

# City Sanitation Plan

## SAMBALPUR



Research Study Series No. 123

June 2012



**National Institute of Urban Affairs**

New Delhi , India





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

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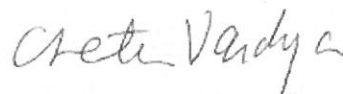
## PREFACE

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 Sambalpur, Rourkela and Berhampur 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 town for the census year 2001 was 1,53,643 , and the current population as of 2011 is estimated to be 1,83,147 with the slum population of 74,131(40%). The total number of households as of 2011 is 41411 in which 15700 are slum households. The town divided into 29 administrative wards is spread over 33.66 Sqkm sloping west to east and has a total road network of 503 km. Due to its importance of trading, there are good number of floating population in the town.

### **Access to Water Supply**

It is observed from the primary survey that as high as 40-50% of both non slum and slum population depend on public stand post where as 33% of non slum properties and only 1% of slum properties have piped water connection. There is a high level of dependence on open well and tube well in the slum area.

### **Water Supply Service Indicators**

The water supply coverage is about 48% where in there are 11386 direct piped water supply connections. The physical coverage is also quite low. As against 503 km road length the water network is available in about 150 km only. Majority population depends upon some 950 public taps, 530 hand pump ps, open wells & tanker supply. The town has adequate water with treatment capacity of 51.25 MLD. NRW is as high as 75%. The citizens get water supply at an average of 2.5 hours a day.

### **Access to Toilets**

According to the survey about 68% of the non slum households and 32% of slum households in the town have individual toilets. Almost 60% of slum population and as high as 21% of non slum population resort to open defecation in the open field, river bank, alongside ponds, drains or road side

### **Wastewater Management**

The town has no concept of wastewater management. About 29% of non slum households and 2% of slum households have onsite sanitation facilities and the remaining population either discharges the sewage into water bodies or resort to open defecation. The sewage generation presently is 32 MLD and as per estimates about 30% of this waste water finds its way into the storm water drains every day and ultimately flows into the Mahanadi river, thereby polluting the river and posing a potential environmental hazard. There are six such outfall points wherein the natural drains flow into the river. The ULB does not have a septage management policy nor a scientific treatment facility for septage.

### **Solid Waste Management**

The ULB had introduced door to door collection of garbage by private contractors and 15 wards were covered by the facility. However the same has been temporarily stopped due to contractual problems. The total solid waste generated per month amounts to 1,800 tons of which only 1,410 tons are collected and disposed at a place called Laxmi Dumuri which is 10 Km away from the main land. The average collection efficiency of the garbage is about 78%. A 26 acre of land has been year marked at Jamadar Palli which is at about 15km from the town.

### **Storm Water Management**

There are six major drains laden with both storm water and sewage finally flowing into the Mahanadi river. The main two natural drain in the city which flows into river Mahanadi area Tangan nallah and Dhobi Jore nallah. The city has a natural slope towards south east which helps in quick drainage of storm water. However due to encroachment and deposition of solid waste the Nallah is Choked causing flood in the city.

### **Basic Services to Urban Poor**

Sambalpur has total 105 numbers of slums out of which 88 are authorized and 17 are unauthorized slums. The slum population total to 74,131 with 26,595 households. Nearly 40% of the total population of the town comprises of the slums. The slums are facing difficulties due to deficiency in various infrastructure facilities like roads, water supply, drainage, street lighting, solid waste management etc. Municipality 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.

### **Financial Status of Sambalpur Municipality**

It can be seen above that the own source revenues are very low and the town depends almost on grant devolutions from the state government. Also the expenditure on salaries is very high. The tax collection efficiency varies in a range of 35% - 45% leading to increased arrears. Also a decreasing trend in collection is observed which is alarming and mostly attributed to shortage of manpower.

### **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
- Unhygienic condition in slum area
- Lack of co ordination 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, 2027 as the intermediate year and 2042 as the ultimate year. The populations projected are 185315, 219294 and 255459 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. Considering the constraints and land availability and local resistance for treatment facility in the neighborhood, centralised system with one zone 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 28 MLD for the ultimate year and 24 MLD for the intermediate year considering 110 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

- 10166 individual toilets for both slum and non slum area
- 1090 shared toilets being shared by two households
- Adequate community toilet seats is available or in progress within accessible distance of the targeted slum
- 30 public toilet seats in 6 toilets suitably located in the public places
- 20 public urinals with provision of two urinals in each facility
- 25666 new household connection
- 417 Km sewer collection network in the city
- One treatment facilities totaling to 24 MLD is proposed.

The total subsidized capita cost is proposed as 167.50 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 61 MT per day. It is projected that the generation will increase to 66 MT per day during 2015 and 88 MT per day during 2030. The waste 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, landfill site, biomedical waste handling and cost of land acquisition.



The total project cost is arrived at Rs. 25.01 crores to be implemented in a time horizon of three years i.e. 2012 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 net worked 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 all of the roads would be required to have drains on one side of the road considering narrow roads within the colony. Total road length of the city is 503 Km. A total of 503 Km of drains are proposed out of which 122 Km of pucca drains are in existence. The additional infrastructure required is 381 Km out of which 57 Km main drain, 133 Km secondary drain and 191 Km tertiary drain are proposed.

The total cost of additional infrastructure is calculated at Rs. 120.70 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 an 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 an 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. 3.50 crores to be implemented over a period of 4 years i.e. 2012 to 2016.

### Cost Abstract

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

Description	Amount in Lakh Rs.
Waste Water Management	16,750.00
Solid Waste Management	2,500.70
Storm Water Drainage	12,070.00
IEC & Capacity Building	350.00
<b>Total</b>	<b>31,670.70</b>

The total investment plan for the city sanitation plan is computed at Rs. 316.71 crores



**Acronyms**

CSP	-	City Sanitation Plan
DTDC	-	Door to door collection
Gol	-	Government of India
GoO	-	Government of Orissa
HH	-	Household
LPCD	-	Litres 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
SUSP	-	State Urban Sanitation Policy
CSP	-	City Sanitation Plan
SAR	-	Sanitation Analysis Report
PPP	-	Public Private Partnership
SM	-	Sambalpur Municipal
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 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.

OP&HS 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. Background

### 2.1. Objective

To determine the gravity of the current sanitation facilities in the Sambalpur, 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.

### 2.2. National Urban Sanitation Policy

NUSP which forms basis for the situation assessment and further development planning for improving the sanitation in the city. 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:

- 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

### 2.3. 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 program 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.

## 2.4. 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**.

## 2.5. 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 1<sup>st</sup> 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. Refer **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
- Testing of Quality of Water and Waste Water
- 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 with details of 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 2<sup>nd</sup> 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 3<sup>rd</sup> 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 3<sup>rd</sup> consultation meeting.

## 2.6. 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

*“How can you deprive us from using the river...it's part of our long standing culture ” – says an old rickshaw puller*

The city ranks at 269 as per the sanitation ranking conducted during 2010 by MoUD.

#### 3.1. Approach

- Study of past development history, growth, economy, values & culture, demographic, socio-economic status etc.
- Secondary data collection on spatial spread, basic services, institutional setup, key stakeholders and financial reports
- Reconnaissance survey on sample basis scientifically distributed across the municipal area
- Interact with key stakeholder with special inputs from councilors on the status and issues related to the ward
- Walk through survey of the wards and observation on the physical situation of infrastructure, service quality and condition assessment
- Conduct focused group discussion on basic services
- Assessment of current service status in water, sewerage, solid waste and drainage sector
- Assessment of current institutional arrangement and financial strength
- Identification of key issues and challenges with special reference to urban poor

##### 3.1.1. 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 institutional setup (existing and proposed)
- 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.



### 3.1.2. 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 councilors 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.
- 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**.

### 3.1.3. Councilor Interaction

A questionnaire was prepared for taking inputs from the councilors on the current status of the ward, perception on the quality of service and issues related to the ward.

### 3.1.4. Focused Group Discussion

Focused group discussion was conducted in two separate groups

- Elected representatives (councilors)
- Officials and managers of service providers

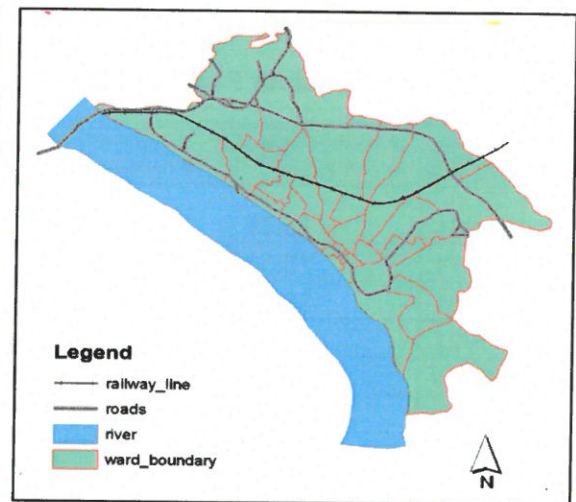
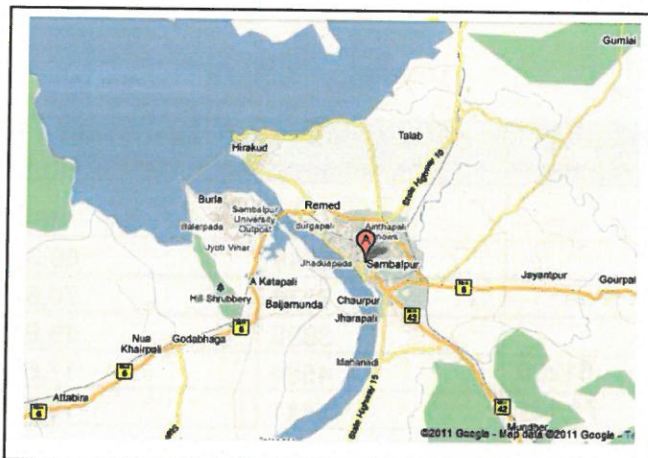
### 3.1.5. Condition Assessment Survey

Condition assessment survey for the existing community toilets was conducted to assess the capacity, physical condition and the usage. Also some information on the operational issues was collected.

## 3.2. Sambalpur City

### 3.2.1. Location

Sambalpur the western town of Orissa located at about 320 Km from the state capital, derived its name from the presiding goddess Samalai, whose stone image was discovered by Balaram Dev, the first Chowhan king of Sambalpur. The town located along side the river Mahanadi and spread over an area of 33.7 SqKm. The town is connected to the state capital by National Highway 42 as well as by east coast railway and strategically located on the Kolkata-Mumbai National Highway number 6. The town forms a part of the north-west upland of Orissa at MSL 150m with the ground sloping towards south east. The town is famous for its Sambalpuri textiles. Hirakud dam, the longest earthen dam in the world and the largest artificial lake of Asia is situated near Sambalpur.



### 3.2.2. Climate

The climate of the town is extreme with summer temperature rising as high as 48°C and the winter temperature falling as low as 5°C. The average annual rainfall in the town is 1388 mm. Heaviest rainfall is 581.9 mm in Sambalpur in 1982 which has been the highest ever in Odisha till date.

### 3.2.3. Culture

The region is rich in culture with famous Sambalpuri songs and dance forms. The handloom is part of the world wide famous culture of the region. Dhanu Yatra is celebrated in sambalpur district as a commemoration of Lord Krishna's visit to Mathura which is celebrated for a period seven days. The tribal which constitute more than 50% of the regional population contribute a rich culture of tribal folk dance and mostly depend on forest products for their living.

### 3.2.4. Economy

The economy of Sambalpur is basically dependent on agriculture and trade. Forests play an important role in the economy in terms of contribution to revenue and domestic product with Kendu leave contributing to major trade. There is presence of large number of rice mill in and



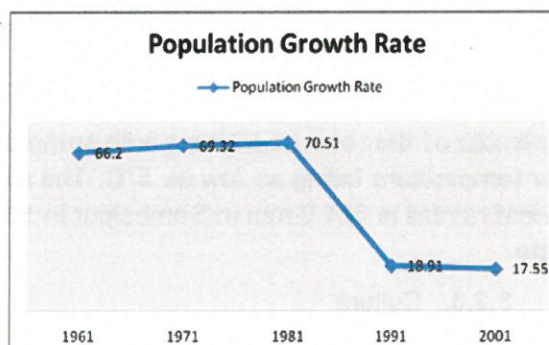
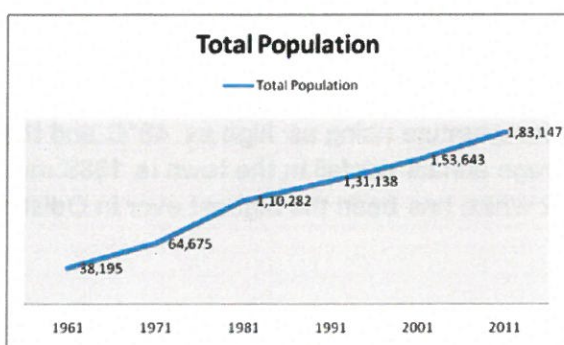
around the town. The major industries influencing the growth of the town are Mahanadi Coal Fields Ltd, Hindalco, Hirakud Industrial works, Bhusan Steels and a number of sponge Iron plants. The city is in the growth trajectory with real estate, housing development and shopping malls remarkably visible since last five years. The Sambalpuri handloom cloths, rice and Kendu leaves also provides significant trading and economic value to the city apart from the effect of industrial growth.

Sambalpur Municipality was established in the year 1876. It is the third largest town of Orissa and has been declared as a Class-I Town as per 2001 census. The town is divided into 29 wards with a total area of 33.7 SqKm.

### 3.3. Demography

Table 1: Sambalpur Population growth

Year	Area of the City	Total Population	Slum Population	Density per Sq.km	Population Growth Rate
1961	25.38	38,195		1504	66.2
1971	25.38	64,675		2548	69.32
1981	33.66	1,10,282		3276	70.51
1991	33.66	1,31,138		3895	18.91
2001	33.66	1,53,643	61200	4580	17.55
2011	33.66	1,83,147	74,131	5441	19.20

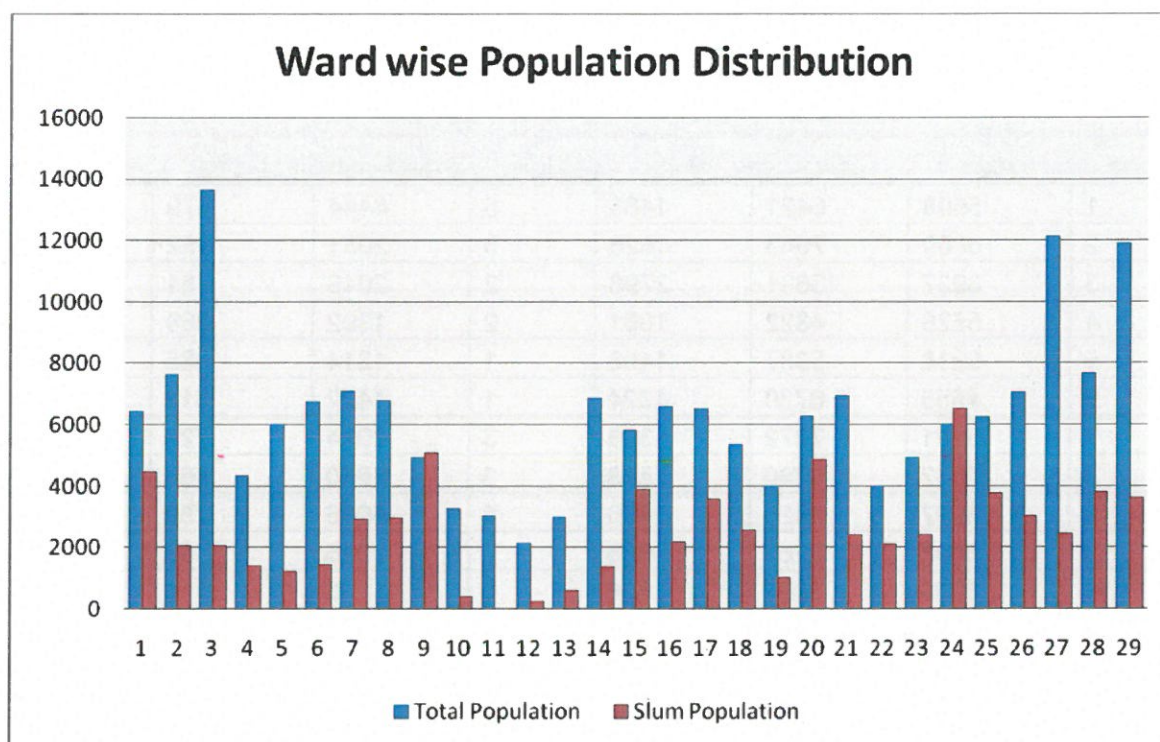


The population of the town for the census year 2001 was 1,53,643 , and the current population as of 2011 is said to be 1,83,147 with the slum population of 74,131(40%). The total number of households as of 2011 is 41411 in which 26595 are slum households. The town divided into 29 administrative wards is spread over 33.66 Sqkm sloping west to east and has a total road network of 503 km. Due to its importance of trading, there are good number of floating population in the town.

**Table 2: Ward-wise estimated population in Sambalpur as on 2011**

WARD NO	Population 2001	Total Population 2011	Total House Holds	Number of Slums	Slum Population	Slum House Holds	% of slum Population
1	5508	6421	1488	5	4444	679	69.2%
2	6060	7643	1626	3	2051	452	26.8%
3	8937	13631	2798	2	2049	451	15.0%
4	5526	4322	1081	2	1392	369	32.2%
5	6218	5987	1406	1	1214	385	20.3%
6	4555	6730	1324	1	1422	313	21.1%
7	5261	7072	1306	3	2924	724	41.3%
8	6032	6790	1578	3	2950	960	43.4%
9	4997	4920	1160	6	5065	758	102.9%
10	3603	3267	695	2	395	88	12.1%
11	3209	3007	606	0	0	0	0.0%
12	3589	2143	447	1	234	51	10.9%
13	4155	3000	790	1	563	78	18.8%
14	4284	6844	1539	2	1338	294	19.5%
15	4053	5792	1339	4	3893	760	67.2%
16	6460	6579	1513	2	2165	476	32.9%
17	6728	6502	1583	5	3574	891	55.0%
18	4760	5351	1293	2	2549	568	47.6%
19	4930	3977	940	2	1005	220	25.3%
20	5796	6279	1456	10	4827	738	76.9%
21	4689	6944	1454	3	2408	615	34.7%
22	3785	3992	856	3	2086	458	52.3%
23	4093	4913	1100	5	2420	531	49.3%
24	5095	6024	1457	11	6521	882	108.3%
25	4125	6238	1520	8	3758	849	60.2%
26	4842	7066	1605	4	3012	891	42.6%
27	6559	12143	2813	4	2458	540	20.2%
28	7377	7668	1724	5	3802	882	49.6%
29	8417	11902	2914	5	3612	797	30.3%
<b>Total</b>	<b>153643</b>	<b>183147</b>	<b>41411</b>	<b>105</b>	<b>74131</b>	<b>15700</b>	<b>40.5%</b>





**Figure1: Ward wise distribution of total and slum population**

The ward wise status 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.

