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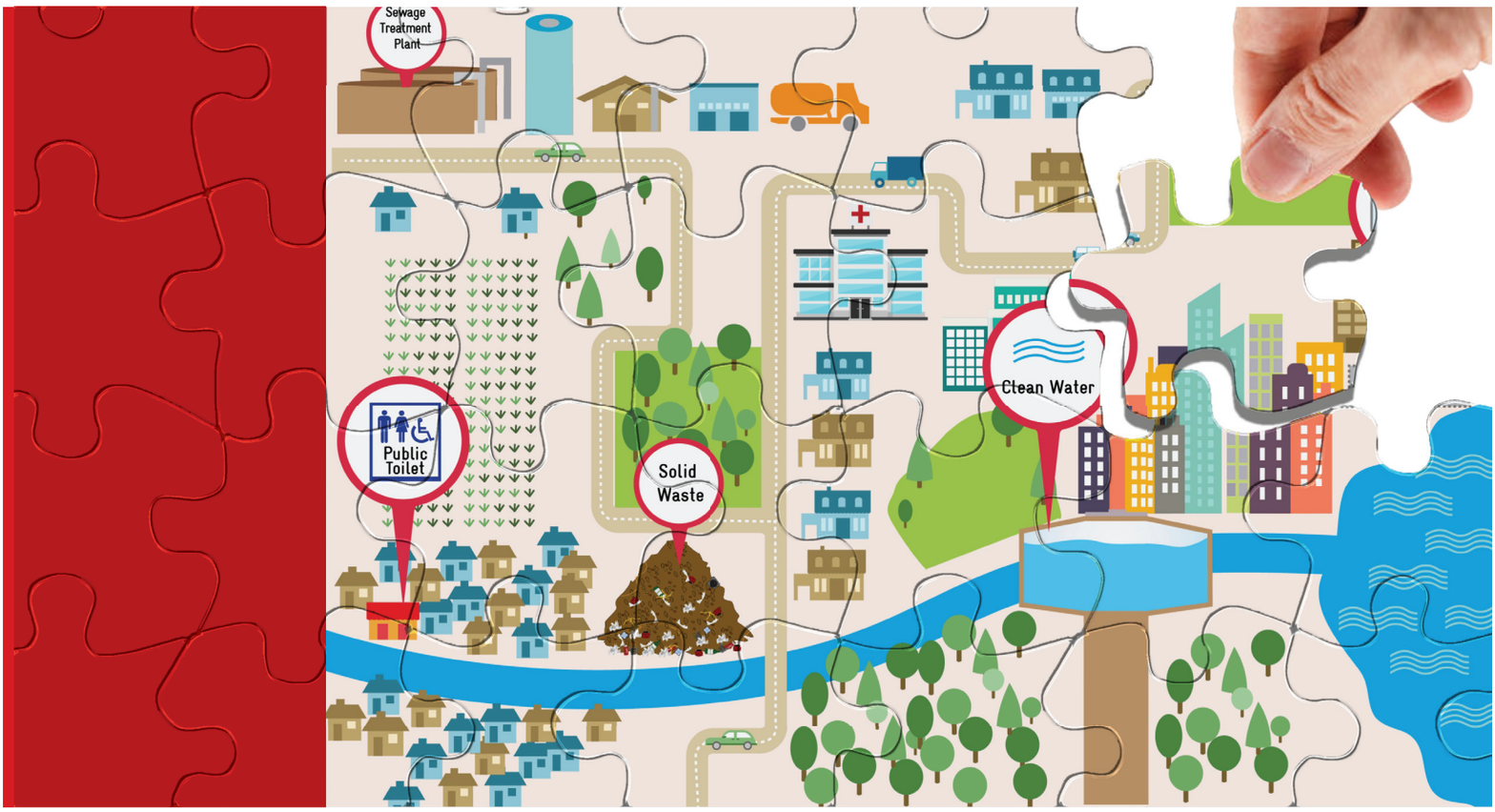

Preparation for City Sanitation Plan:
A Toolkit

About GIZ India

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is owned by the German Government and works in the field of international cooperation for sustainable development. GIZ is also engaged in international education work around the globe and currently operates in more than 130 countries worldwide.

Germany has been cooperating with India by providing expertise through the organisations now forming GIZ, for more than 50 years. To address India's priority of sustainable and inclusive growth, GIZ has been implementing efforts along with the partners in India on the Sustainable Urban and Industrial Development; among others.

Support to National Urban Sanitation Policy (SNUSP) Project – II, as part of Indo-German Co-operation, supports Indian government in implementation of its sanitation improvement schemes and missions such as National Urban Sanitation Policy (NUSP), Swachh Bharat Mission (Clean India Mission) and Atal Mission for Rejuvenation and Urban Transformation (AMRUT). The objective of the project is to support Indian government in making all Indian cities and towns totally sanitised, healthy and livable and ensuring sustainable good of public health and environmental with special focus on the urban poor and women.

Foreword

Urbanisation is taking place at a fast rate in India. Population residing in urban areas in India has increased from 11.4% (1901 census) to 30% (2011 census) and is projected to reach nearly fifty per cent of India's population in the coming decades. This increase in population poses a challenge for the urban development and provision of basic services. Major components of infrastructure and services, such as water supply, waste water management and solid waste management systems, have not been able to keep pace with the needs of the rising urban population.

With the aim to improve the sanitation and solid waste management situation in India, Ministry for Urban Development (MoUD) launched the National Urban Sanitation Policy (NUSP), a comprehensive policy framework for municipal sanitation systems facilitating their improvement.

In 2014, the central government reinforced its commitment by launching the Swachh Bharat Mission (Clean India Mission). The launch of Swachh Bharat Mission (Urban), prioritised the sanitation sector and brought the focus of the nation on provision of toilets and proper management of Municipal Solid Waste (MSW) in all 4,041 urban areas of the country. The ministry has also launched Smart Cities and Atal Mission for Rejuvenation Urban Transformations (AMRUT) Missions which aim at improving service delivery through improved urban planning including sanitation.

These programmes requires holistic and city-wide planning and monitoring for better implementation of projects. City Sanitation Plan (CSP) is a planning tool, which helps Urban Local Bodies and states to select feasible projects and prioritize investments; strategy and vision for the entire sanitation sector recognised by the National Urban Sanitation Policy in 2008, the Swachh Bharat Mission(SBM) and AMRUT. MoUD, recognised the importance of CSPs for achieving significant improvements in the urban sanitation sector. They made the preparation and implementation of CSP a priority in the Indo-German technical cooperation project "Support to the National Urban Sanitation Policy II (SNUSP II)" with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

For facilitating and strengthening this process, GIZ in cooperation with Centre for Science and Environment (CSE) has developed an innovative and unique training and handholding programme on 'Preparation of City Sanitation Plans' which makes an attempt to link trainings to achievement of concrete results on the ground and capacitating states and cities to become the agent of change in the sanitation sector. For the training sessions on Municipal Finances, GIZ has collaborated with Centre for Good Governance (CGG), who contributed with their vast experience in financial planning of Urban Local Bodies. The structure and modules of the

training were developed based on the experiences of GIZ – SNUSP during the first phase of the project (2011-2014) in preparing CSPs.

This publication "Preparing City Sanitation Plan: A Toolkit" presents all the steps that are essential for preparing a quality City Sanitation Plan. It is a participatory process which documents the status of the entire sanitation sector of the city and prepares a plan for improvement through consent and support of relevant stakeholders. Hence the CSP represents the city wide vision and strategy in the sector of sanitation based on its actual requirements of the city. This practical tool-kit guides the reader through each aspect of the CSP preparation in a kind of 'learning by doing' process with detailed explanations and helpful templates. For an overall understanding of the CSP and its development process I would suggest that you read the first of the manual series "Introducing City Sanitation Plans – A Practitioner' Manual". The first manual has been designed to sensitize practitioners (key ULB level officials, decision makers, city engineers etc.) to the importance and significance of the CSP as a holistic planning and decision-making tool.

Complementary to both manuals targeted at practitioners, such as city and state officials, technical professionals and elected representatives, GIZ has published two manuals for trainers "Introducing City Sanitation Plans – Trainer's Manual" and "Preparing City Sanitation Plan – Trainer's Manual". These manuals provide guidance to trainers and resource persons from public and private training and educational institutes as well as technical support units to educate Urban Local Bodies on City Sanitation Plans. It makes use of the Harvard Case Method, which is found more effective for well experienced practitioners.

All manuals were prepared and tested with our project partners in the states of Telangana, Kerala, Andhra Pradesh and Uttarakhand. I want to extend my appreciation to the Commissioner and Director Municipal Administration, Govt. of Telangana, Suchitwa Mission, Local Self Government Department, Govt. of Kerala, Director Municipal Administration, Govt. of Andhra Pradesh and Urban Development Directorate, Govt. of Uttarakhand for the valuable partnership and for taking the City Sanitation Plan forward.

I congratulate my team and partners for developing a strong document which will contribute to the larger goal of improving the sanitation sector at city level and as mentioned in NUSP All Indian cities and towns become totally sanitized, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.

Dirk Walther
Project Director
Support to the National Urban Sanitation Policy II

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INTRODUCTION TO CITY SANITATION PLAN

What is a City Sanitation Plan?

Well-functioning sanitation system in urban areas is one of the success factors for creating livable, sustainable and clean cities in India. The Government of India (GoI) has recognised this as one of their development priorities and showed their commitment by launching the Swachh Bharat Mission (SBM) in 2014.

The groundwork for this mission was already laid in 2008 with the formulation of the National Urban Sanitation Policy (NUSP). It laid out a vision for urban sanitation in India in a comprehensive and detailed manner. NUSP envisaged transforming all the towns and cities of India into 100% sanitised, healthy and livable spaces—ensuring sustained public health and improved environmental outcomes for all its citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and woman. The specific goals of NUSP included awareness generation and behavior change; open defecation free cities and integrated city wide sanitation.

Experiences from the sanitation sector indicate that interventions in cities fail because of a lack of a well-designed planning process and a city-wide and systemic perspective, partial data sets and insufficient focus on institutional, financial and social aspects of technology choices. The State Sanitation Strategy (SSS) and City Sanitation Plan (CSP) are two key planning tools which were introduced by NUSP in order to ensure structured planning for sustainable sanitation at state and city level respectively. The CSP is to be prepared by the Urban Local Body (ULB) and acts as a city-wide vision document for the sanitation sector. With sanitation being a major concern due to its health, socio-economic and environmental implications, CSP is a key document in setting the development vision of the city.

National support programmes for sanitation like SBM and other missions which are linked to urban development like Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and Smart Cities consider the CSP as the reference document for the planning processes. The CSP is considered to provide the necessary planning steps to reach to feasible projects, sector reforms, capacity development activities and awareness raising supported by SBM and AMRUT. The CSP integrates all relevant sectors of urban sanitation and allows therefore cities and states to make use of synergies of SBM, covering access to toilets and solid waste management and AMRUT, covering water supply, septage and sewerage management and storm water management. Furthermore an approved CSP can be a handy document when the city is approaching any external sources of finance.

The CSP details out the current status of the city, the needs and requirements to achieve the sanitation goals and the strategy to achieve these in a sustainable manner through short, medium and long term actions in a well collaborated approach engaging all stakeholders in the urban sanitation sector. While a long term planning period of about 30 years is considered for the vision, the CSP also includes short term actions for 3 years to achieve the sanitation goals of the city. These short, medium and long term measures are intended for the betterment of water supply, wastewater management, access to toilets, storm water management and solid

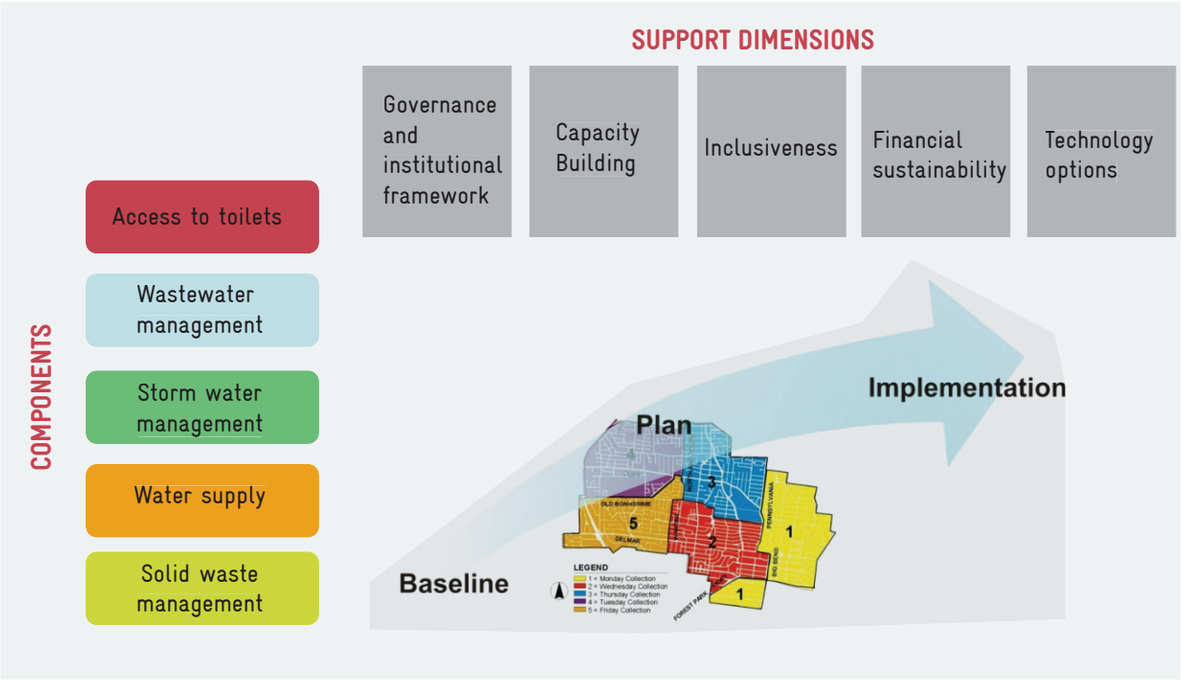
waste management in a city, in terms of technical, financial, institutional, awareness raising and capacity building initiatives. Hence, the CSP has to be understood as a key instrument for step-wise asset creation and performance improvement, helping today's and tomorrow's ULB officials to make informed decisions.

COMPONENTS OF A CSP

The CSP covers the baseline information about the city in all sectors related to sanitation and allows the ULB to analyse the sanitation condition of the city. It also sets the stage for the implementation activities needed for ensuring sustainability through simple steps of planning. The technical components covered under CSP are:

1) Access to toilets
2) Wastewater Management (including septage and sewage management)
3) Storm Water Management
4) Water Supply
5) Solid Waste Management

Figure 1: Components of CSP



The implementation activities in these technical components can be effective only through strengthening the ULB in various aspects like - Governance and Institutional framework, Inclusiveness, Capacity Building, and Financial Sustainability. Detailed baseline assessment, identification of gaps and key issues and prioritizing of implementable actions in all the technical components and the support pillars forms the major part of the CSP document (see Fig 1: Components of CSP). Overall CSP will detail out how to plan and deliver the sanitation outcomes of the city to ensure a well collaborated approach engaging all stakeholders in the urban sanitation sector and achieving the targets of SBM and AMRUT.

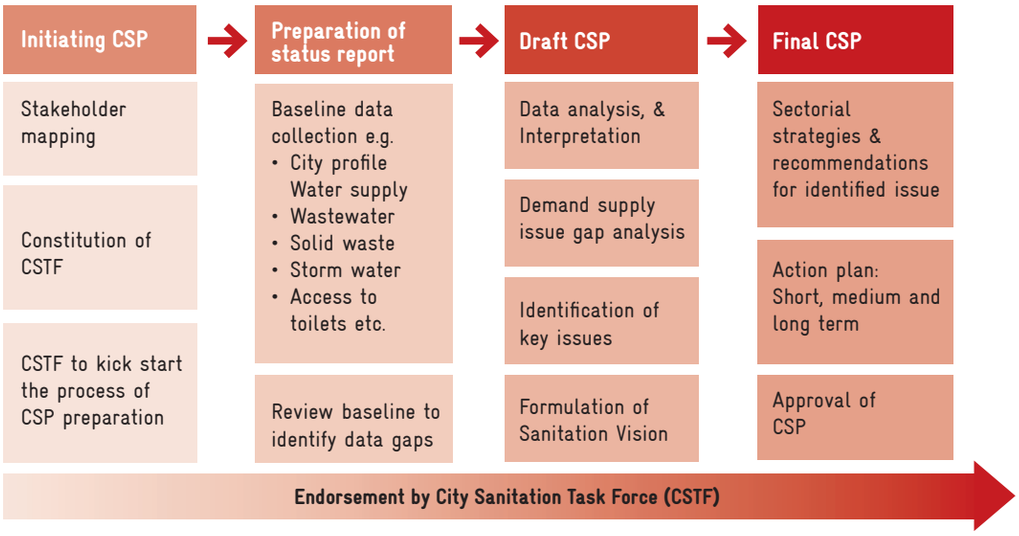
Table 1: Specific services to be considered in CSP

Services	Plan
Access to Toilets	Plan for ensuring 100% toilet coverage across the city and to all socio-economic groups through individual, community and public toilets
Wastewater Management	Plan for safe collection, conveyance, treatment and disposal or reuse of wastewater along with septage management strategies
Solid Waste Management	Plan for collection, management, treatment, safe handling and disposal of solid waste
Water Supply	Plan for stable and sustainable water supply across the city considering both quality and quantity of water supplied
Storm Water Management	Plan for separate and safe drainage and management of storm water

Steps in the CSP Preparation Process

The preparation of CSP is a stepwise process involving all relevant stakeholders from the sanitation sector. There are four key steps in the CSP preparation process that have been illustrated and discussed in the following section (see Fig. 2: Steps of CSP preparation).

Figure 2: Steps of CSP Preparation



STEP 1: INITIATING CSP

The CSP preparation process is initiated by the identification of stakeholders by the ULB in order to constitute thethe City Sanitation Task Force (CSTF). The CSTF, which is a multi-stakeholder body comprising of representatives from various agencies (ULB, PHED, NGO's, Private firms, end-users, civil society representatives etc.) sets the platform for stakeholder interactions which ensures the principal support for the plan . The key task of CSTF is to mobilize stakeholders and to increase the awareness about sanitation amongst the municipal agencies, government departments and importantly, the people of the city. Once constituted, the CSTF will initiate the CSP process preparation through its first meeting.

STEP 2: PREPARATION OF STATUS REPORT

The primary task in CSP preparation is the preparation of status report. The status report consists of necessary baseline information regarding the sanitation condition of the city. This report includes the basic information about the city like the city profile and demographics, spatial and cultural profiles, baseline information about technical sectors like access to toilets, water supply, solid waste, storm water and waste water. The report also entails basic information about the supporting factors like governance, municipal finance, capacity building, health and hygiene. After the collection of sector relevant data, a status report is prepared which can be reviewed and endorsed by the CSTF. The data gaps are also identified at this stage.

STEP 3: DRAFT CSP

The draft CSP is prepared based on the status report by thorough analysis and assessment of collected sanitation data of the city. Along with the analysis and interpretation of baseline data, the city has to assess its demand and supply gaps in the sanitation sector up to the ward or zonal levels depending on the data availability. The results of these steps will support in identification of the key issues. Issues hence identified need to be rationalised based on data rather than only on individual perceptions. The CSTF based on its understanding of these key issues and sanitation status is expected to formulate a sanitation vision for the city envisaged to be achieved over a period of 30 years. The analysis of data, identification of key issues and formulation of vision hence constitutes the draft CSP stage of the process.

STEP 4: FINAL CSP

Once the draft is accepted by the CSTF, the CSP is finalised by preparing the recommendations and an Action Plan. First the identified key issues are translated into goals. For achieving each goal the city is expected to prepare a strategy and specific actions. The actions need to be prioritised based on availability of resources, ownership of the ULB, urgency and others. Thus the actions are classified as short term, medium term and long term. The overall target of achieving the vision is to be considered at every stage of CSP formulation and implementation. The CSTF thereafter sends the CSP for approval to the municipal council.
The active involvement and endorsement of the document by the CSTF at every stage is important in ensuring acceptance and success of the prepared plan.

