सत्यमेव जयते

Ministry of Housing and Urban Affairs
Government of India

SUSTAINABLE CITIES INTEGRATED APPROACH PILOT IN INDIA

Training and Assistance Need Analysis Report

2020-21

VIJAYAWADA

gef

UNIDO
UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

NIUA
National Institute of Urban Affairs

Ministry of Housing and Urban Affairs
Government of India

SUSTAINABLE CITIES INTEGRATED APPROACH PILOT IN INDIA

Training and Assistance Need Analysis Report

For the provision of services and activities related to the delivery of tailored training and relevant capacity building activities to city managing authority of Vijayawada

Component 3:
Partnerships, Knowledge Management and Capacity Building

2020-21

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*Note- In this report Used Water is referred to as Wastewater

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Paramita Datta Dey
Team Lead

Contents

List of Tables

List of Figures

List of Abbreviations

APCRDA	Andhra Pradesh Capital Region Development Authority
APUFIDC	Andhra Pradesh Urban Finance and Infrastructure Development Corporation
AE	Assistant Engineer
AMOH	Additional Medical Officer of Health
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AEE	Assistant Executive Engineer
CHO	Corporation Health Officer
C&D	Construction and Demolition
CE	Chief Engineer
CMOH	Chief Medical Officer of Health
DMA	Directorate of Municipal Administration
DEE	Deputy Executive Engineer
EIA	Environmental Impact Assessment
EE	Executive Engineer
Env. Er.	Environmental Engineer
FSTP	Faecal Sludge Treatment Plant
GoAP	Government of Andhra Pradesh
IUWM	Integrated Urban Water Management
IEC	Information, Education and Communication
ICT	Information and Communications Technology
JE	Junior Engineer
MLD	Million Litres per Day
MT	Million Tonnes
MA&UD	Department of Municipal Administration and Urban Development
MHO	Municipal Health Officer
MoHUA	Ministry of Housing and Urban Affairs
NRW	Non-Revenue Water
NGOs	Non-Government Organizations
O&M	Operation and Maintenance
PHMED	Public Health & Municipal Engineering Department
PH	Public Health
SC-IAP	Sustainable Cities Integrated Approach Pilot Project
SWM	Solid Waste Management
SOPs	Standard Operating Procedures
SI	Sanitary Inspector
SS	Sanitary Supervisor
SE	Superintending Engineer
TANA	Training and Assistance Need Analysis
ULB	Urban Local Body
UGD	Underground Drainage
UNIDO	United Nations Industrial Development Organization
UN	United Nations
UFW	Unaccounted For Water
VMC	Vijayawada Municipal Corporation
VGTMUDA	Vijayawada Guntur Tenali Mangalagiri Urban Developwment Authority
WS	Water Supply

1

INTRODUCTION

1. Introduction

1.1 About Sustainable Cities Integrated Approach Pilot

The Global Environment Facility (GEF) launched the Sustainable Cities Integrated Approach Pilot (SC-IAP) to help cities address the challenges posed by mega-trends (urbanization, rising middle class and population growth) of global environmental degradation in an integrated manner. UNIDO is one of the specialized agencies assisting countries in accessing GEF SC-IAP set aside funds, primarily building on the country allocations the focal areas of climate change and chemicals and waste. The SC-IAP programme currently engages 28 cities in 11 developing nations. UNIDO-GEF projects under this initiative include the Sustainable Cities Integrated Approach Pilot in India.

The United Nations Industrial Development Organization (UNIDO) implements the SC-IAP programme in India along with the Ministry of Housing and Urban Affairs (MoHUA). The core objective is to build resilience in five pilot cities – Jaipur, Bhopal, Mysuru, Vijayawada and Guntur – by integrating sustainability concepts into urban planning and management strategies. One key component is the identification of investment projects and technology demonstrations that encourage the development of low carbon urban infrastructure and help reduce greenhouse gas (GHG) emissions.

The main components of the project include:
Component 1 - Sustainable urban planning and management; handled by UN-Habitat,
Component 2 - Technology and investment support for innovative, low carbon pilot projects; handled by UNIDO, and
Component 3 - Partnerships, knowledge management and capacity building, handled by NIUA.

1.2 Role of NIUA

The main role of NIUA is to undertake the implementation of Component 3 – Partnerships, Knowledge Management and Capacity Building. NIUA will contribute towards building the multi-sectoral partnership platform to ensure the implementation of sustainable city strategies, by understanding various issues and challenges of technical, financial, political, social stakeholders/partners. To solve these major issues and challenges, NIUA will prepare the integrated training curriculum modules for various stakeholders in five cities. These modules will help in the implementation of the projects in the pilot cities. The training program outcomes from these cities will then be scaled up to 25 Indian cities, which share similar scale and complexity of issues in implementing sustainable strategies.

1.3 About TANA

The Training and Assistance Need Analysis (TANA) is designed and developed in coordination with UNHABITAT and UNIDO. The TANA assessed the current status of the five cities in the field of sustainability, with particular reference to water, sanitation and solid waste management. The results were shared with UNIDO and UNHABITAT for review, approval and finalization.

The results of TANA will constitute the basis for a detailed training and technical assistance program. It will include the following:

1. Baseline status of current projects on Water, Sanitation and Solid Waste Management in five pilot cities
2. Baseline assessment of the current level of knowledge of stakeholders and their training needs
3. Collection of information from stakeholders in five cities through Semi Structured Interview (SSI), Focus Group Discussion (FGD), Personal Interviews (PI)
4. Corroborating, compiling and analysing data collected from various sources
5. Conducting validation and triangulation workshop on findings of TANA
6. Review and update of TANA findings in coordination with experts, UNIDO and UNHABITAT

Based on the results of TANA, the training curriculum on Solid Waste Management, Waste Water and Water Management will be developed by NIUA in close coordination with UNIDO and UNHABITAT. This will include the following tasks:

1. Based on TANA results, modules on water, waste water and solid waste management will be prepared for relevant stakeholders
2. For developing the module & pedagogy NIUA will synergize the experience of institutional and sector experts and trainers from relevant training institutes
3. Finalizing module in coordination with UN/experts/local resources/city officials.

As per prior experience in conducting capacity building workshops, it has been identified that one curriculum fails to achieve desired outcomes for different stakeholder groups due to their varied roles, responsibilities and aspirations. Hence, we seek to curate customised training sessions for various stakeholders. A tentative curriculum outline structure is shared as below in Figure 1 and Figure 2.

Figure 1: Curriculum Outline Development

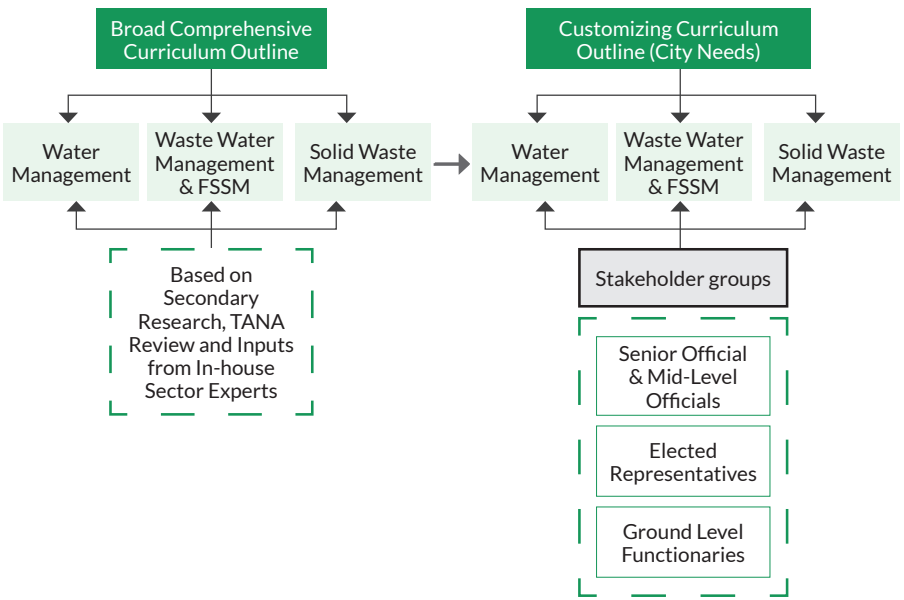

Figure 2: Broad Curriculum Outline

Chapter 1	Overview	Chapter 5	Project Management
Chapter 2	Legislations, Policies and Programmes	Chapter 6	Financial Management
Chapter 3	Technical Concepts, Available Approaches and Technologies	Chapter7	Stakeholder Engagement
Chapter 4	Operation, Maintenance & Monitoring	Chapter 8	Good Practices
Chapter 9	Disaster Preparedness and Emergency Response		


CHE'S PHOTOGRAPHY

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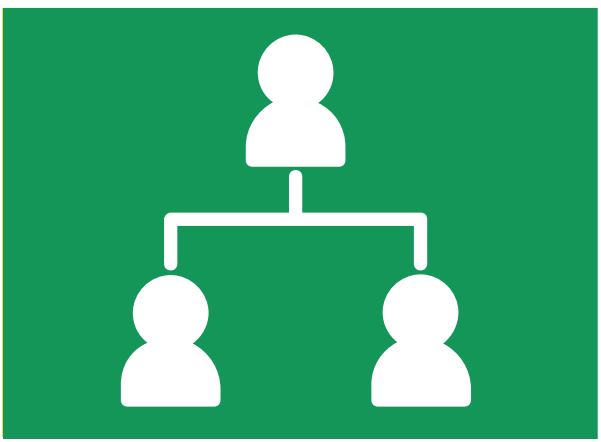
FRAMEWORK OF TRAINING AND ASSISTANCE NEED ANALYSIS



2. Framework of Training and Assistance Need Analysis

2.1 Objectives

The Training and Assistance Need Analysis (TANA) aims to understand the existing knowledge of the municipal corporation employees, across the hierarchy of the Urban Local Body (ULB). The findings of this study provide direction to the designing of the training curriculums customised for the needs of the five pilot cities. The specific objectives of the study are as follows:

1. To understand the focus of the ULB among the three sectors.
2. To understand the job roles of the officials, performed at various designations.
3. To determine the existing knowledge and understanding of the Municipal Corporation officials dealing with the three sectors at various designations.
4. To find the gaps in the existing knowledge of the ULB employees.
5. To determine the preferences of the ULB officials with respect to the content of the training programme.
6. To determine the preferences of the ULB officials for the training programme.
7. To provide a baseline understanding of knowledge to design the training curriculum.

