /HIG
Ownership (own / Rent)	Expenditure			Education Status		
Monthly Expenditure	Electricity	Cable TV			Mobile Phone	

3 WATER SUPPLY

a Source of water	1) PHD-Pipe	2)Open Well	3)Bore well	4)Public Tap	5)Hand Pump	6)Tanker
b Storage Type	1) Sump	2) OH tank	3) Bucket	4) No storage		
c Water sufficiency	Yes / No	If PHD supply, Avg. monthly Bill				
				Do you have latrine in your House		Yes / No

4 SEWERAGE

a If you have latrines in your house

i Total no of Latrines	a) Flushing Type	b) Non Flushing type			
ii Where is the waste water disposed	1)Septic Tank	2)Soak pit	3)Drain	4)Open field	5)Sewer line
Willingness to get connected to sewerage line		Yes / No	Willingness to pay user fee		Yes / No

b If you do not have latrines in your house

i Where do you defecate	1)Open Field	2)Road side	3)Drain	4)Public toilet	
ii Why individual latrine not constructed	1)Space	2)Funds	3)Others		
iii Is there public toilet nearby	Yes / No	Are These maintained properly			Yes / No

c Where is the Kitchen water disposed

i How much are you willing to pay for use of community toilet	1)Drain	2)Open Field	3)Road side	4)Soak pit	5)Sewer line
ii Are you willing to contribute for new latrine	Yes / No				

5 **Solid Waste**

a	Do you have Door to Door collection	Yes / No	If Yes, frequency of collection per week			
	If No, Where do you dispose your waste	1)Road side	2) SW Bin	3)Open field	4)Drain	
b	Is the municipal bin within access	Yes / No				
c	Frequency of garbage collection(per week)		Frequency of street sweeping			
d	Is there frequent foul smell due to garbage	Yes / No	Is the complaint attended within a day			Yes / No
	Is there a user fee	Yes / No	If yes, how much (Rs./ month)			

6 **Drainage**

	Is there a drain available in front of House	Yes / No	Type of drain	1)Pucca	2)Kucha	
	Does the water drain properly during rain	Yes / No	If No, how many hrs of water-logging			
	Frequency of drain cleaning (per week)					

Annexure 5 - Ward-wise Observations

Ward	Major Observations
1	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Wards having Maximum number slum dwellers(hygiene condition is very poor) ▪ Majority area is on water logging ▪ No sewerage system is available ▪ This ward comes under old Berhampur city ▪ 70% HH drain sewerage water to drain ▪ Thickly populated ward ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ Maximum lower middle class people ▪ Environmental hygiene is very poor ▪ Very narrow drain system in the ward(most of the drains are earthen) ▪ Maximum percentage of houses using open field latrine
2	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Road condition is very poor ▪ No sewerage system is available ▪ 60% HH drain sewerage water to drain ▪ Thickly populated ward ▪ This ward comes under old Berhampur city ▪ Maximum upper middle class people ▪ Daily vegetable market is available in this ward ▪ Environmental hygiene is very poor ▪ Mostly business group of people lives ▪ Very narrow drain system in the ward(most of the drains are earthen) ▪ Maximum percentage of houses using latrine
3	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Road condition is very poor ▪ Maximum area is covered by slum people ▪ Majority area is on water logging ▪ No sewerage system is available ▪ 60% HH drain sewerage water to drain ▪ Thickly populated ward ▪ This ward comes under old Berhampur ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ Maximum lower middle class people ▪ Very narrow drain system in the ward(most of the drains are earthen) ▪ 70 percentage of houses using latrine
4	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen) ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are upper middle class
5	<ul style="list-style-type: none"> ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow

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Ward	Major Observations
	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose(Bada bazaar) ▪ Economic condition of people is very good ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ 60% HH drain sewerage water to drain ▪ Maximum percentage of houses using latrine ▪ Maximum people are higher class
6	<ul style="list-style-type: none"> ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Economic condition of people is very good ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 60% HH drain sewerage water to drain ▪ Maximum percentage of houses using latrine ▪ Maximum people are lower middle class
7	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Majority area is on water logging ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 60% HH drain sewerage water to drain ▪ 100 percentage of houses using latrine ▪ Maximum people are lower class
8	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Majority area is on water logging ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward ▪ Daily vegetable market is available in this ward ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 60% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are lower class
9	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Majority area is on water logging ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using latrine

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Ward	Major Observations
10	<ul style="list-style-type: none"> ▪ Maximum people are higher and lower middle class ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Economic condition of people is very good ▪ Drinking water is a problem(supply) ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 40% HH drain sewerage water to drain ▪ Maximum percentage of houses using latrine ▪ Maximum people are lower class
11	<ul style="list-style-type: none"> ▪ Economic condition of people is very good ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 40% HH drain sewerage water to drain ▪ 80% percentage of houses using latrine ▪ Maximum people are higher income group
12	<ul style="list-style-type: none"> ▪ Wards having Maximum number slum dwellers(hygiene condition is very poor) ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 50% HH drain sewerage water to drain ▪ 30% percentage of houses using latrine ▪ 60% people are lower class
13	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Maximum number of Hotels and restaurants ▪ Daily vegetable market is available in this ward ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using latrine ▪ Maximum people are lower class
14	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose ▪ Economic condition of people is very good ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Roads are wide, neat and clean ▪ Maximum number of Hotels and restaurants ▪ 40% HH drain sewerage water to drain ▪ 80% percentage of houses using latrine ▪ Maximum people are lower class
15	<ul style="list-style-type: none"> ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ 50% HH drain sewerage water to drain ▪ All houses using latrine ▪ Maximum people are upper middle class
16	<ul style="list-style-type: none"> ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ 60% HH drain sewerage water to drain

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Ward	Major Observations
	<ul style="list-style-type: none"> ▪ Maximum percentage of houses using latrine ▪ Maximum people are lower class
17	<ul style="list-style-type: none"> ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ 60% HH drain sewerage water to drain ▪ Maximum percentage of houses using individual latrine ▪ Maximum people are higher income group
18	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ Maximum number of Hotels and restaurants ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are higher income group
19	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose ▪ Proper solid waste management in this ward because of privatisation ▪ Thickly populated ward ▪ No sewerage system is available ▪ This ward comes under old Berhampur ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are lower class
20	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose ▪ Wards having Maximum number slum dwellers(hygiene condition is very poor) ▪ 40% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are HIGHER income group
21	<ul style="list-style-type: none"> ▪ Economic condition of people is very good ▪ Proper solid waste management in this ward because of privatisation ▪ Majority area is on water logging ▪ Thickly populated ward ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ Daily vegetable market is available in this ward ▪ 60% HH drain sewerage water to drain ▪ 70 percentage of houses using IHL latrine ▪ Maximum people are lower class
22	<ul style="list-style-type: none"> ▪ lanes and bi-lanes, Roads are narrow ▪ Road condition is very poor ▪ Drinking water is a problem(supply) ▪ Proper solid waste management in this ward because of privatization ▪ Thickly populated ward ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine
23	<ul style="list-style-type: none"> ▪ Economic condition of people is very good ▪ Wards having Maximum number slum dwellers(hygiene condition is very poor) ▪ Drinking water is a problem(supply) ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ Daily vegetable market is available in this ward ▪ 55% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are lower class

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Ward	Major Observations
24	<ul style="list-style-type: none"> ▪ Proper solid waste management in this ward because of privatization ▪ Thickly populated ward ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ 57% HH drain sewerage water to drain ▪ 80 percentage of houses using individual latrine ▪ Maximum people are lower class
25	<ul style="list-style-type: none"> ▪ Front houses are being used for commercial purpose-Economic condition of people is very good ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ Roads are wide, neat and clean ▪ Maximum number of Hotels and restaurants ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 30% HH drain sewerage water to drain ▪ 80% of houses using individual latrine ▪ Maximum people are lower middle class
26	<ul style="list-style-type: none"> ▪ Proper solid waste management in this ward because of privatization ▪ Thickly populated ward ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ 20% HH drain sewerage water to drain ▪ 80 percentage of houses using individual latrine ▪ 40% people are upper middle class
27	<ul style="list-style-type: none"> ▪ Well spaced between the houses and roads are wide ▪ No sewerage system is available ▪ 30% HH drain sewerage water to drain ▪ Maximum percentage of houses using individual latrine ▪ Maximum people are upper middle class
28	<ul style="list-style-type: none"> ▪ Houses are congested, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Maximum official quarters (Residential purpose) ▪ Economic condition of people is very good ▪ Proper solid waste management in this ward because of privatization ▪ Thickly populated ward ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drains are earthen ▪ Maximum number of Hotels and restaurants ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 10% HH drain sewerage water to drain ▪ 100 percentage of houses using own latrine ▪ Maximum people are lower middle class
29	<ul style="list-style-type: none"> ▪ Houses are congested, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Road condition is very poor ▪ Maximum official quarters (Residential purpose) ▪ No pipe water supply in this ward ▪ No sewerage system is available ▪ 40% HH drain sewerage water to drain ▪ 70 percentage of houses using own latrine ▪ Maximum people are higher income group
30	<ul style="list-style-type: none"> ▪ Economic condition of people is very good ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drains are earthen

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Ward	Major Observations
	<ul style="list-style-type: none"> ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 40% HH drain sewerage water to drain ▪ 70 percentage of houses using own latrine ▪ Maximum people are lower middle class
31	<ul style="list-style-type: none"> ▪ lanes and bi-lanes, Roads are narrow ▪ Road condition is very poor ▪ Maximum official quarters (Residential purpose) ▪ Economic condition of people is very good ▪ Thickly populated ward ▪ No sewerage system is available ▪ Roads are wide, neat and clean ▪ 10% HH drain sewerage water to drain ▪ 100 percentage of houses using individual latrine ▪ Maximum people are upper middle class
32	<ul style="list-style-type: none"> ▪ No sewerage system is available ▪ Very narrow drain system in the ward(most of the drain-Roads are wide, neat and clean ▪ 10% HH drain sewerage water to drain ▪ 12% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are lower middle class ▪ Maximum percentage of houses using individual latrine ▪ Maximum people are upper middle class
33	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Maximum official quarters (Residential purpose) ▪ Wards having Maximum number slum dwellers(hygiene condition is very poor) ▪ Drinking water is a problem(supply) ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 45% HH drain sewerage water to drain ▪ Maximum percentage of houses using individual latrine ▪ Maximum people are lower middle class
34	<ul style="list-style-type: none"> ▪ No sewerage system is available ▪ Roads are wide, neat and clean ▪ 20% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine in slums ▪ Maximum people are lower middle class
35	<ul style="list-style-type: none"> ▪ Houses are conjoined, little space between the house, ▪ Buildings are old, ▪ lanes and bi-lanes, Roads are narrow ▪ Maximum official quarters (Residential purpose) ▪ Wards having Maximum number slum dwellers(hygiene condition is very poor) ▪ No sewerage system is available ▪ 50% HH drain sewerage water to drain ▪ Maximum percentage of houses using open field latrine ▪ Maximum people are lower middle class
36	<ul style="list-style-type: none"> ▪ Road condition is very poor ▪ Maximum official quarters (Residential purpose) ▪ Drinking water is a problem(supply) ▪ Proper solid waste management in this ward because of privatisation ▪ No sewerage system is available ▪ Roads are wide, neat and clean ▪ Temporary (space) arrangements has been made for solid waste dumping inside the ward ▪ 45% HH drain sewerage water to drain ▪ Maximum HH have individual toilet