Roles and Responsibilities in the CSP Process

The City Sanitation Plan is an essential planning document for the ULB as its responsibilities rest with it. Within the ULB the document must be prepared with ample support and involvement of the administrative staff as well as the elected representatives. While the administrative staff from different departments is expected to be involved in documentation and analysis, the involvement and support of the elected council is required for each stage, such as data collection, identification of key issues and drafting of Action Plan. The formation of a heterogeneous group like CSTF as the focal stakeholder group is intended to ensure that the ULB gets all the required guidance and support. While the representation of other governmental departments and non-governmental organisations is ensured during the constitution of the CSTF, their inputs throughout the process also need to be taken on board. For most ULBs, it will be required that they communicate with selected state departments in charge of sanitation services. Their regional staff can be involved in the CSTF. Suggestions from the CSP should then be brought forward by the ULB to the states for including them in the Action Plans under AMRUT and SBM.

USING THIS MANUAL FOR CSP PREPARATION

The present manual is a hands-on tool kit for preparing a City Sanitation Plan. It guides the reader through each and every step of CSP preparation and provides examples wherever needed. The process depicted in this manual is in line with the requirements of the National Urban Sanitation Policy, Swachh Bharat Mission and AMRUT.

The chapter 1-4 are structured in the same way the final City Sanitation Plan should be structured, which should include the chapters of

1. City Sanitation Task Force
2. Status Report – Baseline data collection and analysis of technical sectors and support pillars
3. City-wide key issues and sanitation vision
4. Strategy Development, Action Plan, Cost Estimates and IEC/BCC

For further information a CD is available at the back of the manual including the template for City Sanitation Plan, ToRs for CSTF, Overview on existing sanitation standards and benchmarks in India and other guiding documents for facilitating CSP preparation.
All tables and templates provided in this manual are indicative and can be customized to the specific context of the respective cities.

1 FORMATION AND PROCEEDINGS WITH CITY SANITATION TASK FORCE

The acceptance of a development plan is highly dependent on the involvement of stakeholders in its preparation. The National Urban Sanitation Policy (NUSP) highlights **stakeholder mobilisation as significant supportive step towards 100% sanitised cities**. Therefore, as a first step for CSP preparation, elected representative and administrative departments relevant to the sector and groups with an interest in sanitation must be brought together and drawn into the planning process. According to the National Urban Sanitation Policy each city should constitute a multi-stakeholder platform called "City Sanitation Task Force (CSTF)" to steer the CSP preparation and implementation process.

This chapter will guide through organizing and managing of the CSTF to ensure engagement of all stakeholders. The first section "Stakeholder Analysis" guides the CSP preparation team to understand the relevance of each of the stakeholder and what strategies maybe taken for their involvement. In the subsequent chapter, the roles, tasks and formal operating protocols of the taskforce are detailed. Further this chapter looks at the common challenges which are faced by ULBs while mobilizing the CSTF during the entire process of CSP preparation.

1.1 Stakeholder Analysis

Stakeholders primarily comprise of citizens, public institutions, businesses and industries, civic organisations, professional organisations, training and educational institutions, and others with an interest in the development of the city.

To steer the process of engagement of stakeholders for CSP preparation in a structured manner, detailed understanding of stakeholders is important. For this purpose, a stakeholder analysis should be carried out. Stakeholder analysis is a process of systematically gathering and analyzing qualitative information to determine whose interests should be taken into account when developing and/or implementing a policy or program.

The following potentials stakeholder groups to be included into the CSTF:

- **Agencies directly responsible** for sanitation (sewerage, on-site sanitation, water supply, solid waste, drainage) including different divisions / departments of ULB, PHED, Parastatals, other state departments etc.
- **Agencies indirectly involved** or impacted by sanitation conditions (e.g. slum areas, civil society etc.).
- **NGOs** working on water and sanitation, urban development, slums, health, etc.
- **Large institutions** in the city (e.g. Cantonment Boards etc.).
- **Unions** of sanitary workers, "*safai karamcharis*", etc.
- **Eminent persons** and practitioners in civic affairs, health, urban poverty, etc.
- **Private firms /** contractors working in sanitation sector (e.g. garbage collectors, septic tank de-sludging firms etc.).
- **Educational and cultural institutions.**
- **Other significant / interested stakeholder.**

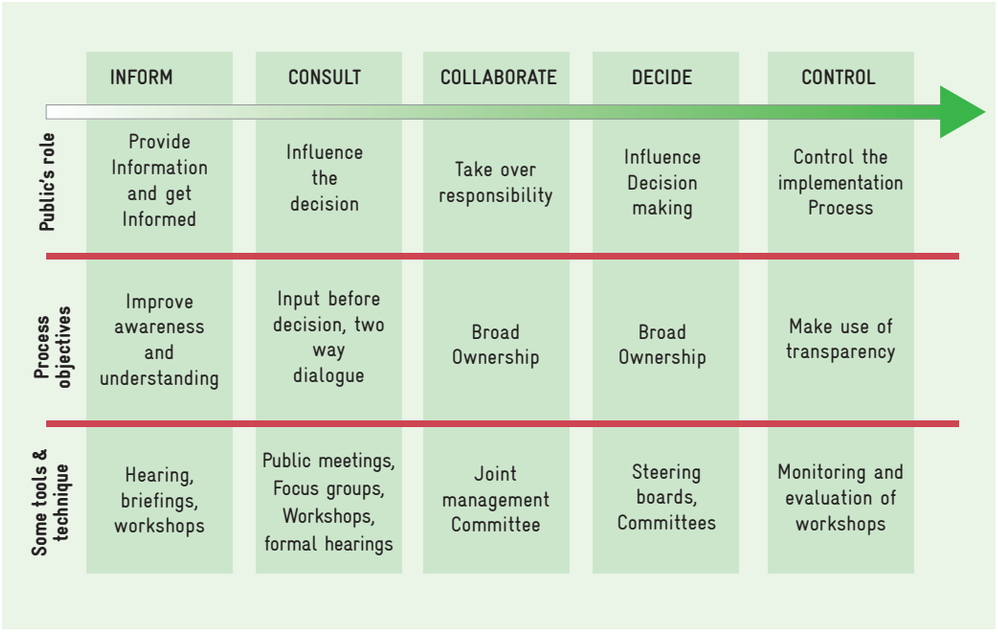
The stakeholders as mentioned might be concerned in different aspects like:

- They might hold important official responsibilities (service provision, regulation / planning, support, control) like substantially involved departments of ULB.
- They might keep important information such as offices of statistics and planning.
- They could keep potentials to contribute to solid solutions in urban sanitation such as NGOs or educational institutions.
- They might represent affected communities of existing poor sanitation conditions such as slum dwellers, CSOs etc.

As illustrated in the Fig. 3 below, different stakeholders can be involved in various ways. For example, media representatives can be taken in a role where they would be updated about the activities so that the general public is informed and aware of the activities; an external agency like an NGO active in the sanitation sector can be taken in a consultative role in the planning process.

Generally, all stakeholders must be informed about the plans and decisions. By improving awareness and understanding of the stakeholders, the overall efficiency of the activities can be improved. Public hearings, workshops etc. can be conducted to provide information to the stakeholders. Similarly, considering a specific target group where some implementation is planned, it is important that they are given a collaborative role in order to take over the responsibility and broad ownership of the project.

Figure 3: Stakeholder participation matrix



Such an analysis of the stakeholders as the first step of CSP is done not only to ensure that all the relevant resources of the city are brought on board, but also for proper representation of underserved and unorganised sectors

Steps for conducting a stakeholder analysis

STEP 1

List the names of all the stakeholders related to the sanitation sector in the city in the left most column of Table 2. The listing should be detailed and explicit so that it covers the entire set of relevant actors specific for city. Further, answering the following questions will ensure that the list is complete.

- Who might benefit or be negatively affected by the planned activities (e.g. groups such as the urban poor, policy proponents such as environmental NGOs)?
- Who should be included because of their relevant formal position (e.g. government authority)?
- Who should be included because they have control over relevant resources (e.g. financial resources, technical expertise and access to social groups)?

STEP 2

As a second step, the following question needs to be answered with respect to each stakeholder and filled into the second column of the table:

a. Why / how are the respective group / actors concerned?

Answering this question is intended to analyse the stakeholders in detail. The current role of the actor in the city specific to the sector must be identified. The relevance of these activities in the sanitation of the city and how it influences the overall city is to be understood while detailing this.

b. What role of actor / stakeholder would be appropriate (for reference refer to Fig. 3 above):

While deciding the roles refer to the previous section to understand the objectives served by the stakeholder interactions and the probable modes of operation. It is important that this definition of involvement must be associated with process of preparation of the plan. When the plan gets into implementation stage the stakeholders can assume different roles depending on the type of implementation.

Table 2: Stakeholder analysis

Actor / stakeholder in your city	Why / how is the actor / stakeholder concerned?	What role for the actor / stakeholder would be appropriate? • Get informed; • Get consulted; • Collaborate; • Co-decide; • Control implementation of decisions

1.2 Roles & Responsibilities of CSTF

Stakeholders identified and analysed in the previous section can be picked up for the constitution of CSTF. Being a multi-stakeholder platform comprising of representatives from different sectors of society, the CSTF will have the primary task of validating and approving the CSP at its various stages of preparation.

The first step in making the cities 100% sanitised is to increase the awareness about sanitation amongst the municipal and government agencies and most importantly, amongst the people of the city which will be done through the CSTF.

The CSTF is a non-statutory body. However, it is recommended that a council resolution be passed recognizing the CSTF as body involved in achieving the sanitation goals of the city. If any other similar committee (at city level) is existing, it can be adapted to serve as the CSTF.

1.2.1 RESPONSIBILITIES OF THE CSTF

Once the CSTF is formulated, a nodal officer is appointed for coordinating the CSP process. Next step is to define the roles and responsibilities that each CSTF's member would have and the work agenda. A council resolution needs to be passed and ideally a public notification is released.

The City Sanitation Task Force will have the following overall responsibilities:

- Providing overall guidance to the ULB
- Approving progress reports provided by the ULB
- Approving of CSP (prepared by ULB) after consultation with the citizens
- Supervise progress regularly
- Issue briefing about the progress to media & state government
- Launch IEC activities on CSP
- Generating awareness amongst city's citizens and stakeholders
- Recommend to the ULB fixing of responsibilities for city-wide sanitation on a permanent basis

The CSTF should conduct various meetings during the process of preparation of the CSP. They will serve as a monitoring and backstopping entity, providing information during the baseline data collection (during preparation of status report), revising and approving the status reports and the final CSP (for information and planning) and defining operational frameworks for the implementation of the CSP.

1.2.2 TASKS OF THE CSTF

The CSTF is entrusted with the following tasks during the CSP preparation process.

a. **Coordination with the agency in charge of preparing CSP (ULB)**: The CSTF should support the agency preparing the CSP (preferably the ULB) in coordinating the preparation process and reaching to sound results. ULB will be responsible for
   - Preparation of CSP (under the steering of CSTF)
   - Implementation of CSP
   - Day-to-day coordination, management and implementation of the sanitation programs on a city-wide basis

b. **Awareness Generation**: The CSTF will create the awareness amongst the city's citizens and stakeholders about the concept, need, relevance and the process followed in the CSP. The IEC campaign (see chapter 4.4) should be developed by the CSTF. It will need to issue briefings to the press/media and state government about progress and outcome of the plan.

c. **Data Collection support:** The CSTF will support the planning process and facilitate/ enable the collection of all the relevant and required information/data by the ULB relating to city demographics, infrastructure (water supply and sanitation in the city) and other related areas.

d. **Planning support and supervise progress:** CSTF should undertake regular meetings to provide overall guidance to the CSP and monitor progress of the work undertaken. Hold at least three meetings coinciding with the following milestones:
   - Inception meeting to kick start the planning process
   - Presentation and submission of the Status Report
   - Formulation a city-wide vision for sanitation and drafting the Action Plan
   - Presentation and submission of the Draft CSP Report

e. **Provide valuable inputs:** The CSTF will provide an overview of the local context, practical issues and concerned areas that need to be taken care of during the planning process and provide feedback. They will feed back the results from the process into their respective target groups. The task force will have a special role in ensuring the integration of the planning tools and programmes from other sectors relevant to the components of CSP (City Mobility Plan, , Service Level Improvement Plans, ODF strategy, Solid Waste Management Strategy, etc.).

f. **Consensus on Plans:** The CSTF will approve the prepared CSP after due consultations with citizens.

The CSP process doesn't end with the formulation of the plan. Especially for the implementation of the CSP Action Plan the CSTF must play a major role. Post CSP, the CSTF has the following tasks for the coordination of implementation:

a. **Implementation Management:** The CSTF would oversee and coordinate implementation of the measures suggested in the CSP. It would help in assuring quality procedures, fairness and provide a focus on deliverables. The CSTF will ensure that the vulnerable groups and areas are targeted.

b. **Monitoring and Evaluation of status:** TheCSTF will monitor the implementation of the CSP against the Action Plan and Milestones based on the M&E framework to be suggested by the CSTF.

c. **Setting Legal and Institutional responsibilities:** The CSTF will recommend the assigning of permanent responsibilities for city-wide sanitation to the ULB. The CSTF will examine all relevant municipal and local legislations to appropriateness, redundancies, and improvements to support the overall goal of improved sanitation.

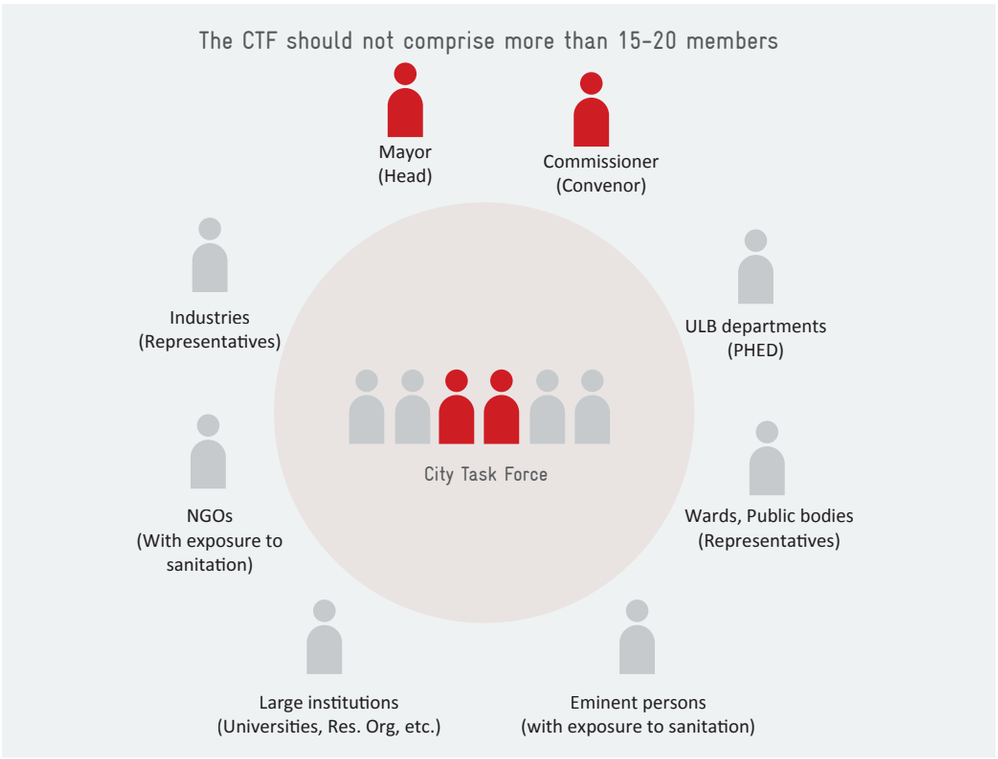
d. **Capacity Building and Training:** The CSTF will take part in the Capacity Building and Training exercises that will be conducted by various agencies at the national and state level and will also assist the ULB in identifying relevant target groups for the same.

1.2.3 COMPOSITION OF THE CSTF

According to the National Urban Sanitation Policy each city should constitute a multi-stakeholder platform comprising different representatives such as (MoUD, 2008):

- Mayor of the ULB, who should head the CSTF. Municipal Commissioner, who will act as the Convener.
- Representatives from divisions and departments of the ULBs directly responsible for sanitation including water supply on-site sanitation, sewerage, solid waste, drainage, etc.
- Representatives from revenue, accounts or finance department
- Owners of shops and establishments and educational and cultural institutions.
- Educational and cultural institutions (Universities, schools, etc.).
- Representatives of other large institutions in the city (e.g. Cantonment Boards, Government of India or State Government Enterprise campuses, etc.).

Figure 4: Members of CSTF



- NGOs working on water and sanitation, urban development and slums, health and environment.
- Representatives of unions of safai karamcharis, sewerage sanitary workers, recycling agents, kabaris, etc.
- Resident welfare organisations, community, Slum-Level Federations, Self Help Groups and other community based organisations
- Representatives from private firms and contractors formally or informally working in the sanitation sector.
- At least one organisation or expert working on women's issues needs to be included in CSTF to assure the inclusion of women's needs in the sanitation sector.
- Media representative
- Any other significant or interested stakeholders

The CSTF should not comprise more than 15-20 members. In small towns it can be even a group of 5-7 members.

1.2.4 STANDARD OPERATING PROCEDURE (INDICATIVE) FOR CSTF

A. APPOINTMENT OF NODAL OFFICER

CSTF should meet frequently in initial stages of CSP preparation to monitor and guide planning process. The city will appoint a nodal officer to organize and coordinate CSTF meetings. S/He will be responsible for spearheading the CSP process.

B. CSTF MEETINGS DESIGN AND PROCEDURE

- ULB will send invitation letters (with agenda) to all CSTF members at least one week prior to CSTF meetings serving as an opportunity for sharing knowledge and communicate expectations.
- ULB will organize a set of meetings with CSTF during the process of preparation of CSP. During these meetings, ULB will brief about the work progress and key concerns raised in the process.
- Minutes of meeting will be circulated clearly outlining summary of discussions, decisions taken and action points with responsibility allocation within a week to the CSTF members. These workshops help to communicate the guiding principles that should be kept in mind to come up with a CSP in line with the interests of the stakeholders and that also could present feasible solutions for the problems.

First CSTF meeting will be organised with the identified stakeholders to take a formal decision to work together in line with the sanitation goals of the city. Guided by the ULB, the groups will develop their vision of the city in a given period of time, describing the aspirations of all different stakeholders. These kinds of participation and consultation exercises would allow directing the actions based on the real needs and what the stakeholder would expect from outcomes.

C. DOCUMENTING CSTF ACTIVITIES IN THE CSP

CSTF and its activities must be represented well in the documentation of the CSP. The validity of the document and its participatory nature is reliant on this. Hence the CSP must have a section on detailing the composition and the activities done by the CSTF. The members of the CSTF have to be listed in the document along with the designations held. The proceedings of the CSTF meetings, minutes of meetings and pictures from the meetings have to be attached as an annexure to the CSP document.

All proceedings with CSTF such as the council resolution, minutes of CSTF meetings, documentation of any CSTF decisions, additional activities of CSTF and even photographs must be added to the CSP.

1.3 Challenges for CSTF Formation and involvement in the process

The preparation of CSP is a process primarily driven by the CSTF. Often, activating and keeping the interest of the CSTF itself is a tedious task for the ULB. However, an active CSTF can make sure that the process runs smoothly and a quality CSP is prepared. Few of the major hurdles in managing CSTF are listed below:

- ## SELECTION OF CSTF MEMBERS

  This is a key task in the entire CSP process. While all relevant stakeholders must be involved, it has to be ensured that the designated representatives from the departments and groups have enough authority to contribute to the discussions. Often there are also some key door-openers within the city that can help in accessing certain groups or departments which are not easily approachable. Working together with them can help in improving the success of the initiatives.

- ## ACTIVATING CSTF

  In some cities there is an existing consensus about the need of improved sanitation. In other cases there has to be a proper awareness generation in order to generate interest in the nominated CSTF members to come together for the cause. The ULB has to make use of the support from media and other forms of communications to generate interest within the CSTF. Along with the usual procedures followed while organizing meetings, CSTF has to be given required publicity. There has to be additional efforts taken by the ULB to ensure the non-participative stakeholders are brought into the discussions as well.

- ## POLITICAL BACKUP

  The CSTF has to be formed as an official body with sufficient political backing from the council through a resolution. A detailed session on CSP has to be organised for sensitizing the council, administrative departments and other CSTF members about the CSP.