2.2 Scope

With regards to this project, majorly ULBs are taken into account while trying to understand the needs of the city. The scope of this project spans over the three sectors of Solid Waste Management, Water Supply and Waste Water Management. The employees of the Municipal Corporations of the five pilot cities were interviewed. The assessment tries to cover the complete hierarchy of the employees, and hence, several members of Municipal Corporations at various

designations have been interviewed. Other parastatal agencies were also interviewed, with an intent to help city officials to plan, implement, operate and maintain sustainable city strategies and low carbon investment projects which are technically and financially viable.

2.3 Limitations

The interviews and primary data collection was anticipated to be done on-site in the five cities. However, the COVID-19 crisis and the lockdown that followed as a response to it disrupted the activities. It had a two fold impact- firstly, the transport services across the country were brought to halt thereby limiting the movement of people. Hence, the research team could not interact with the Municipal Corporations in person. Secondly, during the lockdown that continued for about 2 months, municipal services of Water, Drainage, Sanitation and Solid Waste Management were marked as essential services. As a result of this, the members of the Municipal Corporation that were planned to be interviewed were very occupied with their duties and responding to the crisis. Considering the circumstances, the interviews were conducted through video or audio conferencing and online mediums, coordinated with the City Representatives of UNIDO.

2.4 Structure of the Training and Assistance Need Analysis Report

This document has been structured into various chapters. Chapter 1 provides a basic understanding of the SC-IAP Project, a part of which is the TANA. Chapter 2 provides a framework for the TANA conducted, specifying the objectives of the analysis, defining the scope and the limitations of the process. Chapter 3 illustrates in detail the methodology adopted for the study. The following chapter is dedicated to one of the five pilot cities, providing the baseline status of the cities for the three sectors of Solid Waste Management, Water Management and Waste Water Management, followed by the stakeholder wise Training and Assistance Need Analysis findings. Chapter 5 provides a summary of the gap analysis and an outline of the curriculum that will be delivered in the city, according to the needs highlighted by various stakeholder groups. The Annexures at the end of this document can be referred to for the detailed questionnaires, followed by the detail findings of TANA for Mid-level Officials of Vijayawada.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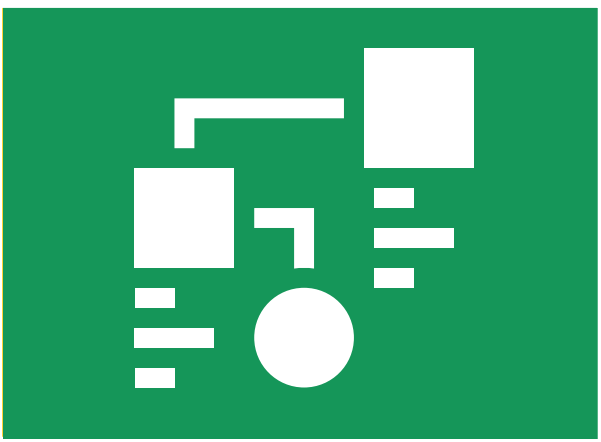
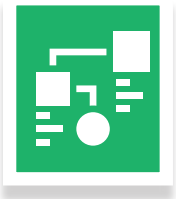
3

METHODOLOGY



3. Methodology



For understanding the training needs of the Urban Local Bodies, primary and secondary research approach was adopted to gather data of the five pilot cities in the three sectors i.e. Water Management, Waste Water Management and Solid waste management. The results of TANA will constitute the basis for a detailed training and technical assistance program. TANA includes the following:

1. A Baseline compilation of the status and relevant projects of Water, Sanitation and Solid waste management in five pilot cities.
2. Gathering information from stakeholders through Structured and Semi-Structured Interview (SSI), Focus Group Discussion (FGD), Personal Interviews (PIs) about their understanding and preferences.
3. Baseline assessment of the current level of knowledge of stakeholders and their training needs.
4. Corroborating, compiling and analysing data collected from various sources.
5. Conducting validation and triangulation workshop on findings of TANA.
6. Review and update of TANA findings in coordination with UNIDO and UNHABITAT experts.

The methodology adopted in each of these sections is detailed in the following sections. Figure 3 details the process adopted to prepare the TANA. The first step in the process was to gather the secondary data from various sources and prepare a framework for the primary data collection.

3.1 Secondary Research

To understand different aspects of the target groups and to identify their training needs, a literature review of various existing TANA reports and a baseline study of each city was done. With the help of UNIDO representatives and from the review findings, stakeholder

mapping and sampling for each city were done which is explained in Figure 4. Considering various aspects of ULBs of each city, stakeholder mapping was formulated to streamline the stakeholders into three groups, viz., i.e. Senior officials, Mid-level officials and Ground-level Functionaries. After the Stakeholder grouping, a response matrix was created for the three sectors. Accordingly, sampling was done. This was followed by primary data collection, detailed in the following section.

3.2 Primary research

The Primary data collection included various research tools, depending on the requirements and needs of the stakeholder groups. In order to understand the training needs of senior officials, personal Interviews were conducted on virtual platforms like Microsoft-Teams, Zoom or conference calls. This was done as per the availability of the interviewees. Mid-level officials were interviewed through structured questionnaires whereas, a semi-structured questionnaire was used to conduct focus group discussions with ground-level functionaries.

Figure 3: Methodology adopted for the TANA

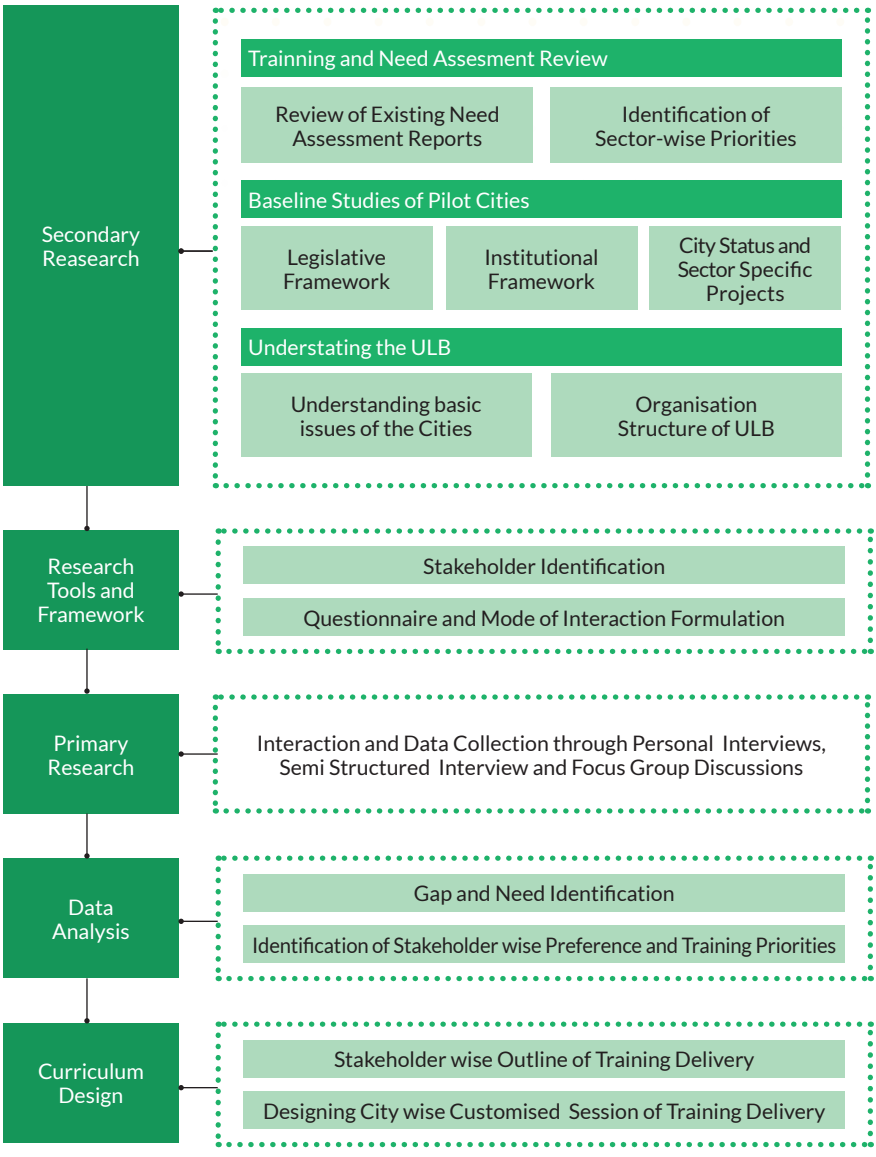
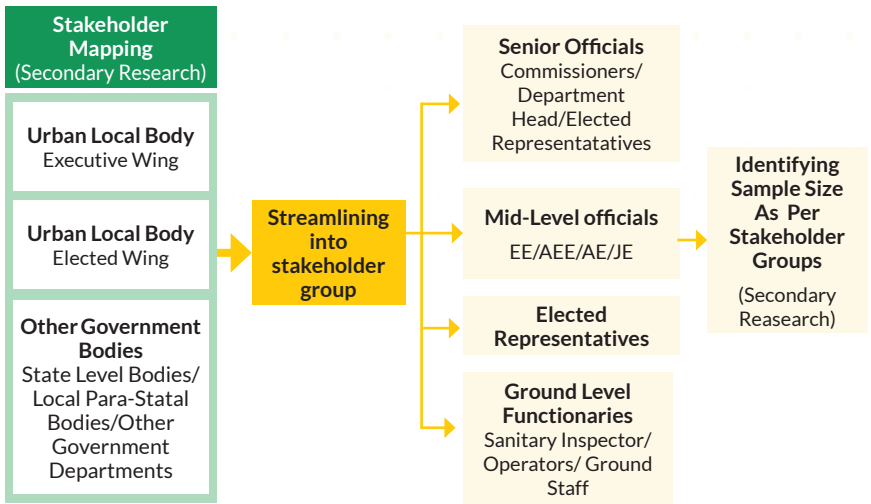


Figure 4: Stakeholder Mapping



3.2.1 Research Instrument

For this study, three main data collection instruments were deployed to collect the data from the respondents. These are as follows:

1. Semi Structured Interviews (SSI) - These were used to interact with the senior officials to understand their needs and expectations of the project. It was done with the help of a few open-ended questions considering the limited time they have.
2. Personal Interviews and Individual Assessment- Personal Interview (PI) and Individual Assessment (IA) was used for interaction with the Mid-level Officials. The objective of the IA was to assess the gaps in their knowledge concerning the sector that they work in, while the PI attempted to understand the preferences of the respondents with respect to the training delivery medium.
3. Focus Group Discussions- Focus Group Discussion (FGD) was the mode of understanding the training needs of the ground-level functionaries. In cities where the language was different or the respondents did not understand Hindi and English, a local translator facilitated the FGD.