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Ward	Major Observations
37	<ul style="list-style-type: none">▪ Maximum HH are lower middle class people▪ Wide and well spaced between the houses▪ Maximum official quarters (Residential purpose)▪ Drinking water is a problem(supply)▪ No sewerage system is available▪ Roads are wide, neat and clean▪ 25% HH drain sewerage water to drain

Annexure 6 - Abstract of Survey Result

Primary Survey Result for Berhampur City			
Sl. No.	Description	Slum %	Non-slum %
	Total House-Hold		
	Survey of House Hold		
1	Structure		
a)	Kucha	42%	19%
b)	Pucca	32%	39%
c)	RCC	26%	42%
2	Employment		
a)	Govt	5%	13%
b)	Private	18%	32%
c)	Self	28%	43%
d)	Retired	2%	5%
e)	Labour	47%	7%
3	Source of Water		
a)	PHD Pipe	13%	37%
b)	Open well	13%	14%
c)	Bore well	1%	2%
d)	Public Tap	67%	44%
e)	Tube well	5%	1%
f)	Tanker	1%	1%
g)	Vendor	0%	1%
4	Storage Type		
a)	Sump	3%	5%
b)	OH Tank	11%	31%
c)	Bucket	80%	61%
d)	No Storage	6%	4%
5	Water Sufficiency		
a)	Yes	48%	57%
b)	No	52%	43%
6	Individual Toilet in house		
a)	Yes	63%	94%
b)	No	37%	6%
7	Access to Toilet		
a)	Connected to Temp Pit	19%	11%
b)	Connected to Soak Pit	22%	51%
c)	Connected to Drain	22%	25%
d)	Shared/ Community Toilet	13%	4%
e)	Open Defecation	24%	7%
f)	Sewer Line	0%	0%

Primary Survey Result for Berhampur City			
Sl. No.	Description	Slum %	Non-slum %
8	Acceptability of sewer network		
a)	Yes	67%	59%
b)	No	33%	41%
9	Open defecation Location		
a)	Drain	3%	92%
b)	Open Field	95%	7%
c)	Road side	1%	0%
d)	Public Toilet	1%	1%
10	Kitchen water disposal		
a)	Drain	68%	85%
b)	Open Field	18%	3%
c)	Road side	13%	11%
d)	Soak Pit	2%	2%
e)	Sewer Line		
11	Regular DTD Collection		
a)	Yes	25%	26%
b)	No	75%	74%
12	Access to SW Bin		
a)	Yes	45%	44%
b)	No	55%	56%
13	Solid Waste Disposal Point		
a)	SW Bin	15%	28%
b)	Road Side	66%	49%
c)	Open Field	12%	17%
d)	Drain	7%	6%
14	Drainage Facility		
a)	Yes	54%	60%
b)	No	46%	40%
15	Type of Drain		
a)	Pucca	63%	73%
b)	Kucha	37%	27%
16	Proper Drainage		
a)	Yes	51%	49%
b)	No	49%	51%
17	Domestic Animal		
a)	Yes	4%	3%
b)	No	96%	97%

Annexure 7 - Focus Group Discussions (Corporators)

1. Basic Information:

- 1.1 Municipality Name: Berhampur Municipal Corporation
- 1.2 Place of Discussion: Berhampur Municipal Guest House
- 1.3 Starting Time : 11.30 AM
- 1.4 Ending Time : 12.45 PM
- 1.5 No. of Male Participants: 6
- 1.6 No of Female Participants:2

Name of the Interviewers	Ranjan Kumar Mallick
Name of the Coordinator	Satish Panigrahi

2. List Participants in FGD

Sl No	Name of the Participants	Designation	Signature of the Participants
1	Mr Shiva Sankar Dash	Mayor	
2	Mrs Sanjukta Samal	Deputy Mayor	
3	<u>Mr Tirupati Patra</u>	Corporator	
4	<u>Smt Pravati Pradhan</u>	Corporator	
5	<u>Mr Dwa Krushana Malla</u>	Corporator	
6	<u>Mr Dayanidhi Behera</u>	Corporator	
7	<u>Mr. Bulu Behera</u>	Corporator	
8	<u>Mr Gopal Nayak</u>	Corporator	

3. Basic infrastructure (MUNICIPALITY)

Items	Total No	Working/Defunct (Remarks)
Street light	3000	2700/300
Public Stand Posts	1200	900/300
Wells	4500(Govt-100, Pvt-4440)	4000/500
Hand Pumps	500	400/100
Tube Wells	3	3
Pond	130	115/15

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School	Govt and Private 600	600
Community Toilet	20	15/5
Public Toilet	30	25/5
Health Centre	Govt-8, Pvt -200	8/200
Dusbin	600	573/30

4. Access to basic amenities:

- Condition of Road :- STANDARD
- Condition of Drain:- WORST
- Solid Waste Management facilities:- AVERAGE
- Access of Sanitation:- AVERAGE
- Access to health care:-WORST
- Hygiene practices:- NO
- Access to safe drinking water:- NO
- Land tenure /Lease status:- NOT KNOWN
- Source of information:-

5. QUESTIONS

1. HOW DO YOU FEEL ABOUT THE BASIC SERVICES IN YOUR MUNICIPALITY? (QUANTITY, QUALITY, CONNECTIVITY)

a. WATER:

- Immediate attention may be given on improvement in water supply system.
- For 24X7 water supply system, over head tank is necessary in ward No-24, 22, 29, 32, 23, and 31.
- New water source development.

b. SEWERAGE:

- Sewerage line is not available, but some of HH having soak pit & others are connected to nearest drain.

c. SOLID WASTE:

- Out of 37 wards, 15 wards have been privatized and other wards are cleaning by municipal staff,
- Rest of the wards need immediate privatization, so that proper collection of waste and timely disposed will be taken place.

d. DRAINAGE:

- In most of the areas drains are not available, where drains are available, that is broken condition
- All the drains are not connected to main drain, for that water logging is a major problem in the municipal

2. HOW CAN THE WATER SUPPLY SERVICE BE IMPROVED?

For improvement of water supply system in the municipal, following steps are needed

- Creation of overhead tank,
- Creation of new water supply source
- Repairing of old pipe lines

3. DO YOU THINK COMMUNITY TOILET IS FEASIBLE IN YOUR CITY, THEN WHICH ARE THE AREAS?

Not feasible in slums. But area like Market place, Bus stand, Canal Road and railway line, where community toilet is needed.

4. DO YOU NEED SEWERAGE TREATMENT PLAN IN YOUR CITY. IF YES, WHERE IT SHOULD BE LOCATED?

Yes we need the sewerage treatment plant. This sewerage treatment plant should be constructed outside (OUT SKIRT) the city.

5. HOW TO SOLVE THE PROBLEM OF OPEN DEFECATION IN YOUR CITY? SUGGEST SOME MEASURES?

To solve the open defecation problem, at first to create awareness program for use of toilets. If people did not listen then take appropriate action.

6. ARE YOU SATISFIED WITH THE MANAGEMENT OF SOLID WASTE? HOW CAN IT BE IMPROVED FURTHER?

- Present management of solid waste is good, but due to lack of money corporation is unable to privatize all the wards for more better management system

7. HOW TO KEEP THE WATER BODIES / PONDS AND ITS SURROUNDINGS CLEAN?

- Construct temple near the ponds, because all most all people are devotees to God. So that the pond area will be neat and clean
- Also develop more community toilet near the ponds

8. IS THERE ADEQUATE DRAIN NETWORK AVAILABLE IN YOUR CITY? IF NO, HOW TO SLOVE THE DRAINAGE PROBLEM IN YOUR CITY?

- Drain network is not available in the municipal
- Improvement of Old drain (back side of house)
- All the drains needs to be connected to each other, so that proper excess water will the drain properly during rainy season

9. WHICH ARE THE AREAS (WARD) WHERE WATER LOGGING PROBLEM IS ACUTE?

- More or less water logging is problem in Berhampur corporation but the ward having acute water logging problems are- 1,2, 7, 8, 22, 26, 28, 27, 31, 32, 36, 37.

10. WHAT ARE THE MAJOR PROBLEMS IN YOUR CITY (RELATED TO WATER AND SANITATION)?

- Due to expansion of city, major water and sanitation problem areas are, ward No-31(Gajapati nagar), Ward No-20 (Bila Sahi), Nucha pada line, First gate, Gusani Nuagaon, hanuman mandir etc.)

11. HOW YOU ARE PLANNING TO SLOVE THE ABOVE MENTIOED PROBLEMS?

- First to create an action plan and submit to Government Orissa and Govt of India to take appropriate action.
- Through City Sanitation Plan above mentioned problem can be solved by intervention of the Government

12. WHICH ARE THE COMMUNITY ORGANISATIONS, ACTIVE IN YOUR MUNICIPALITY?

- Not a single community based organization is active, for that create a Ward wise committee.

13. HOW MUCH DO YOU SPEND ON THE FOLLOWING IN A MONTH?

- a. Cable TV: Rs. 170.00
- b. Mobile Phone : Rs. 500.00
- c. Hospital and medical expenses: Rs. 500/1000
- d. Water Supply – To Municipality and Own expenses: to PHD

14. ARE YOU WILLING TO PAY USER FEE TO GET BETTER SERVICE, A BETTER LIVING CONDITION AND CLEAN CITY? IF NO, WHY?

- First make them use it freely
- Then fee will be charge to all people.