### 3.4. Water Supply service

Water supply and wastewater services are provided by the Public Health Engineering Organisation and the town receives two and half hour of water supply per day. The water service indicators and the targets proposed are shown in the following table

#### 3.4.1. Water Supply Performance

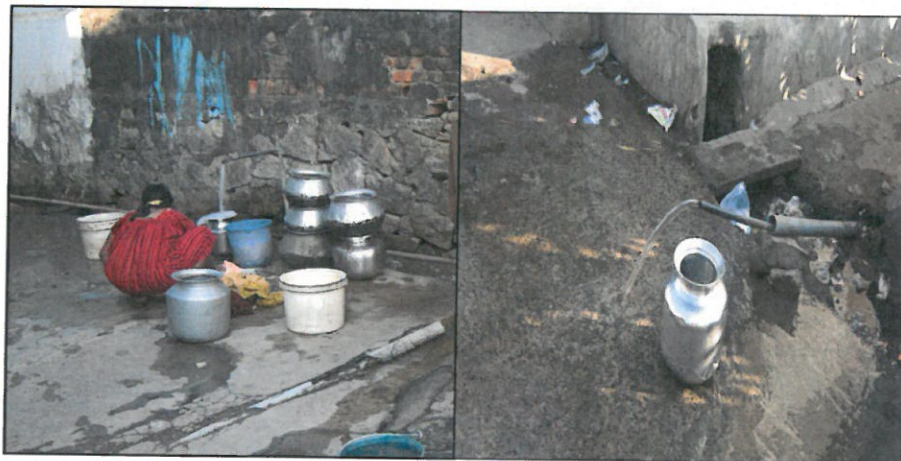
**Table 3: Water Supply Service Indicators**

Performance Indicator	Benchmark	2009-10	2010-11	Target for 2011-12
Coverage (%)	100%	39.3	48.8	55
Per Capita Supply of Water(lpcd)	135	196.1	225.9	215
Extent of Metering (%)	100%	0.13	0.13	0.20
Extent of Non-Revenue Water (%)	15%	84.8	76.9	70
Continuity of water supply	24x7	2.5	2.6	2.65

Performance Indicator	Benchmark	2009-10	2010-11	Target for 2011-12
Eff. in redressal of customer complaints (%)	80%	91.7	92.4	93
Quality of Water Supplied (%)	100%	100	98.	100
Cost Recovery (%)	100%	23.9	20.4	25
Eff. In Collection of Water Charges (%)	90%	27.0	53.6	55

The water supply coverage is about 48% where in there are 11386 direct piped water supply connections as against some 14,500 holdings comprising of 41411 households. As against 503 km road length the water network is available in about 150 km only. The remaining population depends upon some 950 public taps, 530 hand pumps, open wells & tanker supply. The town has adequate water with two functional water treatment facility of 11.25 MLD and 40 MLD and 5 numbers of deep bore well pumps. The average daily water supply to the town from these sources is 40 MLD. The Per capita water supply of 225.6 is high as compared to the national benchmark. Very few meters have been installed and the users are charged at flat rate which is a major cause of wastage leading to high Non Revenue Water (75%). The town has interim water supply with average 2.5 Hrs of supply daily

#### 3.4.2. Access to Water Supply





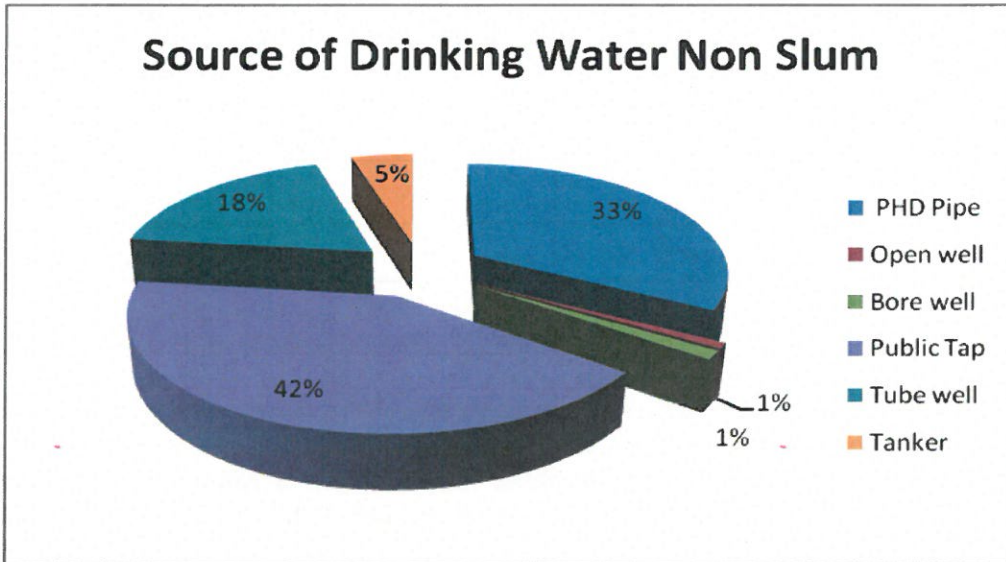


Figure2: Water source in non slum area

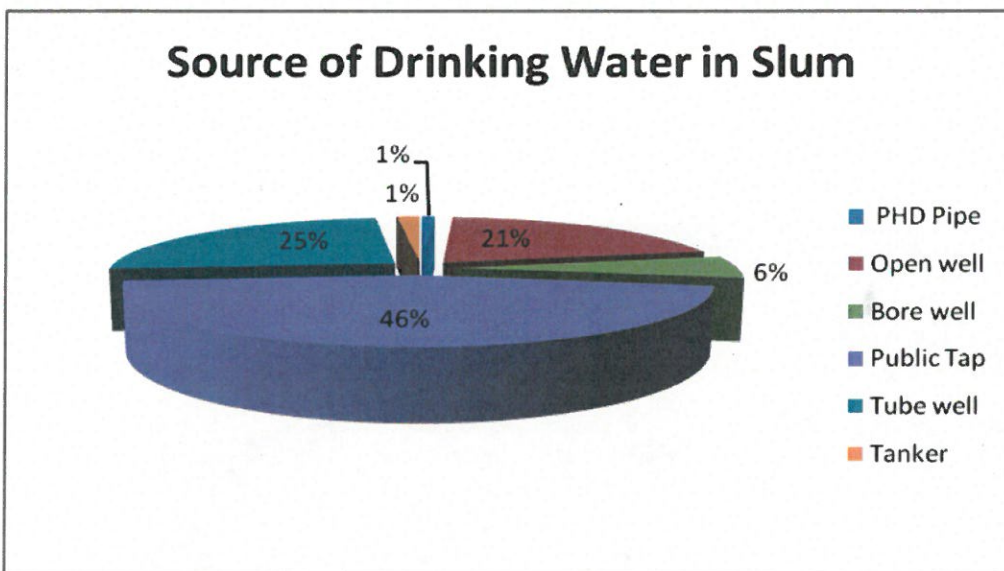


Figure3: Water source in slum area

It is observed from the primary survey that as high as 40-50% of both non slum and slum population depend on public stand post where as 33% of non slum properties and only 1% of slum properties have piped water connection. There is a high level of dependence on open well and tube well in the slum area.



### 3.4.3. Ground Water

The city being situated alongside the river Mahanadi, the water table is very high and the quality of ground water is good. The water from both dug wells and tube wells is marginally polluted due to sub soil contamination

### 3.4.4. Water Bodies

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 36 water bodies in the town and are used for variety of purposes including bathing and drinking. These ponds have deteriorated in water quality due to several causes such as quick siltation, natural damage and rapid & concentrated population growth in concerned area. It is reported that most of the pond contains high organic load. The high BOD could be due to in-flow of sewage, domestic wastes and practice of open defecation. Water quality of most of the ponds does not fit either for drinking or bathing.

### 3.4.5. Key issues

- The city has adequate water but there is inequality in distribution and urban poor are the victim of the system.
- 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 in the ponds leading to unhealthy and unhygienic conditions. Quality of water bodies in the city is degrading rapidly and the ponds are heavily silted.

### 3.5. Sanitation

#### 3.5.1. Access to Toilets

The city ranks at 269 in City Sanitation Ranking conducted during the year 2010.

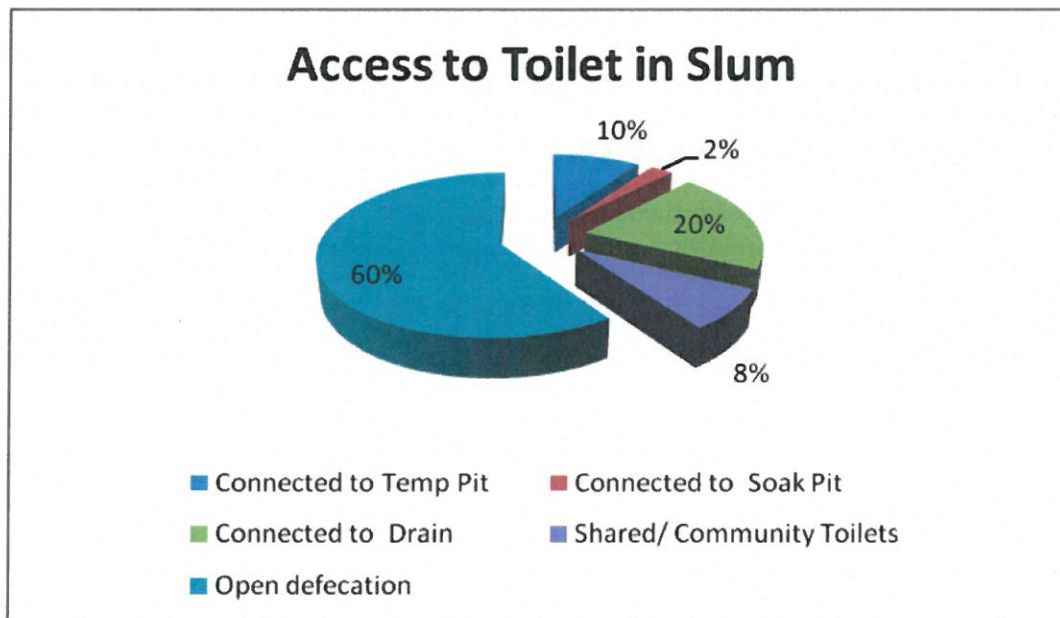
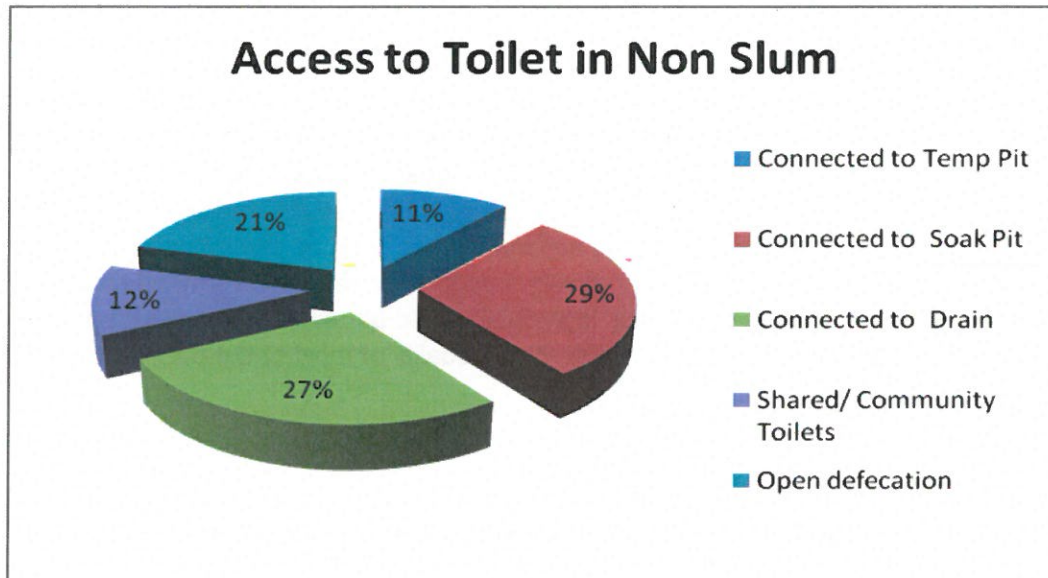


Figure 4 – Access to Toilets in non slum and slum area

According to the survey about 68% of the non slum households and 32% of slum households in the town 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 above shows the availability / access to toilets for the current population in non slum and slum areas of Sambalpur. Out of the remaining household 8-12% of households use either community toilets or share the toilets with neighbors / owners. Almost 60% of slum population and as high as 21% of non slum population resort to open defecation in the open field, river bank, alongside ponds, drains or road side. The detail slum sanitation status is provided at Annexure – 9.

### 3.5.2. Condition Assessment of Community/Public Toilets

There are 9 community toilets with 93 seats and 3 public toilets with 37 seats. All the community toilets are maintained by Municipality and the public toilets are maintained by Sulabh International. The source of water to the community toilet is either from PHD or bore well. The disposal of sewage into individual soak pits. There is no user charges for community toilets whereas the public toilets do charge fees of in the range of Rs.2.00 – Rs.4.00 for usage.



As there is no user fees prescribed for the community toilets which are being maintained by the municipality. The physical conditions of the community toilets are very poor and due to poor maintenance, many of the seats are damaged and have gone defunct. The condition assessment survey report of community & public toilet is provided at Annexure – 11.

The Municipality has received grants under ILCS scheme for 24 community toilets out of which 4 numbers have been constructed. The total seats after completion of the project shall be 333.

Traditionally significant populations in the region have been habituated to open defecation near the local water bodies and along the river side. There are socially demarcated open areas for women, men and sometimes caste divisions also exist in sharing the area surrounding the ponds.



The water bodies are not maintained and are silted over a period of time. These are primarily used by the local residents for their day to day water requirement. However these locations are used for open defecation and disposal for solid waste there by creating hygiene problems.

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.

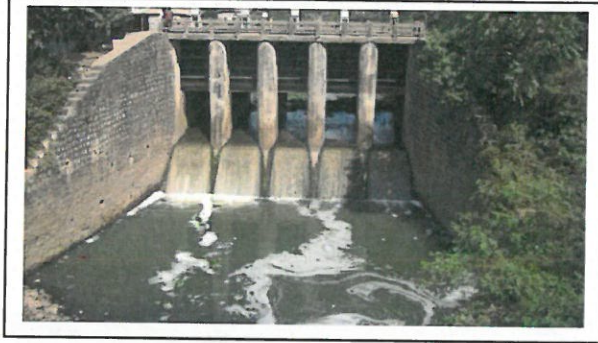


There are 3 public toilets being operated by Sulabh International. The Sulabh Toilets have bathing facility also and they charge Rs.2 for toilet usage and Rs.3 for usage of bath. On an average some 150 – 200 people use the facilities and hence the maintenance of the same is relatively better than the community toilets. The physical condition of the public toilets are found to be good.

### 3.5.3. Wastewater Management

The town has no concept of wastewater management. About 29% of non slum households and 2% of slum households have onsite sanitation facilities and the remaining population either discharges the sewage into water bodies or 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. Non-existent of full-fledged treatment and disposal system for the town is posing a great threat to the public health. At present the supply of water to the city is around 40 million litres per day. The sewage generation presently is 32 MLD and as per estimates about 30% of this waste water finds its way into the storm water drains every day. This waste water ultimately flows into the Mahanadi River, thereby polluting the river and posing a potential environmental hazard. There are six such outfall points wherein the natural drains flow into the river. Even the households with onsite sanitation, there is no sanitary disposal of sludge and the residents hire local suction machines and the septage is disposed of into open pits/nalas located outside the town limits. The ULB does not have a septage management policy nor a scientific treatment facility for septage. At many of the slum area the residents resort to manual scavenging which leads to health hazards. The ward wise existing sanitation status is provided at Annexure – 10.



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

#### 3.5.4. Key Issues

- There is no proper sewerage collection system in the town
- There is no sewerage 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 35% 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.



### 3.6. Solid Waste Management

The Health Department of Municipality is responsible for collection and transportation of solid waste generated in Sambalpur municipal area. For operational purposes the entire area is divided into 29 solid waste wards. A Sanitary inspector heads the wards. The primary collection in the Sambalpur municipal is carried out through open collection points, secondary collection & transportation through tractors & trucks.

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

**Table 4 :Solid Waste Management Indicators**

Sl.	Indicator	Benchmark	2010-11	Target 2011-12
1	Household Level Coverage of SWM Services(%)	100	62	62
2	Efficiency of Collection of MSW (%)	100	65	80
3	Extent of Segregation of Solid Waste (%)	100	0	30
4	Extent of Municipal Solid Waste Recovered (%)	80	0	30
5	Extent of Scientific Disposal of Solid Waste (%)	100	0	0
6	Efficiency in Redressal of Complaints (%)	80	46	60
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 for managing the urban solid waste and the ULBs with the lessons learnt are trying to extend the services to cover entire cities/towns.

The ULB during 2010 -11 had introduced door to door collection of garbage by private contractors and 15 wards were covered by the facility. In the remaining 14 wards the solid waste was dumped at common collection point mostly an open site, from where it was hauled to the disposal site by the Municipality. Currently the DTD activity has been suspended temporarily due to contractual problems. The total solid waste generated per month amounts to 1,800 tons of which only 1,410 tons are collected and disposed at a place called Laxmi Dumuri which is 10 Km away from the main land. 26 acre of land has been year marked at Jamadar Palli which is at about 15km from the town. The Municipality has started using the newly constructed dump area at Jamadar Palli.

The average collection efficiency of the garbage is about 78%. The entire wards in the town are covered by street sweeping for about 6 days, a week. The waste collected by street sweeping is about 720 tons per month is the major source of solid waste which is about 40% of the total waste generated. The municipality is planning to provide DTD facility in all the wards through outsourcing.

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 town.

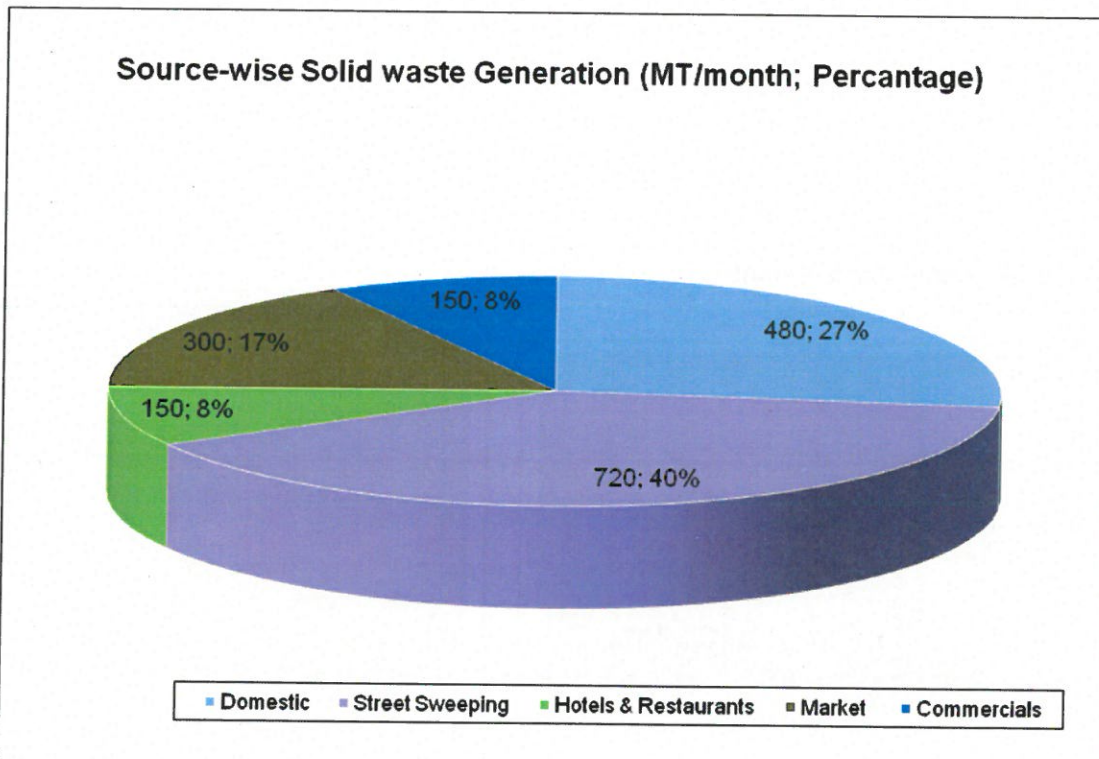


Figure 5 - Source- wise Solid Waste Generated



It is observed that the quantity of waste generated from street sweeping is almost 40% which suggests that there is big presence of road side vendors which caters to the transit passengers. This observation is further strengthened by the high generation figure of market due to the fact that the town is a big trading center in western Odisha.

It is observed that the waste from the areas located on the banks of Mahanadi River is indiscriminately dumped by the local residents into the River posing a serious public health hazard to the number of bathing ghats along the river bank.