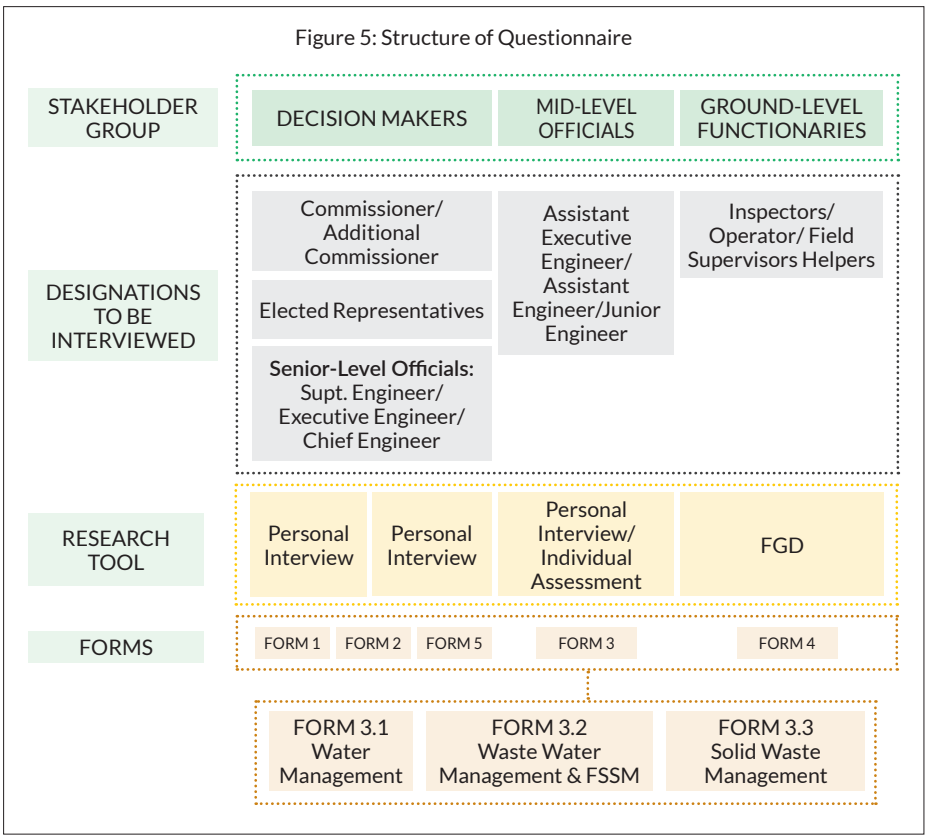
3.2.1.1 Research Questionnaires

To analyse the needs of the identified stakeholders from each functional group, customized questionnaires were prepared for each stakeholder group. Five sets of forms each dedicated to a specific stakeholder group were developed. The overview of the structure of the questionnaire set is depicted in Figure 5.

The questionnaires covered various aspects ranging from individual and professional details like the designation of the officials, their current job responsibilities and future demands for the post, their strengths and existing skill gaps and their needs and expectations from the training programs.

The questionnaires have been developed in consultation with in-house sector experts and city representatives from UNIDO to keep a check on the validity of the questions with respect to the context of the city. The questionnaire set was designed considering the

Figure 5: Structure of Questionnaire



clarity of the questions and the time needed for responding to the questions. Each questionnaire is provided with a brief description of the project.

For ethical approval, a consent form is also attached with the questionnaire which is read to the respondent before gathering any information. The interview is conducted only after the respondent has given his/her consent. Considering the limitations of the mode of interaction, consent was taken for recording the proceedings of the interview for documentation purposes. The approximate estimated time needed for conducting the interview is conveyed to the respondent at the outset. The details of questions covered under each form in the questionnaire are discussed in detail in the following sections.

Form 1

Form 1 of the questionnaire set is specially designed for conducting a one-on-one structured or semi-structured interview with the stakeholder group of senior officials. The questions are framed to gauge the perspective of the decision-makers towards the capacity building needs of the officials and staff with respect to the three sectors of water, waste water and solid waste management.

Figure 6: Structure of Form 1

FORM 1

Q No	Expected Outcome
Q1	Assessing priorities of the city for sustainable development in three identified sectors of water, waste water and solid waste management and also gauging the focus areas in the concerned sectors
Q2	Assessing the capacity building needs of the senior, mid and ground level functionaries
Q3	Assessing the capacity building needs for effective coordination with Elected Representatives
Q4-Q5	Understanding city preparedness strategies during emergencies and assessing the capacity building needs for building resilience towards disasters and emergencies

The assessment from Form 1 is helped to understand the current status and future strategies of the city in water, waste water and solid waste management. This, in turn, would help assess the capacity buildings needs of the city officials for efficient performance. The overview of the form structure is explained in Figure 6.

Form 2

Form 2 of the questionnaire set is designed for conducting a one-on-one structured or semi-structured interview with the senior officials under the stakeholder group of Decision Makers. The questions towards the senior officials and department heads are framed to understand the key focus areas of their particular departments and elicit their suggestions to improve the identified issues and challenges. The interview also helped in gauging the perspective of the senior officials towards the capacity building needs of their team of mid and junior officials and staff.

Assessment Form 2 helped to gauge the needs and expectations of each department working in the three sectors. It also helped to understand the current status of the city in each sector and the corresponding training needs. The overview of the form structure is explained in Figure 7.

Figure 7: Structure of Form 2

FORM 2	
Q No	Expected Outcome
Q1 -Q2	Identifying the key focus areas of the concerned sector and understanding strategies for strengthening the gaps in the identified focus areas
Q3 -Q4	Assessing past training experiences , understanding the current needs and gauging expectations from future training programs
Q5 -Q6	Assessing the capacity building needs for effective coordination with Elected Representatives and other stakeholders
Q7	Identifying sector specific innovative and good practices adopted by the city
Q8 -Q10	Understanding city preparedness strategies adopted during emergencies and assessing the capacity building needs for building resilience towards disasters and emergencies
Q11-Q12	Sector specific questions assessing current status

Form 3

Form 3 is designed for conducting a one-on-one interview with the mid-level officials of the various departments in each sector. The form has three sets - one for each sector i.e. water, waste water and solid waste management. Through this interview, information is elicited from various mid-level officials with respect to their current job responsibilities, their future aspirations and also their expectations from the training program. Since the mid-level officials have to interact with both the ground level functionaries and the senior officials for smooth functioning of the day-to-day tasks, understanding their training needs is essential for efficient service delivery.

The assessment from Form 3 helped to gauge the needs and expectations of the Mid-level Officials of each department working in the three sectors. The form is specially designed to help the officials assess their current level of understanding on various

aspects relevant to their job roles and in turn assess their needs for attending training for the same. The overview of the three sets of the form is explained in Figure 8.

Figure 8: Structure of Form 3

FORM 3.1: Water

Q No	Expected Outcome
Q1 -Q20	Understanding respondent's profile, job responsibilities, expectations from training program and preferences with respect to training pedagogy
Q21-Q28	Assessing respondent's level of understanding with respect to various aspects of their job responsibilities and corresponding training needs
Q27 -Q31	Understanding city preparedness strategies adopted during emergencies and assessing the capacity building needs for building resilience towards disasters and emergencies

FORM 3.2: Waste Water (UGD)

Q No	Expected Outcome
Q1 -Q19	Understanding respondent's profile, job responsibilities, expectations from training program and preferences with respect to training pedagogy
Q21-Q28	Assessing respondent's level of understanding with respect to various aspects of their job responsibilities and corresponding training needs
Q27 -Q31	Understanding city preparedness strategies adopted during emergencies and assessing the capacity building needs for building resilience towards disasters and emergencies

FORM 3.3: Solid Waste Management	
Q No	Expected Outcome
Q1 -Q19	Understanding respondent's profile, job responsibilities, expectations from training program and preferences with respect to training pedagogy
Q21-Q28	Assessing respondent's level of understanding with respect to various aspects of their job responsibilities and corresponding training needs
Q27 -Q31	Understanding city preparedness strategies adopted during emergencies and assessing the capacity building needs for building resilience towards disasters and emergencies

Form 4

Form 4 is designed for conducting a focus group discussion with the ground-level functionaries of the various departments in each sector. Through this focus group discussion, information with respect to their current job responsibilities, their future aspirations and also their expectations from the training program is assessed. Since the ground-level functionaries understand the issues and challenges at the ground level, understanding their perspective is essential for effective planning and implementation of any project.

The assessment from Form 4 helped to gauge the needs and expectations of the ground-level functionaries of each department working in the three sectors. The questions in the form are kept intentionally flexible to help gather anecdotal information from the ground- functionaries with respect to various issues and challenges faced on a day-to-day basis on various aspects. The overview of the form structure is explained in Figure 9.

Figure 9: Structure of Form 4

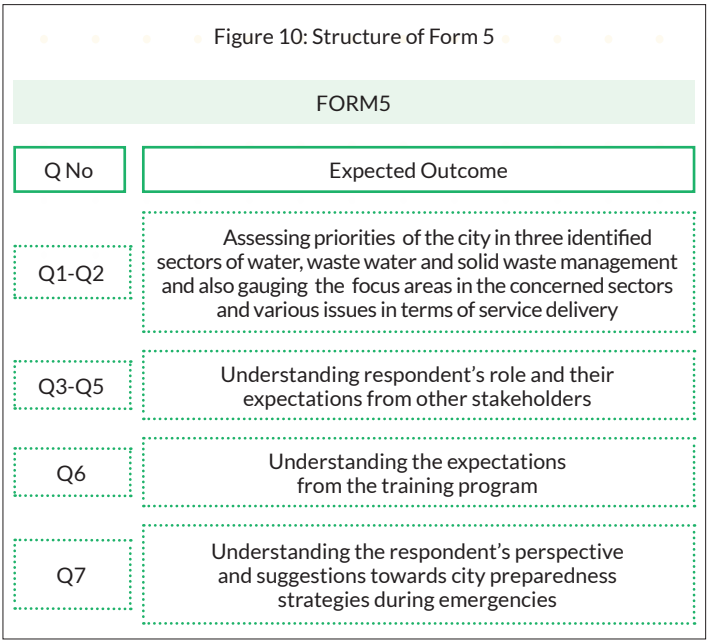
FORM 4	
Q No	Expected Outcome
Q1	Assessing the status of the service delivery in the given sector
Q2-Q3	Assessing the capacity building needs for effective engagement with citizens
Q4 -Q5	Assessing respondent's expectations from senior officials for effective service delivery
Q6 -Q7	Understanding the challenges and issues faced by respondent with respect to day-day job responsibilities
Q8-Q13	Assessing past training experiences, understanding the current needs and gauging expectations from future training programs

Form 5

Form 5 is specially designed for the elected representatives of the city. Since the elected representatives act as a link between the citizens and the Municipal Corporation, understanding their perspective and needs is essential. The questions are framed to gauge the perspective of the elected representatives towards the key focus areas for development in the city. The information gathered through this form would help identify the various activities currently being conducted by elected representatives in the city and the need for further support from citizens and other stakeholders. The assessment would also highlight the need and expectations of the elected representatives from the training program. The overview of the form structure is explained in Figure 10.