- ## ENSURING PARTICIPATION

  It is often observed that the turn-out for initial meetings of the CSTF is low. It demands a constant patient effort organizing further meetings with additional efforts to pursue stakeholders to attend the meeting and actively participate. The added value for each stakeholder must be spelled out. It should aim at bringing forward the participation of all the members. Such strategies can also be used to proactively involve the stakeholders who are not participating enough.

• CONSTRUCTIVE DISCUSSIONS & EFFICIENT MEETINGS

While preparing the meetings and workshops, the ULB has to structure and plan the meetings properly to ensure that the outcome of the activities are useful for the CSP preparation process. This can be done through a structured agenda for the meeting wherein activities are included such that the CSTF members get to add their inputs on data collection, analysis and recommendations during the meeting. Proper moderation of all the meetings will help in ensuring fruitful discussions.

While some of common challenges are listed here, there can be others which are quite context specific. Innovative means for engaging with the CSTF by using mass media, social networks, etc. for increasing visibility, ease of communications and active participation is encouraged.

CASE EXAMPLE: CSTF SHIMLA

City Sanitation Task Force (CSTF) headed by the Commissioner was constituted to support the various processes related to the public toilets management under the CSP implementation. Some of the salient features of the CSTF have been:

- Awareness raising and stakeholder consultations succeeded in bringing MC Shimla executive staff and council members from the three ruling parties together on one table to jointly work towards the improvement of sanitation in the city.
- The Sanitation Tasks Force's members included the Commissioner, Assistant Commissioner, Chief Health Officer, Water Supply Engineer, Project Coordinator, EU Project, JNNURM Project Cell Representative, GIZ Technical Expert, as well as the Mayor, Deputy Mayor and interested council members on for them relevant subjects.
- The core group's role is to support the process of developing various tools and instruments, inter-departmental coordination and acceptance of acknowledgement technical advice provided by GIZ.
- The decisions taken in the eight core group meetings since June 2014 has been forwarded to city council for approval and implementation.

Key successes of the CSTF have been:

1) single point of contact for discussions and decision making to support quick implementation;
2) fast track dissemination of information / clearances / multiple processes managed by the city;
3) inter-departmental knowledge sharing for incorporation and aligning of efforts;
4) a common technical decision point for obtaining council approvals.

2 COLLECTION OF BASELINE DATA AND GAP ANALYSIS

A CSP is a strategic plan for citywide sanitation sector development. A CSP basically comprises of baseline information, key issues and recommendations related to sanitation and sanitation related services in the city. For identification of key issues and formulation of recommendations, various standards / benchmarks (CPHEEO Manual, IS codes, Service Level Benchmarks, Best Practices and etc.) need to be referred.

This chapter gives an overview about the type of data that needs to be collected for conducting baseline data collection. The chapter first introduces key concepts like city profiling, population projection, methods for analysis of data collected etc. The chapter then details what kind of data needs to be collected for every technical sector and support pillar identified for the CSP process. Consequently, the chapter also describes how to analyse selected aspects of the collected data by comparing it with standards and benchmarks and further discusses about identification of gaps and issues for each technical sector and support pillar. The chapter is structured in the same way as the final CSP document should be structured.

2.1 How to collect your data?

The City Sanitation Plan captures the status of the sanitation sector in the city through detailed documentation of baseline information. Baseline data will not only help in understanding the system but also provides information to identify gaps in different services. It also functions as the base information for the overall planning and forecasting of requirements of the city. Further, analysis of the baseline information helps the city to understand the needs of the sector and where to focus the activities. Since the baseline data collected from various sources forms the basis in informed decision making, the quality and quantity of data collected has a very high impact in the effectiveness of the CSP.

Sanitation planning relies strongly on the use of data collected for census, technical documents like DPRs and other planning reports like CDP or Master Plans. However, data often has to be drawn from different sources and departments, which make the harmonisation of definitions, classifications and reporting requirements an important issue. While selecting the data sources, it has to be ensured that the data sources are accepted by the government and the data is updated to provide a clear picture of the current status.

City Sanitation Plan can be developed only using secondary data. Emerging data gaps should be highlighted and actions to fill these gaps can form part of the CSP Action Plan. Primary data collection during CSP Preparation is only recommended if sufficient time and manpower is available.

The role of ULBs in carrying out the baseline is to...

- identify the sources and contacts required to gather the necessary information;
- oversee, coordinate and, where possible, participate in the collection of information;
- provide facilities and resources for an efficient system to store information and enable access for interested members of the general public; and
- use CSTF and consultation meetings to encourage stakeholder participation.

In general, information for the baseline assessment can be obtained from a wide variety of sources and should roughly focus on the following categories of data:

A. Existing data: It is likely that a high proportion of data required is already available. Potential sources of the available data are as follows:

ADMINISTRATIVE RECORDS

SECONDARY DATA

Some key publications from the government, project documents are listed below which can be used to obtain the required data.

- Govt. of India Census and District Census Book
- National Sample Survey Organisation (NSSO) Data
- City Development Plan / Master Plan
- Service Level Improvement Plans, Swachh City Plant, AMRUT State Annual Action Plans
- DPRs for Water Supply, Sewerage including STPs, Storm water Drainage, SWM, Slum Development, Water bodies protection
- Constituency Development Plan
- Service Level Benchmarking
- Drawings from ULBs, Development Authorities, Town & Country Planning Dept.
- Survey of India Topo sheets, Satellite Images

B. Create' Data: When the existing data is not sufficient for the planning process, extra data shall be collected using alternative methods mentioned below:

OBSERVATION

INTERVIEWS

PRIMARY SURVEYS

For all data collection tasks, it is essential to ensure that sources are as reliable as possible. It is helpful to crosscheck sources (e.g. compare data from waste collection authorities with that from the disposal authority) and to double-check that the time period of the data is compatible (e.g. financial year, calendar year etc.).

2.2 How to analyse your data

Data analysis is an essential step in understanding the current sanitation situation and identifies the main issues persisting in the city. It involves detailed study and categorisation of the collected data in different technical and non-technical sectors. There can be various methods that can be followed while doing the data analysis. Apart from these there are other methods for carrying out specific analysis which will be discussed in the subchapters. A few general methods of doing a data analysis are listed below:

- **Comparison of key figures with standards or benchmark values**: This assessment method is applicable for areas of the sanitation system for which precise target figures are stipulated, e.g. through the Service Level Benchmarks. This includes figures such as per capita water supply, extent of scientific disposal of municipal solid waste or cost recovery of sanitation services. The method can precisely specify gaps from required levels of service provision.

- **Map-based identification of hot-spots:** Many sanitation challenges can be better understood when spatially showcased by maps. Data table based analyses, even if disaggregated to ward level, dont adequately indicate problem areas, which require special attention. Maps can visualize these gaps very precisely and in an illustrative manner.

- **Checklist-based assessments:** Checklists can be prepared to do specific performance assessment of aspects such as satisfactory functioning of operation and maintenance services, coordination among different services providers by the city or sustainability of financing the sanitation services. Checklist can be helpful in areas where not sufficient quantitative data is available. They also already provide suggestions on what could be done in the future.

- **SWOT Analysis:** SWOT analysis can be used to identify the Strengths, Weaknesses Opportunities and Threats of a sanitation sector or support pillar. In CSP the same can be used to evaluate the institutional capacities of the city, inclusiveness of sanitation services and identify the gaps / issues related to it.

Box 2.1: Service Level Benchmarks

Service Level Benchmarks (SLB) is an important tool to be considered while doing sectoral analysis. It has been established in four basic urban services – Water Supply, Sewage, Solid Waste Management (SWM) and Storm Water Drainage to analyse the performance of the ULB with respect to these services. It covers a comprehensive list of 28 performance indicators and its parameters and the benchmark to be achieved by the city. The SLBs are set up and institutionalised by the MoUD and utilised by the state departments in planning and policy making.

Each indicator has a designated scale of measurement (e.g.: zonal level, ward level, city wide) and a frequency of measurement. SLBs have to be regularly updated and reported to the state and central governments by the ULBs and can be used for city level planning. Hence SLBs can work as an important data source for CSP status report. Under AMRUT, the ULBs are expected to prepare Service Level Improvement Plans (SLIP) which details out different projects and their impact on improvement of the service levels of the city. Hence it contains key information on how the actions are planned in the city and what changes can be expected in the near future.

For more information:
http://moud.gov.in/policies/servicelevel

2.3 City Profile

The city profile should provide a detailed picture of the city. It should include the background of the city and its important features. Though this section does not cover specific information on water and sanitation condition of the city, the information provided gives the background and rationale for decision making.

The city profile includes the following information:

a. **Location:** Geographical location, administrative boundaries, number of wards, details on district and state along with the nature and importance of the city are mentioned in this section. Commercial, historical and cultural importance of the city is detailed here to understand about seasonality and floating population characteristics.

b. **Physical Data:** The geographical features, total municipal area, class of town terrain details, rainfall data, climate, soil characteristics, ground water table, water resources, etc. are described in this section. Flood prone areas, forests, lakes and protected areas should also be covered along with other information on environmental and climatic factors affecting the city.

c. **Demographic information**: Ward wise details of population including the density and area are covered in this section. Specific information about slums must be included in this section which can be useful in understanding the underserved areas of the city. Information about floating population must also be included.

d. **Land Use:** Land use pattern in the city is important in understanding the requirements in the area. Under this section, the different areas like open areas, slums, water bodies, commercial areas, markets, institutions (hospitals, schools, Government offices) important infrastructures and landmarks are to be identified and mapped.

e. **Existing planning documents:** Under this section the city provides a list with all existing planning documents like Master plan, City Development Plan, Swachh City Plan, Service Level Improvement Plan, etc.

The following table should be used in the CSP to document population data:

Table 3: Ward Data

Ward. No.	Name	Area (sq. km)	No. of House-holds	Population			Density (persons / sq.km)
				Total	Male	Female	

Table 4: Slum Data

Sr. No.	Slum Name	Loca-tion / Ward	Category (Noti-fied, Recognised, Identified)	Area (sq. km)	No. of House-holds	Population			Density (persons / (sq.km)
						Total	Male	Female	

Following maps should be provided:

- Maps depicting administrative boundaries, roads and railways, water bodies and important landmarks
- Map depicting the population density
- Map depicting the existing land use (residential, commercial, institutions, slums, green cover, open land etc.)

2.4 Population projection

An appropriate population projection of the city is important in planning any kind of infrastructure. Population projections are carried out during the preparation of different planning documents of the city like Master Plan, City Development Plan, etc. With reference to CSP these projections are used for multiple uses like design of water supply systems, solid waste management plants, etc.

The planning period of CSP is 30 years therefore population projections for this duration have to be made and used as a basis for the planning of services. Any new establishment or augmentation of a sanitation system needs to be designed taking into account the population size at the end of the design period.

Factors affecting changes in population are:

- increase due to births
- decrease due to deaths
- increase/ decrease due to migration
- increase due to annexation.

The present and past population record for the city can be obtained from the Census of India. For projection of future population, various methods described below can be used:

Table 5: Methods for population projection

	ARITHMETICAL INCREASE METHOD	GEOMETRIC INCREASE METHOD	INCREMENTAL INCREASE METHOD
Suitability	Suitable for large and old cities with considerable development. If it is used for small, average or comparatively new cities, it will give lower population estimate than actual value.	Suitable for a new industrial town at the beginning of development for first few decades since it gives higher values.	Suitable for an average size town under normal condition where the growth rate is found to be in increasing order.
Approach	The average increase in population per decade is calculated from the past census reports. This increase is added to the present population to find out the population of the next decade. Thus, it is assumed that the population is increasing at constant rate.	The percentage increase in population from decade to decade is assumed to remain constant. Geometric mean increase is used to find out the future increment in population.	This method is modification of arithmetical increase method. The increase in increment is considered for calculating future population. The incremental increase is determined for each decade from the past population and the average value is added to the present population along with the average rate of increase.
Calculation formula	dP/dt = C i.e., rate of change of population with respect to time is constant. Population after nth decade will be Pn= P + n.C (1) Where, Pn is the population after 'n' decades and 'P' is present population.	The population at the end of nth decade 'Pn' can be estimated as: Pn = P (1+ IG/100) n (2) Where, IG = geometric mean (%) P = Present population & N = no. of decades.	Population after nth decade is Pn = P+ n.X + {n (n+1)/2}.Y (3) Pn= Population after nth decade X = Average increase Y = Incremental increase.

Depending on the requirements and context, different methods can be selected with varying complexity. For detailed working and examples, documents like Population Forecasting[1] and A Guide to Global Population Projections[2] can be referred.

1 NPTEL IIT Kharagpur Web Courses; Population Forecasting; URL:http://nptel.ac.in/courses/105105048/M5L5.pdf
2 Demographic Research (2001); Volume 4, Article 8, Pages 203-288; URL: www.demographic-research.org/Volumes/Vol4/8/

2.5 Technical Sector 1: Water supply

BASELINE DATA REQUIREMENTS

In the CSP, the situation of the water supply in the city needs to be assessed through Baseline Data Collection. Data on water supply includes information on: 1) the source of water supply for the city, 2) the transport & distribution mechanism of water to households, 3) the area and population coverage of water supply, 4) the distribution of water between different settlements and types of user groups. This data also includes 5) the per capita water supply in slum as well as non-slum areas and 6) the duration for with different areas in the city might receive water.

Following information on water supply needs to be compiled in the CSP:

1. ORGANISATION	☐ Organisational structure is important in overall understanding of water supply as a function within the city. For this, a short description on the departments responsible for planning, asset creation, O&M, cost recovery & regulation is to be added in this section.
2. SOURCES OF WATER SUPPLY	☐ Ground water ☐ Surface water ☐ Tankers ☐ Quantities from each type (MLD or in percentage)
3. TREATMENT & DISTRIBUTION	☐ Pipe network (length, coverage) ☐ Household covered by piped water (number, in percentage) ☐ Metered / unmetered (in percentage) ☐ Public taps ☐ Treatment plant capacity (MLD) ☐ Elevated Storage Reservoir (capacity, usage) ☐ Per capita supply (lit/day), Duration of water supply (hrs / day)
4. O&M	☐ Collection efficiency (in percentage) ☐ Complaint redressal system available (yes/no)

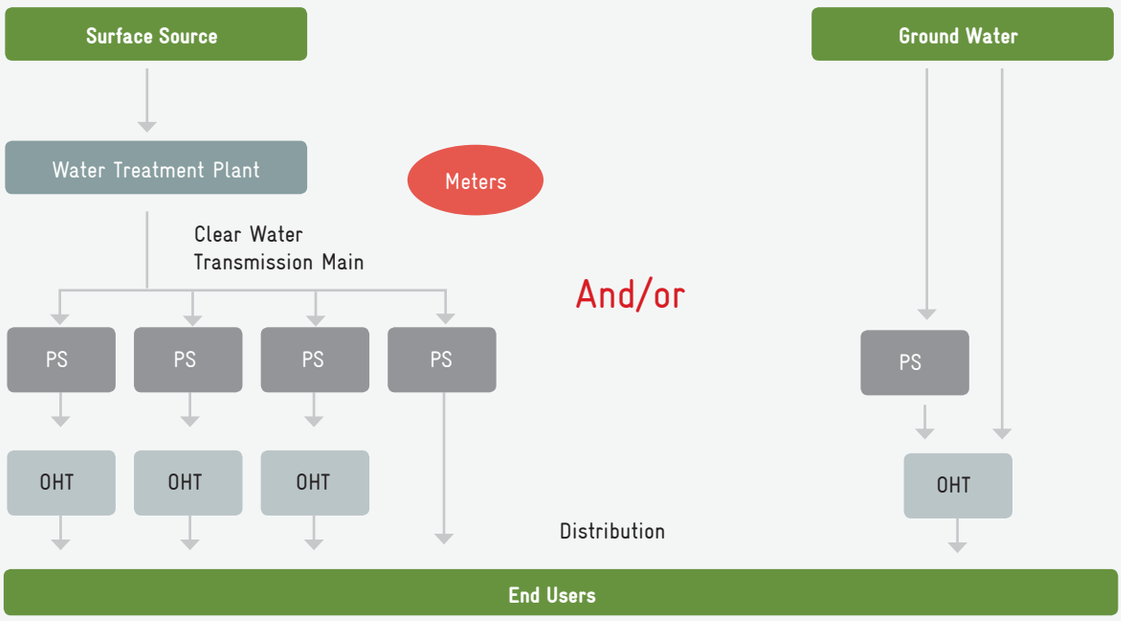
5. MAPS/SPATIAL INFORMATION	☐ Mapping of water sources for different parts of the city like piped system, tankers, etc. ☐ Mapping of Treatment system, Storage structures and Distribution network ☐ Mapping of areas without adequate supply
6. FINANCIAL INFORMATION ON WATER SUPPLY	☐ Water connection charges collected (Rs.) – one time ☐ Water user charges (Rs.) – monthly, Cost recovery & Collection efficiency
7. PROPOSED PROJECTS/ PROJECTS UNDER CONSTRUCTION	☐ Type of project ☐ Supply capacity or coverage after completion (households, in percentage)

Prior to data collection, the existing structure of water supply management in the city has to be understood by the team responsible for CSP preparation. The information related to this may be available with State Parastatals or Waste supply & Sewerage boards which vary for different states. Hence utmost care must be taken to bring these departments together for the planning process and constantly followed up for obtaining required data. Further to this there are many other secondary data sources like government census and ULB data surveys. For some specific information, primary surveys might be needed.

WATER SUPPLY LINE DIAGRAM

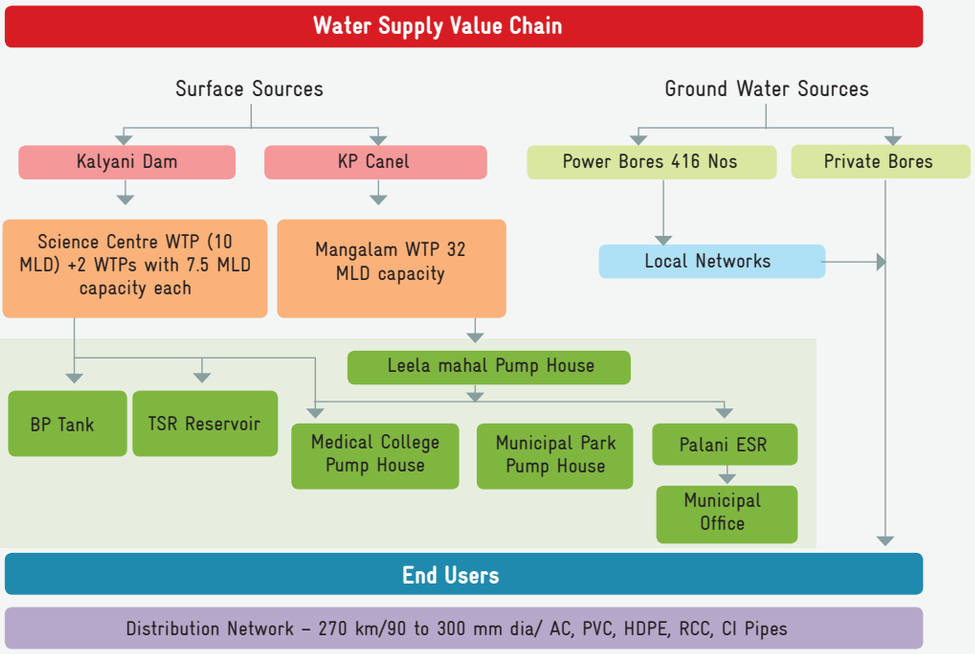
A water supply line diagram can be prepared out of the baseline information collected during the preparation of status report (See Fig. 5: Water Supply Line Diagram). This diagram will illustrate the overall water supply system of the city at a glance from source to end users. The following figure shows the water supply line diagram followed by an example from the city of Tirupati (see Fig. 6: Water Supply Line Diagram for Tirupati).

Figure 5: Water Supply Line Diagram



PS – Pumping Station; OHT – Overhead Tank

Figure 6: Water supply line diagram for Tirupati (Tirupati CSP, 2011)



ANALYSIS OF SELECTED ASPECTS

Water supply is not uniform for all households and areas in the city. The availability of water supply directly influences the choice of sanitation systems. Following 3 aspects of Water Supply should be analysed in the CSP to reach the main issues of this service.