Annexure 8 - Focus Group Discussions (Officers)

1. Basic Information:

- 1.1 Municipality Name : Berhampur Municipal Corporation
 1.2 Place of Discussion : Health Officer Chamber
 1.3 Starting Time : 11.30 AM
 1.4 Ending Time : 12.45 PM
 1.5 No. of Male Participants : 10
 1.6 No of Female Participants: 0

Name of the Interviewers	Ranjan Kumar Mallick
Name of the Coordinator	Satish Panigrahi

2. List Participants in FGD

Sl No	Name of the Participants	Designation	Signature of the Participants
1	Dr Subhakant Dash	Health officer	
2	Mr Ashim Mishra	Executive Engineer	
3	D Jeevan Kumar	Sanitary Inspector	
4	<u>Satya Narayan Acharya</u>	Sanitary Inspector	
5	<u>Arjun Nayak</u>	Sanitary Inspector	
6	<u>Narayan Patra</u>	Sanitary Inspector	
7	<u>N. Nagaeswar Rao</u>	Sanitary Inspector	
8	<u>Surendra Mohapatra</u>	Sanitary Inspector	
9	<u>Upendra Behera</u>	Sanitary Inspector	
10	<u>Gauracharan Rath</u>	Sanitary Inspector	

3. Basic infrastructure (MUNICIPALITY)

Items	Total No	Working/Defunct (Remarks)
Street light	3000	2700/300
Public Stand Posts	1200	900/300
Wells	4500(Govt-100, Pvt-4440)	4000/500
Hand Pumps	500	400/100
Tube Wells	3	3
Pond	130	115/15
School	Govt and Private 600	600
Community Toilet	20	15/5
Public Toilet	30	25/5
Health Centre	Govt-8, Pvt -200	8/200
Dusbin	600	573/30

4. Access to basic amenities:

- Condition of Road :- Poor
- Condition of Drain:- Poor
- Solid Waste Management facilities:- Good
- Access of Sanitation:-Good
- Access to health care:-Good
- Hygiene practices:-Very poor
- Access to safe drinking water:- Good
- Land tenure /Lease status:- Good
- Source of information:- BMC

5. QUESTIONS

1. HOW DO YOU FEEL ABOUT THE BASIC SERVICES IN YOUR MUNICIPALITY?
(QUANTITY, QUALITY, CONNECTIVITY)

A. WATER:

- Water supply is a problem in most of the wards because of Pipeline (most of the pipelines are old)
- Rushikulya Water supply system is not sufficient for Berhampur town (only serves 30% of the population)

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- Dakhinpur Ghai Water Supply covers the 50% of the old Berhampur.
- 20 to 30 % water supply problem in the city.
- Water quality is good but during rainy season hard water is available due to pipe leakage
- In 40% area, there is no pipe water supply system but in 60% area pipe water supply

B. SEWERAGE:

- Sewerage line is not available, but some of the HH having soak pit & others are connected to nearest drain.
- There is no sewerage system in the municipal
- Water logging is a problem in most of the wards, for that that reason more mosquitoes in the city

C. SOLID WASTE:

- Out of 37 wards, 15 wards have been privatized and other wards are cleaning by municipal staff,
- Rest of the wards need immediate privatization, so that proper collection of waste and timely disposed will be taken place.
- Household storage practice is a problem
- People are throwing the waste to road side
- BMC supply dustbin is not sufficient
- Chandil Hill is the disposal point
- BMC is collecting garbage from 40 collection points
- Institutional solidwaste management is poor. (i.e Hotel, Hostel, School, and College etc.)

D. DRAINAGE:

- In most of the areas drains are not available, where drains are available, that is broken condition
- All the drains are not connected to main drain, for that water logging is a major problem in the municipal

2. HOW CAN THE WATER SUPPLY SERVICE BE IMPROVED?

For improvement of water supply system in the municipal, following steps are needed

- Creation of overhead tank,
- Capacity Improvement of exiting water supply system
- Repairing of old pipe lines

3. DO YOU THINK COMMUNITY TOILET IS FEASIBLE IN YOUR CITY, THEN WHICH ARE THE AREAS?

- Yes community toilet is feasible. One thing is lacking in exiting community toilet, i.e proper maintenance.

4. DO YOU NEED SEWERAGE TREATMENT PLAN IN YOUR CITY. IF YES, WHERE IT SHOULD BE LOCATED?
 - Yes we need the sewerage treatment plant in periphery but less in inside the city.

5. HOW TO SLOVE THE PROBLEM OF OPEN DEFECATION IN YOUR CITY? SUGGEST SOME MEASURES?
 - Open defecation is still practiced in the city
 - At first to create awareness program for construction and use of toilets.

6. ARE YOU SATISFIED WITH THE MANAGEMENT OF SOLID WASTE? HOW CAN IT BE IMPROVED FURTHER?
 - More or less satisfied with the exiting solid waste management practice.
 - The following things are necessary for management in solid waste practice i.e creation of solid waste plant, segregation of waste/biomedical, fertilizer preparation

7. HOW TO KEEP THE WATER BODIES / PONDS AND ITS SORROUNDINGS CLEAN?
 - Public Awareness
 - Hoarding for Public information
 - Employ people to make it clean
 - Rapid Action Team to Create Awareness among the People

8. IS THERE ADEQUATE DRAIN NETWORK AVAILABLE IN YOUR CITY? IF NO, HOW TO SLOVE THE DRAINAGE PROBLEM IN YOUR CITY?
 - Drain network is not available in the municipal
 - Improvement of Old drain (back side of house)
 - All the drains needs to be connected to each other, so that proper excess water will the drain properly during rainy season
 - Ban polythin, protect domestic animal, encroachment
 - Major Problem is outlet

9. WHICH ARE THE AREAS (WARD) WHERE WATER LOGGING PROBLEM IS ACUTE?
 - More or less water logging is problem in Berhampur corporation but the ward having acute water logging problems are- 1,2, 7, 8, 22, 26, 28, 27, 31, 32, 36, 37.

10. WHAT ARE THE MAJOR PROBLEMS IN YOUR CITY (RELATED TO WATER AND SANITATION)?

- Due to expansion of city, major water and sanitation problem areas are, ward No-31(Gajapati nagar), Ward No-20 (Bila Sahi), Nucha pada line, First gate, Gusani Nuagaon, hanuman mandir etc.)

11. HOW YOU ARE PLANNING TO SLOVE THE ABOVE MENTIOED PROBLEMS?

- First to create an action plan and submit to Government Orissa and Govt of India to take appropriate action.
- Through City Sanitation Plan above mentioned problem can be solved by intervention of the Government

12. WHICH ARE THE COMMUNITY ORGANISATIONS, ACTIVE IN YOUR MUNICIPALITY?

- Not a single community based organization is active, for that create a Ward wise committee.

13. HOW MUCH DO YOU SPEND ON THE FOLLOWING IN A MONTH?

- a. Cable TV: Rs. 175.00
- b. Mobile Phone : Rs.300.00
- c. Hospital and medical expenses: Rs. 500/00
- d. Water Supply – To House-Own Expenses, To Stand Post-Municipal

14. ARE YOU WILLING TO PAY USER FEE TO GET BETTER SERVICE, A BETTER LIVING CONDITION AND CLEAN CITY? IF NO, WHY?

- Interested to pay more money for user fee.

Annexure 9 - Slum Status

Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
1	(a) Bauri Sukunda & (b) Anadrigam	1	A	520	116	142	12	104	2	98
	Gola Raghunathpur	2	A	364	81	100	8	73		65
	Kailash Nagar	11	A	204	50	119	5	45		
	Dharma Nagar & Shanti Nagar	6	A	900	215	264	108	107		
	Gouda St., Tota St., Acharya St.	13	A	446	114	140	11	103		89
	Kadalibada St., Bada St., Dhoba St., & Reddika St.	14	A	1134	295	362	89	206		
	Laxminrusingh St.	4	A	1005	216	197	65	151		
	Bauri St., Harijan St. & Haridakhandi	15	A	272	73	89	22	51		
2	Haridakhandi Rd. & Shramik Nagar	5	A	550	116	84	35	81		
	Jagabandhu Dandasi St.	120	A	90	34	121	10	24		22
	Sandha Mohanty St.	122	A	303	69		21	48		
	Laxmi Nrusingh St.	3	A	1834	364	332	109	255		
	Kalupatro St.	121	A	347	69		10	59		
	Kasi Nagar, Raghupati Nagar & Mahuri Kalua St.	10	A	692	138	172	48	90		
	Burma Colony	119	UA	566	139	1900	21	118		
3	Ananda Nagar	8	A	1382	298	216	104	194		
	Digapahandi Road	16	A	497	99		35	64		
	Canal Street	19	A	762	132		46	86		
	Gurumurtypeta, Dhoba Bandha Huda	12	A	1626	364	264	146	218		
	Jhilimilli Nagar & Panigrahi Nagar	18	A	397	87	63	35	52		
	Kalupatro St., Chaitanya	7	A	1895	380		57	323		

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
	Nagar & Kalua St.									
4	Panigrahipentho & Kansari St.	20	A	954	192	139	77	115	1	
	Panigrahipentha, Khandia Kumuti St. & Ganapati Nagar	17	A	1600	347	252	139	208		
	Jagjii St., Dandasi St. & Pichipicha Nagar	26	UA	690	142	103	28	114		
	Sankarpur Bauri St.	29	A	1439	288		115	173		67
5	Raja Street	23	A	345	69		28	41		
	Sankarpur Street, Jena Street, Sitaram Street, & Pandara Street,	25	A	2274	455	838	228	227		
	Kumbhar Street, & Pandara Street	21	A	815	166	121	66	100		
6	Gobardhanpeta Sarojinipeta Adua Street, & Balmikipeta	9	A	1107	216	157	108	108		
	Pakalvari Street, Powell Street, Jayantipeta & Gopal Rao Guruda	44	A	617	171		86	85		
7	Mangalbalapeta, Jemi St. & Aga Street	22	A	712	136		61	75		
	Krishnamapeta Street, Mediri Street, Bada Reddika Street, & Sano Reddika Street	62	A	2264	517	375	233	284		
	Jagabandhu Huda & Jagabandhu Sahi	31	UA/A	2897	599	435	90	509		36
	Ganesh Nagar, Prahallad Nagar & Gajananpeta I & II etc.	40	A	2305	460	334	161	299		
	Kailash Nagar	38	A	375	82		37	45		
8	Sitadhimira Street & Pandab Nagar	36	A	1239	299		150	149	2	51