The questionnaires are attached as Annexures 1, 2, 3 and 4 at the end of this document. These questionnaires provided a template for the five cities. However, a few questions have been added or deleted depending on the context of the city. The information thus obtained was analysed following the methodology detailed in the following section.

Figure 10: Structure of Form 5



3.3 Data Analysis Methodology

After the interviews were conducted, the responses were tabulated in Excel worksheets. The Analysis was done separately for the identified stakeholder groups. The responses of the Senior officials, Ground Level Functionaries and the Elected Representatives were coded and qualitatively descriptively analysed, while the responses of the Mid-level Officials were analysed quantitatively.

The aim of the analyses was to understand the contents of the training considering the topics of interest and needs to conduct their roles more efficiently and effectively. Their requirements with respect to the mode and attributes of training delivery such as duration, language, location, etc. were also analysed. The results are quantified and described in the training findings for each city. A summary of training needs is prepared for each stakeholder, mentioned at the end of TANA of the city.

Based on the analyses and training findings, training priorities have been detailed for the Mid-level Officials for the three sectors of Water, Waste Water and Solid Waste Management. The tables at the

end of the chapters are a summary from the detailed tables of training priorities attached in Annexure 5. The Priorities have been marked as “High” if the majority of aspects under a particular parameter were preferred by the participants. The Priority has been marked as “Medium” if brief training was preferred by the respondents on about half of the aspects under a parameter. The Priority has been marked as “Low” if the respondents suggested no training is required for a parameter.

4

VIJAYAWADA – NEED ASSESSMENT AND FINDINGS

4. Vijayawada – Need Assessment and Findings

4.1 City Profile

Vijayawada is the second-largest city of Andhra Pradesh and a suburb of the city of Amravati, the capital city of Andhra Pradesh. It is situated on the banks of the river Krishna. It has a warm and humid climate and an altitude of 20 metres above sea level. It is about 20 km from Amravati, the capital city of Andhra Pradesh, also has the headquarters of Andhra Pradesh Capital Regional Development Authority (APCRDA).

The city is spread in an area of 61.88 sq. km, under the Vijayawada Municipal Corporation (VMC) limits. There are 64 wards divided among three circles viz., East, Central and West, under the VMC. According to the Census of India 2011, VMC has a total of 2,76,081 households and a population of 10,21,806. There are 111 slums in the city housing 2,87,983 residents. The urban outgrowth beyond the municipal limits including the VMC area falls within the limits of APCRDA and/or other municipal limits such as Tadepally or Mangalagiri.

4.2 Status of Water, Wastewater, FSSM and Solid Waste Management

The following sections present an overall picture with numbers and statistics, of the city of Vijayawada concerning Water, Waste Water and Solid Waste Management.

4.2.1 Water

The city of Vijayawada has daily demand for water of 216 MLD split among domestic, industrial, agricultural and other needs, out of which, the VMC supplies about 182 MLD per day. The water is withdrawn from the Krishna River. There is a reported 90 per cent coverage of city water supply connections. Water is supplied for 2 hours daily throughout the city. About 5.2 per cent of all

connections are metered. The NRW is approximately 16 per cent for the water utility. The VMC is looking to expand its coverage of metered connection in the coming years. The VMC charges a flat rate for Water to most domestic connection, except the ones that are metered.

4.2.2 Waste Water

The city generates about 149 MLD of wastewater daily. About 80 per cent of the city is networked with drains for the conveyance of the wastewater. Out of the total wastewater generated, about 35 per cent, that is about 120 MLD (Dey & Babu, 2017), get treated every day at eight Sewage Treatment Plants (STP) with the facility of co-processing the septage and faecal sludge at Ajit Singh Nagar. It has a capacity of 20 MLD. There are two relevant projects in this sector in the planning stage that the VMC wishes to take up first, the rejuvenation and beautification of Budameru Canal, funded by the Irrigation Department; and second, BioEnergy Plant, taken up with the help of UNIDO.

4.2.3 Solid Waste

The city generates about 285 metric tonnes of dry waste and 265 metric tonnes of wet waste every day. The door-to-door collection system covers 100% of the city. There is a reported 50% of source segregation of the waste. The total treated waste is 417 MT. The city has Bio- Mining, Bio- Methanation, Construction and Demolition Waste handling projects currently operational in the city, funded jointly by Swachh Bharat Mission and the Government of Andhra Pradesh (GoAP).

4.3 Legislative Framework

Several legislations enacted by the Government of Andhra Pradesh (GoAP) dictate the governance of urban areas in Andhra Pradesh. The Andhra Pradesh (Andhra Area) Town – Planning Act, 1920 invests the right and duties of overall planning for the state to the Department of Town and Country Planning (GoAP, 1920).

The Andhra Pradesh (Andhra Area) Town – Planning Act, 1920 awards the Directorate of Town and Country Planning in the state to plan for urban and rural development. The Director, reporting to the Principal Secretary of the government, heads the directorate.

The governance of large urban areas has been brought into effect with the Andhra Pradesh Municipal Corporation Act, 1994 (GoAP, 1994). It formulated the establishment of Municipal Corporations in the large cities and laid down their rights and responsibilities, giving them administrative, financial, and implementation powers. However, the Vijayawada Municipal Corporation Act, 1981, constituted the Vijayawada Municipal Corporation.

In 2016, the Andhra Pradesh Metropolitan Region and Urban Development Authority Act, 2016 (GoAP, 2016) was enforced, which overrides all the relevant provisions of the Andhra Pradesh Urban Areas (Development) Act, 1975, Andhra Pradesh Municipal Corporation Act, 1994, and the Vijayawada Municipal Corporation Act, 1981, among others.

The GoAP also notified the Andhra Pradesh State Water Policy in 2009 as an impact of the National Water Policy 2002.

4.4 Institutional Framework

The Andhra Pradesh (Andhra Area) Town – Planning Act, 1920 awards the Directorate of Town and Country Planning in the state to plan for urban and rural development. The Director, reporting to the Principal Secretary to the government, heads the directorate.

In Andhra Pradesh, the Department of Municipal Administration and Urban Development (MA&UD) leads urban governance and urban infrastructure development. The Directorate of Municipal Administration (DMA) is the apex authority of MA&UD, which guides the ULBs in performing their day-to-day activities and coordinates with other departments regarding the delivery of urban civic services to the population. Andhra Pradesh Urban Finance and Infrastructure Development Corporation (APUFIDC) is under the administrative control of the MA&UD.

APUFIDC acts as the nodal agency for planning and implementation of urban infrastructure projects in the ULBs that are GoI, GoAP and/or externally funded. APUFIDC also provides technical assistance to the ULBs in the implementation of such projects. The Public Health & Municipal Engineering Department (PHMED) is under the administrative control of MA&UD and is responsible for the design

and execution of new water supply and sewerage schemes in the ULBs. After completion of the water supply and sewerage schemes under the supervision of the PHMED, it hands over these to the concerned ULBs.

Established in 1978, the Vijayawada Guntur Tenali Mangalagiri Urban Development Authority (VGTMUDA) covering the Municipal Corporations of Vijayawada and Guntur, along with the municipalities of Mangalagiri and Tenali and the area of Vijayawada Guntur Urban Agglomeration. In 2014, it was dissolved upon the reorganisation of the state of Andhra Pradesh, the Andhra Pradesh Capital Region Development Authority Act, 2014 was introduced and Amravati was declared as the capital of the State. The Andhra Pradesh Capital Region Development Authority (APCRDA) looks after the planning of the Amravati, Vijayawada, Guntur, Tenali, Mangalagiri, etc. and its surrounding settlements.

The Vijayawada Municipal Corporation (VMC), the ULB functional in Vijayawada, is responsible for the operation and maintenance, and delivery of various services and amenities in the city. It has various financial and administrative powers as vested in the Andhra Pradesh Municipal Corporation Act, 1994, and the Vijayawada Municipal Corporation Act, 1981.

To understand the functional responsibilities with respect to planning, funding, implementation, O&M and monitoring of the services of the three sectors in Vijayawada by various agencies, a mapping of responsibilities was done. This was helpful in customising the questionnaires for the agencies making them relevant to their functions. Table 1 represents the mapping of responsibilities for the three sectors across agencies. Based on this mapping, it was found that VMC handles all the responsibilities concerning the three sectors within the city limits, in tandem with a few other state-level agencies responsible for handling planning and financing of certain flagship and large scale projects. Therefore, for the needs assessment, all the agencies were interviewed and VMC was assessed in detail.