A. WATER DEMAND FORECAST

Water demand forecast is required to estimate the demand of water in a given city in different time scenarios based on the population projections. While many cities fail to meet the current water supply demands, it is essential that when new infrastructure is planned, it must also be able to cover the future demands. Water demand forecasting helps to understand the future needs of city so that the existing operations may be upgraded or changed to optimize for the future expansions. There are different methods for water demand forecasting ranging from simple exponential method to simulation models.

The key information here is the population projections. As described in the earlier section, population projections can be for different planning horizons and hence water supply forecasting can also be prepared for such time periods viz. current requirement, demand after 5 years, 15 years and 30 years. Based on the accepted population projections, the city is expected to prepare its water demand forecasts for the 30 year time horizon within the CSP. An example of water demand forecast with the current population has been given below:

Table 6: Water Demand Forecasting

No.	Parameter	Data	Calculation
A	Current population of city with piped water supply	assume 1 lac	(A)
B	Current Treatment Capacity of WTP / Treated water supplied to the city	assume 10 MLD	(B)
C	Current technical / distribution losses	assume 20 %	(C)
D	Hence actual treated water supplied	8 MLD	(D=B-B*C)
E	Hence per capita water supply	approx. 80 lpcd	(E=D/A)
F	Water requirement of the city #	e.g. 100 lpcd	(F)
G	Hence current required treatment capacity / water demand	12.5 MLD	(G=F*A/(1-C))

 # Based on adequacy of raw water source and planned sanitation system

In this example the water requirement is set for 100 lpcd considering a city without 100% sewer system coverage. Every city can fix their target per capita supply depending on the infrastructure, local demands and available resources in line with existing guidelines. However, the approach must target the expected changes in the city due to other planned projects and policies. While this example takes up the current demand, forecasting for future supply can be calculated by substituting the population value (A) with the projected population for the specified year as per the example given below.

Table 7: Projection for Future Water Supply Requirements

No.	Parameter	Data	Calculation
A	Per capita water supply	assume 100 lpcd	(A)
B	Technical / distribution losses	assume 20%	(B)
C	Projected population after 5 years*	Assume 1.2 lac	(C)
D	Projected population after 15 years*	Assume 1.5 lac	(D)
E	Projected population after 30 years*	Assume 3 lac	(E)
F	Projected required water demand after 5 years	15 MLD	(F=A*C/(1-B))
G	Projected required water demand after 15 years	18.75 MLD	(G=A*D/(1-B))
H	Projected required water demand after 30 years	37.5 MLD	(H=A*E/(1-B))

** Projected population to be done as explained in 2.4 Population projection*

B. ZONAL LEVEL PIPED WATER SUPPLY

While information about water supply is often available in ward level formats, the infrastructure is not necessarily bound to the administrative boundaries of the city. Water supply distribution systems are planned depending on the geography and terrain of the city. To facilitate consolidated data collection and its representation, organisation of zonal level data is recommended. The zonal level water supply information can be consolidated by using the following table.

Table 8: Zonal level Water supply

Zone No.	Zone name	Reservoir Type	Capacity (KL)	Wards served	No. of HH	No. of connections	Water Quality	Per capita supply (Adequate, Inadequate)	Frequency of water supply	Hours of supply	Pressure (Adequate/ Inadequate)	Remarks

Zonal level data helps in understanding the difference in the service delivery across the city and identify the underserved areas. Hence while making decisions on location and allocation of funds, etc. zonal level data helps the city to make informed decisions. The data displayed in table above should be further illustrated by distribution maps.

C. NON-REVENUE WATER (NRW)

Non-Revenue Water comprises of:

1) Consumption which is authorised but not billed, such as public stand posts;
2) Apparent losses such as illegal water connections, water theft and metering inaccuracies; and
3) Real losses which are leakages in the transmission and distribution networks. This is the component in water supply which does not earn the utility any revenue. As most of these data cannot be quantified due to lack of monitoring mechanisms, NRW is computed as the difference between the total water produced (ex-treatment plant) and the total water for which revenue is collected expressed as a percentage of the total water produced

Financial sustainability is critical for all basic urban services.. Therefore, through a combination of user charges, fees and taxes, all operating costs may be recovered. Cost recovery should be estimated over a period of 5 years to understand the overall performance of the water supply systems.

The simplest approach to NRW is the calculation of cost recovery for which the following table can be used:

Table 9: Cost recovery in water supply services

Cost Recovery	Current year	Previous year	Previous year	Previous year	Previous year
Operating Expenses (Rs.)					
Operating Revenues (Rs.)					
Cost Recovery (%)					

For a water utility, it is not just enough to have an appropriate tariff structure that enables cost recovery but also efficient collection of revenues. It is also important that the revenues are collected in the same financial year, without allowing for dues to get accumulated as arrears.

STANDARDS AND BENCHMARKS

Relevant standards and benchmarks to be applied for data analysis in Water Supply are:

CPHEEO recommendations for standard per capita volume of water supply for any Indian city. In urban areas, where water is provided through public stand posts, 40 lpcd should be considered. These figures exclude "Unaccounted for Water (UFW)" which should be limited to 15%.

Table 10: Per capita water supply guidelines

No.	Classification of towns / cities	Recommended Maximum Water Supply Levels (lpcd)
1	Towns provided with piped water supply but without sewerage system	70
2	Cities provided with piped water supply where sewerage system is existing / contemplated	135
3	Metropolitan and Mega cities provided with piped water supply where sewerage system is existing / contemplated	150

Source: Manual on Water Supply and Treatment(CPHEEO), 1999

SERVICE LEVEL BENCHMARKS

MoUD Service Level Benchmarks for Water Supply

Indicator	Benchmark
Coverage of water supply connections	100%
Per capita supply of water	135 lpcd
Extent of metering of water connections	100%
Extent of non-revenue water (NRW)	20%
Continuity of water supply	24 hours
Quality of water supplied	100%
Efficiency in redressal of customer complaints	80%
Cost recovery in water supply services	100%
Efficiency in collection of water supply-related charges	90%

These benchmarks need to be taken into account while identifying the gaps of the existing water supply system in the city.

Under AMRUT three benchmarks were selected as main objectives to be reached in the sector of Water supply. These three are

- Coverage of Water Supply Connections
- Per Capita Supply of Water
- Quality of Water supplied

This data needs to be reported in the Service Level Improvement Plans of AMRUT and can be taken from the baseline data collection of CSP.

GAPS AND ISSUES

Based on the collected data and analysis done through comparison with the benchmarks and other standards, the city has to list down 3-5 key issues that the city is facing regarding water supply. Some examples of key issues are

- *Inadequate and inconsistent supply in certain parts of the city making the area dependent on private water suppliers*
- *Consistent reporting of high NRW and low cost recovery*

These issues need to have direct evidence being provided within the CSP through the collected data and analysis done.

2.6 Technical Sector 2: Access to Toilets

Ensuring access to toilets for the entire population is a target set by the Government of India through Swachh Bharat Mission. It is furthermore a key service level benchmark to be achieved by all the cities. It is expected that the CSP should contain a plan for ensuring 100% sanitation access to different socio-economic groups in the city.

BASELINE DATA REQUIREMENTS

Baseline data on Access to Toilets must cover both individual and household toilets as well as Community and Public toilets, along with the data on School Sanitation. It is expected that the ULB gathers such data at the ward level. Further, quantification of open defecation (O.D.) & open urination, if any, is also an essential feature of such a baseline data collection. The ULB is expected to collect data covering both existing toilet facilities as well those under implementation / planned / proposed (DPR) under various urban development schemes. It is required that maps showing location of Public / Community toilets have to be collected. If these maps are not available, efforts need to be taken to prepare it with exact information on numbers and location.

Following information on Access to Toilets needs to be compiled in the CSP:

1. OPEN DEFECATION AND URINATION	☐ Hot spots (locations with OD & open urination reported ☐ Number of households practicing OD ☐ Probable reasons & issues at each locations ☐ Other relevant information
2. INDIVIDUAL TOILETS	☐ No. (%) of Toilets ☐ Type of Toilets: pour flush, pit latrine, etc. ☐ Disposal arrangement: sewered, septic tank, etc.

3. PUBLIC AND COMMUNITY TOILETS (DISAGGREGATED FOR WOMEN, MEN AND DISABLED)	☐ No. of Households / population dependent ☐ No. of toilet blocks ☐ No. of toilets seats per block ☐ Disposal arrangement; sewered, septic tank, etc. ☐ O & M agency ☐ User charges & willingness to pay ☐ Functional status / Present condition ☐ Facilities provided: Water, Electricity, Cleanliness, etc. ☐ Design consideration for men & women ☐ Complaint redressal system
4. SCHOOL SANITATION:	☐ List of schools/colleges with number of students attending ☐ No. of toilets seats and urinals per school (Gender wise) ☐ Disposal arrangement; sewered, septic tank, etc. ☐ Functional status / Present condition ☐ Facilities provided: Water, Electricity, Cleanliness, etc.
5. PROPOSED TOILET BLOCKS (DPR)	☐ Number of seats, ☐ Coverage expected ☐ Locations
6. MAPS AND SPATIAL INFORMATION	☐ Maps of all related information like OD hotspots, public/ community toilet locations, proposed toilet blocks

Many of the data mentioned here can be sourced from the Census of India, Swachh City Plans, etc which has been made by for the city. As listed above the baseline must cover specific information about the toilets across the city and the physical location of the same.

ANALYSIS OF SELECTED ASPECTS

Compared to other pillars of CSP, access to toilets has fairly simple aspects to be analysed. Data in both tabular and spatial formats are helpful in understanding the needs and gaps in each area through detailed analysis.

The gap analysis for three aspects necessary to study Access of Toilets are detailed below:

A. ACCESS TO INDIVIDUAL HOUSEHOLD TOILETS

The ward wise population data and the toilet coverage can be presented in the tabular format as illustrated below. The tabular format helps in identifying wards where there is an existing need for toilets and the associated population which would be dependent on them. However there needs to be further analysis on the location and type of toilets through maps and secondary data.

Table 11: Ward wise toilet coverage

Ward	Total HHs	Urban poor HHs	No. of HHs			No of urban poor HHs			Remarks
			Having individual toilets	Dependent on community toilets	Practicing open defecation	Having individual toilets	Dependent on community toilets	Practicing open defecation	

The following figure illustrates areas where open defecation wards is practiced in a city. By analyzing this information and there can be further consensus on planning for toilet constructions. Slum details also provide added insights into this activity.

Figure 7: Open Defecation map

B. COMMUNITY/PUBLIC TOILET

The Swachh Bharat Mission (Urban) considers construction of Community Toilets for roughly 20% of the population practicing O.D. The ULB is expected to make a comprehensive study regarding existing community and public toilets across the city. It is important that these facilities have adequate provision for men, women and facilities for the disabled (e.g. ramp provision, braille signage, etc.) wherever necessary. The baseline data should be analysed for aspects like operation and maintenance, waste water management of the existing community toilets, privacy issues, evaluation and ownership of the toilets, cost recovery calculations etc. as noted in the table below:

Table 12: Ward wise data on Community Toilets

Sr. No.	Location / Ward	No. of Population dependent	No of Seats		No of Urinals		Waste water disposal arrangement (sewered, septic tank, open drains, etc.)	Functional status (water, lighting, etc)	Design consideration for men & women (privacy) – Yes / No	Is complaint redressal system available?	Owned & Maintained by	User charges (Rs.)	Cost Recovery (%)	Remarks
			Men	Women	Men	Women								

Table 13: Public Toilets

Sr. No.	Location / Ward	No. of Population dependent	No of Seats		No of Urinals		Waste water disposal arrangement (sewered, septic tank, open drains, etc.)	Functional status (water, lighting, etc)	Design consideration for men & women (privacy) – Yes / No	Is complaint redressal system available?	Owned & Maintained by	User charges (Rs.)	Cost Recovery (%)	Remarks
			Men	Women	Men	Women								

Separate tables have to be used for public toilets referring to the dependant floating population. Relating the spatial information of these toilets to the open defecation maps can give an indicative understanding on the functionality of toilet blocks. Apart from considering the lack of facilities, the analysis should also consider the socio-cultural and behavioral factors which need sensitisation of the community for reaching the required results.

STANDARDS AND BENCHMARKS

Swachh Bharat Mission (Urban) recommends following norms for identifying the Public and Community toilet requirement for a particular area:

Table 14: Population associated with one seat for sanitation infrastructure

	Men	Women	
Toilet seats	35 per seat	25 per seat	Community Toilets
Toilet seats	One per 100 persons up to 400 persons; For over 400 persons, add at the rate of one per 250 persons	Two for 100 persons up to 200 persons; over 200 persons, add at the rate of one per 100 persons or part thereof	Public Toilets
Urinals	One for 50 persons or part thereof	Nil	

Norms mentioned in National Building Rules, State Municipality building rules, etc. can also be used to identify the public toilet & community toilet requirement for a particular area

The Service Level Benchmarks for access to toilets are integrated in the one for Sewarage Management. Hence the indicators for the same are illustrated in the subsequent section. Apart from the documents mentioned at the beginning of this section, the Swachh Bharat Mission guidelines also provide comprehensive information on the standards based on which the gaps can be analysed.

Existing standards for quantity as well for quality (i.e. design and O&M) need to be compared to the existing situation for calculating the gaps. There are many standards and guidelines which can be referred for the comparison process such as:

- IS 1172: 1993, Code of Basic Requirements for Water supply, Drainage and Sanitation for toilet and septic tank construction parameters,
- Guidelines on Community Toilets, 1995, Ministry of Urban Affairs and Employment (GoI)
- Guidelines given under the Swachh Bharat Mission (Urban)
- National School Sanitation Manual, MoUD & MHRD (GoI) and Guidelines under the Swachh Bharat and Swachh Vidyalaya – A National Mission
- State / Local Municipal Building rules (For e.g. Andhra Pradesh Municipality Building Rules)

GAPS AND ISSUES

Based on the collected data and analysis done through comparison with the standards and needs, the city has to list down 3-5 key issues that the city is facing with respect to access to toilets. Some examples of key issues are:

- *Inadequate number of functional public toilets*
- *Improperly maintained community toilets*
- *Public toilets are not used by women because of safety concerns*

These issues need to have direct evidence being provided within the CSP through the collected data and analysis done.

2.7 Technical Sector 3: Wastewater Management

Wastewater management essentially involves two specific components – sewage and septage. Under this section planning related to both sewage and septage management will be covered. Both components refer to the environmental safety related to disposal of wastes.

BASELINE DATA REQUIREMENTS

Data collection on wastewater management is a challenging task for most cities. While the details of treatment systems are easily available, the generation, collection system and mapping are harder to find. However, this key information gives a strong insight in the wastewater management of the city and hence should be furnished as a part of the CSP.

Following information on Wastewater Management (Sewage and Septage) needs to be compiled in the CSP:

1. WASTEWATER GENERATION	☐ Wastewater generation (MLD) ☐ Generation per type (households, commercial, institutions)
2. WASTEWATER DISCHARGED (MLD, % AGE)	☐ into open drains ☐ into septic tanks ☐ into soak pits ☐ into decentralised wastewater treatment ☐ into sewerage systems (including details on sewer network & pumping system)
3. TREATMENT SYSTEMS	☐ Treatment technologies and design capacities (MLD) ☐ Current utilisation (MLD) ☐ Functional status ☐ Treatment efficiency ☐ Reuse (treated waste-water, sludge, bio-gas)
4. O&M	☐ Responsible agencies ☐ Methods of desludging & conveyance ☐ Existence of complaint redressal system
5. FINANCIAL INFORMATION	☐ User charges collected (Rs.) ☐ Coverage of O&M costs of Sewerage system (source, %age)
6. MAPS	☐ City map spatially shows various waste-water disposal arrangement existing in the city (eg. sewerage system, septic tanks, pit latrines, etc.) ☐ Sewer network

7. PROPOSED PROJECTS	☐ Type of project ☐ Services achieved after completion (coverage, treatment capacity, etc.)

The current wastewater management in most Indian cities can be classified into either offsite – which is dependent on underground sewer networks and large treatment plants or onsite – which are not served by piped sewer systems and is managed by on-site sanitation systems like septic tanks. Depending on the system different aspects need to be analysed. For cities having both the systems, the data collection and analysis needs to be done considering both sewage as well as septage management considering the extent of reach of each systems.

The estimation of wastewater generation is fundamental to designing wastewater collection, transport and treatment facilities. Generally, there exists very little metering and monitoring information of both sewage and septage generated in the city. Hence the quantification is carried out with reference to the water supply. This can be estimated on the basis of water consumption in a particular area, or can be calculated based on the population and usage patterns, or actual flow measurements. Wastewater generation is usually considered to be 80% of the water supplied.

Following tables display the information on wastewater generation in the city as well as ward-wise wastewater disposal arrangements at household level.

Table 15: Calculation of wastewater generation

No.	Parameter	Calculation	Remarks
1	Current population of city	assume 1 lac	(A)
2	Current per capita water supply per day	assume 100 lpcd	(B)
3	Total water supplied at household level	10 MLD	C=AxB
4	Total wastewater generated (80% of water supplied)*	8 MLD	(C/100)x80

** As per CPHEEO Manual, Wastewater generation is calculated at a minimum of 80 per cent of water supplied.*

Note: The participants should provide the table for the current year and the next 5, 10 and 15 years. For this use the population projects provided in Chapter 2.4 and assumptions for amount of water to be supplied after 5, 10 and 15 years.

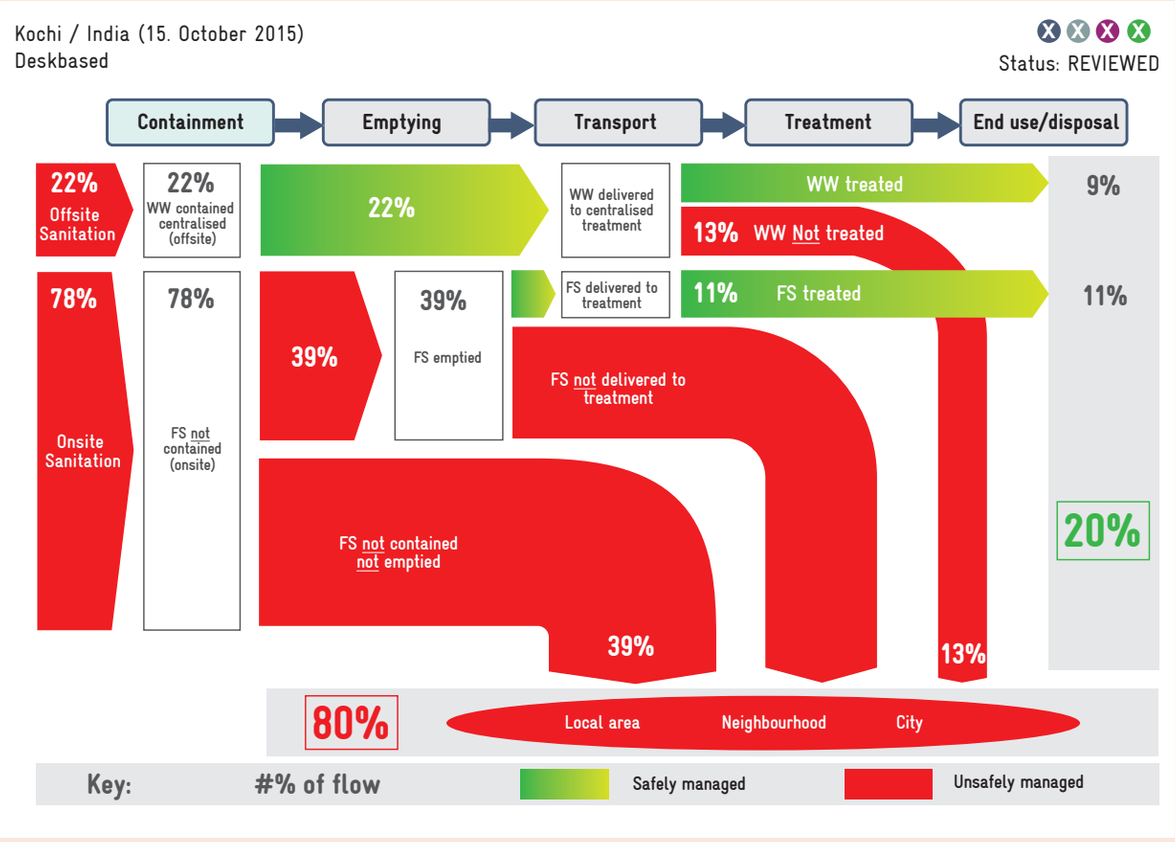
Table 16: Waste water disposal arrangements

Ward	Total No. of Households	Waste water disposal arrangement for toilets (No. of HHs)						No. of Insanitary latrines
		Sewerage system	Septic tank	Soak pit	Pit Latrines	Open drains	Other	
			Connected to soak pit	Connected to open drain				

Box 2.2: Sanitation Flow Diagram

Sanitation Flow Diagram, or SFD, is a tool which shows how excreta move along multiple pathways from containment to disposal or end-use. The SFD is an advocacy and decision-support tool that can be easily understood by decision makers, non-technical stakeholders and civil society. In a single picture it shows the status of the entire waste water management in the city through various streams. It also depicts what share of the wastewater is being discharged without treatment and cause a challenge to the city. It therefore has the potential to shift the focus of attention, money and activities towards more effective management of wastewater. A typical SFD is given in the figure below.