The ULB owns 3 trucks, 8 tractor trailers and 4 auto tippers which are used for lifting and disposal of solid waste. Over and above this the private agency deploys its own equipments for SWM in the 15 wards outsourced to it.

#### 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
- River bank is widely used to dump garbage leading to water contamination and hygiene issues
- Almost 22% of the waste cannot get disposed due to collection problem
- Low level of awareness amongst the citizens on solid waste handling

#### 3.7. Storm Water Management

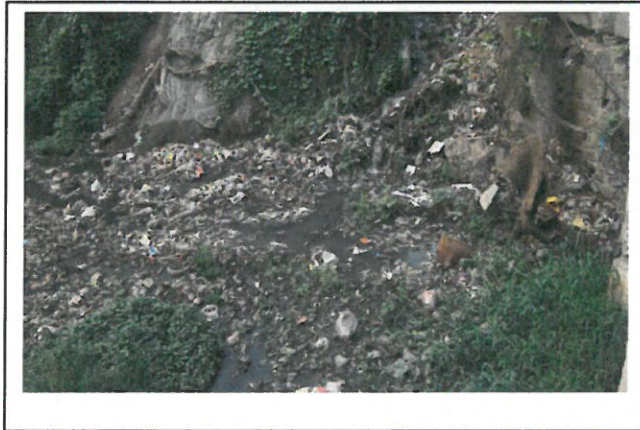


Figure 1 - Storm water drains in Sambalpur



**Table 5: Ward wise existing drainage facilities in Sambalpur Town.**

WARD NO	Population 2011 Estimated	Road Length	Geographical area	Total Length of Drain
Unit	Num	Km	SqKm	Km
1	6421	26.46	2.849	37.3
2	7643	31.58	0.971	44.5
3	13631	29.1	2.104	41.0
4	4322	12.27	0.486	17.3
5	5987	12.11	1.781	17.1
6	6730	3.12	0.324	4.4
7	7072	8.69	0.486	12.3
8	6790	3.84	0.809	5.4
9	4920	55.96	3.31	78.9
10	3267	3.32	0.162	4.7
11	3007	4.64	0.057	6.5
12	2143	3.26	0.162	4.6
13	3000	8.19	0.162	11.5
14	6844	6.11	0.486	8.9
15	5792	6.46	0.486	9.4
16	6579	10.53	0.486	14.8
17	6502	3.56	0.324	5.1
18	5351	3.83	0.486	5.6
19	3977	6.21	0.324	9.1
20	6279	4.16	0.324	6.1
21	6944	10.83	0.971	15.4
22	3992	7.88	0.324	11.1
23	4913	10.5	0.486	14.8
24	6024	47.54	3.634	67.0
25	6238	4.01	5.131	5.7
26	7066	23.31	0.809	32.9
27	12143	33.71	2.266	47.5
28	7668	108.9	1.133	153.5
29	11902	12.99	2.331	18.3
<b>Total</b>	<b>183147</b>	<b>503.07</b>	<b>33.664</b>	<b>710.8</b>

There are six major drains laden with both storm water and se wage finally flowing into the Mahanadi River. The main three natural drain in the city which flows into river Mahanadi area Tangan nallah, Mandilia nallah and DhobiJore nallah. The city has a natural slope towards south east which helps in quick drainage of storm water. However due to encroachment and deposition of solid waste the nallah is Choked causing flood in the city. The expansion of the

city and new un-planned developments on the northern direction towards Jharsuguda would result in possibility of water logging in the future.

**Table 6: Drainage Indicators**

Sl.No.	Indicator	Benchmark	March 2011	Target 2011-12
1	Coverage of Storm Water Drainage Network (%)	100	70	80
2	Incidence of Water Logging/Flooding (Number)	0	07	04

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 Dhobi jore nallah is 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

### 3.8. Overall Citizen satisfaction on Basic services

The citizen perception on urban basic services as analyzed 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.

- 93% of non slum and 95 % of slum residents complain about the sufficiency of water.
- 98% of non slum and 100% of slum residents feel that door to door collection is not regular
- Majority of the residents complaint about easy access to municipal bins
- More than 70% of citizens fell that the drainage facility is inadequate and disposal of storm water is not proper



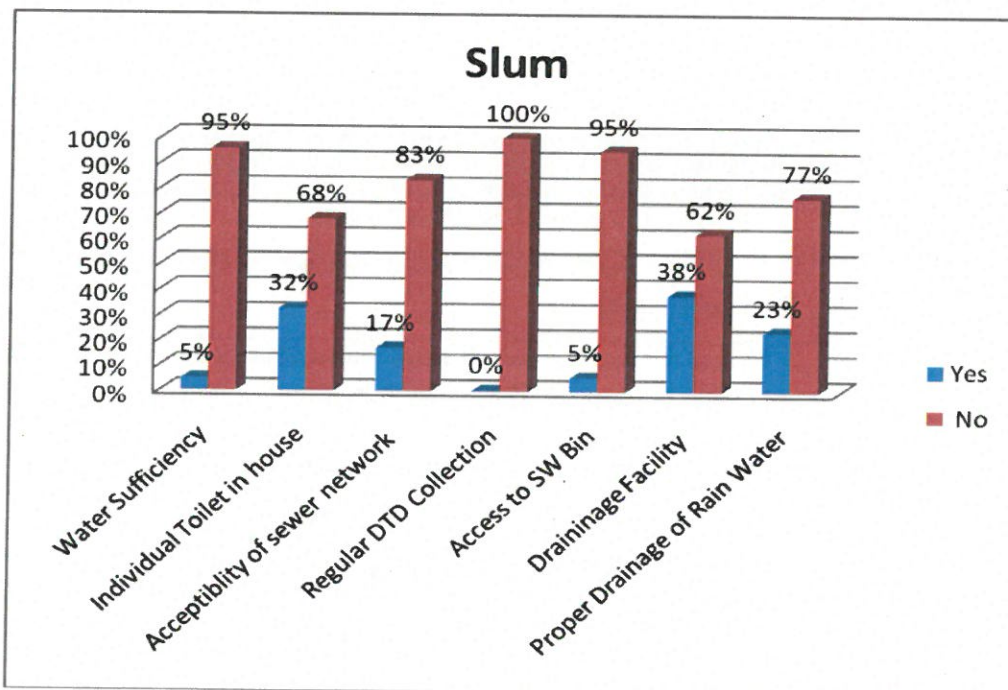
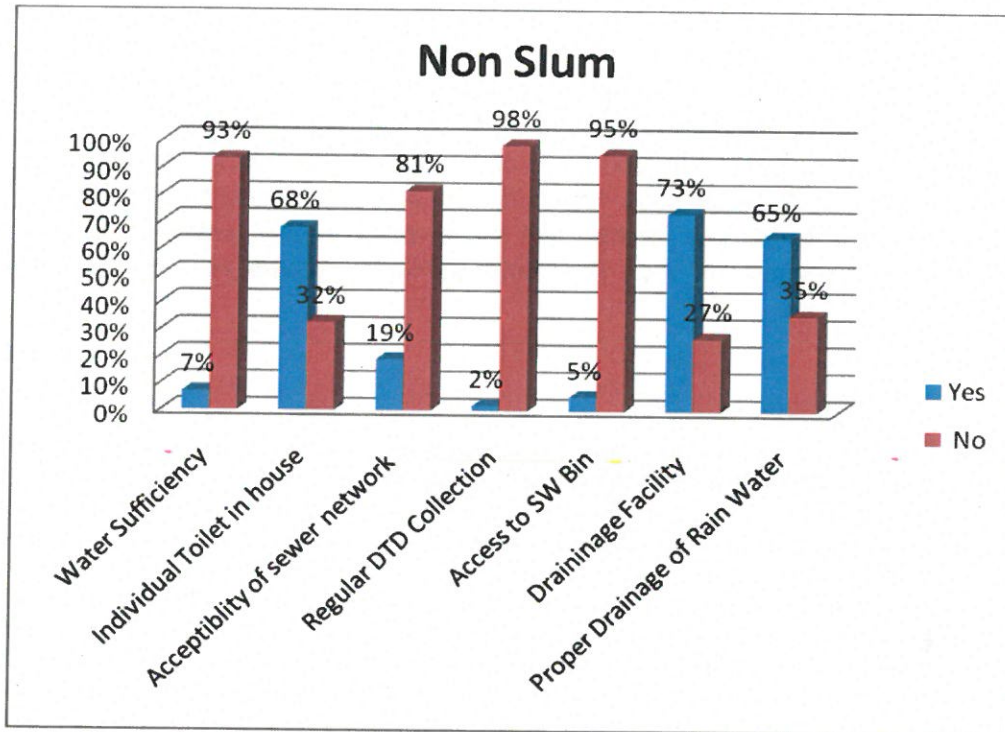


Figure 6 – Citizen Satisfaction on basic services in non slum and slum area

### Basic Services to Urban Poor

Sambalpur has total 105 numbers of slums out of which 88 are authorized and 17 are unauthorized slums. The slum population total to 74,131 with 15700 households. Nearly 40% 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 Sambalpur**

Category	2001	
	City	Slum
Average Literacy Rate	79.09	62
Male Literacy Rate	86.16	51
Female Literacy Rate	71.47	40

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 59 % are with Kuchha houses
water supply	Only 1% have PHD direct piped connection; 46% depend 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 70% of slum area do not have proper drainage facility

Municipality is taking up a number of slum improvement and poverty alleviation programs with assistance from State Gov. and Central Govt. Few to mention are SJSRY, NSDP, RAY, IHSDP, ILCS tec.



## Institutional Framework

**Table 9: Legislatives governing Institutions**

Names of Institution	Governing Institutions
Sambalpur Municipality	Orissa Municipal Act –1950
Sambalpur Development Authority SDA	Orissa Development Authorities Act, 1982
Orissa Water Supply and Sewerage Board	Section 67 of OWSSB 1991
Public Health and Engineering Organisation	Formed by Government of Orissa
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	Sambalpur Municipality	<ul style="list-style-type: none"> <li>Responsible for basic services within the town such as SWM, road, drainage, street lighting,</li> <li>Responsible for city sanitation, preventive health care</li> <li>Responsible for implementation of slum development and poverty alleviation programs</li> <li>Birth and death registration</li> <li>Parking, plantation, markets</li> </ul>	<ul style="list-style-type: none"> <li>As per 74<sup>th</sup> CAA UL B is responsible for 18 basic functions</li> </ul>
2	Sambalpur Development Authority	<ul style="list-style-type: none"> <li>Preparation and implementation of Area Development plans and projects for ensuring scientific land use pattern</li> <li>Working as coordinating agency between various Government and other agencies for development activities.</li> <li>Determining and phasing development.</li> </ul>	<ul style="list-style-type: none"> <li>All functions pertaining to Master plan and development plan Preparation. Preparation of development schemes and its implementation</li> </ul>

Sl. No	Name of the Institution	Responsibilities and Functions	Remarks
3	Public Health Engineering Organisation	<ul style="list-style-type: none"> <li>Responsible for planning, design and engineering of water supply schemes</li> <li>Responsible for construction, operation and maintenance of city water supply system and sewerage system</li> <li>Responsible for internal water supply, plumbing and sewerage system of Govt. buildings</li> </ul>	<ul style="list-style-type: none"> <li>This function needs to be transferred to U LB as per 74<sup>th</sup> CAA</li> <li>Currently the power devolution has been done through a tripartite MoA</li> </ul>
4	Orissa Water Supply and Sewerage Board (OWSSB)	<ul style="list-style-type: none"> <li>Responsible for planning, design and construction of city sewerage system</li> </ul>	
5	State Pollution Control Board, Orissa	<ul style="list-style-type: none"> <li>Responsible for pollution control and environmental protection. Deal with environmental monitoring and pollution control in the state</li> <li>Also undertakes environmental planning studies for the entire State</li> </ul>	<ul style="list-style-type: none"> <li>This institution should continue to act as a monitoring agency for environmental aspects of the city</li> </ul>
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 Sambalpur water supply operation and maintenance consists of 7 technical and 148 non technical staff.

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

- Municipality
- Chair Person;
- Council Committees
- Executive Officer.

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

**Table 11: Classification of posts in Sambalpur Municipality**

Classification of Posts	Total
Deputation	4
Regular	155
DLR & NMR	123
Regular	131
NMR	300
<b>TOTAL</b>	<b>713</b>

The Municipality is facing shortage of manpower which is affecting effective delivery of services. Currently the U LB has 119 vacant posts against the sanctioned posts. The details of staff position are annexed to this report at Annexure - 12.

### Key Issues

- There is a Lack of coordination between the Sambalpur Development Authority and Municipality.
- The Sambalpur 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

### 3.9. Financial Status of Sambalpur Municipality

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

Table 12: Financial Receipts and Expenditure in Sambalpur Municipality

Sl. No.	Subject	2007-08	2008-09	2009-10	%
	<b>RECEIPT</b>				
1	Rates and Receipt	42,12,454.90	30,60,664.06	34,17,132.82	0.8%
2	Licence and other fees	59,40,183.00	47,18,030.00	56,61,206.89	1.4%
3	Receipt under special acts	16,804.00	60,000.00	17,845.00	0.0%
4	Revenue derived from Municipal Properties apart from taxation	53,71,173.00	56,66,430.00	77,21,784.46	1.9%
5	Grants and contribution for general & special purpose	16,24,48,694.00	13,75,51,726.00	29,41,45,610.00	72.8%
6	Miscellaneous	4,52,66,903.86	4,19,31,176.77	9,31,73,802.29	23.1%
7	Extra ordinary & debts	22,42,342.00	29,27,195.00	21,39,614.00	0.5%
	<b>Grant Total</b>	<b>22,54,98,554.76</b>	<b>19,59,15,221.83</b>	<b>40,41,37,381.46</b>	<b>100.0%</b>
	<b>EXPENDITURE</b>				
1	Expenditure towards general administration & collection charges	1,36,88,357.00	2,53,39,846.00	2,00,19,031.00	8.6%
2	Public Safety	76,81,217.00	85,38,619.00	78,66,794.00	3.4%
3	Public Health	6,29,48,836.00	11,25,52,905.00	4,04,51,375.00	17.3%
4	Medical	15,47,376.00	20,58,001.00	30,14,276.00	1.3%
5	Public Convenience	3,47,59,282.00	5,09,96,385.00	5,44,45,865.00	23.3%
6	Public Institution	23,39,012.00	30,48,330.00	12,91,103.00	0.6%
7	Miscellaneous	3,17,22,033.00	4,41,02,811.00	5,05,04,294.00	21.6%
8	Extra Ordinary &	35,97,047.00	23,41,736.00	5,60,48,338.00	24.0%



Sl. No.	Subject	2007-08	2008-09	2009-10	%
	Debts				
	<b>Grant Total</b>	<b>15,82,83,160.00</b>	<b>24,89,78,633.00</b>	<b>23,36,41,076.00</b>	<b>100.0%</b>

It can be seen above that the own source revenues are very low and the town depends almost on grant devolutions from the state government. Also the expenditure on salaries is very high 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 13: Details of Taxes in Sambalpur**

Holding Tax	3%
Water Tax	3%
Light Tax	4%
<b>Total</b>	<b>10%</b>

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

**Table 14: Tax Demand and Collection in Sambalpur**

Sl. No.	Description	2007-08	2008-09	2009-10
1	Demand	2,33,18,131.56	2,42,61,075.53	2,55,09,762.88
2	Collection	96,27,803.94	85,41,994.46	80,86,645.55
3	Balance	1,36,90,327.62	1,57,19,081.07	1,74,23,117.33

The details of revenue and expenditure as per the municipal budget are enclosed at Annexure – 13. The collection efficiency varies in a range of 35% - 45% leading to increased arrears. Also a decreasing trend in collection is observed which is alarming and mostly attributed to shortage of manpower.

#### Key Issues

- Cash based single entry accounting system is followed
- Accounting system has not been computerized
- Ring fencing of expenditure not practiced
- Collection efficiency is low
- Revenue from own source is very low raising serious questions on self sustainability approach

## 4. Population Projection

Year	Population	Increase in population Per decade	% increase in population per decade	Incremental increase in population
	(PO)	(X)	(IG)	(Y)
1971	64675			
1981	110282	45607	70.52	
1991	131138	20856	18.91	-24751
2001	157643	26505	20.21	5649
2011	183147	25504	16.18	-1001
		29618	25.70	-6701

### a) Arithmetic Progression Method

$$(P_n = P_o + nX)$$

Year	Population
2012 =	1,86,109
2021 =	2,12,765
<b>2027 =</b>	<b>2,30,536</b>
2031 =	2,42,383
2041 =	2,72,001
<b>2042 =</b>	<b>2,74,963</b>
2051 =	3,01,619

### b) Geometrical Progression Method

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

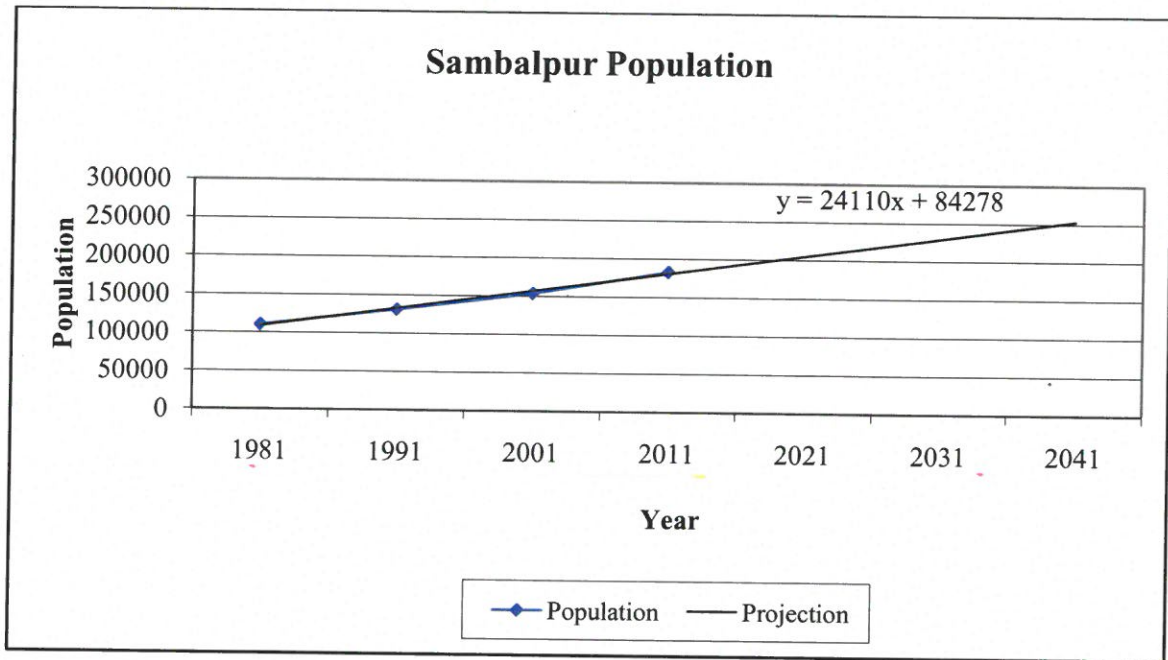
Year	Population
2012 =	1,87,384
2021 =	2,30,211
<b>2027 =</b>	<b>2,64,072</b>
2031 =	2,89,369
2041 =	3,63,729
<b>2042 =</b>	<b>3,72,144</b>
2051 =	4,57,198

### c) Incremental Increase Method

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

Year	Population
2012 =	1,85,740
2021 =	2,06,064
<b>2027 =</b>	<b>2,16,598</b>
2031 =	2,22,280
2041 =	2,31,795
<b>2042 =</b>	<b>2,32,378</b>
2051 =	2,34,609

c) Graphical method



Year	Population
2012	= 185315
2021	= 204828
2027	= 219294
2031	= 228938
2041	= 253048
2042	= 255459
2051	= 277158



## 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	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 effluents are 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.



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

#### **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 some 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.

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

### 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 systems 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 Sambalpur)
- 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 mentioned above is done in accordance with the quality of the waste water influent and desired effluent quality

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

#### **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 settleable 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)

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

**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 or 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.

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



### 5.2.3 Evaluation of options of waste water disposal

Four options for disposal of domestic wastewater, 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.