Table 1: Responsibility mapping of agencies for the three sectors in Vijayawada

Agency name	Jurisdiction	Water Management and Drainage	Solid Waste Management
VMC	City Level	● ● ● ●	● ● ● ●
PHMED	State Agency	● ●	
Swachh Andhra	State Agency		●

Key

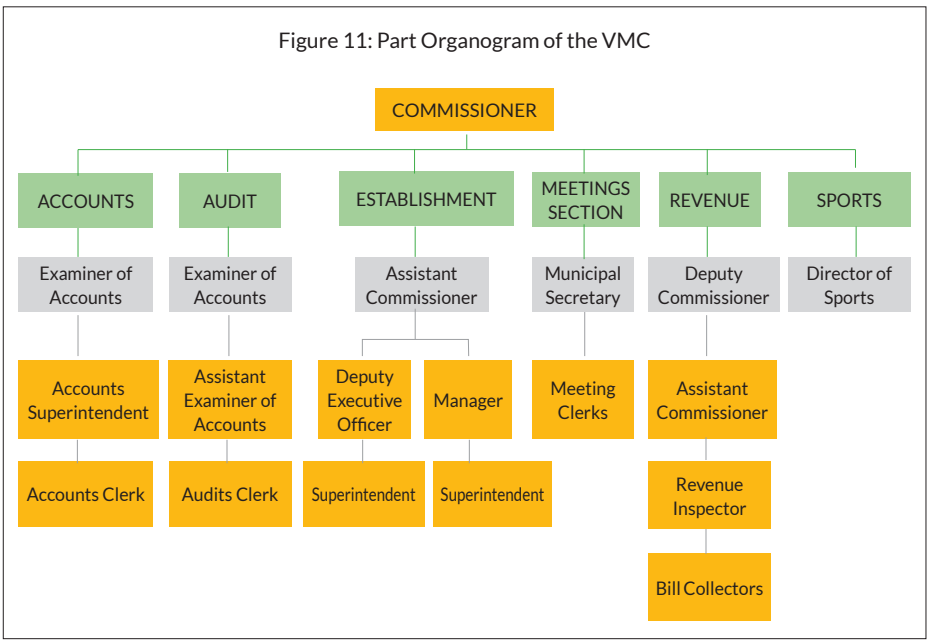
- ● Planning and Funding
- ● Implementation / Execution
- ● Operation and Maintenance
- ● Monitoring

The VMC has 64 wards divided among three circles viz., East, Central and West. The VMC has an executive body and an elected body. The Commissioner of the Municipal Corporation heads the executive body. Figure 11 and Figure 12 show the detailed organisational structure of the VMC.

The Chief Engineer (CE) of the Engineering Department looks after the Water Supply and Drainage. The CE of the Engineering reports to the Commissioner. The Engineering Department is also responsible for the Solid Waste Management, from the transfer station to the landfill site. The work is further divided into separate offices of Superintending Engineer (SE) for Works and Projects each. SEs oversee the implementation of projects, water supply and waste management through respective Executive Engineers (EE) in their respective locations. There are four Works Divisions headed by an EE each, one Works Division each for the circles, and the fourth one dedicated to the Projects. The EE is responsible for the implementation of engineering activities assigned in the respective circle. EEs assign the works to Deputy Executive Engineers (DEE) and Assistant Engineers (AEs), who finally implement it on the field through Work Inspectors, Drivers, NGOs, Contractors, etc. The AEs in VMC handle both Water Supply and UGD works, while there are other AEs dedicated towards the Civil Works.

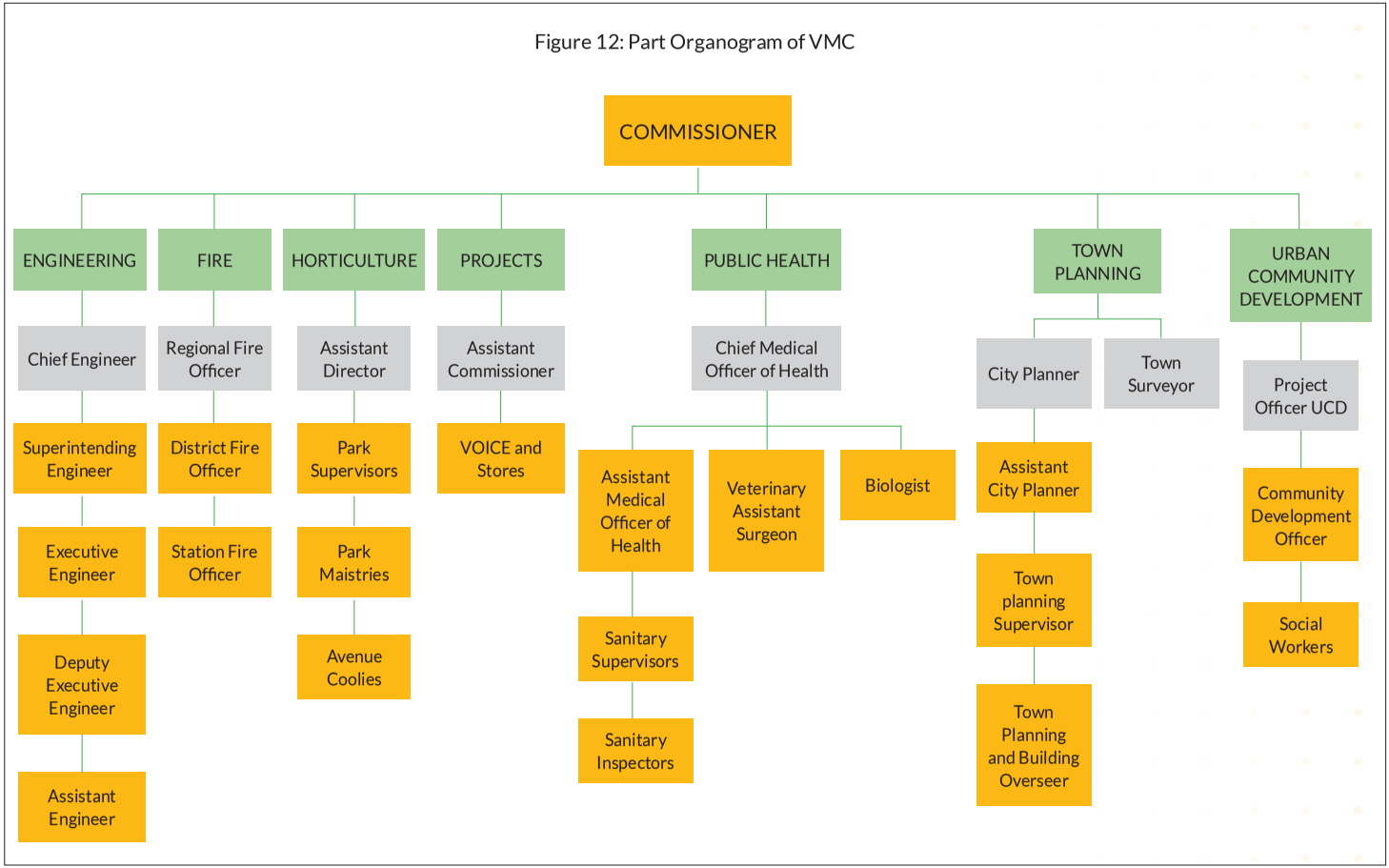
Public Health (PH) Department is responsible for the primary and secondary collection, segregation of municipal solid waste, cleaning of drainage channels and road sweeping. Chief Medical Officer of Health (CMOH) assisted by Additional MOHs heads the PH Department. Sanitary Supervisors takes the instructions of CMOH and/or AMOH and oversees the implementation of sanitation and SWM activities through Sanitary Inspectors (SI). Each SI has Sanitary Maistries under him and each Sanitary Maistry has 10-20 Public Health workers (field workers) for implementing SWM and Sanitation in their respective allocated areas. Each SI allocates areas to each Sanitary Maistry and allocates works on a day-to-day basis (based on complaints received from the public and/or instructions from higher officials) apart from regular sanitation. Sanitary Maistries implements works on the ground with the help of PH workers. SIs inspects the work of SMs and PH workers daily and reports to Sanitary Supervisors. Figure 13 shows the responsibility sharing in VMC sector-wise.

Figure 11: Part Organogram of the VMC



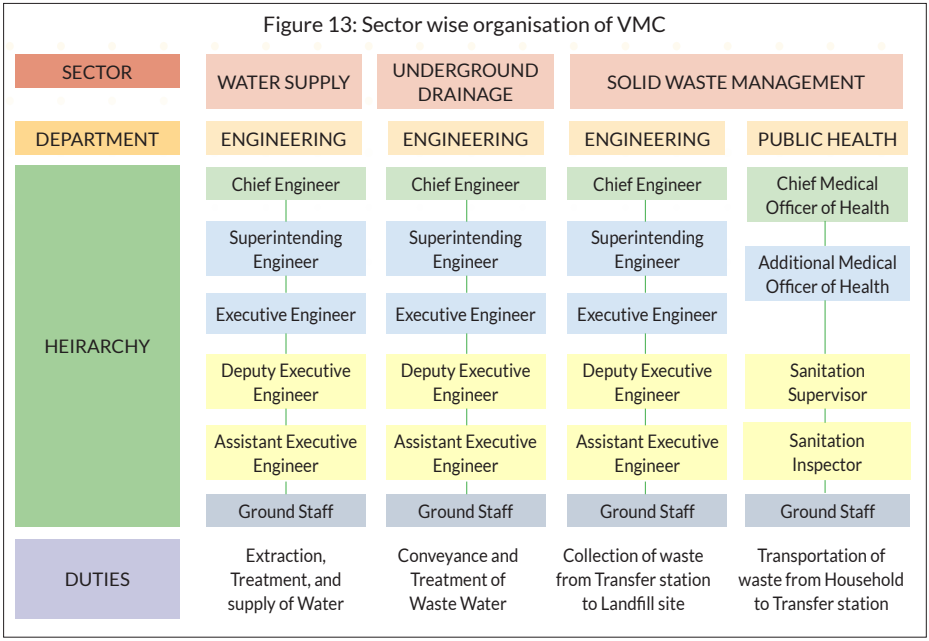
Source: Vijayawada Municipal Corporation

Figure 12: Part Organogram of VMC



Source: Vijayawada Municipal Corporation

Figure 13: Sector wise organisation of VMC



Source: Authors' Compilation

In June 2019, the Chief Minister of Andhra Pradesh Y. S. Jaganmohan Reddy launched the Ward Secretariat and Volunteer system for Andhra Pradesh urban areas. About 3775 Ward Secretariats are established with each Ward Secretariat monitoring about 4000 people. To bring transparency and accountability in the delivery of government services to the citizens, the government of Andhra Pradesh has announced the creation of Ward Secretariats in Urban Areas, consisting of about 10 functional assistants to work in coordination with the ULBs. Table 2 mentions the 10 Ward Secretaries in the secretariat. These Secretariats are established to revamp the service delivery system of the government. Apart from

Table 2: List of Secretaries in the Ward Secretariats

Ward Administrative Secretary	Ward Welfare & Development Secretary
Ward Amenities Secretary	Ward Energy Secretary
Ward Sanitation & Environment Secretary	Ward Health Secretary
Ward Education Secretary	Ward Revenue Secretary
Ward Planning & Regulation Secretary	Ward Women & Weaker Sections Protection Secretary

Source: http://www.apteachers.in/2019/07/qualifications-eligibility-for-ward-secretariat.html