Figure 8: SFD for Kochi, Kerala (GIZ 2015)



Source: http://www.susana.org/_resources/documents/default/3-2303-7-1465206951.pdf

The green arrows indicate safely managed wastewater, while the red arrows indicate unsafely managed wastewater.

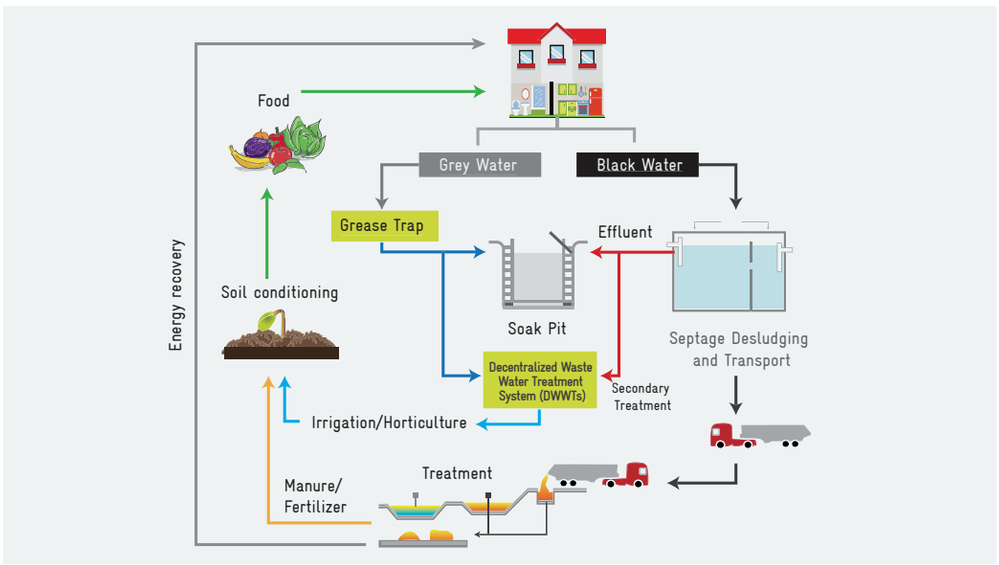
For more information on SFD, please check:
www.sfd.susana.org and www.downtoearth.org.in/coverage/urban-shit-53422

ANALYSIS OF SELECTED ASPECTS – SEPTAGE MANAGEMENT

A significant concept to be understood while analyzing on-site systems is the wastewater value chain. The wastewater value chain shows an ideal system for collection, conveyance, treatment and reuse of wastewater, if a centralised sewerage system is not available.

Source separation of black and grey water should be ensured in a building in case of absence of a piped sewer system; Black water should be directed to a septic tank while grey water, after oil and grease is removed through a trap should flow either into a soak pit or if available can be directed to onsite waste water treatment system. Similarly, the effluent (overflow) from the septic tank can be directed to the DWWT or discharged to a soak pit. The treated water can be used for irrigation purposes. The septage generated from the primary treatment (septic tank) is collected and disposed at a treatment plant by a desludging truck. The dried sludge from such plants is nutritious manure which can again be used in agriculture / horticulture or septage can be used for generation of biogas.

Figure 9: Waste water value chain



For analyzing the status of septage management in the city, checklists are the recommended method due to lack of data and benchmarks in this sector. The checklists would cover following items:

A. SEPTIC TANK

- Does the design of existing septic tanks (in the city) confirm to IS 2470 (Part 1):1985?
- Are the septic tanks two chambered and water tight?
- What is the physical condition & functional status of septic tanks? Are they damaged?
- Are the septic tanks of adequate size?
- Is grey water also entering into the septic tanks?
- Where are the septic tanks located with respect to the building? Are they accessible for cleaning?
- Is the design of septic tanks controlled through building / planning rules at ULB level?
- Where is the grey water and effluent (from septic tanks) disposed?

- Does any secondary treatment system (e.g. soak pit, dispersion trench, etc.) exist for disposal and treatment of effluent (from septic tanks) and grey water?
- Are the secondary treatment systems designed as per IS 2470 (Part 2): 1985?

B. SEPTAGE COLLECTION AND CONVEYANCE

- Is septage collection & conveyance activity completely or partially managed by the private operators? Are these private operators authorised and regulated?
- Is the desludging of septic tanks carried out every 2-3 years?
- Are number & type of vehicles deployed for septage collection & conveyance adequate?
- Does any complaint redressal system exist?
- Are any operational, health & safety standards followed during septage collection & conveyance activity?

C. SEPTAGE TREATMENT & DISPOSAL / REUSE

Herein the ULB identifies gaps & issues with respect to septage treatment and its safe disposal. The issues may include

- Is there a facility available for treatment of septage?
- If there is untreated septage being disposed, what ill effects are it causing?
- Can septage be co-treated at an existing Sewage Treatment Plant?
- Is untreated septage being reused without considering environmental and human health and safety?

D. REQUIREMENT OF SEPTAGE DESLUDGING TRUCKS

The following table calculates the number of trucks required by an area with a population of 1 lakh. Similar calculations can be carried out considering the projected population of the city to understand the need for vacuum trucks for the city to efficiently desludge septage.

Fig. 10: Trucks required for servicing (desludging) 1 lac population (model format)

S.No	Parameters	Calculation	Remarks
1	Nos. of people per household	5	(A)
2	Nos. of houses	20,000	(8=100,000/A)
3	Frequency of desludging, once every	2years	(C)
4	Nos. of houses to be desludged per annum	10,000	(D=B/Cl
5	Coverage with septic tank	100%	(E)
6	Average sludge volume per house, cu.m.	2.00	(f)
7	Volume to be desludged per annum, cu.m.	20,000	(G=D*E*f)
8	Nos. of working day per annum	300	(H)
9	Volume to be desludged, cu.mJday	66.67	(I=G/H)
10	Size of each desludging truck, cu.m.	2	(J)
11	Nos. of houses per trip	1	(K=Jif)
12	Nos. of trip per day (depends on the distance)	3	(l)
13	Volume desludged per truck per day, cu.m.	6	(M=J*L)
14	Nos. of truck required	11.11 say 11	(N=VM)
15	Standby(Range 10%-25%)	1.25	(0)
16	Total no. of trucks required	13.75 say 14	(P=NxO)

Depending on the city there may exist private and public operators which carry out this activity. They have to be taken into consideration and discussed with to understand the actual frequencies being followed in the area and the sizes of desludging trucks.

ANALYSIS OF SELECTED ASPECTS – SEWAGE MANAGEMENT

The specific aspects to be analysed for sewage management are the conveyance and treatment systems. Due to centralised management, the data for these are usually available with the respective departments. In case the city does not have a centralised sewer system, this section does not need to be filled out.

A. SEWER NETWORK & PUMPING STATIONS

The data about sewer network is important for understanding the coverage and actual volumes feeding the system. The following table can be used to document the sewer connections.

Table 17: Sewer Connections

Type of property	No. of properties connected directly to Sewer line	No. of properties connected to Sewer network via septic tanks
Residential		
Commercial		
Industrial		
Total		

B. SEWAGE TREATMENT PLANT (STP)

The information on STPs of the city can be collected in the following table to understand the gap between sewage generated and treated within the city. This is useful in planning for further treatment systems and extensions of sewer networks. The total capacities (design & utilisation) of systems and the total sewage generated in the city must be compared to assess the gaps existing in the city.

Table 18: Sewage Treatment Plant

Sr. No.	Name of STPs	Treatment Process/ technol-ogy	Installa-tion year	Design Capacity (MLD)	Utilisation Capacity (MLD)	Sludge Treatment facility available?	Qty of treated sewage / sludge reused

Cost recovery in sewage management has to be documented in a similar way as that of non-revenue water. The expenses in operating the pumping stations and treatment plants have to be

compared with the revenue raised through new connections and the surcharges levied on the water tariff. The following table, which can be used for a 5-year cost recovery calculation, can be used for the documentation:

Table 19: Cost Recovery

Cost Recovery	Current year	Previous year	Previous year	Previous year	Previous year
Operating Expenses (Rs.)					
Operating Revenues (Rs.)					
Cost Recovery (%)					

For documenting the overall physical condition and functional status of the networks and treatment plants, the following list can be used.

- Are the manuals on inventory, system operations and control available?
- Details on maintenance routines, spare parts inventory and preventive maintenance plans
- Details of staffing, schedules and vacant posts
- Status of alarms and notification systems
- Number of instances of sewer blockages and plant shut downs in the previous years
- Status of recordkeeping of regular activities as well as mechanical failures
- Are health and safety measures being followed by all operators and maintenance personnel?
- Availability of emergency operating plans and protocols

STANDARDS AND BENCHMARKS

The Service Level Benchmarks for sewage management set by the MoUD for sewage management services are as follows:

Sewage Management (Sewerage and Sanitation)	
Indicator	Benchmark
Coverage of toilets	100%
Coverage of sewage network services	100%
Collection efficiency of the sewage network	100%
Adequacy of sewage treatment capacity	100%
Quality of sewage treatment	100%
Extent of reuse and recycling of sewage	20%
Efficiency in redressal of customer complaints	80%
Extent of cost recovery in sewage management	100%
Efficiency in collection of sewage charges	90%

Under AMRUT four benchmarks were selected as main objectives to be reached in the sector of sewerage. These four are

- Coverage of latrines (individual or community)
- Coverage of sewerage network services
- Efficiency of collection of sewerage
- Efficiency in Treatment: Adequacy of sewerage treatment capacity

This data needs to be reported in the Service Level Improvement Plans of AMRUT and can be taken from the baseline data collection of CSP.

As of now there are no service level benchmarks existing for septage management by any agency. However, the following benchmarks and standards are to be referred by the city while reviewing septage management in India:

- IS 2470 – 1985, Code of Practice for Installation of Septic Tanks

  Part 1 – Design Criteria and Construction

  Part 2 – Secondary Treatment and Disposal of Septic Tank Effluent
- Manual on Sewerage and Sewage Treatment Systems, 2013, CPHEEO, MoUD (GoI)
- Advisory note 'Septage management in urban India', 2013, MoUD (GoI)
- The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013

GAPS AND ISSUES

Based on the collected data and analysis done through comparison with the standards and needs, the city has to list down 3-5 key issues of their wastewater management. Some examples of key issues are:

- *Lack of information on waste water disposal arrangements*
- *Regulation and over sight of onsite Sanitation & Septage Management is inadequate*
- *Unscientific disposal of septage from Septic Tanks into open drains causes adverse impacts in downstream areas*
- *Higher risk due to improper septic tanks and septage management leading to contamination of water bodies/water supply distribution system and incidences of water borne diseases*
- *The coverage of centralised sewer network in the city is insufficient and the willingness of households to get connected low*
- *No coverage of sewerage system in peripheral areas and limited sewer connectivity in covered areas*
- *While the sewerage system covers most areas of the city, service delivery is below par on wastewater collection efficiency and treatment performance*

2.8 Technical Sector 4: Solid waste management

A solid waste management (SWM) system includes collection, segregation, transportation, processing and safe disposal of waste. Both SBM guidelines and the Solid Waste Management Rules 2016, mention the need for planning and the role of ULB in preparing SWM plans and enacting them. CSP also holds SWM as an essential component to be planned.

BASELINE DATA REQUIREMENTS

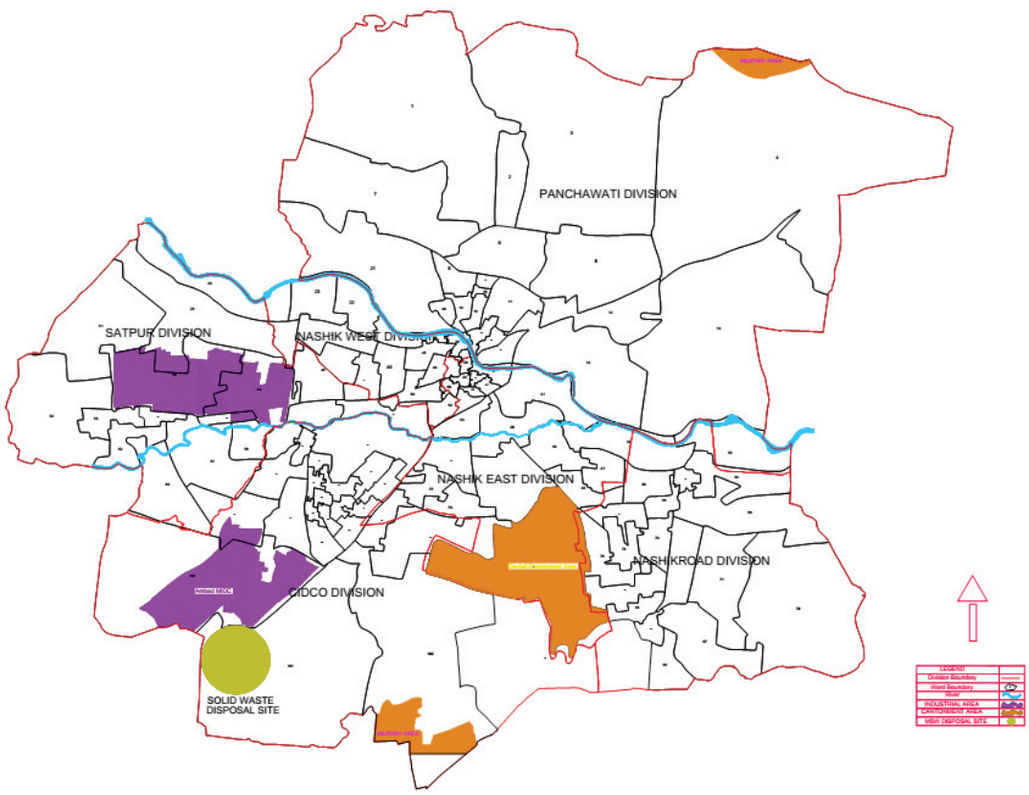
The following points enlisted below need to be addressed for Baseline Data Collection on Solid waste management:

1. SOLID WASTE GENERATION	☐ Overall generation (MT/day) ☐ Generation per capita
2. PRIMARY COLLECTION	☐ If Door to Door collection exists: household coverage, quantity of waste collected, segregation at source, Equipment used and numbers, Waste collection frequency, Waste collection charges ☐ If 'No' Door to Door collection exists: Method and location of disposal, Quantity of waste disposed ☐ Data to be also collected for Commercial Establishments, Markets, Institutions, etc. ☐ Street Sweeping
3. SECONDARY COLLECTION	☐ If Community bins exist: No. of bins, Location of bins, Capacity of bins (MT), Collection frequency, System of collection, No. of transfer stations, its location and capacity ☐ If 'No' Community bins exist: Disposal arrangement, Location of disposal
4. CONVEYANCE TO TREATMENT SYSTEM	☐ Type & No. and type of vehicles deployed, capacity of vehicles, Travel distance
5. TREATMENT FACILITY:	☐ If Treatment facility available: Treatment technology, Treatment capacity, functional status ☐ If 'No' Treatment facility available: Disposal method, location of disposal

6. O&M:	☐ O & M agency, Adherence to safety standards, cost recovery, collection efficiency, complaint redressal mechanism, waste recovery
7. DISPOSAL:	☐ If Scientific landfill facility available: Location, Land area allocated, Distance from the city ☐ If 'No' Scientific landfill facility available: Location of open dump site, Land area, Quantity Distance from the city
8. MAPS	☐ Map depicting areas with door to door collection, community bins, transfer stations, treatment plant, open dumping site, land fill site ☐ Map of collection routes and conveyance to treatment facility
9. PROPOSED PROJECTS	☐ Type of technology, capacity & location

Spatial illustration of solid waste disposal sites can be made like the figure below. Such maps can help in identifying the potential locations for interventions and actions.

Figure 11: Map depicting Solid Waste disposal sites (Nashik City)

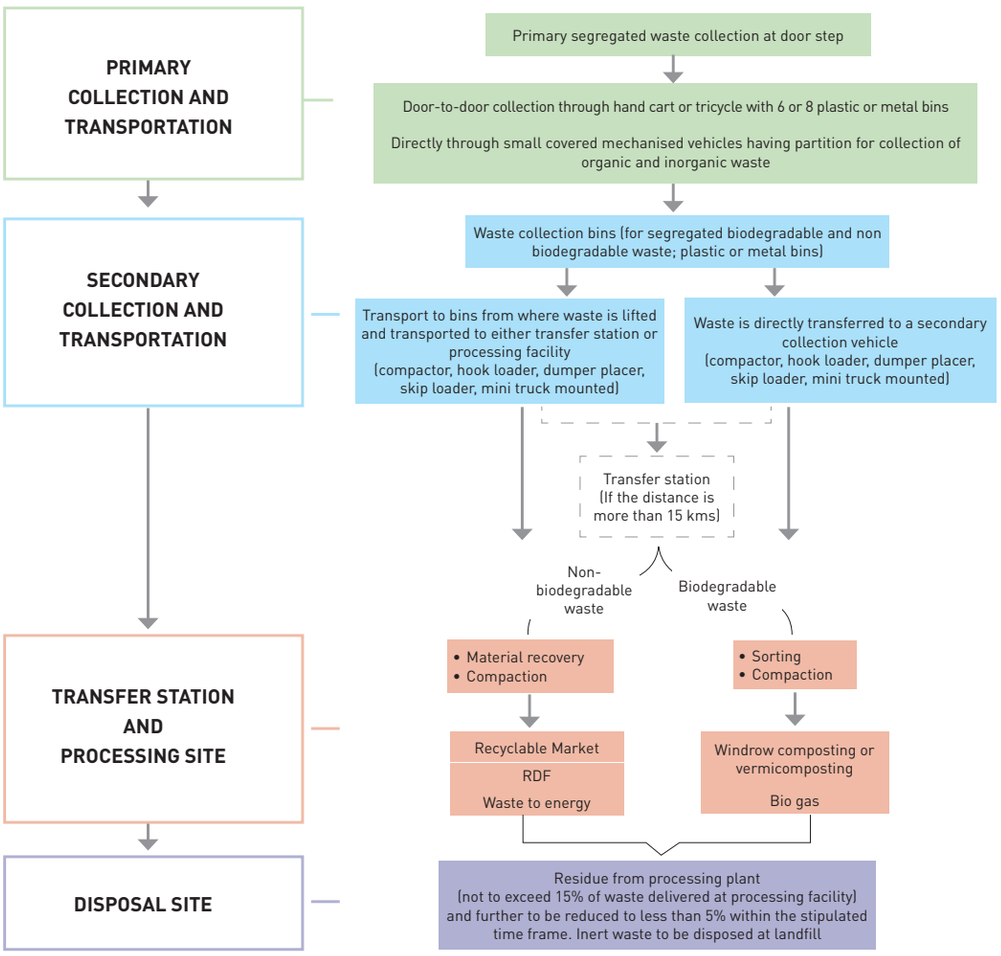


ANALYSIS OF SELECTED ASPECTS

It is important to understand waste sources, streams, amounts and composition of the existing waste management system. The following flowchart covers the activities followed in a SWM process through its different stages.

The stages involved in a typical SWM system are; Storage and segregation of waste at source, Primary Collection, Secondary Collection and Transportation, Waste Treatment, and Waste Disposal. At each stage there are key activities that support the management process which is described in the flow chart. Data on all these activities has to be collected and then analysed.