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
	Radhakanta Street	57	A	1312	316	229	95	221		
	Gangadhar Street & Danda Khuado	33	A	788	157	114	39	118		
	Pandara Street	34	A	853	174	126	61	113		
	Ainabandha Street	35	A	1656	336		101	235		
	Nirakar Nagar	52	A	228	46		14	32		
	Canal Street	37	UA/A	492	102		36	66		
9	Nilanchal Street, 1st, 2nd, 3rd & 4th Line etc.	39	A	1155	249	181	100	149	2	
	Chandra Sekhar Mandir Street & Rajamma Street	30	A	830	169	123	59	110		22
	Martha Street	51	A	1284	267	194	93	174		
	Old Berhampur Bauri Street	43	A	1036	220	160	44	176		44
	Dhobabandha Huda	67	UA	229	47	68	7	40		
	Nrusingha Mandir Street & Thakurani Temple Mochi Street	42	A	838	172	251	60	112		
	Gaigotha Street, & Thakurani Temple Kansari Street	72	UA	336	81	119	20	61		
	Old Berhampur & Arabinda Nagar	64	A	1657	340	563	153	187		
10	Jemadepentha Street	45	A	482	99	145	45	54	1	
	Ranguni Bandha Street	73	A	838	174		78	96		
	Mediri Street	81	A	338	83		33	50		
	Panchudevalaya Street & Panchudevalaya Canal Street	48	A	942	199	145	60	139		28
11	Nilakantha Nagar	85	A	484	101		30	71	1	
	Sahu Colony, Muslim Colony, Nilakantheswar Bandha Huda & Smanar	94	A/UA	112	27	20	5	22		

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
	Padia									
	Leprosy Colony	98	UA	94	43	31	15	28		
	Diamond Tank Bauri Street	46	UA	214	65	47	26	39		
12	Sriram Nagar	27	A	3936	706		212	494		
	Rautopeta Street	49	A	345	69		24	45		
	Dhanamera Street	50	A	1648	310	225	93	217		75
	Mathura Nagar, Hanuman Nagar Canal Huda & Gangadhar Nagar	47	A/UA	1177	209	162	52	157		
13	Kampa Street	41	A	914	254	184	38	216	1	
	Mochi Sahi 2nd Line, T.T. Road	31	A	1398	315	229	142	173		46
	Mochi Street & Patropeta Phula Sundari Street & Gouda Street & Phulasundari Bandhahuda	112	A	1107	305	334	107	198		33
	Madhav Nagar & Triveni Nagar	46	A	277	55		22	33		
	Balajipentha Street & Balajipentha Bandhahuda	111	A/UA	940	201		60	141		
14	Khalasi Street	114	A	1972	455	330	228	227		59
	Bhandari Street & Dhoba Street	53	A	657	175		88	87		
	Harijan Street, Nilakantha Nagar, Gandhi Nagar, 5th Line	58	UA	432	101	74	15	86		
	Gandhi Nagar 1st Canal Street	116	UA	164	43	31	6	37		
15	Bhimarao Peta	54	A	675	156		47	109		
	Radha Krushna Street	115	A	483	122	90	31	91		

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
16	Tulasi Nagar	28	A	537	132	95	33	99		
	Khaja Street	56	A	713	214	155	43	171		
17	Mochi Street, & Canal Street	60	A/UA	551	262	190	39	223		
	Rampa Street & Rampa Street 2nd Line	61	A	740	167	121	58	109		
	Brundabati Nagar, Shanti Nagar, Bila Street & Adua Bila Street	65	A	1396	313	227	63	250		
	Dandasi Street, Jagjili Street & Dasiri Street	122	A	365	92	67	23	69		
	Radha Kanta Bila Street, Bhabani Nagar, Mukteswar Bilo Street, Burma Colony	59	A	1255	304	221	152	152		
	Dhoba Street, & Gate Bazar, Canal Street	123	A	648	160	116	80	80		
	Bank Colony, Canal Street near Braja Nagar	112	UA	131	31	23	5	26		
18	Totapally Bauri Street	110	A	706	172		26	146		46
	Mukteswar Temple Bandha Street	55	UA	201	50	36	8	42		
19	Raghunath Mandir Street, B.K. Street		A	820	212	154	53	159	1	
	Badhei Street, Bhandari Street, Damba Street	71								
	Harijan Colony	68	A	568	141	102	42	99		
	Golapalli Street, & Suriya Nagar	69	A	1164	231	168	69	162		
	Ananda Sarani Canal Street	70	UA	369	92	192	46	46		
20	New Street Near ORT Colony, Gate Bazar	63	A	113	23	17	12	11		20

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
21	Keuta Street, New Laxmi Nagar Lochapada Road, Muktipatho Street, Sana Harijan Street, and Bada Harijan Street	66	A	1316	284	206	114	170		
	Sunaribandha Sahi, Kalua Sahi, Boarding Street	76	A	524	153		61	92	2	
	Bijipur, Bada Bauri Street	77	A	627	132	96	20	112		41
	Bijipur Sana Bauri Street, Laxmi Street, Bandha Street,	75	A	1606	361	262	54	307		
	Dhimira Bauri Street	118	A	1005	223	162	33	190		47
22	Nilakantha Nagar	79	A	427	119	86	36	83		
	Bedabandha Street, Deepa Street, Tota, Chandi Street, Uttareswar Nagar	113	A	1693	368	267	202	166		
	Main Road Dhoba Street, Chandi Street	78	A	696	136		41	95		
	Gosaniuagaon Dhoba Street & Medri Street	83	A	937	193	140	97	96	1	
	Salia Bandha Street, Kadalibada Sahi, Nehru Nagar	82	A	954	223	162	112	111		
23	Rajiv Nagar, Raju Dhoba Sahi	80	A	963	190	138	95	95		36
	Salia Bandha Huda Street	84	UA	682	131	130	20	111		
	Harihar Nagar		A	278	48		14	34		
	Gosaniuagaon	86	A	2544	544	395	272	272		
24	Chanchadapadia, Somanath Nagar, Khajuria Road, Trinath Mandir Street	99	A	1508	351	255	123	228		
	Nehru Nagar	74	A							

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
26	Invalidpeta	125	A	299	67	49	23	44		
	Giri Road	124	A	284	65	47	16	49		
27	Ashok Nagar	81	A	165	45	33	18	27		
28	Padia Sahi	88	UA	198	45		14	31	1	
	Kamapalli Dandasi Sahi	87	A	276	55	40	6	49		
	Ramanagar Odia Sahi	89	A	267	60	43	18	42		
29	Sri Krushna Nagar, Lanjipalli	86	A	285	153	111	77	76		
	Rama Nagar, Lanjipalli	100	A	2187	460	334	230	230		
30	Gollundi Road, Chanchadapathar	89	A	671	154		69	85		33
	Gollundi Sree Nagar, Temle Road Chandra Sekhar Road & Dandasi Sahi	90	A	482	123	89	49	74		
31										
32	Panda Colony	105	UA	214	52	38	26	26		
	Khodasingi Bauri Sahi	102	A	413	83		21	62		
33	Harijan Sahi & Bauri Sahi	93	A	495	106	77	11	95	1	
	Lanjipalli Main Road	95	A	937	210	152	63	147		
	Lanjipalli South Street, Bapuji Nagar, Main Road	96	A	1073	221	160	77	144		
	Goods Shed Road	101	UA	747	176	128	18	158		
	Gauda Bandha Sahi, Deepa Harijan Sahi	92	UA	1263	281	204	42	239		
34	Chandi Street, Jail Road, Bhairabi Nagar	97	A	952	209		31	178		
	Lanjipalli Tota Sahi, Adua Street & Bada Street	112	A	2000	438	318	66	372		
	Dandasi Sahi & Chandi Sahi	91	A/UA	164	37	27	6	31		

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Ward No.	Slum Name	Map Ref No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of houses with toilet	No. of houses without toilet	No. of community toilet	No. of Beneficiary under IHSDP
	Ankuli Main Road, Panakalapalli Birimisti Street, Subash Nagar & Industrial Area, Dhoba Street.	109	A	3092	815	591	122	693		
35	Jaleswar Khandi Bauri Street	106	A	836	241	175	36	205		80
	Ankoli Bauri Sahi	108	A	87	21		3	18		75
	Nigam Nagar, Karji Street	117	A	1935	565	425	85	480		
	Ankoli Mali Sahi, Nua Sahi Bodaghar Sahi & Reddika Sahi	107	A	773	176		26	150		
36	Khodasingi Road & Dhoba Sahi	103	A	750	178	189	71	107	2	
	Khodasingi Village Bauri Sahi & Dhoba Sahi	104	A	310	62	45	28	34		47
37	Ambapua, Ambapua Bauri Sahi & Dhoba Sahi	105	A	1422	346	251	173	173		42
				117,541	26,270	19,203	9,743	17,734	18	1,202

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Annexure 10 - Existing Sanitation Status

Ward No.	No. of Households	No. of Slum	No. of Individual Toilets	No. of Shared Toilets	No. of Community Toilet Seats	No. of Public Toilet seats	Sewer Line
1	1420	8	954		20		
2	2061	8	1281				
3	1765	7	1247				
4	1850	6	1186		10		
5	1915	3	1145			10	
6	1867	2	1040				
7	1743	5	1351				
8	1810	7	1287		20		
9	1867	8	1346		20		
10	1895	4	1099		10		
11	1758	4	945		10		
12	1631	4	1162				
13	1851	6	1260		10		
14	2177	4	1298				
15	1622	2	888			8	
16	2030	2	1111				
17	1954	7	1333				
18	1883	2	1006			16	
19	1667	4	1015		10		
20	2175	2	1173				
21	2193	3	1272		20		
22	1622	4	1039				
23	1660	4	1029		10		
24	2092	2	1206				
25	1798	1	996				
26	1893	2	985				
27	1494	1	764				
28	1934	3	1014		10		
29	1893	2	1112				
30	1648	2	901				
31	2240	-	1124			15	
32	1492	2	785				
33	1595	5	1063		10		
34	1815	4	1308				
35	1589	4	1064				
36	1032	2	583		20		
37	1881	1	1037				
	66,812	137	40,409		180	49	