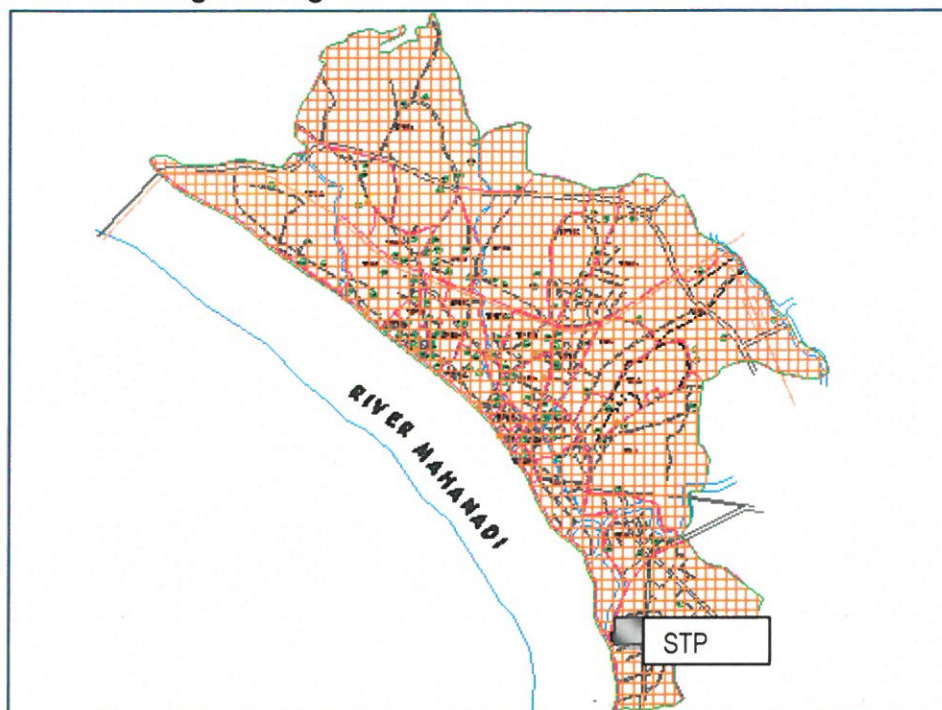


## 5.3 Strategy

### 5.3.1 Water Supply

Water supply coverage has to be increased along with equitable distribution. The production level of the city is 43 MLD which is adequate for next 20 years. A DPR is being prepared for revamping the distribution network and also for increasing the coverage. The fringe area beyond the municipal limits is growing very fast which would need attention in the near future.

### 5.3.2 Sewerage Zoning



The municipal area has been considered as one zone based on the topography and area contour. The slope of the city is towards south west.

### 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, malls 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. On the contrary the Water Works Rule proposed amendment proposes for compulsorily phasing out all the septic tanks once the sewerage network are provided
- 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 being 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
- 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 benchmark 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 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 an 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 framework 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 Sambalpur area is a more of a planned city. The colonies are not well planned with narrow accessible internal roads. The socio economic profile of the city reveals that the slum settlement is quite high and income levels are average. 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 factors affecting choice of treatment options for the various zones are as follows:

### City

- Most of the colonies are not well planned
- Roads are not wider
- Fringe area of the Municipal limit are potential growth centres and the land prices are quite high
- Availability of land within the city is a issue
- Strong public opinion not to have sewerage treatment within the residential area
- Shortage of operational manpower with the ULB
- Proper topography of the area
- Almost 50% of the Slums areas are difficult to access. However water supply through stand post have been made available to them
- Low percentage of individual toilets in slum households as well
- Better paying capacity of the non slum residents where as the slum residents do not have adequate paying capacity

Orissa Water supply & Sewerage Board is a organisation under H &UD department, Government of Odisha, responsible for implementation of sewerage schemes in cities of Odisha. They are preparing a DPR for implementation of sewerage system in Sambalpur. The DPR preparation is in process and the data could not be shared by the Board.

It is proposed that on site sanitation would be encouraged in the inaccessible area and sewerage collection network with centralised Sewerage Treatment Plant is proposed for rest of the city as one zone. ASP or SBR treatment process is proposed for these zones.

## 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 strictly implemented for proper sanitation facility
- 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 Data & Assumptions

The City Sanitation Planning is based on a set of data and certain assumptions which is 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	: 2017
Implementation period	: 2012 – 2017
Average Per capita water demand	: 135 LPCD
Sewage Generation	: 110 LPCD (80% of water supply)

### Data

Data	Unit	Non slum	Slum	Total
Population 2011	Persons	109016	74131	183147
Number of households	Households	25711	15700	41411
Number of community toilets	Number		9	9
Number of seats in community toilets	Number		93	93
Households with individual toilets	Households	17226	5024	22250
Households with sharing toilets	Households	3085	533	3618
Households practicing open defecation	Households	5399	9420	14819
Slum households using community toilets	Households		723	723



Data	Unit	Non slum	Slum	Total
Total Road length	Km			503
Persons per house	persons			4.5
Individual toilets under construction	Toilets			713
Number of Public toilets	Toilets			3
Number of Public toilet seats	Seats			37
Number of community toilets under construction	Toilets			24
Number of community toilet seats under construction	Seats			240
Bituminous road length	Km			162.00
Cement concrete	Km			152.00
Metal road length	Km			99.00
Kacha road length	Km			90.00
Pucca road length	Km			413.00

### Assumption

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	%	75%	Computed
Toilets connected to soak pits	%	25%	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	
Non Slum road length based on HH density	%	62%	
Slum road length based on HH density	%	38%	
Road cutting and restoration required	%	82%	
<b>Cost</b>			
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
Cost of trench less crossing	Rs.	25,00,000.00	Per no.
Cost of Repair of existing community toilet (each)	Rs.	2,50,000.00	Per no.



### 5.6.2 Sewage Generation

Year	Population	Water supply in MLD	Sewage generation in MLD
2012	185315	25	20
2027	219294	30	24
2042	255459	34	28

### 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

City				
Sanitation development	Unit	Base Yr	Target Yr	BoQ
Open Defecation	%		0	
Individual toilet coverage	%	54%	80%	
HH covered under Community toilet coverage	%	2%	6%	
HH with Shared toilet coverage	%	9%	14%	
Coverage of sewer connection	%	0%	95%	
Number of HH with individual toilets	Number	22,963	33,129	10,166
Total Number of shared toilets	Number	1,809	2,899	1,090
Number of community toilet seats	Number	333	333	0
Number of community toilets	Number	33	33	0
Public Toilets	Number	3	9	6
Number of Public Toilets seats	Number	37	67	30
Number of Public Urinals	Number	0	20	20
Number of sewer connection	Number	0	25,666	25,666
Construction of sewerage networks	Km	0	417	417
STP	MLD	0	24	24

The detail sanitation infrastructure need is provided in **Annexure 16A & 16C**

## 5.8 Implementation & Investment Phasing

### 5.8.1 Implementation

City	Unit	Base	Y-1	Y-2	Y-3	Y-4	Y-5	BoQ
<b>Sanitation Provisions</b>								
Individual toilet coverage	%	54%	59%	64%	69%	75%	80%	
HH covered under Community toilet coverage	%	2%	3%	3%	4%	5%	6%	
HH Shared toilet coverage	%	9%	10%	11%	12%	13%	14%	
Coverage of sewer connection	%	0%	19%	38%	57%	76%	95%	
Number of individual toilets	Number	22,963	24,996	27,029	29,062	31,096	33,129	10,166
Total Number of shared toilets	Number	1,809	2,027	2,245	2,463	2,681	2,899	1,090
Number of community toilet seats (incl. Ongoing)	Number	333	333	333	333	333	333	0
Number of community toilets	Number	33	33	33	33	33	33	0
Public Toilets	Number	3	4	5	7	8	8	6
Number of Public Toilets seats	Number	37	42	47	57	62	67	30
Number of Public Urinals	Number	0	4	8	12	16	20	20
Number of sewer connection	Number	0	3,855	8,347	13,481	19,253	25,666	25,666
Construction of sewerage networks	Km	0	83	167	250	334	417	417



## 5.8.2 Investment

Rate in Rs.	Component	Unit	Non Slum			Slum				
			Scope	Cost Rs. Cr	Subsid y %	Net Cost Rs. Cr	Scope	Cost Rs. Cr	Subsid y %	Net Cost Rs. Cr
8000	Individual toilets with sewer connection	Each	4,723	3.78	0%	0.00	2,884	2.31	90%	2.08
10000	Individual toilets with soak pits	Each	1,588	1.59	20%	0.32	970	0.97	90%	0.87
8000	Shared toilets with sewer connection	Each	506	0.40	20%	0.08	309	0.25	90%	0.23
10000	Shared toilets with soak pits	Each	170	0.17	20%	0.03	104	0.10	90%	0.09
120000	Public toilets connected to sewer	Each	6.00	0.07	100%	0.07	0	0.00	100%	0.00
30000	Public urinals of 2 units		20.00	0.06	100%	0.06	0	0.00	100%	0.00
250000	Repair of existing Community toilet	Each	0.00	0.00	100%	0.00	9	0.23	100%	0.23
Estimate	Cost of Sewerage Networks	Km	259	59.35	100%	59.35	158	36.21	100%	36.21
Estimate	House Sewer Connections	Number	15,935	12.36	50%	6.18	9,731	7.55	100%	7.55
2500000	Trenchless crossing	Number	15	3.75	100%	3.75	5	1.25	100%	1.25
2500000	Pumping stations	Number	6	1.50	100%	1.50	4	1.00	100%	1.00
7500000	STP	Number	24.00	18.00	100%	18.00	0	0.00	100%	0.00
	<b>Sub-total</b>			101.03		89.34		49.86		49.51

## Management Improvements

Item No.	Assumptions	Unit	Quantity	Rate (Rs)	Amount (Rs)
1	Engineering and Customer Survey	Nos.	41411	50	20,70,550.00
2	Communications	Nos.	10	10000	1,00,000.00
3	Training for Staffs	Nos.	20	10000	2,00,000.00
4	Sewer cleaning machine	LS			30,00,000.00
5	Safety equipments	LS			30,00,000.00
6	Misc and Unforseen Items	LS			9,450.00
	<b>Total Cost</b>				<b>83,80,000.00</b>



**5.8.3 Investment Abstract**

Component	Unit	Total (Cr. Rs.)	Subsidised cost (Cr. Rs.)	Contingency	Grand Total (Cr. Rs.)	Grand Net subsidised Cost (Cr. Rs.)
Individual toilets with sewer connection	Each	6.09	2.08	5%	6.39	2.18
Individual toilets with soakpits	Each	2.56	1.19	5%	2.69	1.25
Shared toilets with sewer connection	Each	0.65	0.31	5%	0.69	0.33
Shared toilets with soak pits	Each	0.27	0.12	5%	0.28	0.13
Public toilets ( 10 seater) connected to sewer	Each	0.07	0.07	5%	0.08	0.07
Public urinals of 2 units	Each	0.06	0.06	5%	0.06	0.06
Repair of existing Community toilet	Each	0.23	0.23	5%	0.24	0.24
Cost of Sewerage Networks	Km	95.56	95.56	5%	100.34	100.34
House Sewer Connections	Number	19.91	13.73	5%	20.90	14.42
Trenchless crossing	Number	5.00	5.00	5%	5.25	5.25
Pumping stations	Number	2.50	2.50	5%	2.63	2.63
STP	Number	18.00	18.00	5%	18.90	18.90
<b>Sub-total</b>		<b>150.90</b>	<b>138.85</b>		<b>158.45</b>	<b>145.80</b>
Management Improvements						0.84
Project management fee						2.19
Cost escalation						18.33
Miscellaneous Items						0.34
<b>Grand total</b>						<b>167.50</b>

**Total Sewerage project cost is Rs. 167.50 Crores**

## 6.0 Solid Waste Management

### 6.1 Objective:

- Scientific management of MSW of the Sambalpur 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.

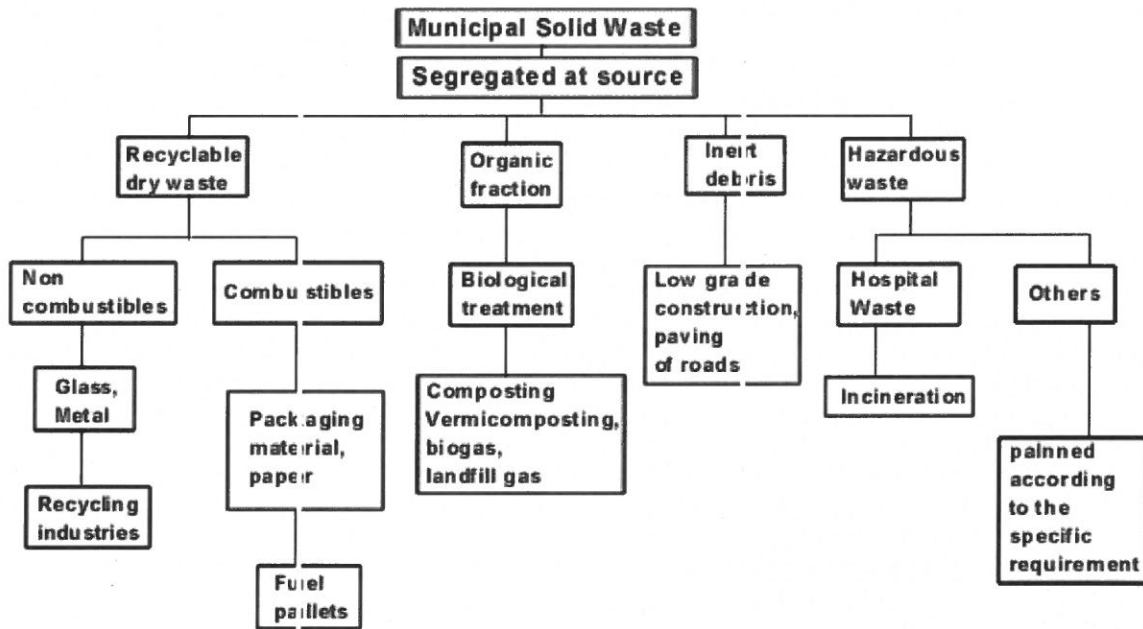
### 6.2 Strategy:

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

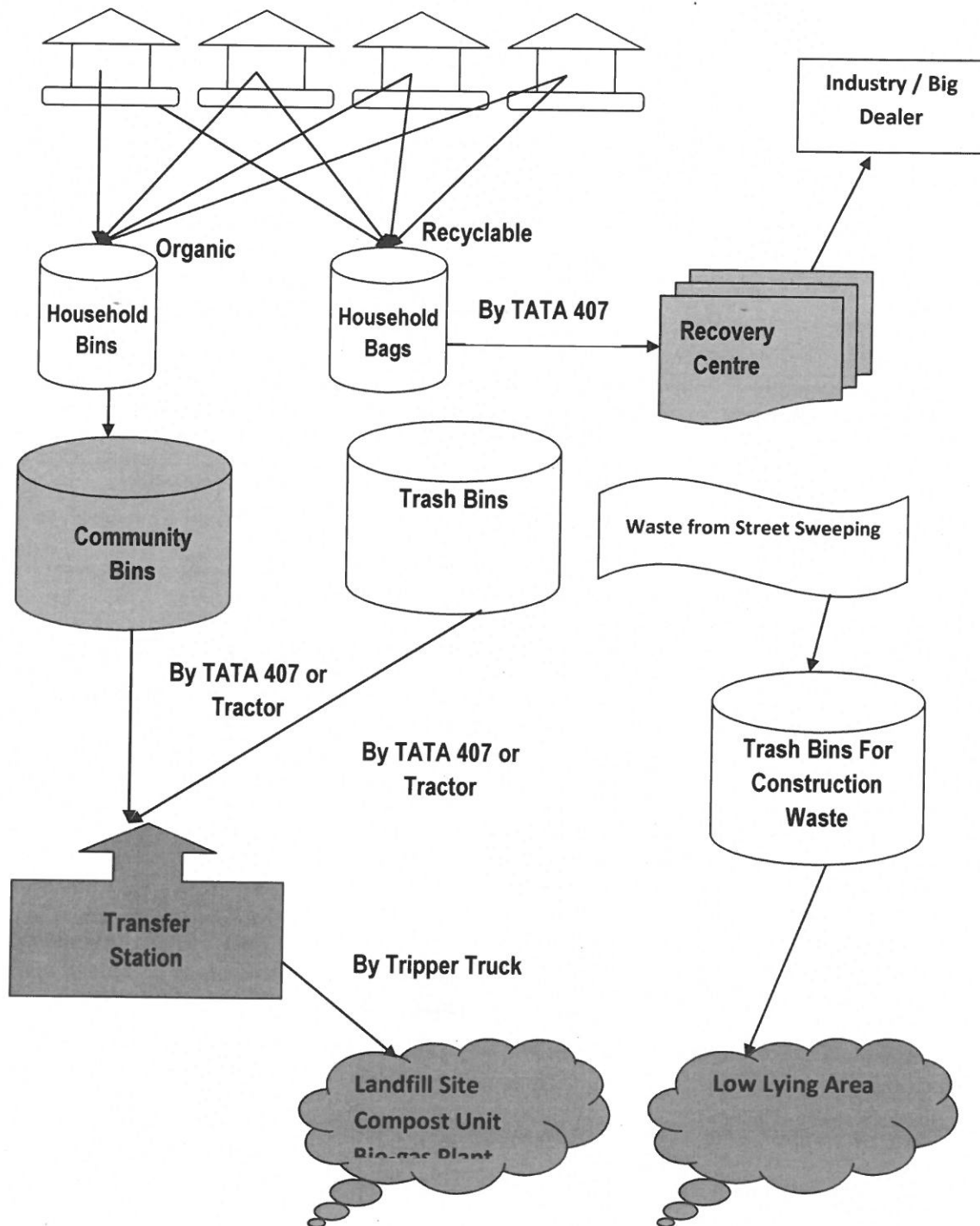
- Preparation of Action Plan for Solid Waste Management under City Sanitation Plan for the City
- SWM practices for Present Level Generation of solid waste and up to the end of the design period i.e. up to the Year 2030
- Implementation year 2012-2015
- The action plans for the City are being formulated 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 270 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 Sambalpur 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 350gm/c/day in house holds & 200 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
<b>A. Organic</b>	
1. Food waste, vegetables waste, Garden trimmings and dry leaves.	63.00
<b>B. Recyclables</b>	
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
<b>Total</b>	<b>13.00</b>
<b>C. Inert, dirt, sand, dust, soil etc.,</b>	<b>24.00</b>
<b>Total</b>	<b>100.00</b>

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
<b>Population</b>			
Non Slum Population	109016	113406	135350
Slum Population	74131	77117	92053
Total Population	183147	190523	227403
Commercial & Inst. Establishments	4000	5000	10000
<b>Generation per day</b>			
Non Slum (MT)	38	39.5	47.5
Slum (MT)	14.7	15.5	18.5
Commercial Establishment (MT)	8	10	20
Others (MT)	0.3	1	2
Total Generation (MT)	<b>61</b>	<b>66</b>	<b>88</b>
Organic Waste (MT)		42	55
Inert Waste (MT)		16	21
Recyclable waste (MT)		9	11

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 designs 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 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
<b>Shared</b>	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.
<b>Individual</b>	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	42,000	8 LITRES	DAILY
HOUSEHOLD BINS (Recyclable Waste)	PLASTIC / METAL	42,000	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	620	100 LITRES	DAILY
COMMUNITY BIN (RECYCLABLE)	FIBRE GLASS	620	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	200	100 LITRES	DAILY
BIN FOR RECYCLABLE MATTER	FIBRE GLASS	200	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	50	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	20	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	50	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  $0.360 \text{ cum.}$

No. required=  $58 \text{ MT} \times .40 = 23.2 \text{ MT} \times 1000/425 = 64.94 \text{ cum}/.360 = 151.61$  or say **152**

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

No. required=  $58 \text{ MT} \times 0.60 = 34.8 \text{ MT} \times 1000/425 = 81.88 \text{ cum}/.720 = 113.72$  or say **114**

ITEM	Capacity	Number
Hand Cart	4 container	152
Pedal Tri cycle	8 container	114
Container	30 Litres	1520

### 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 29 nos of ward of Sambalpur City = 503 km.

Average road length per ward =  $503/29 = 17.34 \text{ km.}$

Total Area of Sambalpur city = 33.70 Sq km.