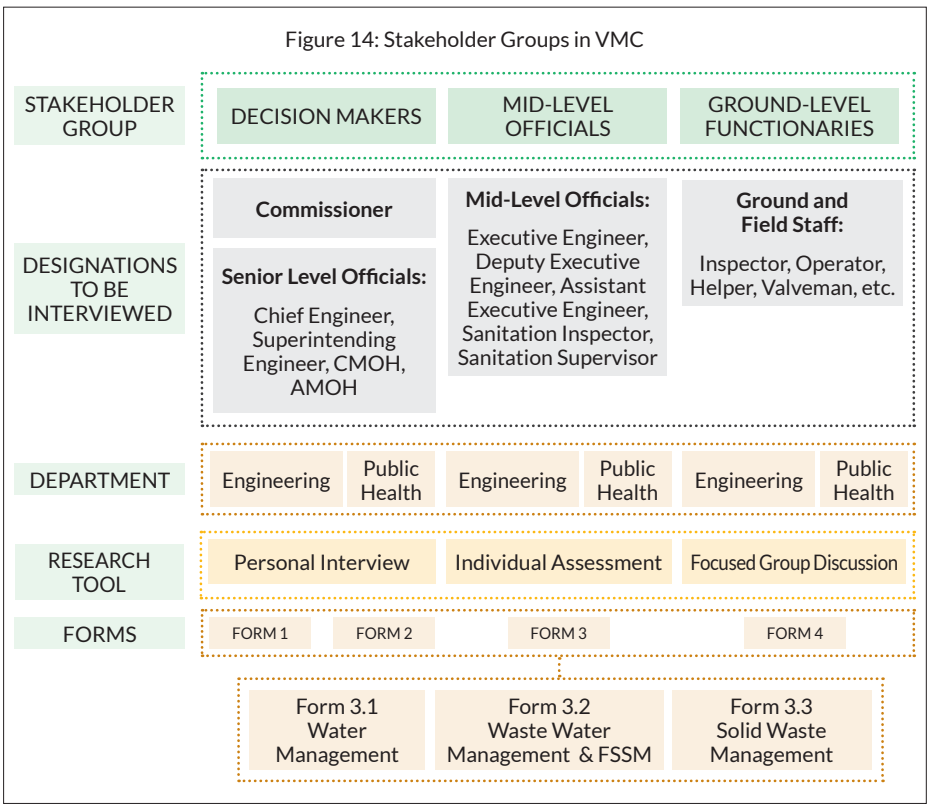
the Secretaries, the system also has volunteers to reach out to the citizens. The volunteers are appointed to perform various tasks and deliver those in 50 Households each.

4.5 Stakeholder Mapping

Based on the organogram of the Vijayawada Municipal Corporation, stakeholders were identified for providing training and technical assistance in the field of Water, Waste Water Management, and Solid Waste Management. The two concerned departments are Engineering Department and Public Health Department. The executive staff of VMC is divided into 3 stakeholder groups, viz. Decision-makers, Mid-level Officials, and Ground-level functionaries.

The Decision Makers involve the Commissioner of VMC, and the heads of the department looking after the Waste Water, Water and Solid Waste Management sectors. The Mid-level Officials comprise

Figure 14: Stakeholder Groups in VMC



Source: Author

Table 3: Responses for VMC

Form Number	Stakeholder Groups	Mode of Interaction	Number of Interviews Conducted
Form 1	Decision Makers	Personal Interview	3
Form 2			
Form 3.1	Mid-level Officials	Individual Assessment	6
Form 3.2			
Form 3.3			
Form 4	Ground- Level Functionaries	Focus Group Discussion	11
-	Additional	Personal Interviews	2

the SE, EE, Deputy EE, AE, Environmental Engineers, SI, etc. The Ground- level functionaries include all the field staff and members of VMC working as plumbers, UGD Operators, Public Health workers, Sanitary Maistries, etc. The VMC did not have any elected body during the period of the study. Hence, no elected representatives could be interviewed in Vijayawada. Figure 14 shows the stakeholder groups for the VMC.

According to the stakeholder groups, various questionnaires were prepared in consultation with sector experts and UNIDO and UNHABITAT city representatives.

A Response Matrix was prepared, mapping the stakeholder groups and the mode of interaction with the interviewees. Due to the national lockdown and hectic schedule of the officials, online interviews were conducted as per availability. Table 3 shows the total number of interviews conducted from each stakeholder group.

4.6 Training Needs Key Findings

The findings of the TANA study have been categorised stakeholder wise and mentioned below. The detail findings of TANA have been represented at the end of this document as annexures.

4.6.1 Training Needs- Decision Makers in Executive body of ULB

The Commissioner heads the executive body of the VMC. The Additional Commissioners, Chief Engineer and Chief Medical

Officer of Health supervise and coordinate the various functions of the Corporation and assist the Commissioner.

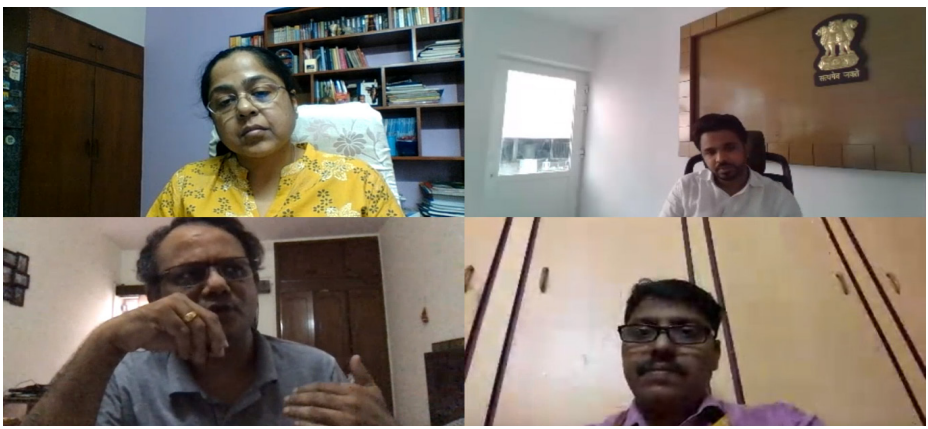
The Engineering Department of the VMC is responsible for the implementation of various schemes concerning water supply, laying of roads, underground sewerage, solid waste disposal etc. The head of the Engineering Department i.e. the Chief Engineer, reports to the Commissioner. The stakeholder group of Decision Makers included the Commissioner of VMC, the Superintending Engineer and the Municipal Health Officer. The findings of the interviews are discussed below.

4.6.1.1 Commissioner

The status, priorities and plans of Vijayawada city in the sectors of water, wastewater and solid waste management were found through an interview with the present Commissioner of the Vijayawada Municipal Corporation Mr Prasanna Venkatesh.

The interview broadly aimed at understanding the perspective of the Commissioner concerning the training needs of the corporation officials working in the sectors of water, wastewater and solid waste management. The Commissioner also discussed the issues and challenges faced in implementing the same. The interview also helped us understand the various disaster preparedness strategies

Figure 15: Screenshot from the interview session with the Commissioner VMC



(Anticlockwise from top right - Mr Prasanna Venkatesh Commissioner VMC; Ms Paramita Datta Dey, Project Coordinator, NIUA; Mr Uday Bhonde, Project Coordinator, NIUA; Mr V Ramana Perkari, City Representative, UNIDO

adopted by the city during the COVID 19, and during natural disasters like floods. Figure 15 is a screenshot from the interview with the Commissioner of VMC.

The following are the findings of the training and needs assessment of the interview with the Commissioner of the Vijayawada Municipal Corporation:

Priorities of City

In Vijayawada, Waste Water Management is the top priority for the city. This was primarily because of the water quality improving the water in the Krishna River. This was followed by Solid Waste Management, and lastly by the Water Management and related issues.

Training Needs for the Senior and Mid-level Staff/Officials

According to the Commissioner of VMC, the Senior and Mid-level Officials would benefit from training with a focus on orientation and exposure to the existing projects around India. A training of trainers (TOT) for Mid-level officials would be beneficial for the Ground-level officials.

Training Needs for the Ground-level Staff/Officials

The Commissioner suggested that the Ground Level officials would benefit from training in communication and public interaction, and using IEC materials.

Training Needs for the Elected Representatives

Since the VMC has no elected body for about a year, training for Elected Representatives would not be required. However, he suggested that the Elected Representatives would benefit from training as well.

Training Needs for the Ward Volunteers:

Since the volunteers recruited under the Ward Secretariat system are new in the field and do not have much experience in social interaction, Mr Venkatesh mentioned that training on social mobilisation would be helpful for the volunteers.

Disaster Preparedness and COVID-19 response:

Discussing the learnings of the COVID-19 crisis, the Commissioner

mentioned that they have Standard Operating Procedures for disaster response. For COVID-19, monitoring there is a control room in Vijayawada, but a Unified Command and Control Centre with an IT system and support be established for efficient interaction and holistic response to the needs of the city.

Table 4 provides a summary of the findings of the interview with the Commissioner of VMC.

Table 4: Summary of Training Needs findings based on the interview with the Commissioner, VMC

SECTOR	STAKEHOLDER	GAPS IDENTIFIED	TRAINING NEEDS	TRAINING MODE	TRAINING MEDIUM
Wastewater Management	Senior-level officials (Chief Engineer, Superintending Engineers)	New Technologies and Systems	Exposure training for New technologies and management practices in India	Online	English
	Mid-level officials (Executive Engineers, Deputy Executive Engineers, Assistant Engineer)	New Technologies and Systems	Exposure training for New technologies and management practices in India; Operation and Maintenance; TOT for Ground Staff	Online	English
	Ground Staff (UGD Operators, WTP Operators, etc.)	Public Interaction	Training for communication and IEC materials	Online and On-site	Regional Language
Solid Waste Management	Senior-level officials (CMOH, AMOH)	New Technologies and Systems	Exposure training for New technologies and management practices in India	Online	English
	Mid-level officials (Environmental Engineer, Sanitary Inspectors, Sanitary Supervisors)	New Technologies and Systems	Exposure training for New technologies and management practices in India; Operation and Maintenance; TOT for Ground Staff	Online	English
	Ground Staff (Public health workers, Sanitary Maistries, etc.)	Public Interaction	Training for communication and IEC materials	Online and On-site	Regional Language
	Volunteers (Ward Secretariat System)	Communica-tion Skills and Public Interaction	Training for communication and social mobilisation	Online and on-site	Regional Language

SECTOR	STAKEHOLDER	GAPS IDENTIFIED	TRAINING NEEDS	TRAINING MODE	TRAINING MEDIUM
Water Management	Senior-level officials (Chief Engineer, Superintending Engineers)	New Technologies and Systems	Exposure training for New technologies and management practices in India	Online	English
	Mid-level officials (Executive Engineers, Deputy Executive Engineers, Assistant Engineer)	New Technologies and Systems	Exposure training for New technologies and management practices in India; Operation and Maintenance; TOT for Ground Staff	Online	English
	Ground Staff (UGD Operators, WTP Operators, etc.)	Public Interaction	Training for communication and IEC materials	Online and On-site	Regional Language

4.6.1.2 Department Heads

Online interviews were conducted with the heads of the Engineering and Public Health department to understand their needs and the assistance they seek in management and monitoring of services provided by the VMC for Water supply, Drainage and Solid Waste Management.