Annexure 11 - Condition Assessment Survey of Community/ Public Toilet

Sl. No	Ward No.	Location	Total No. of Seats	Functional Seats	Default Seat	Fees (Rs.)			Remarks
						Bathing	Toilet	Both	
Community Toilets									
1	1	Haridakhandi ladies	10	-	-	-	-	-	Roof & Door damage
2		Haridakhandi Gents	10	-	-	-	-	-	Roof & Door damage
3	4	Nelia Bandha	10	-	-	-	-	-	Roof & Door partly damage
4	8	Aina Bandha	10						Roof & Door damage
5		Pandav Nagar	10						Roof & Door damage
6	9	Nilanchal	10						Door Partly damage
7		Thakurani Temple	10						Roof & Door damage
8	10	Diamond Tank Road	10						Door partly damage
9	11	Ramalingam Tank Road	10						Roof & Door damage
10	13	Kampa Sahi	10			1.00	1.00		
11	19	Horizon Street	10						Chock & Jam
12	21	Bijipur Tank Bandha-Gents	10	7	3		2.00		Wall & Door partly damage
13		Bijipur Tank Bandha-Ladies	10						Chock & Jam; Wall & Door partly damage
14	23	Agula Bandha - Ladies	10	5	5				
15	28	Kampa Palli	10						Roof & Door damage
16	33	Langipalli	10						Door damage
17	36	Khodasingi - Ladies	10						Roof & Door damage
18		Khodasingi - Gents	10						Roof & Door damage
Public Toilets									
1	4	Pendragadia Market	10			2.00	3.00	5.00	
2	15	New Bus stand	8			2.00	2.00	5.00	
3	18	Bus Stand	16			2.00	2.00	5.00	
4	31	Medical College	15			2.00	2.00	5.00	

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Annexure 12 - Staff Position

SL NO	Name of the post	Sanctioned strength	Men in position	Vacant
1	Head Assistants	7		7
2	Senior Assistants	21	6	15
3	Junior Assistants	55	29	26
4	Asst Engineers	3	3	0
5	Junior Engineers	8	6	2
6	Community	3	3	0
7	Medical Officers	4		4
8	P A to C P	1	1	0
9	Steno	3	2	1
10	Peons	12	12	0
11	Watcher	6	6	0
12	khalasi	2	2	0
13	Driver(pwd)	9	7	2
14	Cleaner	4	4	0
15	Mechanic	1		1
16	Addl Mechanic	1	1	0
17	Helper to mechanic	1	1	0
18	Helper to J E	1		1
19	Pump Driver	1		1
20	Road Coolic	27	20	7
21	Work sarkar	3	2	1
22	Draftsman	1	1	0
23	Fireman	1	1	0
24	Turn cock	2	2	0
25	Pipe Mistry	1	1	0
26	Work Mistry	1	1	0
27	Electric Mistry	1	1	0
28	Pipe Fitter	1	1	0
29	Light Checkar	3	3	0
30	Gardener	2	2	0
31	Town Surveyor	1		1
32	Amin	4	4	0
33	Chainman	2	2	0
34	Pharmacist	3	1	2
35	Addl Pharmacist	1		1
36	Helper to Homoco	2	1	1
37	Mid wife	2		2
38	M N O	2	1	1
39	FNO	2		2
40	Medical Sweeper	2	2	0
41	Graduate Librarian	2	2	0
42	Asst Librarian	1	1	0
43	Library Attender	1		1
44	Libaray watecher	1	1	0
45	Medical watcher	1		1
46	primary Conductress	7	5	2
47	primary peon	1	1	0
48	spinning Teacher	1	1	0
49	Tax sarkar	27	27	0
50	Mohrior	3	3	0

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SL NO	Name of the post	Sanctioned strength	Men in position	Vacant
51	Octroi collector	18	9	9
52	Jr Octroi Collector	17	14	3
53	Octroi peon	22	16	6
54	Fees Supervisor	3	2	1
55	Fees Collector	12	12	0
56	Fees peon	8	6	2
57	Driver (Health)	6	6	0
58	Cleaner	1	1	0
59	Carpenter	1	1	0
60	Helper to Carpenter	1	1	0
61	Attender	1	1	0
62	Zamadar	25	15	10
63	Sweeper(ph)	480	416	64
	Total	850	674	182

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Annexure 13 - Budget details for the Year 2010-2011

Berhampur Municipal Corporation Revenue Details for 2010-11

Sl. No.	Purpose	Actual 2009-10	Actual 2010-11	Budget Estimate 2010-11	Budget Estimate 2011-12
1	Holding Tax	0.36	0.35	0.80	0.90
2	Tax on Carriage Cart	0.02	0.03	0.05	0.05
3	Water Tax	0.43	0.42	0.96	1.08
4	Lighting Tax	0.28	0.28	0.64	0.72
5	Latrine Tax	0.43	0.42	0.96	1.08
6	Drainage Tax	0.28	0.28	0.64	0.72
	Total	1.80	1.76	4.05	4.55
Rental Income from Municipal Properties					
1	Rent from shopping Stall, Cabin and Staff, Quarter.	0.38	0.28	1.00	1.00
2	Guest House Conference Hall	0.04	0.05	0.12	0.12
3	Kalyan Mandap	0.15	0.11	0.25	0.25
4	Town Hall	0.02	0.03	0.12	0.12
5	Market Fee	0.18	0.14	0.50	0.50
6	Slaughter House	0.00	0.01	0.01	0.01
7	Bus Stand fee	0.35	0.29	0.60	0.60
8	Cesspool Rent	0.06	0.07	0.10	0.15
9	Hire charge of Water Tanker	0.01	0.00	0.01	0.02
10	Lease of Tanks	0.00	0.00	0.11	0.11
11	& Ponds	0.00	0.00	0.00	0.00
12	Tap Connection Fee	0.04	0.05	0.06	0.07
	Total	1.22	1.03	2.88	2.95
Trade License, Fees Under user Charges.					
1	Trade License	0.03	0.18	1.00	1.00
2	Road cutting	0.12	0.16	0.20	0.25
3	Cattle Pounds	0.00	0.01	0.05	0.05
4	Hoarding License	0.10	0.06	0.25	0.25
5	Parking Fee	0.01	0.02	0.03	0.05
6	Lease and Encroachment Fee	0.03	0.01	0.05	0.05
7	Advertisement	0.00	0.00	0.00	0.04
8	Park Entry Fee	0.00	0.00	0.00	0.01
	Total	0.29	0.44	1.58	1.70
Miscellaneous					
1	Sundry	0.04	0.02	0.10	0.16
2	Court Coast	0.01	0.00	0.03	0.02
3	Lifting of garbage	0.00	0.00	0.01	0.02
4	R.T.I. information	0.00	0.00	0.00	0.00
5	fee	0.01	0.02	0.02	0.05
6	Interest from Bank Accounts	0.20	0.47	0.15	0.50
7	Selling of papers	0.00	0.00	0.00	0.00
8	Mutation fees	0.00	0.00	0.01	0.01
9	Fine Collected from water packet	0.00	0.00	0.01	0.01
10	Registration Fees of Contractors &	0.00	0.01	0.01	0.03
11	Sale of Tender	0.08	0.22	0.10	0.20
	Total	0.34	0.75	0.435	1.00

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Sl. No.	Purpose	Actual 2009-10	Actual 2010-11	Budget Estimate 2010-11	Budget Estimate 2011-12
Extraordinary and Debt					
1	Security Deposit	0.10	0.08	0.80	0.80
2	E M D	0.08	0.08	0.70	0.70
3	Other Deposit	0.17	0.13	0.50	0.50
	Total	0.35	0.29	2.00	2.00
Grant					
1	Road Maintenance (normal)	0.26	0.26	2.00	2.00
2	Road Maintenance (hard cash)	0.25	0.00	0.25	0.50
3	Road Development	1.93	1.93	5.00	5.00
4	12th FCA / 13th FCA	1.87	1.45	3.00	5.00
5	FERJNFCR/NCCF/SRC Grant.	0.09	0.00	37.12	3.00
	NFCR-FDR distrusted	0.00	0.00	0.10	0.00
6	Preservation of Water Bodies with incentive under UIDSSMT	0.75	2.00	2.00	2.00
7	Special Problem	0.15	0.19	0.25	0.25
8	Providing Basic Service for Urban poor	0.06	0.01	10.00	10.00
9	Performance based incentive.	1.17	1.04	1.65	2.00
10	SJSRY	0.05	0.00	6.21	9.86
11	Provision of street light & energy charge	0.24	0.21	0.30	0.50
12	IHSDP	11.60	0.00	20.00	20.00
13	Entertainment Tax grant	0.03	0.03	0.01	0.05
14	BRGF	2.79	1.93	6.00	6.00
15	Local Festival Grant	0.01	0.00	0.02	0.02
16	Urban Tourism Grant	1.25	0.00	2.00	2.00
17	Const. of Boundary wall for protection of Govt. Land	0.40	0.30	0.30	0.50
18	Development of Park & Greenery	0.41	0.05	0.50	0.50
19	MLA LAD	0.04	0.43	1.00	1.00
20	MP LAD	0.55	0.09	0.75	1.00
21	Urban Election	0.00	0.02	0.10	0.01
22	Census	0.00	0.20	0.10	0.01
23	Road and Bridge	0.00	0.93	0.00	1.50
	Total	23.89	11.08	98.66	72.70