Average area per ward =  $33.70/29 = 1.16 \text{ Sq km.}$

Taking into consideration of average road length & area of a ward it is proposed to have 2 no of dumper placer containers of 1 Cum capacity in each ward at suitable locations for organic waste, 1 no of dumper placer container of 3 Cum capacity in each ward for recyclable waste.

- In addition to this it is proposed to place two nos. of dumper placer container of 3 cum Capacity in each ward at suitable locations for waste from street sweeping.
- 10 nos. of 4.5 cum capacity dumper placer containers at major commercial area
- 4 nos. of 4.5 cum capacity at vegetable markets

Considering generation of 2015 total dumper placer container required

Total no of 1 cum capacity container= 29x2	= 58
Total no of 3 cum capacity container = 29x3	= 87
Total no of 4.5 cum capacity container	= 14

## 2. Container Lifting Vehicles

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

Considering 5 numbers of containers can be lifted & transported per vehicles per day, the number of Dumper Placer required =  $159/5 = 31.8$  or say 32 nos. Add 10% extra =  $32+4 = 36$  nos.

Out of the above, 12 nos. will be of Auto transported dumper placer and rest 24 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
<b>Ramp:</b> 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.
<b>Pit:</b> 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 level where transfer will take place is uneven.



For the Sambalpur City one numbers of two level transfer stations (Ramp type) are proposed at the following locations

i- Ward No-27

For the above purpose land area of 2000 Sq.mt. (approximately 70mt.x30mt) is required at the above locations. These transfer stations should be within 10-15 km distance from the proposed Land fill Site. 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 = 42 MT per day

Capacity of each Prime Mover = 5 MT

No. of Prime Mover required =  $42 / (5 \times 3 \text{ trips}) = 2.8$  say 3 nos.

Provide 10% extra as stand by unit.

Total No. of Prime Mover =  $3+1 = 4$  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 Sambalpur 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 **16 MT/day**

No. of vehicles to be engaged for lifting of 16 cum = 3.2 or say 4 nos.

Add 10% extra =  $4+1 = 5$  nos.

#### 6. Street sweeping

Total length of the road of Sambalpur City = 503 km.

The widths of the roads are different. Considering 20% of road length having 10 Mt. width, 40% of the road length having 7 Mt. width & 40% of road length having 3 Mt. width, the length of the roads of different width are as follows-

10 Mt. width road = 101 km; 7 Mt. width road = 201km; 3 Mt. width road = 201 km

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

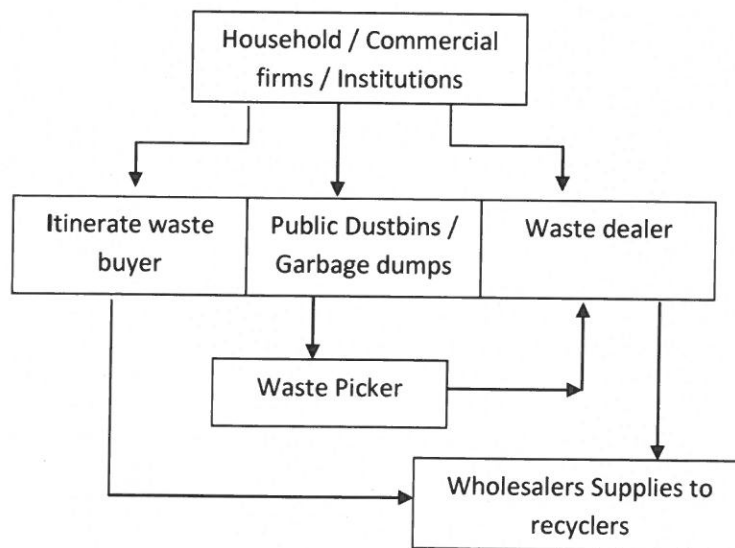
For 10Mt.width road	= (10x101000)/2500	= 404 nos.
For 7Mt.width road	= (7x201000)/2500	= 526 nos.
For 3Mt.width road	= (3x201000)/2500	= 241 nos.
<b>Total</b>		<b>= 1171 nos.</b>

**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 one recovery centre is 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 centre 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 centre.



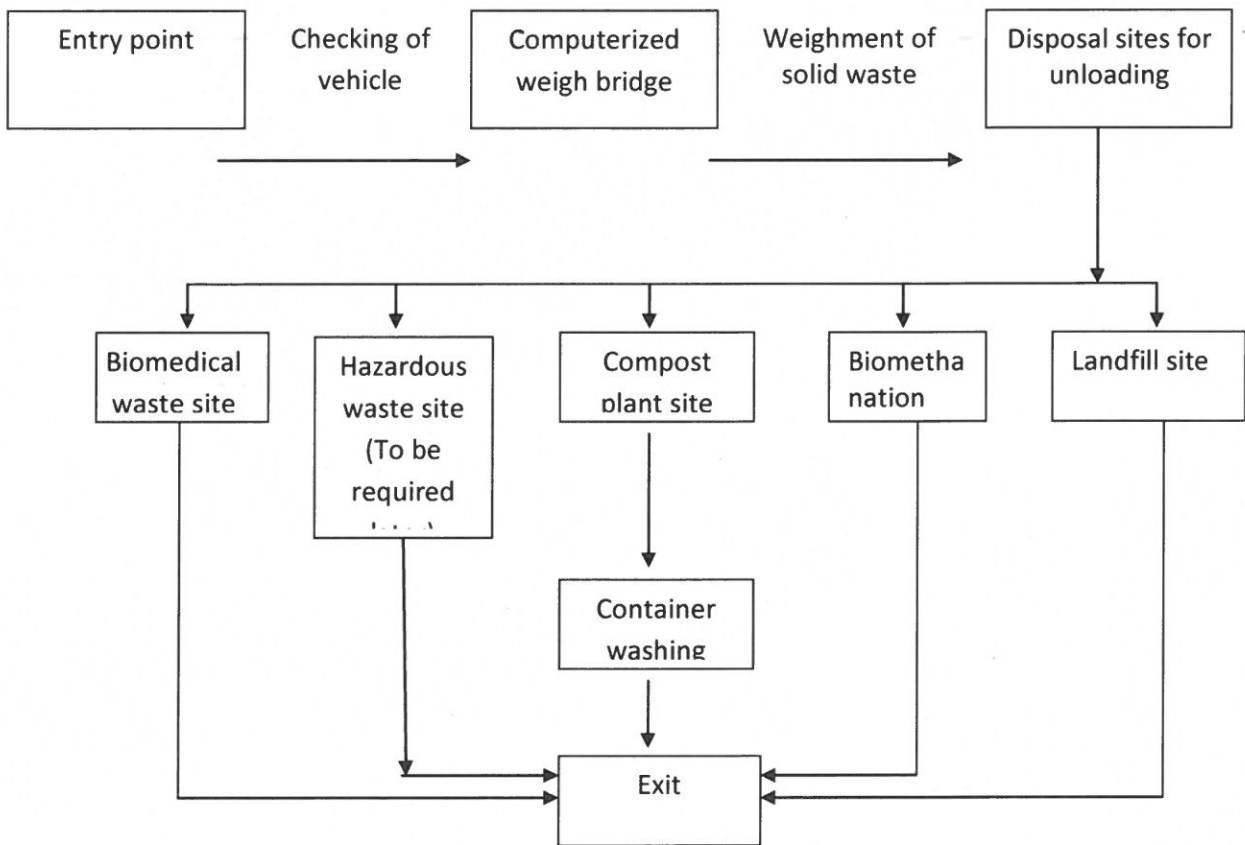
The schematic representation of recovery

**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



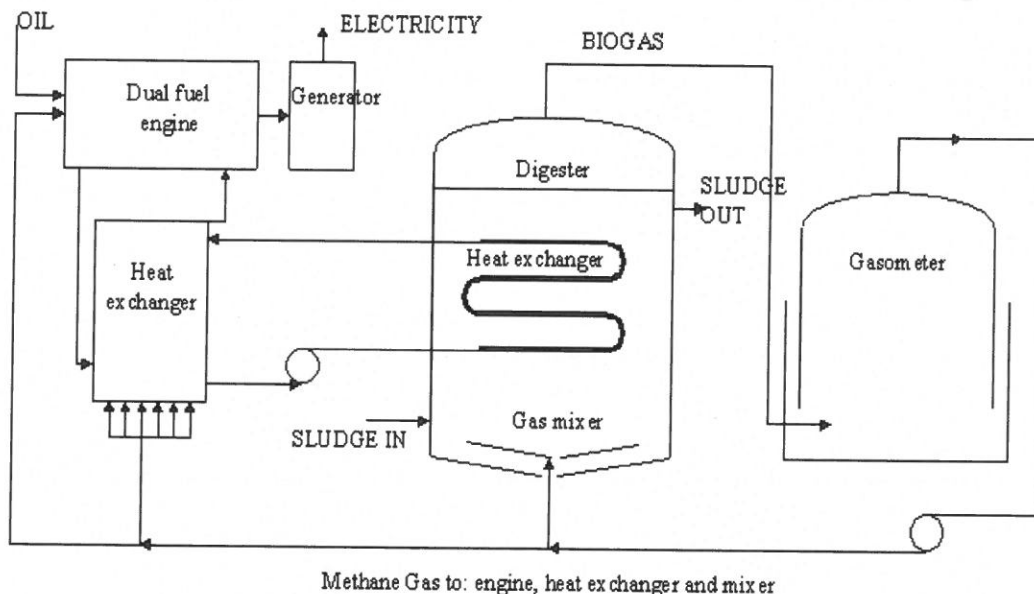
### 3. Compost unit

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% of the organic waste =  $42 \times 0.50 = 21 \text{ MT}$ .

It is proposed to construct **1 no.** compost yard of **25 MT** capacities each, near the land fill site. 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 =  $42 \times 0.30 = 12.6 \text{ MT}$ .

It is proposed to install **1 no.** of Digester Plant of **15 MT** capacities each, near to the land fill site. Land area required for each unit is around 1500 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 proposed site at Jamadar Palli which is 15 Km away from the city and fulfils all the criteria. Land fill site has to be designed for 2030 projection. 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)	:	42 tonnes / day
Waste generation by 2030(Organic Waste)	:	66 tonnes / day
Design Life	:	Active period = 15 years
Average total rainfall	:	900 mm per year

#### Land Fill Area

- i) Waste to be disposed at landfill site by 2015  
@ 20% of 42MT (organic waste) = 8.4 tonnes / day
- ii) Waste to be disposed at landfill site by 2030  
@ 20% of 55MT (organic waste) = 11.0 tonnes / day
- iii) Total waste to be disposed in 15 years  $(0.5 \times (8.4 + 11) \times 365 \times 15) = 0.53 \times 10^5$  tons
- iv) Total volume of the waste, (considering density of the waste 0.85 ton/cum  
Volume of Waste  $V_w = \frac{0.53 \times 10^5}{0.85} = 0.623 \times 10^5$  Cum
- v) Volume of daily cover  $V_{de} = 0.1 \times 0.623 \times 10^5$  Cum =  $0.062 \times 10^5$
- vi) Volume of liner and cover system  $V_e = 0.125 \times 0.623 \times 10^5 = 0.077 \times 10^5$  Cum

- vii) Volume likely become available within 30 days due to settlement of biodegradable waste and inert waste@ 7.5%

$$V_s = 0.075 \times 0.623 \times 10^5 = 0.047 \times 10^5 \text{ cum}$$

- viii) Estimate of landfill volume

$$C_i = V_w + V_{de} + V_e - V_s$$

$$= (0.623 + 0.062 + 0.077 - 0.047) \times 10^5$$

$$= 0.715 \times 10^5 \text{ Cum}$$

- ix) Proposed L:B ratio = 1:1

x) Proposed landfill height = 3.50mt

x) Land area required =  $(0.715 \times 10^5 / 3.5) \text{ Sqm}$   
 = 20428 Sqm  
 = 5.10 Acre or **say 6 Acre**

The land available at Jamadar Palli ( the proposed location for landfill site) is around 26 acre. Only 8 acre of land is required for landfill site as well as for compost unit etc. upto the year 2030. Hence there will be absolutely no problem for Municipal authority to develop MSLF, Compost Unit & setting up Bio-gas Digester Plant.

#### 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) Water Supply
- g) Lighting, Signs and Direction
- h) Vehicle Cleaning Facility
- i) Fire Fighting Equipment

#### Landfill equipment

The following equipment is required at a landfill site

- a) Dozers – for spreading waste and daily cover -**1 Nos**
- b) Landfill Compactors – for compaction waste - **1 Nos**
- c) Loader– for loading of Waste (internal movement) – **1 Nos**
- d) Tractor trailers –for internal movement of waste/daily cover soil – **1 Nos.**
- e) Soil compactor – sheep foot rollers and smooth steel drum rollers – **1 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 biological 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.	<b><u>Soiled Waste :</u></b> Waste contaminated with blood, body fluid (cotton, dressing, soiled plaster cut, linen, etc.)	Needles, syringes, scalpel, blade, broken glass, nails and any other items that may cause puncture and cuts.
		<b><u>Solid Waste :</u></b> Disposable items other than waste sharps (rubber gloves, plastic tubing, catheters, IV sets, etc.	

##### 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 Bio-Medical Waste

Total No of Bed- Sambalpur Govt Hospital	- 100
Other Primary Hospitals & Nursing Homes (10 Nos. x 30 bed average )	<u>- 300</u>
Total -	400 beds.

Considering the waste generated @1.5 Kg/cap/day

The total waste generated = 0.6 MT/Day

Out of which the municipal solid waste is considered as 75%, = 0.45 MT

and the Bio- Medical Waste is considered as 25% i.e. = 0.15 MT

### 6.4 Infrastructure, Investment & Implementation

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
<b>Cost Estimate For Primary Collection System</b>							
1	House Hold Bins(For Organic Waste)	8 Lit.	42000	0	42000	100.00	42,00,000.00
2	House Hold Bins(For Recyclable Waste)	10Lit	42000	0	42000	150.00	63,00,000.00
3	Community bins (For Organic)	100Lit.	620	0	620	1,000.00	6,20,000.00
4	Community bins (For Recyclable)	200Lit.	620	0	620	2,000.00	12,40,000.00
5	Bins For Commercial Estt.(For Organic)	100Lit.	200	0	200	1,000.00	2,00,000.00
6	Bins For commercial Estt. (For Recyclable)	300Lit.	200	0	200	3,000.00	6,00,000.00
7	Bins For Institutions	100Lit.	50	10	40	1,000.00	40,000.00
10	Container For Marriage Mandap	4.5 Cum.	20	5	15	50,000.00	7,50,000.00
11	Container For Hotels & Resturant	2 Cum	50	0	50	20,000.00	10,00,000.00
12	Containers For Hand Cart & TriCycle	30Lit.	1520	0	1520	500.00	7,60,000.00
13	Hand carts	4 container	152	0	152	6,000.00	9,12,000.00
14	Pedal tricycle	8 container	114	0	114	10,000.00	11,40,000.00
15	Dumper placer containers	1/3/4.5 Cum	159	0	159	2,00,000.00	3,18,00,000.00
						<b>Total</b>	<b>4,95,62,000.00</b>



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
<b>Street Sweeping</b>							
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	100	550	100.00	55,000.00
						<b>Sub Total</b>	<b>50,55,000.00</b>
<b>Transportation Vehicles</b>							
19	Small vehicle for congested places / Auto Carried Dumper Placer	0.3Cum	12	7	5	2,50,000.00	12,50,000.00
20	Tractors fitted with hydraulic trolleys with equipments for dumper placer	1 Cum.	24	9	15	12,00,000.00	1,80,00,000.00
21	Prime Movers with hydraulic tripper	4.5 MT	4	2	2	30,00,000.00	60,00,000.00
22	Tractors fitted with hydraulic trolleys for construction waste	1 Cum.	5	3	2	10,00,000.00	20,00,000.00
						<b>Total</b>	<b>2,72,50,000.00</b>
<b>Secondary transfer station</b>							
23 I	Boundary Wall		1	0	1	10,00,000.00	10,00,000.00
II	Raised Platform		1	0	1	30,00,000.00	30,00,000.00
III	Administrative Office		1	0	1	10,00,000.00	10,00,000.00
IV	Approach Road		1	0	1	10,00,000.00	10,00,000.00
V	Electrification & W/S		1	0	1	5,00,000.00	5,00,000.00
						<b>Sub Total</b>	<b>65,00,000.00</b>

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
<b>Recovery Centre</b>							
24	Boundary Wall		1	0	1	10,00,000.00	10,00,000.00
II	Concrete Yard		1	0	1	30,00,000.00	30,00,000.00
III	Administrative Office		1	0	1	10,00,000.00	10,00,000.00
IV	Approach Road		1	0	1	10,00,000.00	10,00,000.00
V	Electrification & W/S		1	0	1	5,00,000.00	5,00,000.00
						<b>Sub Total</b>	<b>65,00,000.00</b>
<b>Compost Units</b>							
25	<b>Civil Items</b>						
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		1	0	1	20,00,000.00	20,00,000.00
IV	Approach Road		1	0	1	5,00,000.00	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
VIII	Surface Drains		1	0	1	2,00,000.00	2,00,000.00
VIII	Leachate Tanks		1	0	1	5,00,000.00	5,00,000.00
						<b>Sub Total</b>	<b>87,00,000.00</b>
26	<b>Other Mechanical &amp; Elect. Items</b>						
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	10,00,000.00
	Electrification & W/S						10,00,000.00
						<b>Sub Total</b>	<b>34,00,000.00</b>



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
<b>Bio-methanation Plant</b>							
27	Package anaerobic digester plant					L.S	1,50,00,000.00
<b>Land Fill Sites</b>							
28	<b>Civil Items</b>						
I	Construction of boundary wall all around the Land Fill site.		1	1	0	L.S.	
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.	20,00,000.00
VI	Leachate Tanks					L.S.	50,00,000.00
VII	Sedimentation Tank					L.S.	5,00,000.00
VIII	Treatment Unit for Leachate					L.S.	1,00,00,000.00
	Landfil gas recovery arrangements					L.S.	1,00,00,000.00
						<b>Sub Total</b>	<b>3,50,00,000.00</b>
29	<b>Other Mechanical &amp; Elect. Items</b>						
I	Weigh Bridge	20MT		0	0	L.S.	8,00,000.00
II	Mechanical Tools & Equipments for Works					L.S.	20,00,000.00
III	Loader ( 2 nos )		1	1	0	30,00,000.00	-
IV	Compactors ( 3nos )		2	0	2	40,00,000.00	80,00,000.00
V	Dozer ( 1 nos )		1	0	1	25,00,000.00	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 )		1	0	1	8,00,000.00	8,00,000.00



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
VIII	Electrification & W/S						
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 LandFill					L.S	1,00,00,000.00
						<b>Sub Total</b>	<b>6,81,00,000.00</b>
<b>Medical MSW Waste Management</b>							
37	Cost towards collection, transportation , Waste from Municipal hospitals					L.S	50,00,000.00
<b>Land Acquisition</b>							
38	Cost towards land acquisition for different sites					L.S	2,00,03,000.00
<b>GRAND TOTAL</b>						Rs.	<b>25,00,70,000.00</b>
<b>SAY</b>						Rs.	<b>25.01 Crores</b>

## 6.6 Private Sector Participation in SWM

Private sector participation or public private partnerships may be encouraged / attempted by the Sambalpur 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 & Anareobic 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. No.	Designation of post	Sanitation workers	Drivers
1	Street sweepers for street sweeping	1171	--
2	primary collection of waste through hand cart & pedal cycle	266	--
3	For Auto carried Dumper placers .	12	12
4	For tractor /mini truck carried Dumper placers with tipping arrangement	24	24
5	For tractor /mini truck for lifting of construction waste/debris	5	5
6	For Tipper with hydraulic arrangement	8	4
7	For bulldozer and excavators for landfill site	4	2
8	Labour at landfill site	20	--
9	Labour at Bio-Gas Plant site	15	--
10	Labour at Compost Plant site	10	--
11	Labour at Recycling Centre	10	--
12	Tractor trailer at landfill site	2	1
13	Loader, Compactor & water tanker required for landfill site	8	4
14	Labour required for secondary transfer station	10	--
	<b>Total</b>	<b>1565</b>	<b>52</b>
15	Weekly off relievers /Leave Reserve @ 10%	157	6
	<b>Grand Total</b>	<b>1722</b>	<b>58</b>

**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 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 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 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.