Water Supply and Underground Drainage

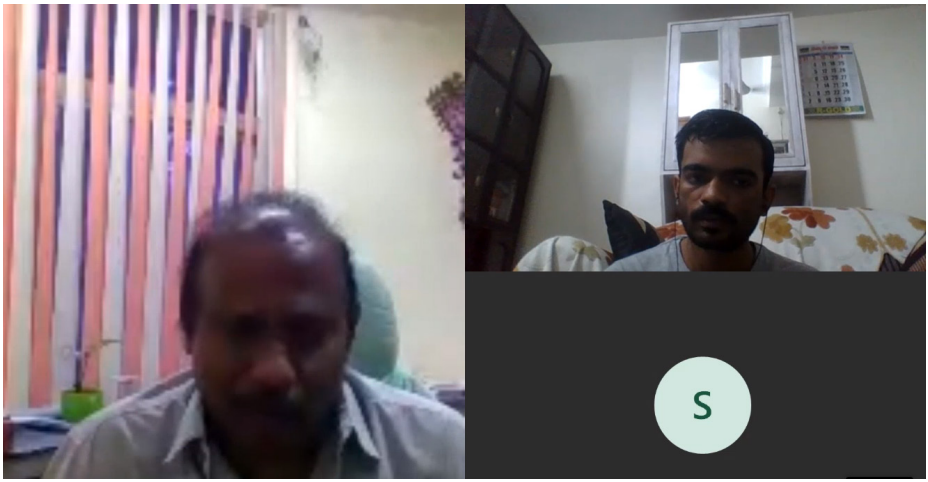
In VMC, the Engineering Department headed by the Chief Engineer looks after the Water Supply and Underground Drainage in the city. The Executive Engineers (EE), one for each Circle, assist the Chief Engineer. Superintendent Engineers (EEs) manage and monitor the works in the water and wastewater sector daily and report to the SE.

A personal interview (Figure 16) conducted with Mr D Mariyanna, the Chief Engineer aimed to understand his training needs and assess the training needs of his officials and staff members to help build their capacities for better and efficient work performance. The following are the findings of the training and needs assessment of the interview with the Chief Engineer of the Vijayawada Municipal Corporation.

Training Needs for the Executive body

According to the Chief Engineer of VMC, the staff members in the Engineering Department are adept and skilled with the needs and demands of the responsibilities that come as a part of their job. Hence, only basic training of new concepts may be helpful.

Figure 16: Screenshot from the interview with the Chief Engineer of VMC, Mr D Mariyanna



(Left to Right) Mr D Mariyanna, Chief Engineer, VMC; Mr Gaurav Thapak, Research Associate, NIUA

Training Needs for the Ground-level functionaries

The ground-level functionaries are well equipped with the skills and knowledge that would help perform their duties, hence, no training is required for the ground level functionaries in the Engineering Department at VMC.

Training Needs for the Secretaries at Ward Secretariats

Mr Mariyanna mentioned that the Amenity Secretary in the Ward Secretariats are newly recruited young professionals and graduates, hence, they would need training on basic knowledge related to their work and the skill required to perform their jobs well, like communication, maintenance, etc.

Replace with Table 5 on next page provides an overview of the training needs assessed across the Engineering department in the VMC dealing with water and wastewater sectors as per the discussion held with the Superintending Engineer.

Solid Waste Management

In VMC, the Public Health Department does the collection of waste from Households. The Chief Medical Officer of Health (CMOH) heads the Public Health Department. The CMOH works in close coordination with the Assistant Medical Officer of Health (AMOH).

Table 5: Summary of findings of Training Needs based on the interview with the Superintendent Engineer, VMC

SECTOR	STAKEHOLDER	GAPS IDENTIFIED	TRAINING NEEDS	TRAINING MODE	TRAINING MEDIUM
Wastewater Management	EE, Deputy EE, AE	None	New Concepts and technologies	Online	English
	Ground Level Functionaries	None	Basics of Public Interaction, and O&M	Online or offline	Regional Language
	Amenity Secretaries	Domain knowledge, Public Interaction	Basics of Underground Drainage, Legislative aspects, Public Interaction	Online or offline	Regional Language
Water Management	EE, Deputy EE, AE	None	New Concepts and technologies	Online	English
	Ground Level Functionaries	None	Basics of Public Interaction, and O&M	Online or offline	Regional Language
	Amenity Secretaries	Domain knowledge, Public Interaction	Basics of Water Supply, Legislative aspects, Public Interaction	Online or offline	Regional Language

The CMOH deputes the works related to Solid Waste Management to the various AMOH, trickling down to the Sanitary Supervisors (SS) and Sanitary Inspectors (SI). The SS monitor the day-to-day activities in their areas performed by the SI, Public Health workers and Sanitary Maistries.

During this study, the CMOH post was vacant in VMC and one of the AMOH held an additional charge of CMOH. A telephonic interview conducted with Mr R Venkata Ramana, AMOH aimed to understand the priorities of the VMC in terms of SWM and training for the staff in the Public Health Department.

Detailed below are the findings of the interview with the AMOH for training and need assessment.

Priorities of the VMC

In the Solid Waste Management Sector, the AMOH mentioned that VMC needs support to improve services across the value chain of the SWM. Hence, transportation of waste, segregation, and treatment are all equally important.

Disaster and Emergency Preparedness

Mr Venkata Ramana mentioned that trained employees in VMC would have handled the COVID-19 crisis better. Hence, a brief training on disaster and emergency preparedness is desirable.

Training Needs for the Senior-level functionaries

The Senior Level Functionaries do not have any particular needs. However, it would benefit to provide them with an overview of the SWM value chain and tell them about innovative strategies to manage municipal waste.

Training Needs for the Mid-level Officials

According to the AMOH, it is important to sensitise the Mid-level Officials, the Sanitary Supervisors and Sanitary inspectors about the importance of waste segregation and proper treatment. Particularly in times of COVID-19, the waste un-segregated by anyone at any point in the value chain. Hence, this training would be helpful. Training in the English language delivered on the weekdays for 2-3 hours shall be sufficient according to the AMOH.

Training Needs for the Ground-level functionaries

Mr Venkata Ramana mentioned that the Ground Level Functionaries need training on proper collection, segregation and disposal of waste. Such training can be provided online or on-site, over the weekdays in regional language.

Training Needs for the Ward Volunteers

The Ward Secretaries and volunteers were very helpful in spreading awareness in the COVID-19 times. Since the Ward Volunteers and Secretaries are untrained, it would be beneficial to provide them with a brief orientation training for SWM.

Table 6 summarises the findings of the interview with the Environmental Engineer of GMC.

Table 6: Summary of findings of Training Needs based on the interview with the Additional Medical Officer of Health, VMC

STAKEHOLDER	GAPS IDENTIFIED	TRAINING NEEDS	TRAINING MODE	TRAINING MEDIUM
CMOH, AMOH	No perceived gaps	Overview of Value Chain of SWM; Innovative Case Studies	Online	English
Mid-level Officials Sanitary inspector, Sanitary supervisors	Importance of Segregation and Disposal	Segregation Techniques, and Home Composting Techniques	Online	English
Ground-Level Functionaries Public health workers, Sanitation workers, Sanitary Maistries	Importance of Segregation and Disposal	Collection and Segregation techniques and importance	Online and/or On-Site	Regional Language

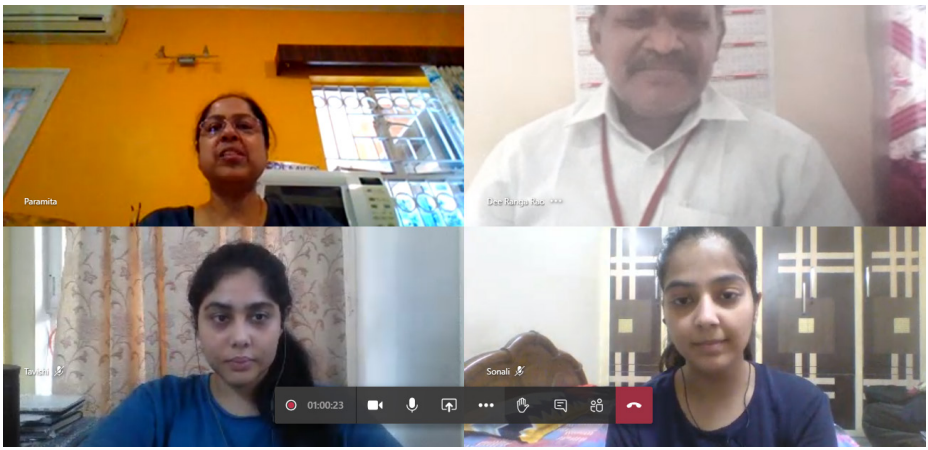
4.6.2 Training Needs- Mid-level Officials

The Senior officials and the Heads of departments depute work to the Mid-level Officials. The Mid-level Officials comprising SE, EE, AEE, Sanitary Supervisors, and Sanitary Inspectors were individually assessed. This was done separately for the three sectors of Water Supply, Underground Drainage and Solid Waste Management. The questionnaire as described in the chapter detailing the Methodology and detailed in Annexure Annexure 1. , Annexure 2. , Annexure 3. and Annexure 4. had a set of questions for characterising the respondent profile. The first part of the questionnaire asks for the personal information of the respondent. The second part of the questionnaire was aimed at understanding the general preferences of the respondents concerning the training delivery. The third part of the questionnaire assessed the Mid-level Officials on various sector-specific parameters. The findings of the survey have been mentioned sector-wise in the following sub-sections.

4.6.2.1 Water Supply

As mentioned earlier, in VMC the most engineers in Mid-level Officials who look after the water supply also look after the underground drainage. The mid-level staff members of the Engineering department dealing with the water supply were assessed on the legislative and institutional aspects of water supply, technical and engineering aspects of water supply systems, financial

Figure 17: Screenshot from interview with Mr T Ranga Rao, Deputy Executive Engineer in VMC



(Anticlockwise from top left- Mr T Ranga Rao, DEE, VMC; Ms Paramita Datta Dey, Project Coordinator, NIUA; Tavishi Darbari, Research Associate, NIUA; Sonali Mehra, Research Associate, NIUA)

management, community engagement and project management concerning various responsibilities and job roles of the respondents. Based on the assessment, the gaps in their skill sets and the training priorities were identified.