Note: The Actual budget for 2010-11 is from 1-04-2010 to 1-12-2010

Berhampur Municipal Corporation Expenditure Details for 2010-11

Sl. No	Purpose	Actual 2009-10	Actual 2010-11	Budget Estimate 2010-11	Budget Estimate 2011-12
General Administration					
1	Salary & Allowance of Deputations Officer M.C, /Dy.MC	0.08	0.06	0.08	0.08
2	Honorarium to Mayor, Deputy Mayor, & Corporators.	0.02	0.01	0.06	0.16
3	Salary & allowance of LFS Staff	0.81	0.60	0.87	0.93
4	Unutilized Leave Salary	0.00	0.00	0.00	0.00
5	Salary & allowance of Non-LFS Staff	1.87	1.46	1.88	2.06
6	Gratuity	0.14	0.07	0.20	0.20
7	Pension Contribution to LFS & Non-LFS	0.16	0.27	0.20	0.30
8	DLR out Side Coolly , out side driver wages	1.14	1.22	1.70	1.70
9	Health Section Establishment	4.07	3.82	5.38	5.80
10	EPF Contribution to Arrear DLR	0.00	0.00	0.25	0.10
11	T.A to Staff and Officer	0.00	0.00	0.01	0.01
12	Arrear D.A. of Staff Part	0.00	0.00	0.00	0.20
13	6th Pay arrear of staff part.	0.00	1.07	1.00	1.50
14	Arrear PF of staff deposit	0.00	0.07	0.50	0.10
	Total	8.28	8.66	12.13	13.14
Public Health					
1	Privatization of Sweeping SWM	0.58	1.18	3.00	3.00
2	Maintenance of Sulabh Toilets	0.08	0.05	0.10	0.09
3	Contingences	0.26	0.04	0.80	0.70
4	Fuel & Maintenance of Vehicles	0.77	0.73	0.75	1.00
5	Hire Charge of Vehicles.	0.04	0.07	0.10	0.10
6	Public Toilet	0.00	0.00	0.10	0.10
7	Epidemic	0.00	0.00	0.10	0.10
	Total	1.74	2.07	4.95	5.09
P.W.D. Section Expenditure					
1	Road Repair & Maintenance (Normal) Hard cash	1.29	0.93	3.50	1.80
2	Road Development & construction of New Road & Extension Road	4.19	1.24	3.50	4.50
3	Development of Road on Urban Tourism	0.00	0.00	2.00	1.50
4	Repair & Maintenance of Drain & Extension	0.22	0.20	1.00	0.30
5	Const. of C.O New Drain	0.46	0.42	1.00	0.50
6	Const. of new Office Building & other Buildings	0.26	0.78	1.00	0.20
7	Repair of Staff Quarter, Kalayan Mandap, Guest House, Town Hall etc.	0.28	0.26	0.50	0.50
8	IHSDP	0.00	0.15	20.00	18.10
9	Preservation of wastes Bodies with incentive under UIDSSMT	2.02	2.01	6.00	5.05

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Sl. No	Purpose	Actual 2009-10	Actual 2010-11	Budget Estimate 2010-11	Budget Estimate 2011-12
10	SJSRY	1.19	0.20	6.00	4.50
11	BRGF	0.82	0.55	6.00	2.00
12	Const. & Development of Park Garden & A forestation	0.00	0.00	0.50	0.50
13	Const. of Boundary wall for protection of Govt. Land Burial ground etc.	0.00	0.00	0.50	0.30
14	Electrical Energy Charges	0.74	0.43	0.70	0.80
15	Provision of Street Light Maintenance	0.69	0.36	0.70	0.80
16	MLA LAD	0.33	0.24	0.90	0.90
17	MP LAD	0.26	0.02	0.60	0.90
18	Local Festival	0.00	0.01	0.01	0.05
19	E Governors System	0.03	0.00	0.02	0.05
20	Providing Basic Urban services	0.06	0.03	0.10	0.05
21	Performance based incentive	1.17	1.25	1.00	1.50
22	Solid Waste Management	0.00	3.60	0.50	2.00
23	Maintenance of Xerox, Fax Machine, Computer Sets & purchases of Furniture etc.	0.15	0.14	0.03	0.25
24	Matching Contribution of Development Over sources.	0.00	0.00	6.00	8.00
25	FDR, SFCR, NEC ,SRE etc.	0.09	0.26	2.55	0.95
	Total	14.24	13.07	64.60	56.00
Miscellaneous Expenditure					
1	Law Charge	0.01	0.03	0.05	0.10
2	Printing & Stationary etc	0.02	0.02	0.04	0.05
3	Census	0.00	0.19	0.10	0.05
4	Election	0.00	0.00	0.10	0.01
5	Contingents & Phone bill etc.	0.09	0.03	0.10	0.10
6	Grant in Aid	0.01	0.02	0.10	0.10
7	Purchase of Newspaper &Menus	0.02	0.01	0.05	0.05
8	V.I.P visit, Independence day, Republic day, Self employment	0.02	0.02	0.15	0.25
9	Tour of Officials & elected representatives	0.01	0.01	0.10	0.20
10	Advertisement	0.06	0.08	0.10	0.15
11	Emergency work at all ward, Fire accident, water supply, etc.	0.00	0.00	0.37	0.37
12	Vending Zone	0.00	0.00	0.00	0.17
	Total	0.24	0.41	1.26	1.60
Extra ordinary & Debt.					
1	Refund, of SD	0.00	0.02	0.50	0.50
2	Refund of EMD	0.05	0.08	0.50	0.20
3	Refund of other Deposit	0.01	0.00	0.20	0.20
	Total	0.07	0.11	1.20	0.90

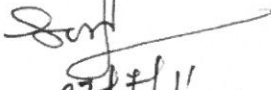







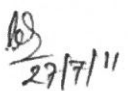
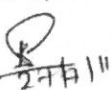

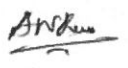

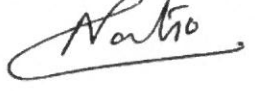







Note: The Actual budget for 2010-11 is from 1-04-2010 to 1-12-2010

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Annexure 14 - 2nd Consultation & observation during other intermediate consultation



Presentation and 2nd Consultation meeting held on 27th July 2011 on Situation Analysis

Members present in the CSP power point presentation on 27.7.11 at Guest House conference Hall, EAM

Sl. No	Name of Participant	Designation	Signature
1	Siva Saikar Das	Mayor	
2	Satyujita Sarma	Dy. Mayor	
3	Bhima Manbeta	MC	
4	S.K. Harichandan	CE	
5	DR S.K. DAS	Health Officer	
6	Anim Mishra	BB	
7	Sivanshal Sadangi	AE	
8	Pooja Kumar Ray	AE	
9	Uitenjali Samantaray	C.O	
10	Satish Kumar Parigrali	Secretary General VEDIC, Bani.	
11	Noronjans Das	CEO VEDIC	
12	A. Nageswar Rao		
13	Anjan Nayak	S-2	
14	Narayana Patra	S-1	
15	Surya Mohapatra	SI	
16	D. Jeovan Kumar	SI	
17	Satya Narayan Achary	S-1	
18	Pratap Kishore Padhi	S-1 J/c	
19	Bibhas Mahapatra	OP&HS	
20	Sanjay Kumar Mishra	OP&HS	
21	Santosh Chakrabarti	125 OP & HS	

22) Ramesh Deka
23) Sajit Kumar Neog

24) Joyram Saha - AE (PH) (S.D. 27/7/11)

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Observation and suggestions provided by the participants during 2nd consultation meeting on 27th Jul. 2011

- Shared toilet preferred to community toilets
- Urinals should be provided at public places
- Study limitation should be mentioned in the report

Observation and suggestions provided by the participants during consultation workshop on 12th Sept. 2011

- Combined system is not acceptable by MoUD for funding and hence should not be adopted
- Option analysis should be taken up to conclude the best feasible sanitation option
- Ongoing projects on sanitation needs and DPRs to be reflected in the report

Observation and suggestions provided during Review meeting with Commissioner cum Secretary, H&UD Dept., Odisha on 31st Jan. 2012

- Availability of household survey data from 2011 census may explored for better mapping of the sanitation facility
- ULB observation by 15th Feb and final report by 31st Mar 2012

Annexure 15 - Calculation of Solid Waste Generation

Present Generation

Present Population

The total population by 2011	- 355823
The total Non Slum population	- 238282
The total population in slums	-117541
Approximate no. of Commercial Estt.	- 15000

Present Level of Generation

Per capita generation rate in Non Slum	= 400gm/cap/day
Slum pockets	= 300 gm/cap/day
I) Residential area - $(238282 \times 0.400) / 1000$ M.T	= 95.31 MT
II) Slums - $(117541 \times 0.300) / 1000$ MT	= 35.26 MT
III) Commercial Establishment - $(15000 \times 2.00 \text{ Kg}) / 1000$ MT	= 30.00 MT
Total	= 160.57 MT
Say	161 MT/day

Generation at end of Implementation period (2015)

Projected Population

The projected population by 201	- 383378
Projected households population	- 256863
Projected population in slums	-126515
Projected no. of Commercial Estt.	- 16000

Projected Generation

I) Residential zone - $(256863 \times 0.400) / 1000$	= 102.74 MT
II) Slums - $(126515 \times 0.300) / 1000$	= 37.95 MT
III) Commercial Establishment- $(16000 \times 2.00 \text{ Kg}) / 1000$	= 32.00 MT
IV) MSW from hospitals & nursing homes	<u>=1.58 MT</u>
Total	=174.27 MT
Say	175 MT/day

Out of which, organic waste would be **110 MT** (63.00% of 175 MT); Inert waste would be **42 MT** (24% of 175MT) and **23 MT** (13.00% of 175 MT) of recyclables waste.

Generation at end of 2030

Projected Population

The projected population by 2030	- 484806
Projected households population	- 324820
Projected population in slums	- 159986
Projected no. of Commercial Estt.	- 25000

Projected Generation of Solid Waste by 2030:

I) Residential zone - $(324820 \times 0.400) / 1000$ M.T	=129.92 MT
II) Slums - $(159986 \times 0.300) / 1000$ MT	= 48.00 MT
III) Commercial Establishment - $(25000 \times 2.00 \text{ Kg}) / 1000$ MT	= 50.00 MT
IV) MSW from hospitals & nursing homes	= <u>3.00 MT</u>
Total	= 230.92 MT
Say	231 MT/day

Out of which, organic waste would be **146 MT** (63.00% of 231MT), Inert waste would be **55 MT** (24% of 231MT) and **30 MT** (13.00% of 231 MT) of recyclables waste.