Description	Sambalpur
<b>DATA</b>	
Road Length	503
Length of available Pucca Drain	122
<b>TARGET</b>	
Target for coverage	100%
<b>ASSUMPTIONS</b>	
Drain Length per Km of Road	1.25
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
<b>INFRASTRUCTURE</b>	
Main Drain (Km) 15%	76
Secondary Drain (Km) 35%	177
Tertiary drains (Km) 50%	253
<b>IMPLEMENTATION</b>	
Period	2012 to 2016

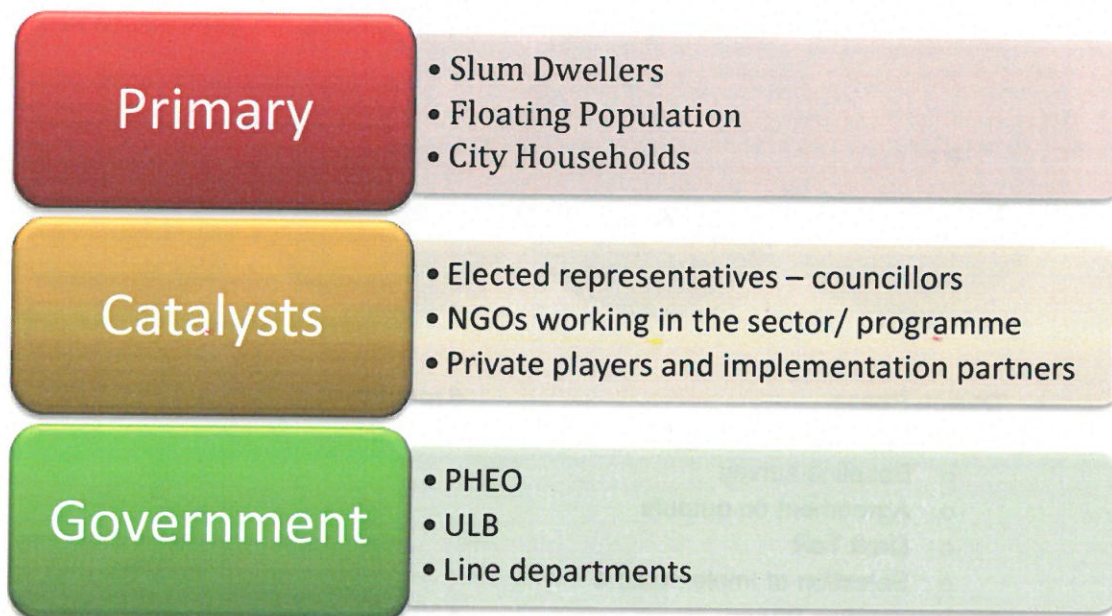
## 7.2 Investment

Description	Unit	Quantity	Rate (Lakh Rs.)	Cost (Lakhs Rs)
<b>DATA</b>				
Road Length	Km	503		
Length of available Pucca Drain	Km	122		
Drain Length per Km of Road		1.25		
Total Drain Length Required	Km	626		
Balance Drain to be executed	Km	507		
Target for coverage		100%		
<b>INFRASTRUCTURE</b>				
Main Drain (Km) 15%	Km	76	60.00	4,560.75
Secondary Drain (Km) 35%	Km	177	27.00	4,788.79
Tertiary drains (Km) 50%	Km	253	8.50	2,153.69
Pumping station with all accessories	Set	6	35.00	210.00
			<b>Sub Total Rs.</b>	<b>11,713.23</b>
Repair of existing drains	Km	122	2.90	353.80
			<b>Total</b>	<b>12,067.03</b>
			<b>SAY</b>	<b>12,070.00</b>

**Rs.120.70Crores**

## 8.0 IEC & Capacity Building

### 8.1 Stakeholders



### 8.2 Approach

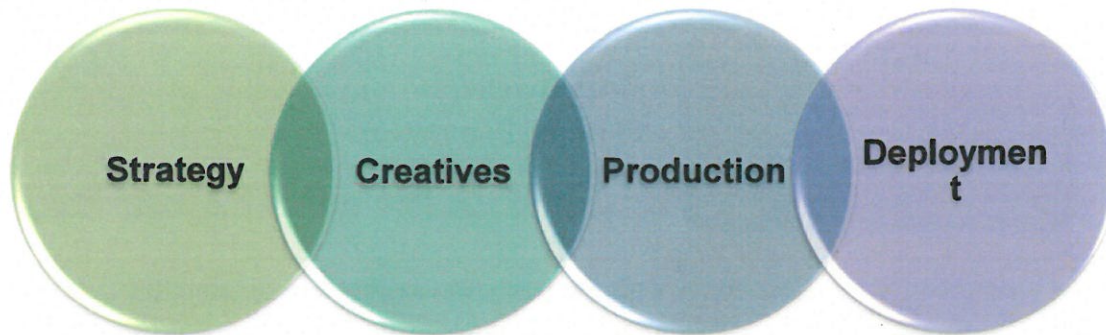
- Generating awareness about sanitation
- Promoting sanitation linking with personal health
- Use a range of media vehicles and messages
- Target external, internal and intermediary stakeholders
- Underpin high level commitment of government
- Backed by robust enforcement mechanism
- Periodic review 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	55.00
Radio spots	25.00
Posters and flyers	25.00
Events and workshops	47.00
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
<b>Total</b>	<b>350.00</b>

### Capital Cost Summary

Description	Amount in Lakh Rs.
Waste Water Management	16,750.00
Solid Waste Management	2,500.70
Storm Water Drainage	12,070.00
IEC & Capacity Building	350.00
<b>Total</b>	<b>31,670.70</b>

**Rupees 316.71 Crores**



**Annexure 1 - City Level Committee****OFFICE OF THE MUNICIPAL COUNCIL: SAMBALPUR**No 275 /MDate 17.9.11

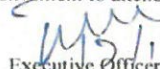
In pursuance to the Govt. in H&UD Orissa letter No. 23443/ 11 & UD Dt. the city level implementation committee is formed as per the following.

1. Chairperson	Sambalpur Municipal Council	Chairperson
2. Vice Chairman	Sambalpur Municipal Council	Member
3. Executive Officer	Sambalpur Municipal Council	Member C
4. Health Officer	Sambalpur Municipal Council	Member
5. Municipal Engineer	Sambalpur Municipal Council	Member
6. Executive Engineer	PHED	Member
7. Planning members	Sambalpur Dev. Authority	Member
8. General Manager	DIC Sambalpur or his Representative	Member
9. Miss. Aparna Padhi	C.O SMC	Member
10. President Apex	Sambalpur	Member
11. Sri Sangram Keshari Sahani	Ex- Chairman SMC	Member

The first meeting of the above committee will be held on Dt. 19.01.11 at 3 Conference hall of the Municipality. The consultant OP&HS along with their exp will apprise the committee on preparation of city sanitation plan.

Therefore you are hereby requested to kindly make it convenient to attend as per time & date fixed.

O/c

  
Executive Officer  
Sambalpur Municipality

**Annexure 2 - 1st Consultations**



**1st Consultations on 18.01.2011**



### Annexure 3 - Data Collection & Consultation



Household survey



Discussion with public



Discussion with slum residents



Focused Group Discussion



## 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/MI G/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		1)Drain	2)Open Field	3)Road side	4)Soak pit	5)Sewer line	

i	How much are you willing to pay for use of community toilet	Rs./month	
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 No	Major Observations
1	<ul style="list-style-type: none"> <li>• Houses are conjoined, little space between the house,</li> <li>• Roads are pacca but without drainage facility</li> <li>• Pipe water supply to all the padas</li> <li>• No sewerage system is available</li> <li>• 90% HH have no latrines in slums</li> <li>• Thickly populated ward</li> <li>• Water supply problem in the ward</li> <li>• Maximum upper middle class people</li> <li>• No door to door collection of solid waste</li> <li>• Environmental hygiene is very poor</li> <li>• Few patches (near Gandhi mandir) are water logging area</li> <li>• Economic condition of people are well up</li> </ul>
2	<ul style="list-style-type: none"> <li>• Water supply is a big problem in the ward</li> <li>• Roads are narrow</li> <li>• Road condition is very poor</li> <li>• No sewerage system is available</li> <li>• 100% HH have no toilet in slums</li> <li>• Economic condition of people are not good</li> <li>• Environmental hygiene is very poor</li> <li>• No door to door waste collection is practiced</li> </ul>
3	<ul style="list-style-type: none"> <li>• Water supply is a big problem in the ward</li> <li>• Houses are conjoined, little space between the house, lanes and bi-lanes, Roads are narrow</li> <li>• Road condition is very poor</li> <li>• No sewerage system is available</li> <li>• Thickly populated ward</li> <li>• Economic condition of people are lower middle class</li> <li>• Environmental hygiene is very poor</li> <li>• No door to door waste collection is practiced</li> <li>• 70% HH have no toilet in slums</li> </ul>
4	<ul style="list-style-type: none"> <li>• Water supply is a big problem in the ward</li> <li>• Roads are narrow</li> <li>• Road condition is very poor</li> <li>• No sewerage system is available</li> <li>• 60% HH have no toilet</li> <li>• Economic condition of people are well up</li> <li>• Environmental hygiene is very poor</li> <li>• No door to door waste collection is practiced</li> </ul>
5	<ul style="list-style-type: none"> <li>• Water supply is a big problem in the ward</li> <li>• Roads are narrow</li> <li>• Road condition is very poor</li> <li>• No sewerage system is available</li> <li>• Most of the drains are encroached by the people</li> <li>• 30% HH have no toilet in slums</li> </ul>



Ward No	Major Observations
	<ul style="list-style-type: none"> <li>• Environmental hygiene is very poor</li> <li>• No door to door waste collection is practiced</li> </ul>
6	<ul style="list-style-type: none"> <li>• Water supply is a big problem in the ward</li> <li>• Roads are narrow</li> <li>• Road condition is very poor</li> <li>• No sewerage system is available</li> <li>• Most of the drains are encroached by the people</li> <li>• 40% HH have no toilet in slums</li> <li>• Environmental hygiene is very poor</li> <li>• No door to door waste collection is practiced</li> <li>• 80% HH lower middle income group people</li> </ul>
7	<ul style="list-style-type: none"> <li>• Houses are conjoined, little space between the house</li> <li>• lanes and bi-lanes, Roads are narrow</li> <li>• Thickly populated ward</li> <li>• No sewerage system is available</li> <li>• 60 percentage of houses using latrine</li> <li>• 80% HH lower middle income group people</li> </ul>
8	<ul style="list-style-type: none"> <li>• Houses are conjoined, little space between the house,</li> <li>• lanes and bi-lanes, Roads are narrow</li> <li>• Majority area is on water logging</li> <li>• No sewerage system is available</li> <li>• Maximum people are lower class</li> <li>• 20% HH using open field for latrine</li> </ul>
9	<ul style="list-style-type: none"> <li>• Houses are conjoined, little space between the house,</li> <li>• Buildings are old,</li> <li>• lanes and bi-lanes, Roads are narrow</li> <li>• Majority area is on water logging</li> <li>• No sewerage system is available</li> <li>• 30 percentage of houses using latrine in slums</li> <li>• No door to door solid waste collection practice</li> <li>• Environmental hygiene is very poor</li> </ul>
10	<ul style="list-style-type: none"> <li>• Houses are conjoined, little space between the house,</li> <li>• lanes and bi-lanes, Roads are narrow</li> <li>• Economic condition of people is very good</li> <li>• Drinking water is a problem(supply)</li> <li>• No sewerage system is available</li> <li>• Maximum people are lower class</li> <li>• -No door to door solid waste collection practice</li> <li>• Environmental hygiene is very poor</li> <li>• 30% HH using latrine</li> </ul>
11	<ul style="list-style-type: none"> <li>• Economic condition of people is very good</li> <li>• No sewerage system is available</li> <li>• 40% HH drain sewerage water to drain</li> <li>• 80% percentage of houses using latrine</li> <li>• Maximum people are higher income group</li> </ul>

Ward No	Major Observations
12	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• 10% percentage of houses using latrine</li> <li>• 60% people are lower class</li> <li>• No door to door solid waste collection practice</li> <li>• Environmental hygiene is very poor</li> </ul>
13	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• Maximum percentage of houses using open field for latrine</li> <li>• Maximum people are lower class</li> <li>• No door to door solid waste collection practice</li> <li>• Environmental hygiene is very poor</li> </ul>
14	<ul style="list-style-type: none"> <li>• Economic condition of people is very good</li> <li>• No sewerage system is available</li> <li>• 30% percentage of houses using open field</li> <li>• Maximum people are lower class</li> <li>• No door to door solid waste collection practice</li> <li>• Environmental hygiene is very poor</li> </ul>
15	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• 50% HH drain sewerage water to drain</li> <li>• Maximum people are upper middle class</li> <li>• No door to door solid waste collection practice</li> <li>• 70 % HH using open field for latrine</li> </ul>
16	<ul style="list-style-type: none"> <li>• Thickly populated ward</li> <li>• No sewerage system is available</li> <li>• Very narrow drain system in the ward</li> <li>• Maximum percentage of houses open field</li> <li>• Maximum people are lower class</li> <li>• No door to door solid waste collection practice</li> </ul>
17	<ul style="list-style-type: none"> <li>• Thickly populated ward</li> <li>• No sewerage system is available</li> <li>• Very narrow drain system in the ward</li> <li>• Maximum percentage of houses using open field</li> <li>• Maximum people are higher income group</li> <li>• No door to door solid waste collection practice</li> </ul>
18	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• Maximum percentage of houses using open field latrine</li> <li>• Maximum people are higher income group</li> <li>• 20% HH using open field</li> <li>• No door to door solid waste collection practice</li> </ul>
19	<ul style="list-style-type: none"> <li>• Thickly populated ward(old bus stand area)</li> <li>• No sewerage system is available</li> <li>• 50% HH drain sewerage water to drain</li> <li>• Maximum percentage of houses using open field latrine</li> <li>• Maximum people are lower class</li> <li>• No door to door solid waste collection practice</li> <li>• 0% HH using open field</li> </ul>



Ward No	Major Observations
20	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• Maximum percentage of houses using open field latrine</li> <li>• 40% HH drain sewerage water to drain</li> <li>• Maximum percentage of houses using open field latrine</li> <li>• No door to door solid waste collection practice</li> <li>• 20% Houses using open field</li> </ul>
21	<ul style="list-style-type: none"> <li>• Economic condition of people is very good</li> <li>• Thickly populated ward</li> <li>• No sewerage system is available</li> <li>• Very narrow drain system in the ward</li> <li>• 30 percentage of houses using IHL latrine</li> <li>• Maximum people are lower class</li> </ul>
22	<ul style="list-style-type: none"> <li>• lanes and bi-lanes, Roads are narrow</li> <li>• Road condition is very poor</li> <li>• Drinking water is a problem(supply)</li> <li>• No sewerage system is available</li> <li>• Maximum percentage of houses using open field latrine</li> </ul>
23	<ul style="list-style-type: none"> <li>• Wards having Maximum number slum dwellers(hygiene condition is very poor)</li> <li>• Drinking water is a problem(supply)</li> <li>• No sewerage system is available</li> <li>• 55% HH drain sewerage water to drain</li> <li>• Maximum people are middle income group</li> <li>• No door to door solid waste collection practice</li> </ul>
24	<ul style="list-style-type: none"> <li>• Thickly populated ward</li> <li>• No sewerage system is available</li> <li>• 20 percentage of houses using individual latrine</li> <li>• Maximum people are lower class</li> <li>• No door to door solid waste collection practice</li> </ul>
25	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• Roads are wide, neat and clean</li> <li>• 50% of houses using individual latrine</li> <li>• Maximum people are lower middle class</li> <li>• No door to door solid waste collection practice</li> </ul>
26	<ul style="list-style-type: none"> <li>• No sewerage system is available</li> <li>• Very narrow drain system in the ward(most of the drains are earthen)</li> <li>• 20% HH drain sewerage water to drain</li> <li>• 50 percentage of houses using individual latrine</li> <li>• 40% people are upper middle class</li> <li>• No door to door solid waste collection practice</li> </ul>
27	<ul style="list-style-type: none"> <li>• Well spaced between the houses and roads are wide</li> <li>• No sewerage system is available</li> <li>• 30% HH drain sewerage water to drain</li> <li>• Maximum percentage of houses using individual latrine</li> <li>• Maximum people are upper middle class</li> <li>• 20% HH have own toilet</li> </ul>



Ward No	Major Observations
	<ul style="list-style-type: none"> <li>• No door to door solid waste collection practice</li> </ul>
28	<ul style="list-style-type: none"> <li>• lanes and bi-lanes, Roads are narrow</li> <li>• Maximum official quarters (Residential purpose)</li> <li>• Economic condition of people is very good</li> <li>• No sewerage system is available</li> <li>• 10% HH drain sewerage water to drain</li> <li>• 80 percentage of houses using own latrine</li> <li>• Maximum people are lower middle class</li> </ul>
29	<ul style="list-style-type: none"> <li>• No pipe water supply in this ward</li> <li>• No door to door Solid waste collection in the ward</li> <li>• No sewerage system is available</li> <li>• 40% HH drain sewerage water to drain</li> <li>• 80 percentage of houses using own latrine in non slum area</li> <li>• Maximum people are higher income group</li> </ul>

## Annexure 6 - Abstract of Survey Results

Primary Survey Result for Sambalpur City			
Sl. No.	Description	Slum %	Non Slum %
1	<b>Structure Type</b>		
a)	Kucha	59%	6%
b)	Pucca	28%	62%
c)	RCC	14%	33%
2	<b>Employment</b>		
a)	Govt	8%	12%
b)	Private	13%	35%
c)	Self	35%	43%
d)	Retired	5%	9%
e)	Labour	39%	2%
3	<b>Source of Drinking Water</b>		
a)	PHD Pipe	1%	33%
b)	Open well	21%	1%
c)	Bore well	6%	1%
d)	Public Tap	46%	42%
e)	Tube well	25%	18%
f)	Tanker	2%	5%
g)	Vendor	0%	0%
4	<b>Water Storage Type</b>		
a)	Sump	6%	3%
b)	OH Tank	8%	14%
c)	Bucket	85%	84%
d)	No Storage	0%	0%
5	<b>Water Sufficiency</b>		
a)	Yes	5%	7%
b)	No	95%	93%
6	<b>Individual Toilet in house</b>		
a)	Yes	32%	68%
b)	No	68%	32%
7	<b>Access to Toilet</b>		
a)	Connected to Temp Pit	10%	11%
b)	Connected to Soak Pit	2%	29%
c)	Connected to Drain	20%	27%
d)	Shared/ Community Toilets	8%	12%
e)	Open defecation	60%	21%
f)	Sewer Line	0%	0%

Primary Survey Result for Sambalpur City			
Sl. No.	Description	Slum %	Non Slum %
8	<b>Acceptability of sewer network</b>		
a)	Yes	17%	19%
b)	No	83%	81%
9	<b>Open defecation Location</b>		
a)	Drain	39%	29%
b)	Open Field	50%	67%
c)	Road side	11%	4%
10	<b>Kitchen water disposal</b>		
a)	Drain	14%	12%
b)	Open Field	62%	74%
c)	Road side	19%	14%
d)	Soak Pit	5%	0%
e)	Sewer Line	0%	0%
11	<b>Regular DTD Collection</b>		
a)	Yes	0%	2%
b)	No	100%	98%
12	<b>Access to SW Bin</b>		
a)	Yes	5%	5%
b)	No	95%	95%
13	<b>Solid Waste Disposal</b>		
a)	SW Bin	3%	3%
b)	Road Side	14%	8%
c)	Open Field	69%	78%
d)	Drain	14%	12%
14	<b>Drainage Facility</b>		
a)	Yes	38%	73%
b)	No	62%	27%
15	<b>Type of Drain</b>		
a)	Pucca	32%	56%
b)	Kucha	68%	44%
16	<b>Proper Drainage of Rain Water</b>		
a)	Yes	23%	65%
b)	No	77%	35%



**Annexure 7 - Focus Group Discussions (Councilors)****1. Basic Information:**

- 1.1 Municipality Name: Sambalpur Municipal
- 1.2 Place of Discussion : Vice Chair Person Office Chamber
- 1.3 Starting Time : 12.30 PM
- 1.4 Ending Time : 02.00 PM
- 1.5 No. of Male Participants: 6
- 1.6 No of Female Participants: 1

Name of the Interviewers	Ranjan Kumar Mallick
Name of the Coordinator	Harish Dash

**2. List Participants in FGD**

Sl. No	Name of the Participants	Designation	Signature of the Participants
1	Mrs Reena Tribedi	Chairperson	
2	Sri Sidhartha Saha	Deputy Chairperson	
3	Susanta Ku Purohit (ward No-29)	Councilor	
4	<u>Mr Ashok Kumar Suri</u>	Councilor	
5	<u>Mr Bhakta Charan Mirdha</u>	Councilor	
6	<u>Mr Saroj Dalphat</u>	Councilor	
7	Sushanta Purohit (ward no-15)	Councilor	

**3. Basic infrastructure (MUNICIPALITY)**

Items	Total No	Working/Defunct (Remarks)
Street light	494	50
Public Stand Posts	824	100
Wells	2810	2110/700
Hand Pumps	NA	
Tube Wells	40	15
Pond	400	

School	34 Primary + 21 ME and 4 HS-59	59
Community Toilet	11	2
Public Toilet	10	10
Health Centre	Govt-13, Pvt -20	33

#### 4. Access to basic amenities:

- Condition of Road :- 20% good and 80% Bad
- Condition of Drain:- 100% bad
- Solid Waste Management facilities:- 100% bad
- Access of Sanitation:- Normal
- Access to health care:-Good
- Hygiene practices:- Bad/NIL
- Access to safe drinking water:- Normal
- Land tenure /Lease status:- Most of the lands are encroached
- Source of information:-Sambalpur Municipal

#### 5. QUESTIONS

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

Basic amenity condition is very poor.

a. WATER:

- Immediate attention may be given on improvement in water supply system.
- For 24X7 water supply system, is necessary for the municipal people

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 29 wards, 10 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

- Proper planning and coordination between SMC and PHD is highly important
- Un authorized connection and non connection needs to be identified
- Private and P ublic Partnership i s needed t o i mprove w ater su pply s ystem i s needed for improvement in water supply.