Figure 12: Flow chart of municipal solid waste management



A. SOLID WASTE GENERATION

One of the most important parameters of solid waste management is the quantity of waste to be managed. The ULB should calculate solid waste generated by the city for the current year and also forecast the solid waste generation for short term (5 years), intermediate term (15 years) and long term (30 years). The quantity is the parameter determining the size and number of functional units and equipment required for managing the waste. In that view, it is a key component of any planning procedure and its estimation needs to be documented with all different tools available.

Population (A)	Total Waste Generated (B)	Per capita waste generation (C = B/A)
1,00,000	25 tones per day	250 gm/person

The per capita waste generation in different cities has been studied by different institutions like NEERI, CPHEEO, CPCB, etc. The CPHEEO Municipal Solid Waste Manual indicates a range of 0.2-0.4 kg/capita/day in the urban centers and it goes up to 0.5 kg/capita/day in metropolitan cities. The following table details the per capita solid waste generation in 43 cities.

Figure 13: Per-capita waste generation rates

Population Range (in million)	No. of Cities Surveyed	Average per capita value (kg/ capita/ day)
0.1 to 0.5	12	0.21
0.5 to 1.0	15	0.25
1.0 to 2.0	9	0.27
2.0–5.0	3	0.35
>5.0	4	0.50

Source: NEERI "Strategy Paper on Solid Waste Management in India" (1996)

Studies suggest that the per capita waste generation is increasing by about 1.3% per year. With an urban growth rate of 3-3.5% per annum, the annual increase in waste quantities can been estimated at 5 % per annum (CPHEEO, 2016). Measuring quantities and characteristics aims at ensuring adequate capacity for waste collection, recycling and disposal. The waste service must be able to cope with daily and seasonal fluctuations, so measurement of variability is important. An indicative way of calculating future solid waste production with respect to population projections is given in the following table:

Table 20: Solid Waste Generation Projection

No.	Parameter	Data	Calculation
A	Per capita solid waste generation	Assume 0.21 kg/capita/day	(A)
B	Projected population after 5 years*	Assume 1.2 lac	(B)
C	Projected population after 15 years*	Assume 1.5 lac	(C)
D	Projected population after 30 years*	Assume 3 lac	(D)
E	Projected required water demand after 5 years	25,200 kg/day	(E=A* B)
F	Projected required water demand after 15 years	31500 kg/day	(F=A*C)
G	Projected required water demand after 30 years	63000 kg/day	(G=A*D)

** Projected population to be done as explained in 2.4 Population projection*

B. PRIMARY & SECONDARY COLLECTION

The following table is proposed for the ward wise data on primary and secondary collection of solid waste. The data is needed to be compiled in a ward-wise format in order to understand the detailed needs. Such an analysis will give details on the specific needs such as manpower, awareness on source segregation.

Table 21: Data on Primary Collection

Ward No. & Name	No. of HHs	Total waste generated (MT/day)	If Household Door to Door collection system is available							If Household Door to Door collection system is not available			Remarks
			No. of HHs covered	Qty. of waste collected (MT/day)	Source segregation (Yes/No)	Waste collection frequency	Waste collection charges (Rs/month)	Existing manpower (Nos.)	Equipments used (Nos.)	Method of disposal	Qty of waste disposed (MT/day)	Location of Disposal	

Table 22: Secondary Collection of Solid waste

Ward No. & Name	Ward population	Waste generated (MT/day)	If Community bins are available for secondary collection					If Community bins are not available for secondary collection			Remarks
			No. of community bins available	Location of bins	Capacity of bins (MT)	Collection frequency	System of collection (type and number of vehicle used)	Reason for unavailability of bins	Disposal arrangement	Location of disposal	

Further to the review of the table, the complaint redressal mechanisms existing in the city has to be reviewed for the percentage of complaints solved and time taken for solving. The number, and capacities of vehicles used for conveyance needs to be checked for adequacy depending on the generation in the area covered. The economic viability of travel distances also needs to be checked for different routes being followed by the conveyance trucks. The city also needs to check if operational health and safety norms are being followed during collection. A considerable amount of solid waste collection happens through sweeping of streets by the public health departments. Their schedules, collection bins and collection mechanisms also needs to be reviewed to ensure 100% collection.

C. TREATMENT & DISPOSAL

If the city has a solid waste treatment facility, apart from analyzing the capacity requirements, the ULB should confirm on the specific handling on biodegradable, non-biodegradable and hazardous wastes. The efficiency of treatment and quality of emissions needs to be reviewed in comparison with the Solid Waste Management Rules, 2015 and Draft Municipal Solid Waste Management Manual, 2014, CPHEEO, MoUD (GoI).

STANDARDS AND BENCHMARKS

The Service Level Benchmarks set by the MoUD for solid waste management services are as follows.

Solid Waste Management	
Indicator	Benchmark
Household level coverage of solid waste management services	100%
Efficiency of collection of municipal solid waste	100%
Extent of segregation of municipal so lid waste	100%
Extent of municipal solid waste recovered	80%
Extent of scientific disposal of municipal solid waste	100%
Efficiency in redressal of customer complaints	80%
Extent of cost recovery in SWM services	100%
Efficiency in collection of SWM charges	90%

The objectives of SBM of 100% door to door collection, 100% transportation of waste and 100% processing and safe disposal are in line with these Service Level Benchmarks and should be considered when identifying gaps and issues in the city. The data on SWM collected for the CSP can be used for completing the Swachh City Plan, which is a requirement under SBM. In case the city already has a Swachh City Plan, this data can be integrated in the CSP as well.

GAPS AND ISSUES

Based on the collected data and analysis done through comparison with the standards and needs, the city has to list down 3-5 key issues that the city is facing on solid waste management. Some examples of key issues are

- *Lack of source segregation and limited composting / waste recovery levels*
- *Door-to-collection is negligible while processing / safe land filling is non-existent*
- *Indiscriminate dumping of solid waste in open storm water drains and inadequate treatment and disposal facility causes adverse impacts in downstream areas*

2.9 Technical Sector 5: Management of Storm Water and Receiving Water Bodies

Storm water management includes a comprehensive plan for separate and safe drainage and management of storm water and to ensure maximum coverage of the storm water drains. Like with other components of the CSP, it is important to look at storm water management as a step towards planning for the sustainable management of water in the future and to improve resilience of the city, considering diminishing water resources and the impact of climate change. For the same, an accurate estimation regarding the coverage of storm water existing / planned in comparison with the benchmarks should be revealed vis-à-vis a Baseline Data Collection study.

BASELINE DATA COLLECTION

In general, the following aspects need to be included in the baseline data collection to ensure accurate analysis in the future of the storm water drain management in the city:

1. COLLECTION AND CONVEYANCE:	☐ Constructed Drain: Length of roads and drains, coverage, functional status ☐ Natural Drain: Length of drains, coverage functional status ☐ Storm water pumping station: Nos. Capacity, Electricity consumption
2. DISPOSAL:	☐ Disposal arrangements, connected to retention zone, Discharges into water bodies
3. WATER LOGGING:	☐ Location and frequency of water logging
4. O & M:	☐ Complaint redressal, Responsible department
5. MAPS:	☐ Natural drain networks, Storm water drain networks, flood prone areas and water logging areas
6. PROJECTS PROPOSED FOR STORM WATER MANAGEMENT	☐ Area to be covered

ANALYSIS OF SELECTED ASPECTS

A. COVERAGE OF STORM WATER DRAINAGE

The following table is for analyzing the coverage and functionality of existing storm water drains.

Table 23: Storm Water Drainage

Zone / Catchment	Length of roads (km)	Constructed Drains				Natural Drains			Remarks
		Length (km)	Type (Surface, covered, etc.)	Functional status	Disposal arrange-ment	Length (km)	Functional status	Disposal arrangement	

B. WATER LOGGING/FLOODING

The ULB is expected to record baseline data with respect to water logging / clogging in a similar tabular format (below). Herein the ULB identifies gaps & issues with respect to water logging. It is important that the ULB first identifies flood prone points within the city as locations that experience water logging at key road intersections, or along a road length of 50 m or more, or in a locality affecting 50 households or more. The ULB should calculate the frequency as a yearly aggregate of all such water logging incidences at each of such identified sites. Wherever possible, the survey data must be corroborated by corresponding maps depicting natural or constructed drains (existing or subsequently created). Any specific measures taken in preventing flooding (like rainwater harvesting, permeable pavements) has to be documented about its status and learnings.

Table 24: Water Logging data

Zone	Location / wards	Frequency (No. per year)	Reasons	Remarks

STANDARDS AND BENCHMARKS

The Service Level Benchmarks propose identifying water logged situations as an occasion or incident which affects transportation and normal life, typically, stagnant water for more than four hours of a depth more than six inches. Coverage is defined in terms of the percentage of road length in km (only considering roads that are more than 3.5 m wide carriageway) covered by the storm water drainage network in km (only considering drains that are made of pucca construction and are covered) and the benchmark value for comparison is 100% coverage. The ULB is expected to conduct actual ground level surveys although calculation of storm water drain coverage through updated city road maps is also acceptable. The Service Level Benchmarks set by the MoUD for storm water management services are as follows:

Storm Water Drainage	
Indicator	Benchmark
Coverage of storm water drainage network	100%
Incidence of water logging/flooding	0

Under AMRUT three benchmarks were selected as main objectives to be reached in the sector of storm water management. These three are

- Coverage of Storm water drainage network
- Incidence of sewerage mixing in the drains
- Incidence of water logging

This data needs to be reported in the Service Level Improvement Plans of AMRUT and can be taken from the baseline data collection of CSP.

GAPS AND ISSUES

Based on the collected data and analysis done through comparison with the standards and needs, the city has to list down 3-5 key issues that the city is facing on storm water management. Some examples of key issues are

- *Poor functional status of storm water drains (eg. broken),*
- *Clogging of storm water drains due to solid waste dumping,*
- *Waste water discharged into storm water drains etc.*

2.10 Support Pillar 1 – Governance, Institutions and Inclusiveness

Different states in India show varying institutional arrangements involving single or multiple institutions in charge of water and sanitation services. The success of any sanitation system depends on the people and institutions that plan, operate and manage it. The CSP therefore includes data collection, analysis and identification of short, medium and long-term actions for the fields of governance, institutions and inclusiveness.

A. GOVERNANCE AND INSTIUTIONS

BASELINE DATA COLLECTION

1. INSTITUTIONAL ARRANGEMENT	☐ Organisational chart: Organisation structure of ULB & parastatal agencies –Department wise staff in-position ☐ Department wise role and responsibilities for planning, implementation, O&M ☐ Inter departmental coordination mechanism ☐ Other stakeholders for sanitation and their role: State Pollution Control Board, NGOs

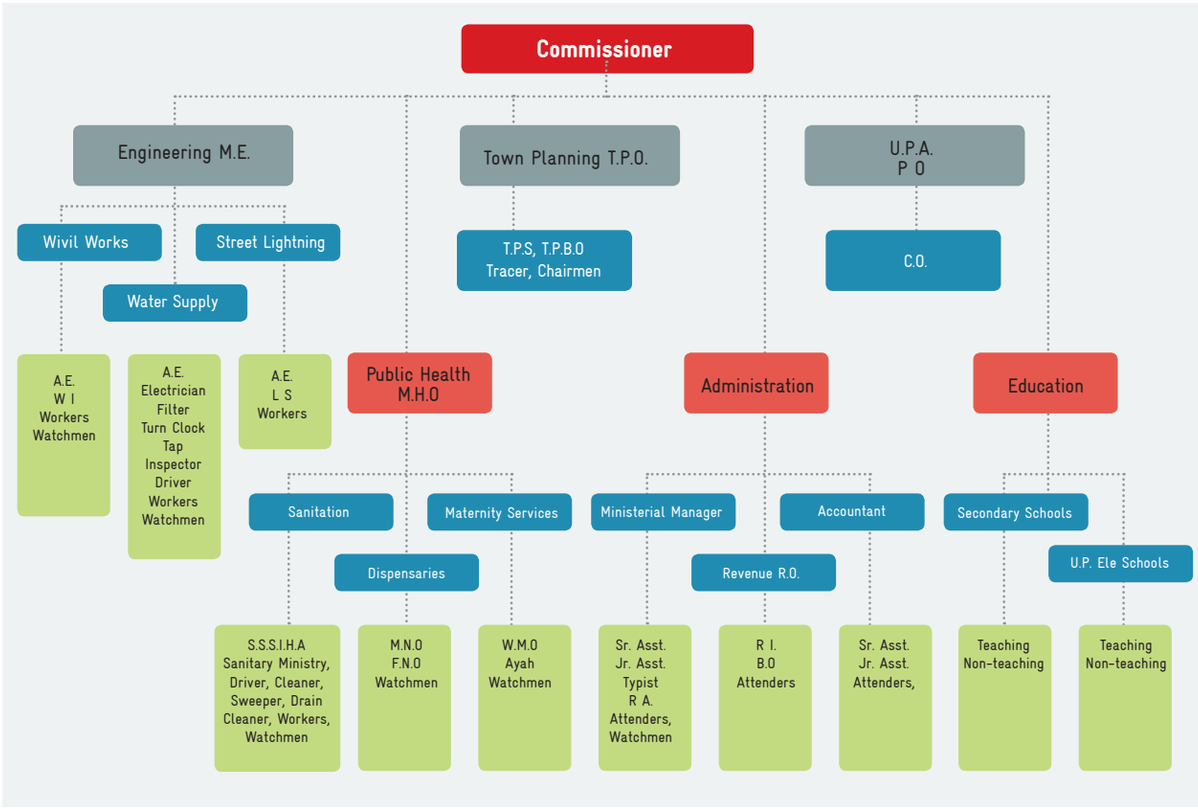
For providing the institutional overview of the complete sanitation sector the following table should be filled out. This indicate, which institution at city or state level is responsible for the various steps of the sanitation value chain. It shows clearly if there are any unclearities of roles and responsibilities for the various steps.

Table 25: Institutional arrangements for all water and sanitation services

Urban Services	Institutions in charge of planning	Institutions in charge of im-plementation	Institutions in charge of O&M	Institutions in charge of collecting user charges
Water Supply				
Sewerage				
Septage Management				
Storm Water Drainage				
SWM				
Public Toilets				

The organisation chart of the city needs to be included in the CSP.

Figure 14: Sample organogram of a city ULB (Source: Kurnool Municipality)



For information on governance and regulation, a list of all legislations, rules and regulations relevant to municipal sanitation services such as Municipal act, Service rules, Building bye-laws, Municipal bye-laws have to be listed and their enforcement mechanisms should be described (special mention needs to be of legislative instruments targeting reuse of recycled water, cost recovery mechanisms for water supply & solid waste etc.). Various governance reforms have been implemented through different programs like JnNURM and AMRUT. Data to be included in this activity covers implementation and follow up of the following reforms:

2. GOVERNANCE AND REGULATION	☐ E-Governance – ULB Digitalisation and eMAS (Municipal Administration System) for water and sewerage charges Constitution and professionalisation of municipal cadre for capacity building ☐ Augmenting double entry accounting ☐ Preparation of Service Level Improvement Plans (SLIP), State Annual Action Plans (SAAP) ☐ Delegation for funds, functions and functionaries to the zonal level ☐ Review of Building by-laws for water and sewerage management ☐ Energy and Water audits and green building incentives

ANALYSIS OF SELECTED ASPECTS

Using the baseline collected in line with the above mentioned points, ULB should analyse and identify issues related to institutional arrangement, governance and inclusiveness with relevance to sanitation sector. Broadly, one needs to analyse:

1. CLEAR DISTRIBUTION OF ROLES AND RESPONSIBILITIES

- roles and responsibilities are overlapping / diffused / unclear (with respect to planning, implementation, O&M and M&E) concerning water supply, public toilets, waste water, septage management, storm water, water bodies & solid waste management.

2. RULES AND ENFORCEMENT MECHANISMS IN PLACE

- regulations & its enforcement status,
- if the citizen grievance redressal system effective,
- whether there is proper management of private service providers,
- coverage of e-governance,
- whether any reforms have been carried out leading to poor services
- absence of required municipal bye-laws

3. INTER-DEPARTMENTAL COORDINATION

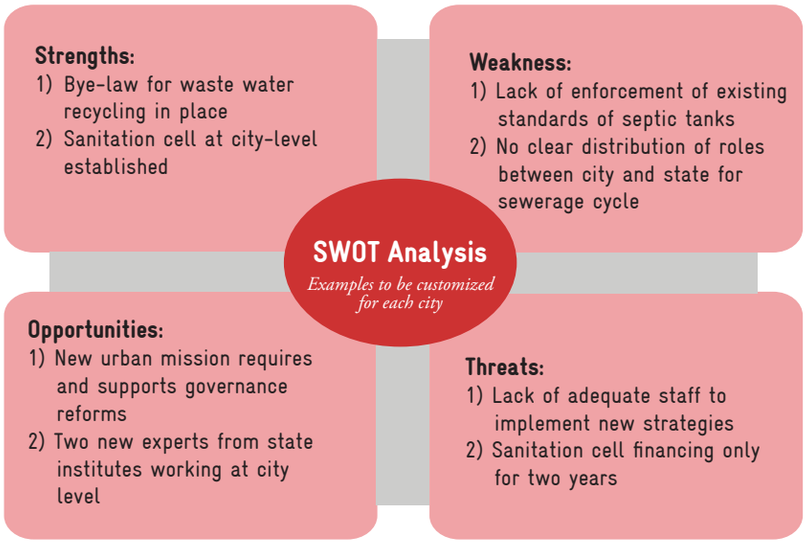
- coordination status between various sanitation related departments of ULB,
- inter-institutional coordination mechanism (ULB, Parastatals, PHED, NGOs, SPCB),

4. STAKEHOLDER PARTICIPATION.

- whether CSTF has been formed and is active
- whether stakeholder participation is encouraged in planning and implementation of project awareness and participation of public in the activities and programmes organised by the ULB
- representation of various stakeholders in decision making committees of ULB beyond CSTF

As a subsequent step, the answer to these questions should be filled in a Strength, Weakness, Opportunity, Threats (SWOT) analysis The SWOT matrix then gives a comprehensive overview of the status of the complete governance sector. The following SWOT matrix presents an example:

Figure 15: Sample SWOT Analysis of Governance and Institutional aspects



Note: The text in the box are as an example of how to do Swot Analysis for each city. Please customise as per your requirement.

B. INCLUSIVENESS

BASELINE DATA COLLECTION

Women and representatives of the urban poor are crucial players for awareness raising, operation and maintenance of services and for ensuring a broad acceptance level for decision makers. Thus the key for ensuring planning for inclusive sanitation facilities is to facilitate community participation of all stakeholders, particularly the weaker sections of society. Data on the following elements of inclusiveness (with special focus on women and the urban poor) needs to be gathered with regards to planning and implementation of sanitation projects:

1. INCLUSIVENESS CHECKPOINTS	☐ Whether there is community participation, ☐ The level of involvement of women & urban poor in planning processes ☐ Access to sanitation services in slum settlements for women and urban poor (for e.g. even the CPHEEO manual has distinct guidelines for access to toilets for women) ☐ Strength of policies or schemes for sanitation service delivery to women & urban poor – (for e.g. any specific budget allocation for urban poor recommended), are being followed or not. ☐ Efficacy of implementation of these policies ☐ Sufficiency of budgets reserved for urban poor and women ☐ Provision of sanitation services takes into account the specific requirements of women and the urban poor.