Annexure 16A – Infrastructure Need (Sewerage)

Ward No.	No. of Slum	INDIVIDUAL TOILETS		SHARED TOILETS		COMMUNITY TOILET SEATS		PUBLIC TOILETS SEATS		URINALS		SEWER LINE	
		Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	Existing	New Requirement
1	8	1206	0		113	20					2		9.5
2	8	1303	365		165		10				1		9.5
3	7	1304	116		141		10				2		8
4	6	1311	180		148	10							8
5	3	1205	341		153		10	10			1		9
6	2	1099	407		149		10				1		8
7	5	1442	0		139		10				1		8
8	7	1395	0		145	20					1		8
9	8	1471	0		149	20					1		8
10	4	1187	341		152	10					1		8
11	4	1001	412		141	10					1		8
12	4	1289	19		130		10				1		8
13	6	1397	95		148	10					1		8
14	4	1426	340		174		10				2		10
15	2	939	360		130		10	8					7
16	2	1175	468		163		10						9
17	7	1395	121		156		20				1		9
18	2	1111	407		151		10	16			2		8
19	4	1068	270		133	10					2		8
20	2	1262	502		174		10				1		10
21	3	1382	335		177	20					1		10
22	4	1137	162		130		10						7
23	4	1117	214		133	10					1		7
24	2	1272	423		167		10				2		10

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Ward No.	No. of Slum	INDIVIDUAL TOILETS		SHARED TOILETS		COMMUNITY TOILET SEATS		PUBLIC TOILETS SEATS		URINALS		SEWER LINE		
		Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	Existing	New Requirement	
25	1	1053	394		144			10			1			8
26	2	1045	483		151			10			1			8
27	1	811	380		120			10			1			6
28	3	1075	486		155	10			5		2			9
29	2	1172	356		151			10						8
30	2	986	335		132			10			1			8
31	-	1195	624		179			10	15		2			10
32	2	832	359		119			10			1			6
33	5	1113	163		128	10					1			7
34	4	1365	97		145			10			1			8
35	4	1269	3		127			10						6
36	2	663	77		83	20					1			4
37	1	1138	380		150			10			2			7
	137	43,611	10,015		5,345	180		250	49		40			298

Annexure 16B – Infrastructure Need (Solid Waste & Drainage)

Ward No.	No. of Slum	ROAD LENGTH	DRAINAGE		SOLID WASTE MANAGEMENT			
			Existing	New Requirement	Existing	New Requirement	Existing Collection Centre	Secondary Transport Station
1	8	11.93	4.40	13.49		4		
2	8	11.88	4.38	13.44		5		
3	7	10.18	3.75	11.52	1	4	1	
4	6	10.66	3.93	12.06		4		
5	3	11.04	4.07	12.49		5		
6	2	10.76	3.97	12.17		5		
7	5	10.05	3.71	11.37	1	4	1	
8	7	10.43	3.85	11.80		5		
9	8	10.73	3.96	12.14		4		
10	4	10.93	4.03	12.36		4		
11	4	10.13	3.74	11.46		4		
12	4	9.4	3.47	10.63		4		
13	6	10.67	3.94	12.07	3	5	3	
14	4	12.55	4.63	14.20	3	5	3	
15	2	9.34	3.44	10.57	1	4	1	
16	2	11.7	4.32	13.23		5		
17	7	11.26	4.15	12.74		4		
18	2	10.85	4.00	12.27	1	4	1	
19	4	9.61	3.54	10.87		4		
20	2	12.55	4.63	14.20		5		
21	3	12.64	4.66	14.30	2	5	2	1
22	4	9.34	3.44	10.57	2	4	2	
23	4	9.57	3.53	10.83	1	4	1	
24	2	12.05	4.44	13.63	2	4	2	
25	1	10.36	3.82	11.72	4	6	4	

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Ward No.	No. of Slum	ROAD LENGTH	DRAINAGE		SOLID WASTE MANAGEMENT			
			Existing	New Requirement	Existing	New Requirement	Existing Collection Centre	Secondary Transport Station
26	2	10.91	4.02	12.34	5	3	5	
27	1	8.62	3.18	9.75	1	4	1	
28	3	11.15	4.11	12.61	3	5	3	
29	2	10.91	4.02	12.34	1	5	1	
30	2	9.5	3.50	10.75		5		
31	-	12.91	4.76	14.60	2	4	2	
32	2	8.6	3.17	9.73	2	4	2	
33	5	9.19	3.39	10.40		4		
34	4	10.46	3.86	11.83		4		1
35	4	8.16	3.01	9.23		4		
36	2	4.95	1.83	5.60	1	4	1	
37	1	9.03	3.33	10.21		3		
	137	385	142	436	36	160	36	2

Annexure 16C – Location of Proposed Infrastructure

Community Toilets	Map Ref. No.	Public Toilets	Map Ref. No.	Urinals	Map Ref. No.
Existing		Existing		New	
Haridakhandi (Gents)	C1	Bus Stand	P1	Raghunathpur Chowk	U1
Haridakhandi (ladies)	C2	Pendragadia Market	P2	Haridakhandi Chowk	U2
Neliabandha	C3	Medical College	P3	Digapahandi Road	U3
Pandav Nagar	C4	New		Cart Stand	U4
Aina Bandha	C5	Haridakhandi Bauri Sahi	NP1	Gurumurty Petta	U5
Nilanchal	C6	Prahalad Nagar	NP2	Forest office	U6
Thakurani Temple	C7	Ananda Nagar	NP3	Hanuman Temple Road	U7
Diamond Tank Road	C8	Digapahandi Road	NP4	Chandrama Main Road	U8
Ramalingam Tank Road	C9	Cart Stand	NP5	Old Berhampur	U9
Kampa Sahi	C10	Chandrama Main Road	NP6	MPL High School	U10
Horizon Street	C11	Old Berhampur	NP7	Prem Nagar	U11
Bijipur Tank Bandha (Gents)	C12	Prem Nagar	NP8	Hindu Ghat	U12
Bijipur Tank Bandha (Ladies)	C13	NH 217, Aska Road	NP9	Teneya Tank	U14
Agula Bandha Ladies	C14	Taxi Stand	NP10	Municipality Office Road	U15
Kampa Palli	C15	NH 217, Aska Road	NP11	Bus Stand	U16
Langipalli	C16	State Bank Road	NP12	Aska Road, NH 217	U13
Khodasingi (Gents)	C17	Brahma Nagar, NH 217	NP13	Aska Road, NH 217	U17
Khodasingi (Ladies)	C18	Burma Colony, Near Railway Station	NP14	MPL High School, Ratna St.	U18
New		Badriraj Nagar	NP15	Utkala Ashrama Street	U19
Dharma Nagar	NC1	Gopabandhu Nagar	NP16	Haralaxmi Colony	U20
Khandia Kumuti Sahi	NC2	Tata Benz Square	NP17	Chandrama Street	U21
SankarPur Street	NC3	Baidya Nagar	NP18	Brahma Nagar, NH 217	U22
City High School Back side	NC4	Jayaprakash Nagar	NP19	Aparna Peta Road	U23
Dandasi Street	NC5	Srikrishna Nagar	NP20	Gosani Nuagram	U24
Ratha Street	NC6	Gopalpur Junction	NP21	Burma Colony, Near Railway Station	U25
Manharmadan Grave Yard	NC7			Khajuria Road	U26
Police Lane	NC8			Girl High School chowk	U27
NH 217	NC9			Tata Benz Square	U28
Bank Colony	NC10			New Bus Stand	U29
Laxmi Nagar	NC11			Kampa Palli Chowk	U30
Gauda Street	NC12			Goilundi Square	U31

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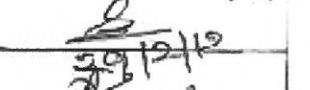
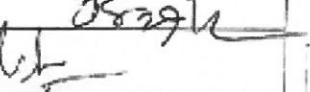
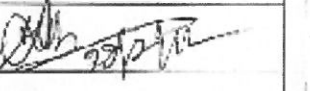

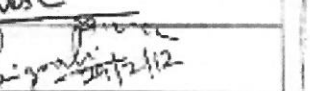
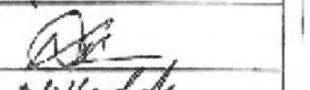
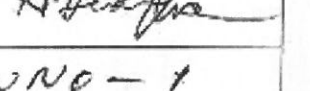
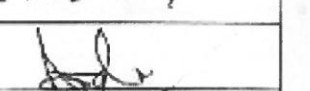
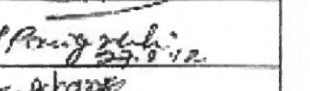
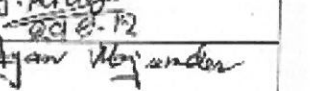
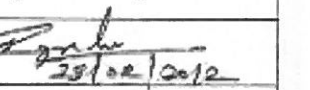
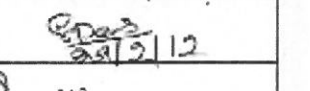





Community Toilets	Map Ref. No.	Public Toilets	Map Ref. No.	Urinals	Map Ref. No.
Baikuntha Nagar	NC13			NH 217	U32
Nilakantha Nagar	NC14			Medical College	U33
Utereswar Temple	NC15			Gajapati Nagar	U34
Railway Station Back side	NC16			Laxmi Nagar	U35
Khallikote College Road	NC17			Langipalli Bauri Street	U36
HaraLaxmi Colony	NC18			Srikrishna Nagar	U37
Ram Nagar	NC19			Khodasingi Chowk	U38
GOILUNDI	NC20			Gopalpur Junction	U39
Sidhartha Nagar	NC21			NH 217	U40
Laxmi Nagar	NC22				
Indira Nagar	NC23				
Ankoli Mouza	NC24				
Ambapua Village	NC25				

Annexure 17 - 3rd Consultations held on 29.02.2012



Presentation and 3rd Consultations meeting held on 29th Feb 2012 on draft CSP

**MEMBERS PRESENT IN THE CSP POWER POINT PRESENTATION ON
29.02.2012 AT GUEST HOUSE CONFERENCE HALL BRAHMAMPUR.**


SL. NO.	NAME OF PARTICIPANT	DESIGNATION	SIGNATURE
1	Sri Shankar Das	Mayor BMC	
2	Sanjiv Kumar Samal	Mayor BMC	
3	A.K. Mohanty	Comm, BMC	
4	H. Chandra Prasad	Dy Commissioner	
5	S. Laxmi Pati	City Engineer BMC	
6	Dr. Subhas Kant	Head of Office	
7	Anim Mishra	B.B. BMC	
8	Rajesh Kumar Panigrahi	Secretary General VEDIC Bank	
9	Niranjan Das	CEO VEDIC Bank	
10	N. Hudu Patra	Coop. Secy. Unit-28	
11	Deepti		WNO-1
12	Sanghita Das	ward No. 21	
13	Jayashree Panigrahi	C.O. BMC	
14	Jyashra Acharya	C.O.	
15	AYAN MAJUMDER	SENIOR MANAGER GENES	
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19	Smriti Das	C.O.	