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

Not feasible in the city because most of the public lands are encroached by rich people and slum dwellers.

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

Yes we need t he sewerage treatment plant. This sewerage treatment plant should be constructed near Tanga Nala and Dhobijhar area.

## 5. HOW T O SL OVE THE PR OBLEM O F O PEN D EFECATION IN YO UR C ITY? SUGGEST SOME MEASURES?

To solve the open defecation problem, at first to

- Create awareness program for use of toilets
- Impose Fine system, those who defecate in open area
- Strict guideline from SMC

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

- Present management of solid waste system is very poor, but recycles plant highly necessary for solid waste management system.

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

- First Identification of Ponds in Sambalpur city



- Make boundary / walling to make it clean
- Use Bleaching for water cleaning purpose
- Make gardening in fence area

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 Sambalpur Municipal but the ward having acute water logging problems are- 2,5, 6, 7, 9, 18, & 29.

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 MENTIONED PROBLEMS?

- First sufficient drinking water is not available and Sanitation condition is very poor.
- 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?

- Two NGOs (BISWA and JAGRUTI) are working in Sambalpur Municipal, both the NGOs work is not Satisfactory.

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

- a. Cable TV: Rs. 150.00
- b. Mobile Phone : Rs. 500.00
- c. Hospital and medical expenses: Rs. 500

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?

Poor people can not pay the user fee and minimum amount for all the people.

**Annexure 8 - Focus Group Discussions (Officers)****1. Basic Information:**

- 1.1 Municipality Name: Sambalpur Municipal
- 1.2 Place of Discussion : Sambalpur Health Officer Chamber
- 1.3 Starting Time : 04.00 PM
- 1.4 Ending Time : 05.00 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	Harish Dash

**2. List Participants in FGD**

Sl. No.	Name of the Participants	Designation	Signature of the Participants
1	Mr Subash Chandra Sathoi	Executive Officer	
2	Mr Basant Kumar Pandy	City Engineer	
3	Dr Bharat Chandra Dash	Health Officer	
4	<u>Mr Pradeep Kumar Mohapatra</u>	Sanitary Inspector	
5	<u>Mr Shovaram Nayak</u>	Sanitary Inspector	
6	<u>Mr Surendra Nag</u>	Supervisor, BISWA	
7	<u>Mrs Arpan Padhi</u>	Community Organisor	
8	<u>Mrs Anarpurna Mitra</u>	Community Organisor	

**3. Basic infrastructure (MUNICIPALITY)**

Items	Total No	Working/Defunct (Remarks)
Street light	4104	4104
Public Stand Posts		
Wells	2810	2110/700
Hand Pumps	NA	
Tube Wells	NA	



Pond	400	
School	34 Primary + 21 ME and 4 HS-59	59
Community Toilet		
Public Toilet	10	10
Health Centre	Govt-13, Pvt -20	33

#### 4. Access to basic amenities:

- Condition of Road :- 20% good and 80% Bad
- Condition of Drain:- 100% bad
- Solid Waste Management facilities:- 100% bad
- Access of Sanitation:- Normal
- Access to health care:-Good
- Hygiene practices:- Bad/NIL
- Access to safe drinking water:- Normal
- Land tenure /Lease status:- Most of the lands are encroached
- Source of information:- Sambalpur Municipal

#### 5. QUESTIONS

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

Basic amenity condition is very very poor.

##### a. WATER:

- Immediate attention may be given on improvement in water supply system.
- For 24X7 water supply system, is necessary for the municipal people

##### 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 29 wards, 10 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:

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

- Proper planning and coordination between SMC and PHD is highly important
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4. DO YOU NEED SEWERAGE TREATMENT PLAN IN YOUR CITY. IF YES, WHERE IT SHOULD BE LOCATED?

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5. HOW T O SLOVE T HE PROBLEM O F O PEN D EFECATION IN YO UR C ITY? SUGGEST SOME MEASURES?

To solve the open defecation problem, at first to

- Create awareness program for use of toilets
- Impose Fine system, those who defecate in open area
- Strict guideline from SMC

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

- Present management of solid waste system is very poor, but recycles plant highly necessary for solid waste management system.

7. HOW TO KEEP THE WATER BODIES / PONDS AND ITS SURROUNDINGS CLEAN?
- First Identification of Ponds in Sambalpur city
  - Make boundary / walling to make it clean
  - Use Bleaching for water cleaning purpose
  - Make gardening in fence area
8. IS THERE ADEQUATE DRAIN NETWORK AVAILABLE IN YOUR CITY? IF NO, HOW TO SOLVE THE DRAINAGE PROBLEM IN YOUR CITY?
- Drain network is not available in the municipal
  - Improvement of Old drain (back side of house)
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- 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.)
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- First sufficient drinking water is not available and Sanitation condition is very poor.
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12. WHICH ARE THE COMMUNITY ORGANISATIONS, ACTIVE IN YOUR MUNICIPALITY?
- Two NGOs (BISWA and JAGRUTI) are working in Sambalpur Municipal, both the NGOs work is not Satisfactory.
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- a. Cable TV: Rs. 150.00
  - b. Mobile Phone : Rs. 500.00



- c. Hospital and medical expenses: Rs. 500
- 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?

- Poor people can not pay the user fee and minimum amount for all the people.

## Annexure 9 - Slum Status

Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. of toilets under UIDSSM	No. of seats
1	Vatra - 1	2	A	1140	217		55	162		18	3	3	30
	Vatra-2	3	A	937	188		55	133					
	Betra para	1	UA	1165	283		83	200					
2	Govindtolla	6	A	381	84		27	57			4	2	20
	Dhanupalli	4	A	657	135		41	94					
	Turipara	8	A	545	131		41	90					
	Charvati	5	A	1114	287		96	191		25			
3	Moti Jharan	10	A	1269	220		66	154				2	20
	Sunapalli	9	A	780	175		50	125		49			
	Bhutapara	7	A	556	127		38	89		60			
4	Naganchoti Rastnapati colony	11	A	982	217		62	155	1		6	1	10
	Maya bagicha	13	UA	410	152		43	109					
5	Pension para Kalibadi	14	A	1214	385		108	277	1			2	20
	Dalaipara	15	UA	1422	394		103	291				2	20
	Salia Bagicha	16	A	810	178		68	110					
				1439	296		83	213		20			

Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. of toilets under UIDSSM	No. of seats
	Dani Bandha	17	A	675	145		41	104					
7	Dhuchura para	18	A	1242	268		79	189			10		
	Bahal para	21	UA	627	123		36	87					
	Sidheswar Benna	20	UA	1081	235		70	165					
	Ekodapara	19	A	977	183		51	132			10		
8												1	10
9	Salchi para	22	A	873	155		52	103				1	10
	Samali para	23	A	1210	215		65	150					
	Sarlakani	26	A	1211	215		72	143		36			
	Sarlakani Gandhi colony	25	A	411	73		20	53					
	Sarla	24	A	383	68		19	49		16			
	Jhankanpara	27	A	172	31		10	21					
10	Keut para	28	A	223	88		22	66					
11									1				
12	Dhubapada	29	A	234	51		18	33		28		1	10
13	Pattayak para	31	A	563	78		22	56					
14	Tanla para	32	A	581	98		28	70	3				



Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. of toilets under UIDSSM	No. of seats
	Mali bagicha	33	A	757	127		37	90					
	Kamli Bazar	30	A	412	69		19	50		18			
15	Telka Para	35	A	1339	217		64	153					
	Sahu colony	34	UA	1396	280		82	198					
	Ambedkar nagar	36	A	1610	263		75	188			2		
16	Bohidarbandha	37	A	555	146		46	100					
	LIC	38	A	674	125		43	82					
	Ghurijuda Bandha	41	UA	583	105		32	73					
17	Manik munda	40	A	652	148		42	106					
	Nandram tank	39	A	1201	252		81	171					
	Samaleswari colony	42	UA	1210	265		109	156					
18	Chamar para	44	A	484	86		26	60		26		1	10
	Nandini colony	43	UA	2065	402		121	281					
19	Ghunguto para	45	A	440	105		31	74	2				
	Amairi para	46	A	565	95		27	68					
	Bangali para	47	A	461	57		22	35					
	Malibari	49	A	308	58		19	39					

Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. toilets under UIDSSM	No. of seats
20	Majhi para	53	A	390	71		29	42		24	7		
	Kustapara	52	A	381	69		24	45					
	Suna dhuba para	56	A	708	129		32	97					
	Keut para	51	A	198	36		15	21					
	Gangira para	50	A	757	138		43	95					
	Bhuan para	55	A	250	45		17	28					
	Madha bandh	54	A	717	130		44	86		13			
	Bad bazar Chandan nagar	48	A	657	120		43	77					
21	Talvata para	61	A	1134	206		78	128					
	Mandilia	58	UA	756	165		45	120					
	Tiwari gali	62	A	591	107		27	80					
22	Daldali para	75	A	1285	282		68	214	1			2	20
	Panika para	60	A	389	85		28	57					
	Bangla para Nuabandh	59	A	412	91		23	68					
23	para	63	A	416	121		36	85					
	Mahabir gali	76	A	244	71		25	46					



Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. of toilets under UIDSSM	No. of seats
	Pardesi para	65	A	853	248		99	149		21			
	Munga para	64	A	316	92		28	64					
24	Remed Village	72	A	921	124		40	84		59		1	10
	Kanujuri	68	A	675	91		38	53					
	Durga pali	69	A	532	72		38	34					
	Durga pali Telipara	70	A	943	127		41	86					
	Laxmidunguri	71	A	543	76		23	53					
	Remed - Barijanpara	67	A	340	46		19	27					
	Nuapara	74	A	1463	297		84	213					
	kadamal	79	A	226	30		11	19					
	Baghanamal khejiria para	89	A	375	51		13	38					
	Pujari para	77	A	312	42		11	31					
	Kusum para	84	A	191	26		7	19					
25	Dhumer pada	78	A	430	132		39	93		15			
	Gopal pali	80	A	558	171		47	124		31			
	Gopal pali Tikinapara	82	A	335	65		19	46					
	Ranibagicha(B arai pali)	83	A	930	286		84	202		40			



Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. toilets under UIDSSM	No. of seats
	Makhanapada	81	A	280	86		25	61		22			
	Tetel para	85	A	234	72		21	51					
26	Nuapara	73	A	270	75		22	53		62			
	Raniband Adibasi kolpara	93	UA	721	152		44	108					
	Beheramunda	66	A	622	152		60	92			12	3	30
	Thakur para	88	A	482	97		28	69					
	Stationpara	87	UA	832	172		50	122					
	Panchagachia	86	UA	1076	303		125	178					
27	Gopalmal	92	A	411	90		35	55			2	1	10
	Danipali	91	A	881	193		76	117					
	Mill para	97	A	493	108		33	75		30			
	Katardhua	90	A	673	148		58	90					
28	Dukhupara	94	A	634	151		66	85			23	1	10
	Santi nagar	96	A	167	45		18	27					
	Ramgarh-Telipara	98	A	119	35		18	17					
	Binsa munda (Ainthapali)	95	UA	1995	455		161	294					
		100	A	463	104		46	58			21		

Ward No.	Slum Name	Map Ref. No.	Authorized / Unauthorized	Population	No. of House Holds	No. of BPL family	No. of HHs with toilet	No. of HHs without toilet	No. of community toilet	No. of Beneficiary under IHSDP	No. of Individual Beneficiary under ILCS	No. of toilets under UIDSSM	No. of seats
	Majhapara	101	A	818	152		67	85					
29	Khajhripara	102	A	346	107		45	62					
	Goala para	104	A	887	215		77	138					
	Dehuripara	103	A	1327	342		123	219					
	Tangarpali	99	UA	658	172		67	105					

**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	1488	5	820	65	30		
2	1626	3	963	71	20		
3	2798	2	1552	122	20		
4	1081	2	587	47	20		
5	1406	1	755	61	30		
6	1324	1	711	58	20		
7	1306	3	722	57			
8	1578	3	858	69	10		
9	1160	6	685	51	10		
10	695	2	373	30			
11	606		326	26	13		
12	447	1	268	20	10	10	
13	790	1	424	35			
14	1539	2	827	67	30		
15	1339	4	737	58		20	
16	1513	2	815	66		7	
17	1583	5	851	69			
18	1293	2	721	56	10		
19	940	2	505	41	20		
20	1456	10	826	64			
21	1454	3	781	64			
22	856	3	460	37	30		
23	1100	5	612	48			
24	1457	11	842	64	10		
25	1520	8	987	66			
26	1605	4	874	70	30		
27	2813	4	1544	123	10		
28	1724	5	949	75	10		
29	2914	5	1588	129			



## 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	
<b>Existing &amp; Ongoing Community Toilets</b>									
1	1	Bhatra	10						
2		Dhanupalli	10						
3		Dhanupalli	10						
4	2	Bhutapara	10						
5		Charbati	10						
6	3	Motijharan	10						
7		Sunapali	10						
8	4	Near Stadium	10	10					
9		Nagar Chouti	10						
10	5	Maga Bagicha	10						
11		Nelson Mandala Chowk	10						
12		Kumbhar Pada	10	10					
13	6	Lear Jilla School Chowk	10						
14		Kumbhar Pada	10						
15	8	Dhturapada	10						
16	9	Sakhipada Road	10						
17	11	Kanji House, Dalaipada	13	13					wall partly damaged
18	12	Dhubapada	10						
19	14	Ring Road, Daldali Pada	10	10					
20		Kamla Bazar, Smasanghat	10	10		-	-	-	Partly Door damaged
21		Ring Road, Nandapada	10	10					
22	18	Cherupada	10						
23	19	Sameswari Mandir	10	10					
24		Amatipada, Badbazar	10	10					
25	22	Daldali Pada	10						
26		Mandilia	10						
27		Ketrajpur Hindi School	10	10					
28	24	Durga Palli	10						
29	26	Station Pada	10						
30		Station Pada	10						
31		Thakur Pada	10						

Sl. No	Ward No.	Location	Total No. of Seats	Functional Seats	Default Seat	Fees (Rs.)			Remarks
						Bathing	Toilet	Both	
32	27	Bus Stand	10						
33	28	Ainthapalli	10						
<b>Public Toilets</b>									
1	13	Goal Bazar	10	10		2.00	3.00	4.00	
2	15	Taxi stand	20	20		3.00	3.00	5.00	
3	16	Head quarter Hospital	7	7		2.00	3.00	4.00	

## Annexure 12 - Staff Position

Category of Post	Original Sanctioned Strength	Sanctioned abolished	Present sanctioned	Staff in position	Vacancy
<b>GENERAL ESTABLISHMENT</b>					
Head Assistant	2	--	2	--	2
Senior Assistant	10	--	10	1	9
Junior Assistant	15	1	14	12	2
Junior Asst (Cashier)	1	--	1	1	--
Treasury Sarkar	1	--	1	1	--
Peon	24	7	17	15	2
Senior Steno	1	--	1	--	1
Typist	2	1	1	1	--
Community Organiser	5	1	4	3	1
<b>MEDICAL :</b>					
<b>(A) J.P.M. Hospital</b>					
Asst. Surgeon	2	--	2	2	--
Child Specialist	1	--	1	1	--
Pharmacist	1	--	1	1	--
Staff Nurse	1	--	1	1	--
Dhai	4	--	4	3	1
Peon	3	--	3	3	--
Sweeper	3	1	2	1	1
<b>(B) Kshetrajpur Dispensary</b>					
Asst. Surgeon	1	--	1	1	--
Pharmacist	1	--	1	--	1
Dresser	1	--	1	1	--
Dhai	1	--	1	1	--
<b>(C) Homeopathy Dispensary</b>					
Asst. Surgeon	1	--	1	1	--
Homeo Assistant	1	--	1	0	1



Category of Post	Original Sanctioned Strength	Sanctioned abolished	Present sanctioned	Staff in position	Vacancy
<b>LIGHT ESTABLISHMENT</b>					
Light Inspector	1	--	1	1	--
Lamp Lighter	4	--	4	3	1
Peon	1	--	1	1	--
<b>COLLECTION ESTABLISHMENT</b>					
A.H.C.C.	1	--	1	1	--
Misc. Inspector	1	--	1	--	1
Tax Collector	22	3	19	16	3
Octroi Moharir	17	--	17	2	15
Octroi Peon	16	--	16	12	4
Night Watcher	1	--	1	1	--
<b>ENGINEERING ESTABLISHMENT</b>					
Executive Engineer	1	--	1	1	--
Asst. Engineer	1	--	1	1	--
Jr. Engineer	3	1	2	2	--
Work Sarkar	3	1	2	2	--
Park Mali	8	3	5	4	1
Store Keeper	1	--	1	1	--
Market Inspector	1	--	1	--	1
Market Sweeper	1	--	1	1	--
<b>HEALTH ESTABLISHMENT</b>					
Sweeper & Sweepress	307	111	196	137	59
Zamadar/Peon	21	--	21	11	10
Driver	6	--	6	4	2
Store Keeper (Health)	1	--	1	1	--
Library Peon	1	--	1	1	--
Law Clerk	1	--	1	--	1
<b>TOTAL</b>	<b>502</b>	<b>130</b>	<b>372</b>	<b>253</b>	<b>119</b>