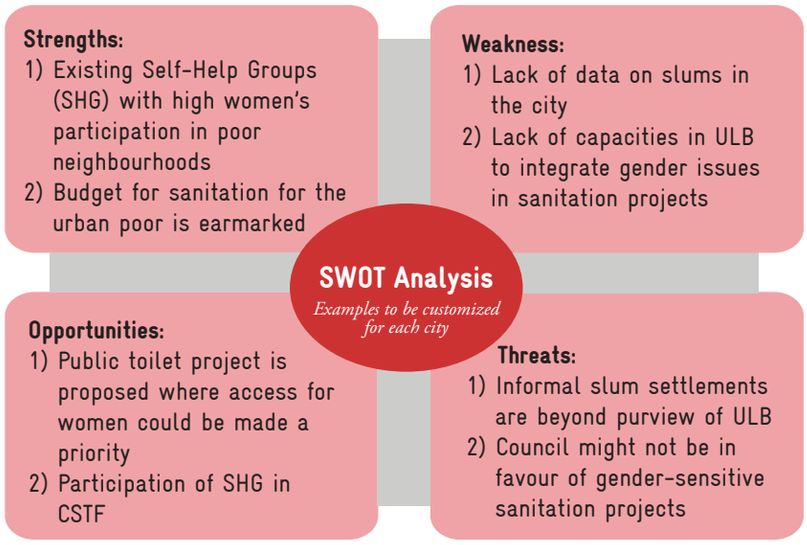
ANALYSIS OF SELECTED ASPECTS

For analysis regarding inclusiveness a SWOT analysis can be conducted for Gender and Urban Poor targeted inclusiveness similar to the one depicted in the above section. From the above collected data, one can prepare the SWOT analysis with the help of the following question set:

- Are community based organisations involved in your CSTF?
- Are women representatives involved?
- Are representatives from slum settlements involved?
- Do you have on-going projects targeting women and the urban poor?
- How many gender-friendly public toilets do you have?
- Do you have budget ear-marked for the urban poor?

The answers to the questions can then resonate in the SWOT analysis for the city as shown in the illustration below:

Figure 16: Sample SWOT Analysis of the inclusiveness of specific activities



Note: The text in the box are as an example of how to do Swot Analysis for each city. Please customise as per your requirement.

GAPS AND ISSUES

Based on the collected data and analysis, the city has to list down 3-5 key issues that the city is facing in Governance, Institutions and Inclusion. Some examples of key issues are

- *Lack of clear distribution of roles between different government agencies*
- *Lack of coordination between different departments working in the sector*
- *Grievance redressal systems not in place*
- *Sanitation provisions in slum settlements is poorer than in the rest of the city.*
- *Sanitation Hotspots have been identified majorly in slum settlements.*

2.11 Support Pillar 2: Capacity enhancement

BASELINE DATA REQUIREMENTS

Capacity enhancement means increasing organisational or individual ability to achieve overall objectives. It is the need of all organisations and involves enhancing the skills, knowledge and systems. The preliminary data to be compiled in this section is the list of staff (permanent and contractual) and the existing vacancies. Further description on strategies employed in training the employees and maintaining the quality of staff is to be provided. It is also important to take note of the current capacities of the ULB and the on-going capacity enhancement initiatives. Also the performance evaluation of staff needs to be carried out to understand whether the quality and quantity of staff match the requirements of the organisation. This can be detailed as follows

1. HUMAN RESOURCE DEVELOPMENT:	☐ List of staff and vacancies ☐ Number of trainings in which municipal staff has participated ☐ Trainings planned for the next 2-3 years ☐ Performance Evaluation of staff
2. CAPACITY / OUTSOURCING MANAGEMENT:	☐ Number of contractual staff and list of outsourced services ☐ System of monitoring performance of contractual staff ☐ Training programmes and safety measures for contractual staff

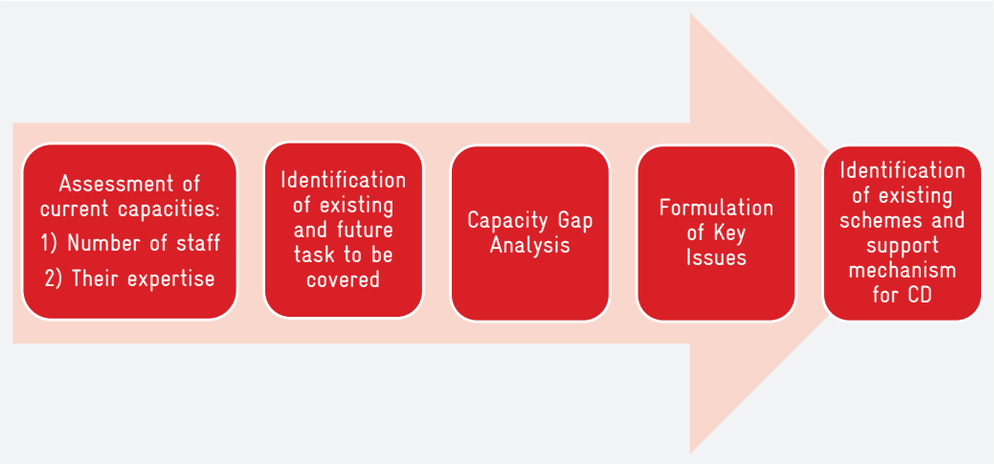
ULBs might often outsource services and tasks to other institutions or agencies. It is useful to know what services have been outsourced and what the quality is (i.e. level of expertise) and quantity (number of programmes) of the capacity enhancement programmes conducted. It is important to assess and enhance the capacities of these external service providers as well. This ensures that the capacities of external as well as internal work force synergize.

ANALYSIS OF SELECTED ASPECTS

A. CAPACITY NEEDS ASSESSMENT

The first step in capacity analysis is to understand the capacities and expertise of the current staff and whether they meet the requirements of the current and future tasks that have been planned.

Figure 17: Capacity Needs Assessment



During needs assessment the number and expertise of current staff is compared to the existing and future tasks. Hence the gaps can be identified on different timescales and which will help in visualizing the key issues in capacity development of the ULB. Based on this the ULB in consultation with the state government must identify support schemes for the development. SBM and AMRUT provide funding to the states for implementing a capacity building plan including training activities as well as placement of experts in the cities.

It is important to note that different departments or divisions of the organisation would have different needs based on the tasks performed by them. The table given below can be used as a template for documenting this.

Table 26: Template for capacity assessment

Institution/Department	Tasks to be performed	Permanent Staff	Contractual Staff	Gaps in Number	Gaps in Skills
Municipal corporation (overall)					
Engineering Department					
Health Department					
Social mobilisation department					

GAPS AND ISSUES

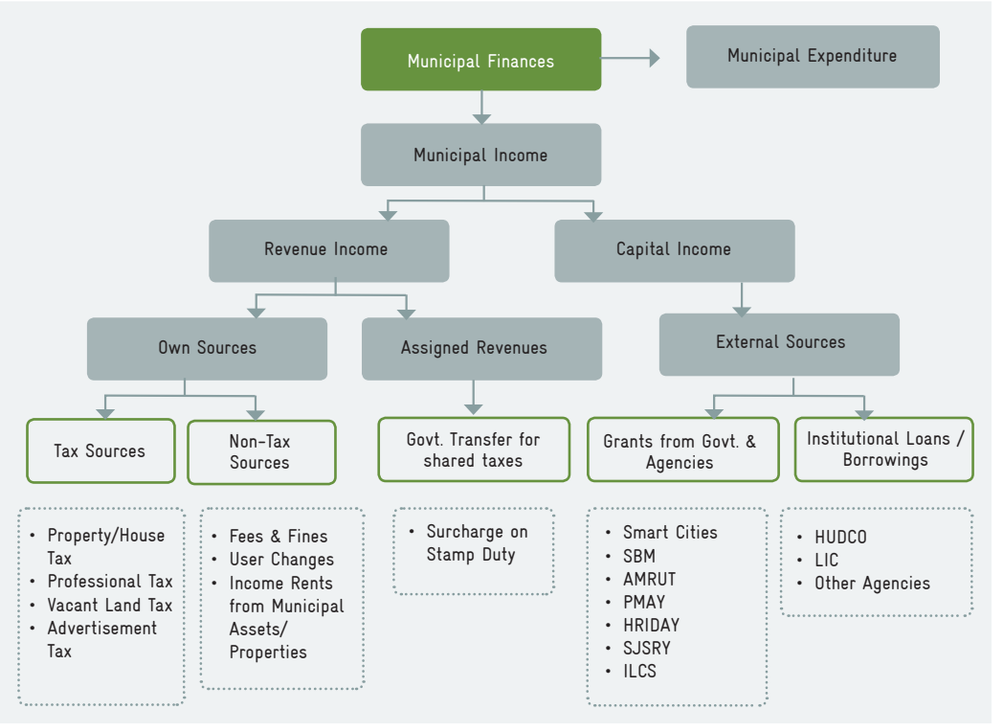
Based on the collected data and analysis done through comparison with the standards and needs, the city has to list down 3-5 key issues that is being faced by the city on in its capacity enhancement. Some examples of key issues are

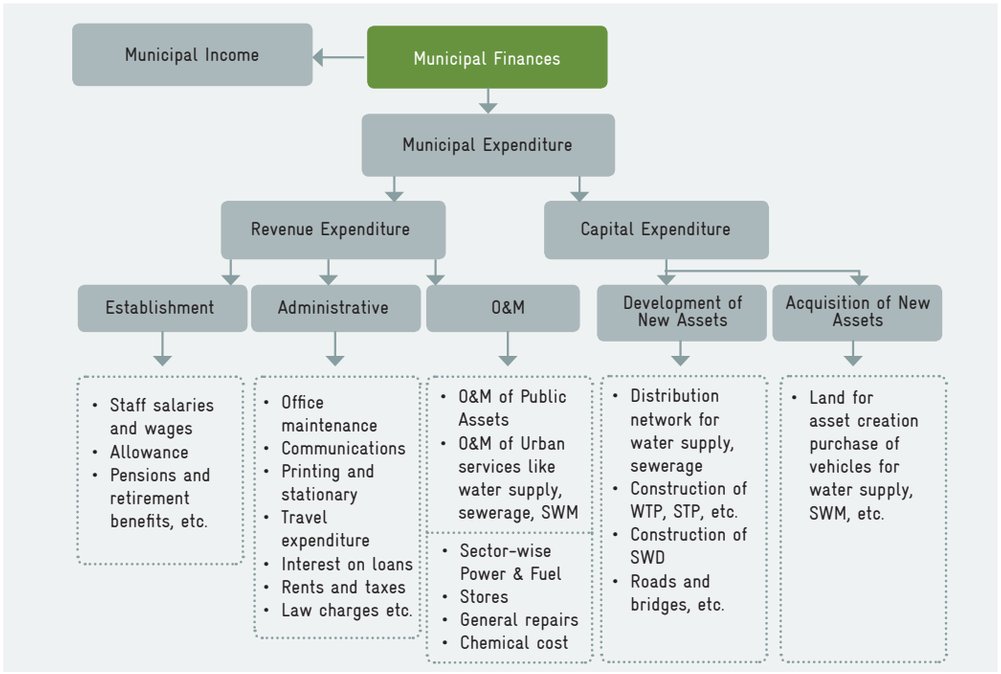
- *Understaffing of specific departments*
- *Staff frequently change as many vacancies are being filled through temporary postings.*
- *Staff are not being trained enough to perform their tasks*

2.12 Support Pillar 3: Municipal finances

Every action planned under the CSP needs sufficient financing. For this it is required to assess the financial capacities of a city by assessing income and expenditure and options for increasing the revenue or decreasing cost. The financial planning under the CSP needs to have a long term perspective to ensure that the created infrastructure and services can financially be maintained even after 15-30 years. An overview of the municipal finances of a city is illustrated in the following graphic:

Figure 18: Municipal Income & Expenditure





BASELINE DATA REQUIREMENTS

The data collection on finances has to be made considering the previous 3-4 years and including separate information about each year as shown in Table 27. The following points needs to be considered in compiling the data:

1. REVENUE INCOME	☐ Income from Taxes ☐ Income from Non-Taxes ☐ Income from Assigned Revenue ☐ Total Revenue Income
2. CAPITAL INCOME	☐ Grants and Loans ☐ Total Capital Income ☐ Total Income
3. REVENUE EXPENDITURE	☐ General, Establishment and Other Revenue Expenditure ☐ O&M of Sanitation including SWM ☐ Total Revenue Expenditure
4. TOTAL CAPITAL EXPENDITURE	
5. TOTAL EXPENDITURE	
6. REVENUE SURPLUS/DEFICIT	
7. CAPITAL SURPLUS/DEFICIT	
8. OVERALL SURPLUS/DEFICIT	

ANALYSIS OF SELECTED ASPECTS

A. INCOME AND EXPENDITURE GAPS

The income and expenditures made by the city in the previous few years indicates the financial status of the city. With the table compiled through the baseline data collection (shown below), the lacunae in the financial systems can be identified.

Table 27: Income and Expenditure gaps

#	Particulars	Amount (Rs. in Lakhs)			
		2012-13	2013-14	2014-15	2015-16
Revenue Income					
1	Income from Taxes				
2	Income from Non-Taxes				
3	Income from Assigned Revenue				
	Total Revenue Income (1+2+3)				
Capital Income					
4	Grants and Loans				
	Total Capital Income (4)				
	Total Income (1+2+3+4)				
Revenue Expenditure					
5	General, Establishment and Other Revenue Expenditure				
6	O&M of Sanitation including SWM				
	Total Revenue Expenditure (5+6)				
Capital Expenditure					
7	Capital Expenditure				
	Total Capital Expenditure (7)				
	Total Expenditure (5+6+7)				
	Revenue Surplus/Deficit (1+2+3-5-6)				
	Capital Surplus/Deficit (4-7)				
	Overall Surplus/Deficit (1+2+3+4-5-6-7)				

If available the city should also provide separate tables on expenditure and income from water supply, solid waste management and other sanitation services. By analyzing the specific accounts of property taxes, solid waste etc. the improvement needed in the collection systems can be identified.

B. FINANCIAL PROJECTION WITH PROPOSED GROWTH RATES

The population projections and the development of the city have a direct impact on the income and expenditure made by the city and hence the projected changes in the finances are important in identifying the potential of implementing the CSP. The following table can be used to collect the current years' data and include the projections for the subsequent years. Any projects which are planned for the near future which can cause significant changes in the finances of the city have to be considered while compiling the data.

Table 28: Financial projection

#	Particulars	Amount (Rs. in Lakhs)		
		2016-17	2017-18	2018-19
Revenue Income				
1	Income from Taxes			
2	Income from Non-Taxes			
3	Income from Assigned Revenue			
	Total Revenue Income (1+2+3)			
Capital Income				
4	Grants and Loans			
	Total Capital Income (4)			
	Total Income (1+2+3+4)			
Revenue Expenditure				
5	General, Establishment and Other Revenue Expenditure			
6	O&M of Sanitation including SWM			
	Total Revenue Expenditure (5+6)			
Capital Expenditure				
7	Capital Expenditure			
	Total Capital Expenditure (7)			
	Total Expenditure (5+6+7)			
	Revenue Surplus/Deficit (1+2+3+4-5-6-7)			
	Capital Surplus/Deficit (4-7)			
	Overall Surplus/Deficit (1+2+3+4-5-6-7)			

GAPS AND ISSUES

Based on the collected data and analysis, the city has to list down 3-5 key issues that the city is facing on its municipal finances. Some examples of key issues are:

- *Poor cost recovery from water supply, public toilets, waste water and solid waste management,*
- *Poor collection efficiency for cost of services,*
- *Lack of budget for efficient O&M of existing assets,*
- *Poor asset management,*
- *Dependency on state / central support for implementing / improving sanitation services,*
- *Excessive expenditure for managing solid waste,*
- *High establishment cost for managing sanitation services,*
- *Lack of financial reforms (eg. double entry accounting) & monitoring mechanisms for transparency*
- *Lack of incentive & punitive measures to increase fund flow.*

2.13 Health & Hygiene

The state of water and sanitation infrastructure in any city has direct implications over the health of the people of the city. A number of water borne diseases can be prevented through proper sanitation and cleanliness. In many cases the repeated occurrence of certain diseases can be often related to inadequacy of sanitation in the local premises. Hence the status of public health is an important part of the status assessment part of the CSP.

BASELINE DATA COLLECTION

Baseline data indicating the health and hygiene profile of the city for the last 3-5 years shoukd be collected for the CSP. The following data is indicative of the baseline data on health and hygiene required by the city:

HEALTH AND HYGIENE DATA	
	☐ Data on the instances and prevalence of water borne diseases like cholera, typhoid, etc.
	☐ Data on awareness levels among low income groups
	☐ Data on existing NGOs SHGs working on health and sanitation related issues
	☐ Data on ongoing campaigns on health and sanitation

For example, when this information is collected in a ward wise format and compared to the open defecation, solid waste dumping and water logging information in the surrounding regions, it can help in determining the areas where actions must be prioritised. Depending on the availability of infrastructure facilities, the required action can be either improvement of facilities or hygiene awareness or both.

GAPS AND ISSUES

Based on the collected data and analysis, the city has to list down 3-5 key issues that the city is facing on the aspects of health and hygiene. A few examples have been provided below:

- *Prevalence of water borne diseases,*
- *Epidemics (related to sanitation & hygiene practices) especially during monsoon,*
- *Lack of public awareness on health & hygiene in low income groups,*
- *Lack of coordination with existing NGOs, SHGs working on health & sanitation related issues*

3 CITY-WIDE KEY ISSUES AND SANITATION VISION

While analyzing the data from individual sectors relevant to city sanitation, the gaps and issues related to each sector are identified.. As a next step the city should compile these sector specific issues in 8-10 main city-wide issues, which they would like to address with the CSP.

Once the key issues have been determined, the next target would be to formulate a vision of how to solve the issues identified. The formulation of the sanitation vision initiates this process by defining the city's overall outlook towards the problems and setting the targets for tackling the issues. While the first part of this chapter guides through the steps on defining the key issues the latter half covers the process of formulation of the vision.

3.1 City Wide Key Issues

The following steps can be followed in refining the gaps and issues identified in each technical sector and support pillar during the process of CSP Preparation and developing them to a list of city wide key issues.

STEP 1: LISTING OF ISSUES FROM ALL SECTIONS OF CSP

During the process of preparation of the CSP, through assessment of the individual sectors, the city has already identified many gaps and issues which are listed under each of the sections as mentioned in the previous chapter. The table must cover all the issues identified in each of the sector even if there are similar issues being listed in different sectors.

Table 29: A sample list of key issues identified from sectors

Sewerage/Septage	Only 11% of the total sewage generated is treated in spite of installed treatment capacity
Water supply	NRW levels are high and needs urgent attention.
SWM	Indiscriminate dumping of solid waste in open storm water drains and inadequate treatment and disposal facility
Toilets	Prevalence of open defecation in certain low-income pockets.
Drainage	Storm water drain network faces severe abuse with 'grey water flows' and solid waste dumping.
Finances	Cost recovery levels in sewerage and solid waste are very low vis-à-vis prevailing O&M costs.

STEP 2: FORMULATING CITY-WIDE ISSUES

While reviewing the list of issues, it can be observed that many issues listed under one sector can have direct linkages to another. For example lack of water supply can directly affect the functionality of existing and newly planned toilets. These linkages clearly suggest the need for synchronised action in each sector in order to meet the requirements of the city. To establish these linkages and give an overall view the following matrix can be used. The sectors are listed in the first row and column of the matrix and the cells inside have to be filled with interlinking issues as illustrated in the example. This will help in selecting those issues which can have a stronger impact when tackled.

Fig. 19: Matrix for formulating key issues

	Key issue Sewerage	Key issue Water	Key issue SWM	Key issue Toilets	Key issue drainage
Key issue Sewerage		Increased water supply→ more wastewater		Newly built toilets need septage management	
Key issue Water					
Key issue SWM					
Key issue toilets		Lack of water supply limits functionality of toilets	Littering clog storm water drains		
Key issue drainage	Untreated wastewater goes to open drains				

These inter-linkages can help to restructure certain issues by merging the needs in multiple sectors. Merging and restructuring of issues will help in bringing the focus to a city-wide approach and to define an Action Plan which covers multiple sectors through a single programme. Hence the sector specific issues needs to be translated to 8-10 key issues which. are relevant for the entire city. For listing these city-wide key issues use the Table 30 below:

STEP 3: RATIONALE FORMULATION

The rationale for each city –wide key issue has to be detailed based on the collected data. This helps in providing a logical reason for further action and understanding how each action would add to improvement of the sanitation condition in the city. The rationale includes the summary of the results from the data analysis, which gives evidence for this key issue

If the number of key issues is high, it becomes difficult for the city to plan and manage programmes to tackle. Hence it is important for the city to prioritize and select up to 8 - 10 key issues which ensures maximum impact. These issues should be in line with the objectives of the on-going national programmes such as SBM, AMRUT and Smart Cities

Table 30: City-wide key issues

Key Issue 1	
Rationale for this key issue	
Key Issue 1	
Rationale for this key issue	
Key Issue 1	
Rationale for this key issue	

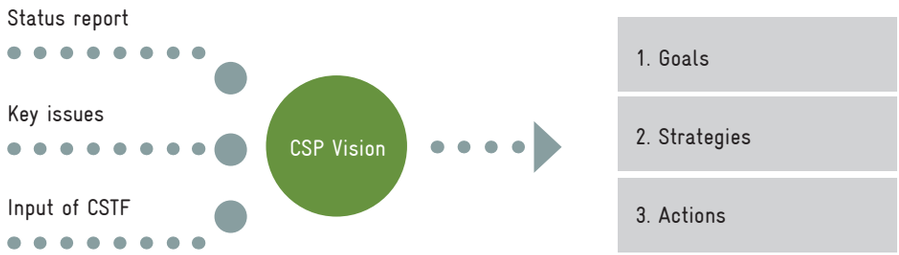
An example of the same has been illustrated as under

Key Issue:	**Unscientific treatment of septage**
Rationale:	The septage management is done by private service providers who do not have any scientific knowledge about the treatment and disposal of collected septage. The collected septage is disposed into city's river which is the the main source of water. The unscientific design of the septic tank and the absence of a septage treatment plant makes the risk for the environment and public health of septage high.