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	Susmita Patnaik	C.O	Signature
	Arpita Bhatnagar	C.O	Signature
22	D. Jyoti Kulkarni	S.I	Signature
23	Ramesh Mishra	pharmacist	Signature
24	Ana Madhu Nayak	AS (STP) PH Dept CUM	Signature
25	Radha Kishan Singh	Contractor	
26	Sandesh Kumar Chakra	OPRHS	Signature
27	Sajal Kumar Nayak	Jr Asst	Signature
28	Kabita Ranis Patro	C.O	Signature
29	Suany Sabita Nayak	C.O.	Signature
30	Surita Biswal	C.O.	Signature
31			
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Annexure 18 - City Sanitation Rating Methodology & Questioner

National Rating and Award Scheme for Sanitation for Indian Cities Ministry of Urban Development (GOI)



Goal



In order to rapidly promote sanitation in urban areas of the country (as provided for in the National Urban Sanitation Policy and Goals 2006), and to recognize excellent performance in this area, the Government of India intends to institute an annual rating award scheme for cities.

The award is based on the premise that improved public health and environmental standards are the two outcomes that cities must seek to ensure for urban citizens. In doing so, governments in states and urban areas will need to plan and implement holistic city-wide sanitation plans, thereby put in place processes that help reach outputs pertaining to safe collection, confinement and disposal (including conveyance, treatment, and/or re-use without adverse impacts on the environment in and around the cities). It may be noted that the awards will not recognize mere inputs, hardware or expenditure incurred in urban sanitation but assess how these lead to achievements of intermediate milestones toward the final result of 100 percent safe disposal of wastes from the city on a sustainable basis. Cities will need to raise the awareness of city stakeholders (households, establishments, industries, municipal functionaries, media, etc.) since improved sanitation can ensure improved public health and environmental outcomes only if considerable changes in behavior and practice take place across the spectrum of society.

Concept of Totally Sanitized Cities

A totally Sanitized City will be one that has achieved the outputs or milestones specified in the National Urban Sanitation policy, the salient features of which are as follows:

- Cities must be open defecation free.
- Must eliminate the practice of manual scavenging and provide adequate personnel protection equipment that addresses the safety of sanitation workers.
- Municipal wastewater and storm water drainage must be safely managed.
- Recycle and reuse of treated wastewater for non potable applications should be implemented wherever possible.
- Solid waste collected and disposed off fully and safely.
- Services to the poor and systems for sustaining results.
- Improved public health outcomes and environmental standards.



Cities will need to raise the awareness of city stakeholders since improved sanitation can ensure improved public health and environmental outcomes only if considerable changes in behavior and practice take place across the spectrum of society.

Baseline, Eligibility and Selection Procedure

- a) **Baseline and Planning:** First, each of the cities will conduct a survey (based on secondary and primary data sources) and establish a comprehensive baseline with respect to (liquid and solid) waste generation, collection and disposal in the city. This will enable them to place themselves through objective self-assessment, in the relevant sanitary category (Table 2). This will form the basis for a City Sanitation Campaign to mobilize all stakeholders, and raise awareness about and priority to 100 percent sanitation. Based on the baseline, the city will draw up and implement with support from the State Government and Government of India, a comprehensive City Sanitation Plan to address the situation in order to reach the goal of becoming 100 percent sanitized.
- b) **Implementation:** The city will implement its City Sanitation Plan in a strategic manner, clearly prioritizing areas that need urgent attention, and implementing long-term plans in parallel. Again, emphasis will be on mobilizing all city stakeholders and raising the importance of behavior change, practices and installations for safe and sanitary disposal of all wastes of the city on a sustainable basis.
- c) **Achievement of Milestones:** The cities/urban areas that have achieved the sanitation outputs and outcomes described above and have systems and procedures in place to sustain these, will apply to their State Governments (State Urban Development / Municipal Administration Department), for recognition and nomination for the national award.
- d) **State-level Verification and Awards:** The state government will be fully responsible for supporting and supervising their cities to implementing the above steps, and in this regard, may consider instituting a state-level award scheme to promote competition amongst the urban areas within the state. State Governments will also need to launch state-level awareness campaigns.
- e) **National Cities' Sanitation Rating:** The Ministry of Urban Development (MoUD), Government of India, will commission independent agencies to carry out surveys of all urban centers in India and publish the results nationally as the basis for recognizing performance. In addition, Government of India may also request states for recommending cities showing commendable performance, that will be followed by a due verification process.
- f) **Criteria for Awards:** The National Urban Sanitation Advisory Group, constituted by the MoUD, will be responsible for setting out and revising criteria for the national award. This Committee will also be the final authority in deciding annual awards to applicant cities.
- g) **Type of Awards:** The award scheme will recognize the achievement of cities at the national level. However, no monetary incentive or reward is envisaged for the award. The award may however include, for city and state representatives, sponsorship to participate in national events, trainings, and exchange and learning visits to other locations.

Rating and Categorization of Cities

- The rating of cities with regard to their performance in sanitation improvements will be based on set of objective indicators of outputs, processes and outcomes, as presented in Table 1.

Table 1: Indicative Objective Rating Chart for Sanitation in Cities

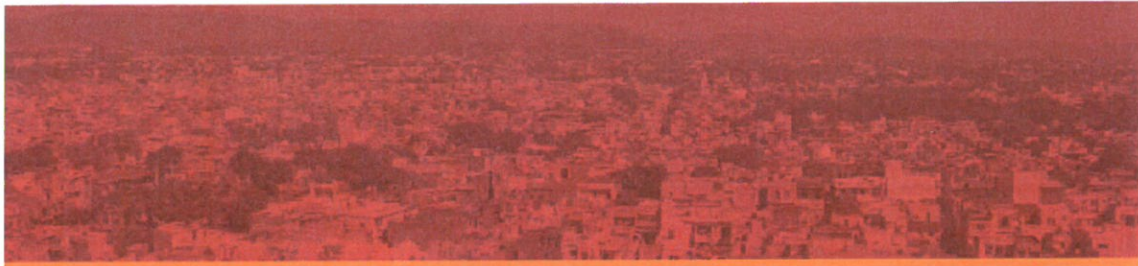
No	Indicators	Points*	No	Indicators	Points*
1	Output-related	50	2	Process-related**	30
A	No open defecation sub-total	16	A	M&E systems are in place to track incidences of open defecation	4
i.	Access and use of toilets by urban poor and other un-served households (including slums) - individual and community sanitation facilities	4	B	All sewerage systems in the city are working properly and there is no ex-filtration (Not applicable for cities without sewerage systems)	5
ii.	Access and use of toilets for floating and institutional populations – adequate public sanitation facilities	4	C	Septage/sludge is regularly cleaned, safely transported and disposed after treatment, from on-site systems in the city (MAXIMUM 10 marks for cities without sewerage systems)	5
iii.	No open defecation visible	4	D	Underground and surface drainage systems are functioning and are well-maintained	4
iv.	Eliminate manual scavenging and provide personnel protection equipment to sanitary workers	4	E	Solid waste management (collection and treatment) systems are efficient (and are in conformity with the MSW Rules, 2003)	5
B	Proportion of total human excreta generation that is safely collected (6 points for 100 percent)	6	F	There is clear institutional responsibility assigned; and there are documented operational systems in practice for B)/C) to E) above	4
C	Proportion of total black waste water generation that is treated and safely disposed off (6 points for 100 percent)	6	G	Sanctions for deviance on part of polluters and institutions is clearly laid out and followed in practice	3
D	Proportion of total grey wastewater generation that is treated and safely disposed off (3 points for 100 percent)	3	3	Outcome-related	20
E	Proportion of treated wastewater that is recycled and reused for non potable applications	3	A	Improved quality of drinking water in city compared to baseline	7
F	Proportion of total storm-water and drainage that is efficiently and safely managed (3 points for 100 percent)	3	B	Improved water quality in water bodies in and around city compared to baseline	7
G	Proportion of total solid waste generation that is regularly collected (4 points for 100 percent)	4	C	Reduction in water-borne disease incidence amongst city population compared to baseline	6
H	Proportion of total solid waste generation that is treated and safely disposed off (4 points for 100 percent)	4			
I	City wastes cause no adverse impacts on surrounding areas outside city limits (5 points for 100 percent)	5			

* The marks for the above indicators will be revised every two to three years. Over time, indicators about more stringent conditions e.g. re-urination, or spitting in open/public spaces, etc. will be introduced as indicators. The weights accorded to each category and specific indicators will also be revised. ** In this context, bigger cities may consider instituting good practice systems that comply with ISO (International Standards Organization) and/or BS (Bureau of Indian Standards) process systems.

- On the basis of the above rating scheme, cities will be placed in different categories as presented in Table 2. National rating survey data will utilize these categories for publication of results.

Table 2: City Color Codes: Categories

No.	Category	Description	Points
1	RED	Cities on the brink of public health and environmental 'emergency' and needing immediate remedial action	<33
2	BLACK	Needing considerable improvements	<34 ≤66
3	BLUE	Recovering but still diseased	<67 ≤90
4	GREEN	Healthy and Clean city	<91 ≤100



- On the basis of plans prepared and implemented, cities will be able to measure the results of their actions, and be able to clearly chart out their improvements over time compared to their baseline situation.
- On achievement of remarkable results, i.e. coming into the Green category (Healthy and Clean City), cities will typically become eligible for the national award. Other cities showing remarkable incremental performance or selective achievements may also be given special or honorary awards. Cities in different size-classes may also be considered for category-wise awards.
- Based on results of the Rating survey and selection of awardees, cities will be invited to participate in a National Urban Sanitation Award ceremony.



Special and Honorary Awards

In order to mobilize cities to participate in the competition, two strategies will be followed-

- Institution of award schemes as a part of State Strategies
- Institution of special and honorary awards to cities showing spectacular performance in selective dimensions or substantial increments

Special Awards: will be given to recognize special achievements, especially in the initial stages, since achievement of 100 percent sanitation may be difficult especially in the initial stages. For instance, a city may demonstrate remarkable performance in the area of stopping open defecation although 100 percent treatment may be constrained because of lack of time and resources within a given year. In such cases of selective performance, awards will be

instituted – in the initial years, these awards will be to accord recognition to:

- Stopping open defecation.
- Remarkable performance in awareness generation.
- Institutional assignment and implementation of operational procedures.
- Mobilization of community organizations or non-government agencies in sanitation campaigns.

Honorary Awards for Exemplary Performance: it may be difficult for many urban areas to immediately show all-round performance in sanitation. Therefore, cities showing maximum overall improvements in a given year, compared to their baseline situation, may also be given an award with a view to recognition of incremental efforts made.

If State strategies incorporate award schemes, many of the above category of performers will be pre-selected from states, and sent up for the national competition.



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