## Annexure 13 - Budget details for the year 2011-12

RECEIPT	Head of Receipts	Estimate for the Year
(I)	Rates and Taxes	
	Tax on Holding	45,00,000.00
	Tax on Carriages, carts, Horses & other animals	50,000.00
	Water Tax	45,90,000.00
	Lighting Tax	57,95,000.00
	Latrine Tax	1,00,000.00
	<i>Total</i>	<i>1,50,35,000.00</i>
(II)	License and Other Fees	
	Fees on registration on dogs	1,000.00
	Fees on Vessels	
	Licenses fees for projection & erection	20,000.00
	License fees for offensive & danerous trades etc.	80,000.00
	<i>Total</i>	<i>1,01,000.00</i>
(III)	Receipts under specials acts	
	Pounds	25,000.00
	Ferry rents	39,000.00
	<i>Total</i>	<i>64,000.00</i>
(IV)	Revenue Derived from Municipal Properties and Powers apart from Taxation	
	Rents of lands, building, saraies, dark bangles, Dharmasalas, coultries etc.	5,00,000.00
	Sale proceeds of lands and produce of lands	2,00,000.00
	Revenue receipts	1,00,000.00
	Sale proceeds of unserviceable articles	2,00,000.00
	Conservancy receipts other than taxes	1,00,000.00
	Fees and revenue from Education institution	10,000.00
	Fees and revenue from Medical institution	1,00,000.00
	Fees and revenue from Markets, slaughter houses, cart stand etc. maintained by the municipality	50,00,000.00
	Interest on investment (other purpose)	30,00,000.00
	<i>Total</i>	<i>92,10,000.00</i>
(V)	Grants and contribution for general and special purposes	
	From Goverments	
	a) For medical purposes	5,00,000.00
	b) For sanitation purposes	16,74,000.00
	c) For maintenance of roads	17,00,07,000.00
	d) For water supply	5,21,81,000.00
	e) for other purposes	27,42,73,000.00



		<i>Total</i>	49,86,35,000.00
(VI)	Miscellaneous		
	Recoveries on accounts of services rendered		
	Fisheries		85,000.00
	Other rents (Misc.)		4,00,00,000.00
		<i>Total</i>	4,00,85,000.00
(VII)	Extra ordinary and debt		
	Sale proceeds of Securities		
	a) For Depreciation fund		5,00,000.00
	b) For Shinking fund		6,00,000.00
	c) For other purpose		10,00,000.00
		<i>Total</i>	21,00,000.00
	Loans		50,00,000.00
	Advances		1,00,000.00
	Deposits		20,00,000.00
		<i>Total</i>	71,00,000.00
	<b>Total Receipts</b>		<b>57,23,30,000.00</b>
<b>EXPENDITURE</b>			
	<b>Heads of Expenditure</b>		<b>Estimate for the Year</b>
(I)	General Administration and Collection charges		
	1	General Administration	
		Office establishment	52,01,000.00
		Contigencies	17,42,000.00
		Conveyance allowance	5,000.00
		Deareness allowance	20,15,400.00
		Travelling allowance	1,50,000.00
		Leave salary and pensionary contribution	20,20,000.00
		Other items (6th pay comm. Arrear)	50,00,000.00
		<i>Total</i>	1,61,33,400.00
	2	Collection of Taxes & fees	
		Establishment	25,02,700.00
		Contigencies	80,000.00
		Deareness allowance	12,35,000.00
		Conveyance allowance	8,000.00
		<i>Total</i>	38,25,700.00
	3	Collection of ferry rents	10,000.00
	4	Refunds	10,000.00
	5	Pensions and gratuities	2,00,50,000.00
		<i>Total</i>	2,00,70,000.00
(II)	Public Safety		
	Lighting establishment and equipment		1,51,35,200.00
(III)	Public Health		



1	Establishment Charges	69,82,000.00
2	Epidemic charges	8,01,000.00
3	Fairs, festivals & exhibitions	6,00,000.00
4	Drainage & sewerage works	70,00,000.00
5	Water supply & water works	6,59,16,000.00
6	Conservancy	
	Latrines and urines(I)Public, (II) Private	2,51,61,000.00
	Road watering and road cleaning	1,72,05,000.00
7	Markets, cart stands and slaughter houses	27,67,000.00
	<i>Total</i>	<i>12,64,32,000.00</i>
(IV)	Medical	
	Homeopathic	5,47,400.00
	Medical	2,27,000.00
	Maternity and child welfare centres	24,40,000.00
	<i>Total</i>	<i>32,14,400.00</i>
(V)	Public Conveyance	
1	Plantation and preservation of trees on roads and public places and maintenance of public garden	54,25,000.00
2	Swimming Pools	21,50,000.00
3	Public works	
	a) Establishments	55,20,000.00
	b) Building (Original & repairs)	7,67,33,000.00
	c) Roads (Original & repairs)	23,58,64,000.00
4	Stores and plant	50,000.00
5	Burning and burial grounds	10,00,000.00
	<i>Total</i>	<i>32,67,42,000.00</i>
(VI)	Public Instruction	
1	Primary education	55,57,000.00
2	Secondary and other education	85,300.00
3	Libraries and reading rooms	2,33,000.00
4	Misc. contribution	3,70,000.00
5	U.B.S.	1,07,00,000.00
	<i>Total</i>	<i>1,69,45,300.00</i>
(VII)	Miscellaneous	
1	Interest on loans	10,00,000.00
2	Law charges	2,00,000.00
3	Stationary and printing	2,00,000.00
4	Provident funds	45,00,000.00
5	Election	20,000.00
6	Relief works in time of famine etc	1,00,000.00
7	Census	2,00,000.00
8	Contributions for treatment of municipal employees in recognised sanatoria for Leprosy, TB etc	2,00,000.00

9	Expenditure on indigent patients for treatment of special diseases	50,000.00
10	Unforeseen and extraordinary charges	3,40,10,000.00
	<i>Total</i>	<i>4,04,80,000.00</i>
(VIII)	Extraordinary and Dept	
	Repayment	5,00,000.00
	Advance	3,00,000.00
	Deposits	10,00,000.00
	<i>Total</i>	<i>18,00,000.00</i>
	<b>Total Expenditure</b>	<b>57,07,78,000.00</b>
	<b>Probable balance at the close of the year</b>	<b>5,72,33,000.00</b>
	<b>Grand Total</b>	<b>62,80,11,000.00</b>

**Annexure 14 - 2<sup>nd</sup> Consultation & Observations during other intermediate Consultation**



**Presentation and 2<sup>nd</sup> Consultation meeting held on 25<sup>th</sup> July 2011 on Situation Analysis**



2<sup>nd</sup> Consultation 26.07.11

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SAMBALPUR MUNICIPAL COUNCIL: SAMBALPUR

Sr No.	Name	Designation	Ph.No.	Signature
1	Roena Jaiswari	Char. Pr. Secy	9793700761	[Signature]
2	Sankar Chandra Patra	E.O. SMC, SMC	9437201181	[Signature]
3	Dr. P. S. Das	I.D.	9687882277	[Signature]
4	Gouranga Das Patra	M. C.	9437201181	[Signature]
5				
6	Appa Das Patra	C.O. SMC	9803850404	[Signature]
7	Anna Das Patra	Secy. SMC	9437201181	[Signature]
8	Sankar Das Patra	C.O. SMC	933553440	[Signature]
9	Subal Das Patra	Secy. SMC	9437201181	[Signature]
10	Pratibha Das Patra	M. C.	8763028558	[Signature]
11	M. Das Patra	M. C.	9437201181	[Signature]
12	Ranjana Das Patra	C.O. SMC	9437201181	[Signature]
13	Gunjan Das Patra	M. C.	9178920689	[Signature]
14	Santosh Das Patra	M. C.	9437201181	[Signature]
15	Bibhas Mahapatra	C.O. SMC	9437201181	[Signature]

#### Observation and suggestions provided by the participants during 2nd consultation meeting on 26<sup>th</sup> Jul. 2011

- Shared toilet preferred to community toilets
- Community /Public toilet if required should be made 5 seater
- Mandilia drain and other natural drain renovation to be included in CSP

#### Observation and suggestions provided by the participants during consultation workshop on 12<sup>th</sup> 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 31<sup>st</sup> Jan. 2012

- Household survey data from 2011 census available with ULBs may be used for better mapping of the sanitation facility
- ULB observation by 15<sup>th</sup> Feb and final report by 31<sup>st</sup> Mar.

**Annexure 15 - Calculation of Solid Waste Generation****Present Generation**Present Population

The total population by 2011	- 183147
The total Non Slum population	- 109016
The total population in slums	-74131
Approximate no. of Commercial Estt.	- 4000

Present Level of Generation

per capita generation rate in households = 350gm/c/day

Slum pockets. = 200 gm/cap/day

I) From residential zone - (109016x 0.350)/ 1000 M.T	= 38.15 MT
II) From slums - (74131 x 0.200)/ 1000 MT	= 14.82 MT
III) From commercial Establishment - (4000x 2.00 Kg)/1000MT	= 8.00 MT

Total = 60.97 MT

Say 61 MT/day

**Total Generation at end of Implementation period (2015)**Projected Population

The projected population by 2015	- 190523
Projected households population	- 113406
Projected population in slums	-77117
Projected number of Commercial Estt.	- 5000

Projected Generation

I) From residential zone - (11340 x 0.350)/ 1000	= 39.69 MT
II) From slums - (77117 x 0.200)/ 1000	= 15.42 MT
III) From commercial Establishment (5000x 2.00 Kg)/1000	= 10.00 MT
IV) MSW from hospitals & nursing homes	= 0.79 MT

Total = 65.90 MT

Say 66 MT/day

Out of which, organic waste would be **42 MT** (63.00%); Inert waste would be **16 MT** (24%) and **8 MT** (13.00%) of recyclables waste.

### Generation at end of 2030

#### Projected Population

The projected population by 2030	- 227403
Projected households population	-135350
Projected population in slums	- 92053
Projected no. of Commercial Estt.	- 10000

#### **Projected Generation of Solid Waste by 2030:**

I) From residential zone - $(135350 \times 0.350) / 1000 \text{ M.T}$	= 47.37 MT
II) From slums - $(92053 \times 0.200) / 1000 \text{ MT}$	= 18.41 MT
III) From commercial Establishment - $(10000 \times 2.00 \text{ Kg}) / 1000 \text{ MT}$	= 20.00 MT
IV) MSW from hospitals & nursing homes	= 2.00 MT
	<hr/>
Total	= 87.78 MT

**Say 88 MT/day**

Out of which, organic waste would be **55 MT** (63.00%), Inert waste would be **22 MT** (24%) and **11 MT** (13.00%) of recyclables waste.



## Annexure 16A – Infrastructure Need (Sewerage)

Ward No.	No. of Slum	INDIVIDUAL TOILETS		SHARED TOILETS		COMMUNITY TOILETS SEATS		PUBLIC TOILETS SEATS		URINALS		SEWER LINE (Km)	
		Existing	New	Existing	New	Existing	New	Existing	New	Existing	New	Existing	New
1	5	820	247	65	29	30			5		1		21
2	3	963	299	71	43	20					1		24
3	2	1552	698	122	74	20					2		21
4	2	587	188	47	28	20					1		11
5	1	755	222	61	37	30					2		10
6	1	711	271	58	35	20							3
7	3	722	402	57	34								8
8	3	858	420	69	42	10							3
9	6	685	233	51	31	10					1		41
10	2	373	226	30	18						1		3
11		326	95	26	16	13							4
12	1	268	37	20	12	10							3
13	1	424	254	35	21			10					7
14	2	827	263	67	41	30							5
15	4	737	436	58	35			20			2		6
16	2	815	506	66	40			7	5		1		9
17	5	851	512	69	46						1		3
18	2	721	308	56	37	10							3
19	2	505	147	41	25	20					1		6
20	10	826	426	64	38								4
21	3	781	472	64	39								10
22	3	460	43	37	23	30			10		1		7
23	5	612	334	48	29								9
24	11	842	333	64	38	10					1		40

Ward No.	No. of Slum	INDIVIDUAL TOILETS		SHARED TOILETS		COMMUNITY TOILETS SEATS		PUBLIC TOILETS SEATS		URINALS		SEWER LINE (Km)	
		Existing	New	Existing	New	Existing	New	Existing	New	Existing	New	Existing	New
25	8	987	331	66	40				5				4
26	4	874	284	70	42	30							20
27	4	1544	797	123	74	10					1		27
28	5	949	457	75	45	10					2		93
29	5	1588	925	129	78				5		1		12
<b>Total</b>	<b>105</b>	<b>22,963</b>	<b>10,166</b>	<b>1,809</b>	<b>1,090</b>	<b>333</b>	<b>-</b>	<b>37</b>	<b>30</b>	<b>20</b>	<b>20</b>	<b>417</b>	<b>417</b>


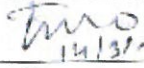

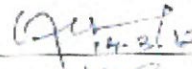


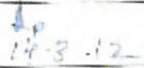



## Annexure 16B - Infrastructure Need (Drainage &amp; Solid Waste)

Ward No.	No. of Slum	ROAD LENGTH (Km)	DRAINAGE (Km)		SOLID WASTE MANAGEMENT			
			Existing	New	Existing	New	Existing Collection Centre	Secondary Transport Station
1	5	26.5	6.4	20.0		8		
2	3	31.6	7.7	23.9		5		
3	2	29.1	7.1	22.0		8		
4	2	12.3	3.0	9.3	1	5	1	
5	1	12.1	2.9	9.2		8		
6	1	3.1	0.8	2.4		7		
7	3	8.7	2.1	6.6	1	5		
8	3	3.8	0.9	2.9		6		
9	6	56.0	13.6	42.4		5		
10	2	3.3	0.8	2.5		5		
11		4.6	1.1	3.5		3		
12	1	3.3	0.8	2.5		5		
13	1	8.2	2.0	6.2		4		
14	2	6.1	1.5	4.6	1	5	1	
15	4	6.5	1.6	4.9	1	6	1	
16	2	10.5	2.6	8.0		5		
17	5	3.6	0.9	2.7		5		
18	2	3.8	0.9	2.9	1	5	1	
19	2	6.2	1.5	4.7		5	1	
20	10	4.2	1.0	3.2		3		
21	3	10.8	2.6	8.2		5		
22	3	7.9	1.9	6.0		5		
23	5	10.5	2.5	8.0		4		
24	11	47.5	11.5	36.0		5		



Ward No.	No. of Slum	ROAD LENGTH (Km)	DRAINAGE (Km)		SOLID WASTE MANAGEMENT			
			Existing	New	Existing	New	Existing Collection Centre	Secondary Transport Station
25	8	4.0	1.0	3.0		7		
26	4	23.3	5.7	17.7		5		
27	4	33.7	8.2	25.5		5		1
28	5	108.9	26.4	82.5	1	8	1	
29	5	13.0	3.2	9.8	2	7	2	
<b>Total</b>	<b>105</b>	<b>503</b>	<b>122</b>	<b>381</b>	<b>8</b>	<b>159</b>	<b>8</b>	<b>1</b>

**Members presents in City Sanitation Meeting on Dt.14.03.2012**


Sl.No.	Name	Signature
1	Reena Toradi, Chairperson, SMC	 14/3/12
2	Subash, Chandra Sethia E.O.SMC	 14/3/12
3	Dr. B. C. Dash, HD	
4	S. P. Acharya, Asst. Manager	 14.3.12
5	L. N. Panley, S.E.PHD	 14.3.12
6	M. Anoj Patra, AE, SMC	
7	Apparna Padhee, C.O. Officer	 14-3-12
8	Santosh Kumar Sharma, O.P.S.I.S	
9	Anna Puspa Basik	 14.3.12
10	Bibhas Mahapatra, O.P.S.I.S	







**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.



**TOWARDS CITY WIDE SANITATION**



**Annexure 17 - 3<sup>rd</sup> Consultations held on 14.03.2012**



**Presentation and 3<sup>rd</sup> Consultations meeting held on 14<sup>th</sup> March 2012 on draft CSP**

## Annexure 16C – Location of Proposed Infrastructure

Community Toilets	Map Ref. No.	Public Toilets	Map Ref. No.	Proposed Urinals	Map Ref. No.
<b>Existing</b>		<b>Existing</b>		<b>New</b>	
Bhatra	C1	Gole Bazar Daily Market	P1	Dhanupali	U1, U2
Dhanupalli	C2	Bus Stand	P2	Jail Chowk	U3
Dhanupalli	C3	HQ Hospital	P3	Near School	U4
Bhutapara	C4	New		Zilla School Chowk	U5
Charbati	C5	Dhanupali	NP1	Circuit House Road	U6
Near Stadium	C6	Laxmi Talkies Chowk	NP2	Kachery Chowk	U7
Motijhara	C7	Staion Road	NP3	Sakhipada Road	U8
Sunapalli	C8	Ketraipur	NP4	City Station	U9
Nagan Chouti	C9	Remed Chowk	NP5	Municipal Chowk	U10
Maga Bagicha	C10	Ainthapalli Chowk	NP6	Gole Bazar Chowk	U11
Nelson Mandala Chowk	C11			Laxmi Talkies Chowk	U12
Kumbhar Pada	C12			LH Chowk	U13
Lear Jilla School Chowk	C13			Modipada Chowk	U14
Kumbhar Pada	C14			Rajghat, Ring Road	U15
Dhturapada	C15			Ketraipur	U16
Sakhipada Road	C16			Remed Chowk	U17
Kanji House, Dalaipada	C17			Bus Stand	U18
Dhubapada	C18			Ainthapalli Chowk	U19
Ring Road, Daldali Pada	C19			Ainthapalli Chowk	U20
Kamla Bazar, Smasanghat	C20				
Ring Road, Nandapada	C21				
Cherupada	C22				
Sameswari Mandir	C23				
Amatipada, Badbazar	C24				
Daldali Pada	C25				
Mandilia	C26				
Ketraipur Hindi School	C27				
Durga Palli	C28				
Station Pada	C29				
Station Pada	C30				
Thakur Pada	C31				
Bus Stand	C32				
Ainthapalli	C33				



**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*
<b>1</b>	<b>Output-related</b>	<b>50</b>	<b>2</b>	<b>Process-related**</b>	<b>30</b>
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 personal 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 (5 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 (5 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	<b>3</b>	<b>Outcomes-related</b>	<b>20</b>
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)	6			

\* The marks for the above indicators will be revised every ten to fifteen years. Over time, indicators about more strategic activities e.g. excretion, or spilling in open/public spaces, etc. will be introduced as indicators. The weights assigned to each category and specific indicators will also be revised. \*\* In the context, bigger cities may consider existing good practice systems that do 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



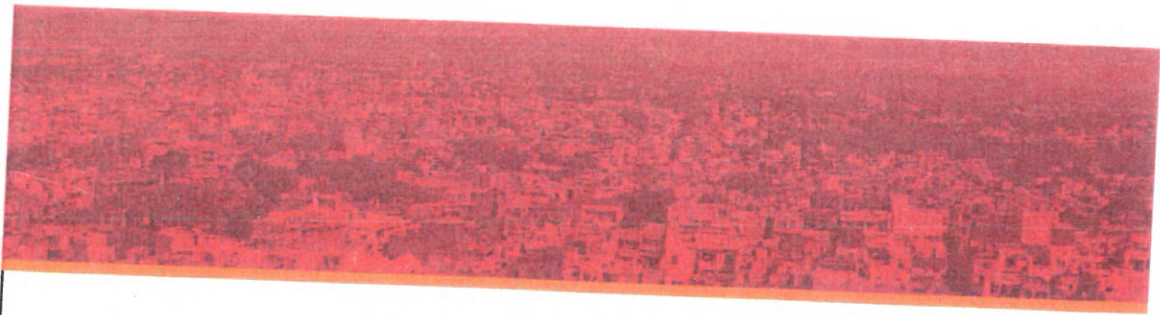


Cities will need to raise the awareness of city stakeholders since improved sanitation can ensure improved public health and environmental outcomes only if considerable changes in behavior and practice take place across the spectrum of society.

#### 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.





- 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 Performances:* 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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