3.2 CSP Vision

The vision of the city sanitation ideally covers the description of optimal future of the sanitation sector in the city. It is to be formulated by looking into the existing conditions, needs and the aspirations of the city. The CSP Vision must be formulated by the CSTF using the learnings earned through the preparation of the Status Report and the city wide key issues which were identified. The following figure describes the role of vision in the CSP.

Figure 20: CSP Vision



The vision also stands as the starting point for translating the CSP into actions. The specific goals and strategies have to be defined based on the vision by setting up milestones and achievable targets. This could further be translated into action points. The vision will also serve as a guidance and inspiration for the ULB to streamline its focus areas.

The vision statement is formulated by giving a simple answer to the question "**How would the sanitation situation in your city ideally look like in 30 years from now?**" Being a generic question, it is sometimes difficult to answer it in a commonly acceptable way. In order to formulate it in a participatory manner, it has to be prepared with the CSTF through a facilitated meeting. For such a formulation of the CSP Vision, the participants can be told to come prepared with 2-3 vision formulations which can be concretised in the meeting, or the meeting can be conducted in a way such that small groups are formed and each comes up with a vision formulation in the meeting itself.

Examples for potential CSP vision

- The full sanitation cycle city - The city that uses their liquid and solid waste as a resource
- The participatory city – A city where ULB, NGOs, Council, businesses, citizens and many more stakeholder take the sanitation agenda jointly ahead
- Our city will become a centre for smart sanitation solutions, which will share their experience with other cities and state. It will be the forerunner for septage management in our state.

4

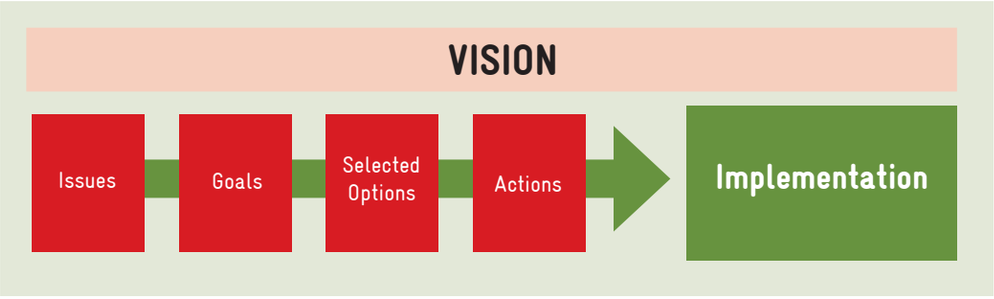
STRATEGY DEVELOPMENT AND ACTION PLAN PREPARATION

The success of any planning document can be judged only when it is brought into action. The final aim of strategy development is reaching an informed decision that can be explained to stakeholders, council and CSTF and that is implementable. It has to be understood that every context is different and informed decisions have to be made by understanding the context and analysing a suitable solution. Multiple solutions must be considered, analysed and weighed before coming to a decision on the action. The assessment of options should not be limited to the technical aspects but should also cover social, environmental, financial aspects and the human resource demands. The solutions must be discussed with the CSTF and technical teams of the ULB before finalising.

The main tool for planning the implementation of CSP is the Action Plan and the investment plan. This chapter will detail on how to develop the Action Plan starting from translating issues into goals, selecting a suitable option for reaching the goal and defining actions. The investment plan will form part of the next chapter.

4.1 Strategy Development

A strategy defines the way how each city plans to tackle the issues identified based on the data collected and analysed. Based on the key issues selected in the previous chapter, a set of goals are prepared which set the target for improvement of sanitation services in that city. In order to achieve these goals, different technical and non-technical options can be applied by the ULBs. After a suitable analysis of these options, the most appropriate ones are selected. These selected options are further translated to actions that structure the implementation.



STEP 1: FORMULATION OF GOALS

The goals of the CSP need to be in line with the city-wide key issues. Therefore, every CSP will not have more than 8-10 main goals. These goals should be in line with the objectives of any on-going national or state programme, which would provide financial support for selected projects (e.g. AMRUT, SBM, etc.).

The formulation of the goal should follow the criteria in the figure below.

Criteria for the definition of good goals:

S	Specific:	The goal is specifically addressing the Key Issue; it is precisely formulated.
M	Measurable:	The goal achievement can be measured / verified.
A	Attainable:	The goal can be realistically achieved by the respective city.
R	Relevant:	The goal addresses the most relevant issue.
T	Time-bound:	The goal provides a temporal reference so that progress can be measured during the course of implementation

The following table lists examples for key issues and the corresponding goals

Table 31: Formulation of goal

ISSUE	GOAL
No coverage to sewerage system in peripheral areas and limited sewer connectivity in covered areas	Achieve 100% sewer connection in a combined mode of centralised and decentralised system
Prevalence of open defecation in certain low-income pockets.	Provide adequate sanitation facilities in all slum settlements
Cost recovery levels in water supply and solid waste are very low against O&M costs.	Improve collection efficiency of solid waste and water charges
Littering and waste dumping in open storm water drains	Make open drains litter-free
Regulation and oversight of onsite sanitation and septage management is inadequate.	Implement a septage management priority project with clear roles and responsibilities

Table 32: This table below should be used for listing the goals of the CSP

SANITATION GOALS	
1	
2	
3	
4	
5	
6	
7	
8	

STEP 2: SELECTING THE ADEQUATE OPTION

For achieving the goals of the city, there are various technical, institutional, financial options one could select. If the goal is that no wastewater will be disposed in water bodies, one could go for a centralised sewer system covering the whole city, or could also go for decentralised systems for grey water and a centralised septage management plant. Alternatively one could opt for a mixed system depending on the area of the city.

For achieving 100% treatment of solid waste, one could opt for household level composting of biodegradable waste or else suggest various decentralised vermi-compost plants or alternatively opt for a regional waste-to-energy solution.

The suitable option for the respective city depends on the local conditions, the finances available and the framework conditions in the state or the region. The selection of an option should be based on a clear criteria and undergo a systematical assessment

While selecting an option it is important to keep in mind that one solution must not cover the complete city. Solutions can be mixed or implemented area-wise in a sequence of importance. Different options can be applied in parallel (e.g. for different wards of the city) or in combination in one area. An example would be a combined sewerage system comprising central elements through sewer network in the core city area and decentralised systems in the city outskirts for big apartment complexes and institutions such as colleges and hospitals.

Not only technical options should be considered for achieving the goal. If for example one wants to achieve an improvement in the collection efficiency of water charges, a suitable option might be to strengthen the institution that is in charge of the collection through additional capacities or training.

Current programs like AMRUT or Smart Cities encourage "Out of the Box" solutions as to promote water reuse and recycling, septage management, decentralised and centralised sewerage systems, smart solutions, etc. It is encouraged to move away from conventional or cost-intensive options as appropriate alternatives can be applicable to many contexts with a better feasibility.

In the following section, there are indications of how to select and option and what are the necessary criteria for conducting assessment:

GOAL: THE WASTEWATER OF ALL HOUSEHOLDS IN THE CITY IS COLLECTED, STORED SAFELY AND TREATED

For this the city is required to select the adequate wastewater management system.
The following options are available for a city:

- **Offsite centralised system:** Sewerage system combined with Sewage Treatment Plant(s).
- **On-site system:** On-site sanitation with adequate septage management and subsequent treatment of effluent and grey water.
- **Mixed system:** Combination of centralised and decentralised systems for different parts / locations of the city.

Table 33: Selection Criteria for choosing the appropriate Sanitation System

Key factors influencing the choice of Sanitation System	Sewerage system	On-site Sanitation
Water supplied per household	**High supply** (>= 135 lpcd)	**Lower supply** (< 135 lpcd)
Ground Water Table (GWT)	**Not feasible** in high GWT areas (0-3 mtrs)	**Feasible** in high GWT areas (comparatively) (0-3 mtrs)
Geology	**Not feasible** in rocky terrains	**Feasible** in rocky terrains (comparatively)
Financial Capacity of ULB for O&M of sanitation system	**Cost Intensive** for ULB; financing O&M through revenues feasible	**Less cost intensive** for ULB; difficulties in getting sufficient revenues
Staff and skills available for planning, implementation and maintenance of sanitation system (Managerial and technical skills)	Requires **greater skills and staffing** at ULB	Requires **lesser skills and staffing** at ULB (comparatively)
Land available / accessible for ULB	Requires **sufficient public land** for constructing STP and sewer system	Requires **limited public land**

GOAL: IMPROVEMENT OF ON-SITE SANITATION SYSTEM FOR HOUSEHOLDS AND PUBLIC/COMMUNITY TOILETS NOT CONNECT TO A SEWER SYSTEM

There are various on-site sanitation available in India, which differ in technology, resource requirement and level of treatment. While simple septic tanks or twin pit latrine achieve maximum of primary treatment, bio-digester, bio tanks and advanced septic tanks can achieve a higher level of treatment. The table below indicates possible selection criteria for on-site systems:

Table 34: Selection Criteria for different options of On-site Systems

Selection Criteria	Septic Tank with Soak Pit	Twin-Pit Latrine	DRDO Bio-Digester	Bio Tanks
Soil type	For soak pits to function, soil condition must be suitable	For twin pits to function, soil condition must be suitable	For soak pits to function, soil condition must be suitable	No effect of soil type
Ground water table	Suitable in lower GWT areas	Suitable in lower GWT areas	Suitable in lower GWT areas	No effect of GWT
O & M	Reasonable attention	Reasonable attention	Minimum attention	Maximum attention
Land requirement	40-50 sq. ft	40-60 sq. ft	25 sq. ft	16 sq. ft
Approx. Cost (including toilet)	Rs. 15,000-20,000	Rs. 25,000-30,000	Rs. 24,000-37,000	Rs. 20,000

GOAL: ALL SOLID WASTE GENERATED IN THE CITY WILL BE TREATED SCIENTIFICALLY

In India various treatment options for different types of solid waste are available. Each treatment option should selected according to desired selection criteria:

Table 35: Selection Criteria for different options of SWM

Selection criteria	Windrow composting	Vermiculture composting	RDF	Waste incineration
Capital Investment	15-20 Cr for 500 TPD plant	1 Cr. per 20 TPD	17-20 Cr for 500 TPD plant	High capital + O& M cost 15 cr per MW power production
Land requirement	For 300 TPD of segregated/pre-sorted MSW: 5 ha of land including buffer zone is required	For 20 TPD of segregated/pre-sorted: 1.25 ha; location close to quarters	For 300 TPD of segregated/pre-sorted of MSW: 2 ha of land is required	For 1000 TPD of mixed waste: 5 ha of land including buffer zone.
O&M	Labour intensive, technically qualified staff required	Labour intensive, semi-skilled staff / care taker required	Labour intensive, technically qualified staff required	Not labour intensive, technically qualified staff required
Waste quantities which can be managed by single facility	20 TPD and above	1-20 TPD	100 TPD of segregated waste	1000 TPD and above of mixed waste
Market for product	Quality compost if compliant with standards has high potential.	Good market potential in urban and rural areas, often not adequately explored	High market potential for RDF. As a feeder in cement/ power plants.	High potential of energy generation if power purchase agreements are made.

4.2 Development of Action Plan

The Action Plan is the core of the City Sanitation Plan. It outlines the specific actions and their sequence to achieve each goal.

An action plan has 3 main elements.

- Specific tasks: **What** will be done
- Time horizon: **When** will it be done (short – medium – long term)
- Responsibilities: **Who** will do it

Finally as addition to the Action Plan an investment plan needs to be prepared to indicate cost and resource allocation for each action.

A clear definition of each action is very important while preparing an Action Plan. It has to be specific and detailed at the same time so that the stakeholders are aware of their roles from the initial stage itself. In order to be a successful plan, it needs to comply with the following criteria:

- **Complete** - It should list all the action steps or changes to be sought in CSP in all relevant sectors (e.g., technical, financial, management, social etc.)
- **Clear** - It should be clear who is responsible for what and when to achieve
- **Current** - It should be based on the current status of activities in the city and should reflect all on-going works to avoid duplications. It should consider ongoing/upcoming govt. schemes, proposed projects, laws/regulations etc. in the sanitation sector

STEP 1: IDENTIFICATION OF SPECIFIC ACTIONS FOR EACH GOAL

The specific actions required to achieve each goal needs to be detailed in a logical sequence. It must be ensured that for each goal all relevant activities including IEC, capacity development programmes, financial interventions, etc. need to be outlined. Focusing only on technical interventions such as DPR development is not sufficient. The following example illustrates a simple listing of actions for a goal.

GOAL: TO MAKE XXXX CITY OPEN DEFECATION FREE

1. Detailed survey of existing facilities and identify open defecation areas
2. Repair and upgradation of existing public/community toilets
3. Construction of new public and community toilets in Open Defecation areas
4. Support private households (without toilet facilities) for construction of household toilet facilities through subsidies, grant etc.
5. Initiate phasing out of dry latrines
6. Develop system for sustainable management of public toilet facilities

Departments/Categories involved in the actions: Technical, financial, local administration, capacity development, IEC, legal provisions

STEP 2: STRUCTURING ACTIONS OF EACH GOAL ACCORDING TO TIMELINES AND PRIORITIES

The final step in preparation of Action Plan is to structure it according to the timelines and priorities.

With reference to Table 36 below, the actions can be classified into the following:

- **Short term actions:** The on-going projects, tasks which are easy to implement, actions which already have funds available, actions with high political will, etc. Can be listed as short term actions. Ideally these are the actions which are targeted to be completed within 3-5 years.
- **Medium term actions:** Typically actions which require fair amount of pre-planning or the ones for which funding options and legal provision are required are listed in medium term actions. They have to be targeted to be completed in 5-10 years time.
- **Long term actions:** Large scale infrastructure projects, actions which require short-term and medium term actions to be completed before initiating implementations, long-term changes in institutional structure can be listed here. The timeframe for long term actions are more than 10 years.

Actions can also be prioritised within each section of short, medium and long term strategies. For prioritizing actions following criteria among others can be applied:

- Availability of funds
- Implementation of action is under the control of the ULB
- Action eligible/mandated by Swachh Bharat Mission, AMRUT, State Finance Commission
- Pressure from the public
- Adverse impact (negative impact if the action is not implemented)
- Visibility

It is recommended to start with smaller measures that have high visibility, which are under the implementation control of the ULB. Such measures can be called “quick wins” and will provide a positive experience for the public and the ULB that changes on the ground are indeed possible. This will facilitate public support for future more controversial projects.

While listing actions in the timeframe, it needs to be ensured that all goals are thoroughly reviewed. Wherever possible, some action components of every goal should fall into the short term category. This is to ensure that every issue is addressed in whatever scales possible. Further, care should be taken to ensure that each timeframe is not overloaded with many action points nor have too few actions. The former can cause delays in finishing the tasks and the latter can result in laxity over progress.

The following table brings out a simple format to which the plan can be prepared.

Table 36: Format for Action Plan

Sectors	Goals (from list above)	Actions			Agency responsible for action (ULB, PHED, etc.)
		Short term (within 3 yrs.)	Medium term (3 to 5 yrs.)	Long term (within 10 yrs.)	
Water supply					
Toilets					
Waste-water					
Solid waste					
Storm water					
Finance Management					
Administration/ Governance/ Institutions					
Capacity Enhancement					
Gender and support to the urban poor					

4.3 Financial Plan / Cost Estimation

It is often observed that Action Plans are stalled due to lack of appropriate funding. It has to be noted that SBM and AMRUT do not cover the complete project cost. The ULB needs to look at additional funding sources and revenue creation options in order to ensure smooth implementation. While financing from state government is always a strong option, involving local sources and incorporating public-private partnership models are also encouraged.

The ULB should calculate the cost action for short-term, medium-term and long-term activities. Further, the funding sources that have been planned to be used for covering the cost of the acitivities must also be added. For this it is required to have a clear picture of the financial capacities of the ULB for which the financial analysis and budget project from chapter 2.12 can be referenced.:

Table 37: Cost Estimates for CSP

No	Actions (taken from CSP Action Plan)	Description (All activities included in this action)	Cost in Rs.			Source for funding (ULB own revenues, Grant under SBM, AMRUT, etc.)
			Short Term	Medium Term	Long Term	
1						
2						
3						
4						
5						
6						
7						

After the Action Plan and the Investment Plan, the city should additionally provide a list of potential Detailed Project Reports (DPRs) emerging from the Action Plan to be submitted under AMRUT or SBM.

This list can be presented in the following tabular manner:

Table 38: Details of DPRs to be implemented under the CSP

Sr. No.	Potential DPR (name / sector)	Current Status (planned / prepared / submitted / approved / under implementation)	Lead agency for DPR preparation/implementation

4.4 Information, Education & Communication for Behaviour Change

Information Education and Communication (IEC) Campaigns as well as Behavioural Change Communication (BCC) are extremely important drivers for successful CSP implementation since they can ensure, both qualitative and quantitative, stakeholder involvement. An effective external communication strategy is crucial for achieving the CSP goals.. Together with the CSTF, the ULB should decide for which of the CSP goals, IEC or BCC campaigns would be most important. For each of these goals the message for motivating change that should be conveyed to the public/community/stakeholders needs to be defined. Messages can refer to concrete behavioural change ("Stop littering in public places") or to awareness raising ("Lack of sanitation facilities lead to bad health for your children). Then the tools, means, target area and target groups for communicating this message adequately need to be identified.

Given below is an illustration of an effective IEC campaign.

Table 39: Example for preparing an external campaign

Campaign Objective	Stop Littering in Public Spaces
Possible location	Commercial areas (markets, etc.)
Target audience	Families, women and children
Current behavior	Throwing plastic waste into the open areas, especially waste of products they just bought
Desired behavior	No littering in the areas
Partners for campaign	Vendors, market associations, ULB, RWA, safai karamcharis
Communication Actions	Display messages, organize street theatre at the market, organize, clean-up actions with children, etc.
Communication Channels	Board at shops, Personal interactions
Monitoring systems	Monthly monitoring day with vendors and buyers at markets taking pictures
Sustainability	Incentive system for street vendors

Inputs in the right column are examples which need to be adapted for each individual city.

5 COMPLETION OF CSP

All results from Chapter 1-4 outlined in this Tool-kit must be documented and compiled in one coherent CSP document. For finalizing the CSP and bringing it into action, following steps should be followed:

- **Approval from the Municipal Council:** Apart from the approval by the CSTF, the CSP should be approved or endorsed by the local government, which in most cases would be the Municipal Council. This would provide the CSP document the necessary political backing for its implementation.
- **Sharing the CSP with the public:** The CSP document should be made available to the public by e.g. uploading it on the website of the ULB or putting it up for public display in the office of the ULB.
- **Media coverage on CSP completion:** The ULB should ideally issue a press release on the completion of the CSP. Broader coverage by local media would be even better. Information on CSP completion could also be shared via existing social media networks on Whatsapp, Telegram, Facebook, etc.
- **Setting up a monitoring process:** During the finalisation of the CSP the CSTF together with the council should decide a frequency of monitoring of CSP implementation progress. The main tool for monitoring should be the action plan. It is advised that at least every 3-6 months the council reviews the Action Plan for assessing the implementation of CSP and make any strategic changes if and when required.
- **Revision of CSP:** To make the CSP a living document every 3-5 years, the document and the baseline data should be updated.

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