A brief description of the respondents' profile is discussed below.

Age-wise Classification

Among the respondents, an equal share was found among the age groups of 20-30, 31-40, and 51-60. Most staff members in VMC are in the assistant engineer cadre. Figure 18 shows the age group composition of the respondents of mid-level staff in the engineering department dealing with Water Supply in VMC.

Educational Background

Most officials in VMC have a degree in engineering. There was an equal share of diploma holders, bachelor degree holder and postgraduate degree holders among the respondents. Figure 19 shows the Educational Background of the respondents at VMC in Water Supply Sector.

Figure 18: Age group composition of the Mid-level Officials of VMC

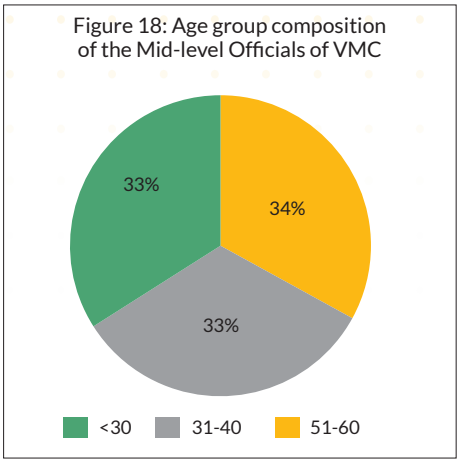


Figure 19: Educational Background of Mid-level Officials dealing with Water Supply at VMC

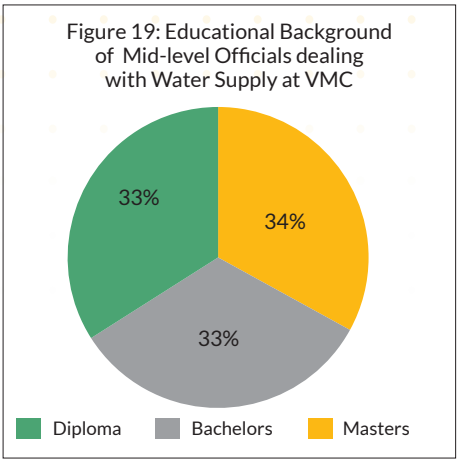
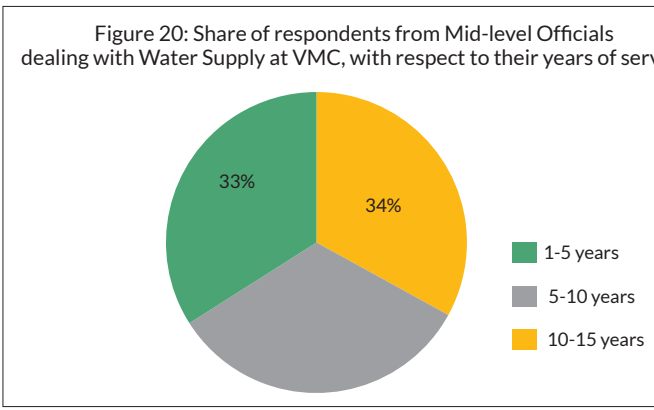


Figure 20: Share of respondents from Mid-level Officials dealing with Water Supply at VMC, with respect to their years of service



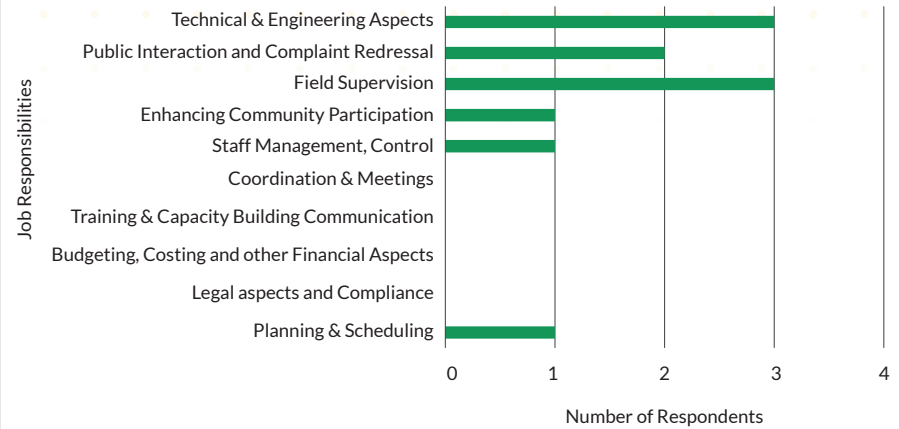
Years of Service

The VMC staff comprises mostly young people. The engineers interviewed had mostly an experience of fewer than ten years. These people are generally on the Assistant Executive Engineer Position. The senior officials hold the Deputy Executive Engineer Position. Figure 20 shows the work experience profile of the Mid-level Officials in the Engineering Department dealing with Water Supply at the VMC.

Responsibilities as part of the Job

Most officials working in Water Supply at VMC have to deal with Technical and Engineering aspects of water supply and conduct field supervision. Following this was engaging with public and complaint redressal, staff management, planning, scheduling, and enhancing

Figure 21: Job Responsibilities of the Mid-level Officials in Water Supply at VMC



community participation. The legal compliance, financial aspects of the projects, and planning and scheduling of works is not a part of their job roles. Figure 21 shows the job roles taken up by the respondents in the water supply at VMC.

The profile of the respondents was analysed to customise the training module corresponding to their job responsibilities and personal attributes. The following sections discuss the findings of the need assessment.

Sector Specific Assessment

The following section deal with the various aspects of Water Supply at VMC. The respondents were assessed on their knowledge and understanding of the five domains concerning water supply, viz. Institutional and Legislative Framework, Technical and Engineering Aspects, Financial Management, Community Engagement, and Project Management. In addition to this, their understanding of the city resilience for disasters and emergencies was also recorded. The relevance of the parameters under those five domains, concerning their jobs was recorded and whether they would require training on the same was asked to understand their training priority. The findings under the five domains are listed as under. The detailed findings for the Mid Level Staff and the methodology of analysis have been mentioned in Annexure 5.

Institutional and Legislative Framework

For Institutional Framework, they have a poor understanding of the way the various legislations, policies, etc. work. It is relevant to their jobs and they would not require training for those. However, most respondents have a good understanding of the provision of water supply in various schemes and missions.

Technical and engineering aspects

All the respondents mentioned that they have a good understanding of the topics related to technical and engineering aspects of Water Supply. It is highly relevant to their job role. They mentioned that they do not need any training on the technical and engineering aspects; however, most respondents had a good understanding of Integrated Urban Water Management (IUWM) yet asked for training on it owing to its relevance to their work.

Financial aspects

The Mid-level Officials do not have to perform any tasks related to financial management, hence the questions asked were not relevant to their job role. Because of which, they have suggested that no training would be required for that.

Community Engagement

The Mid-level Officials who were interviewed mentioned that they have a good understanding of the subjects related to community engagement, which is also relevant to their work. Therefore, they suggested that no training would be required for that.

Project Management and Private Partnerships

The Mid-level Officials mentioned that project management is an important part of their job role. To the parameters that were asked

Table 7: Summary of Training Needs for Mid-level Officials in the Water Supply Sector

Domains/ Aspects	Training Need
Institutional and Legislative framework	Brief training on the provision for water supply in various schemes and missions
Technical and Engineering Aspects	No training required for the technical and engineering aspects. However, a brief training on IUWM was suggested.
Financial Management	No gap identified. No training required.
Community Engagement	No gap identified. No training required.
Project Management and Private Partnerships	No gap identified. No training required.

relating to the job of project management, they mentioned that have a good understanding of those and would not require any training on any of the mentioned topics.

The findings of TANA for the Mid-level Officials working for Water Supply in the Engineering Department has been summarised in Table 7.

4.6.2.2 Waste Water

The mid-level staff members of the Engineering department dealing with the underground drainage and wastewater were assessed on the parameters of legislative and institutional aspects of water supply, technical and engineering aspects of water supply systems and FSSM, financial management, community engagement and project management and private partnerships concerning various responsibilities and job roles of the respondents. Most respondents had a shared responsibility of Water Supply and Underground Drainage. Based on the assessment, the gaps in their skill sets and the training priorities were identified. A brief description of the respondents' profile is discussed below.

Age-wise Classification

The interviewed engineers who deal with underground drainage in the Engineering department at VMC are all less than 40 years of age. Figure 22 shows the share of age groups among the respondents interviewed.

Figure 22: Age group profile of respondents dealing with Underground Drainage in VMC

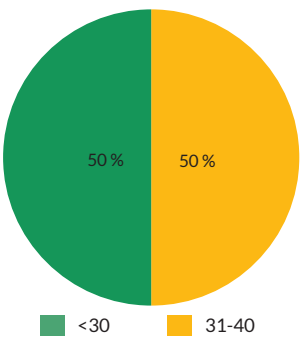
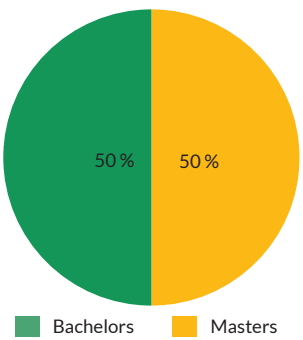


Figure 23: Educational Background of respondents dealing with Underground Drainage in VMC



Educational Background

In terms of educational qualification, all the staff members at VMC have a higher education degree, of minimum graduation level in engineering. Figure 23 shows the educational profile of respondents at VMC.

Years of Service

The engineers working at VMC in underground drainage are fairly experienced. Figure 24 shows the share of respondents for their years of service.

Responsibilities as part of the Job

Most officials working in Water Supply at VMC have to deal with Technical and Engineering aspects of water supply and conduct field supervision. Following this was engaging with public and

Figure 24: The Years of Service of respondents dealing with Underground Drainage in VMC

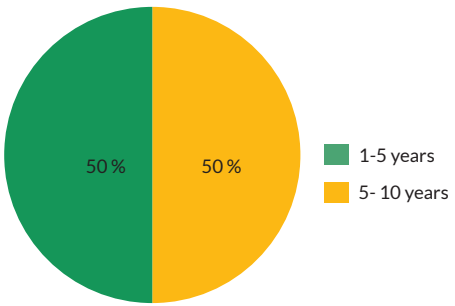
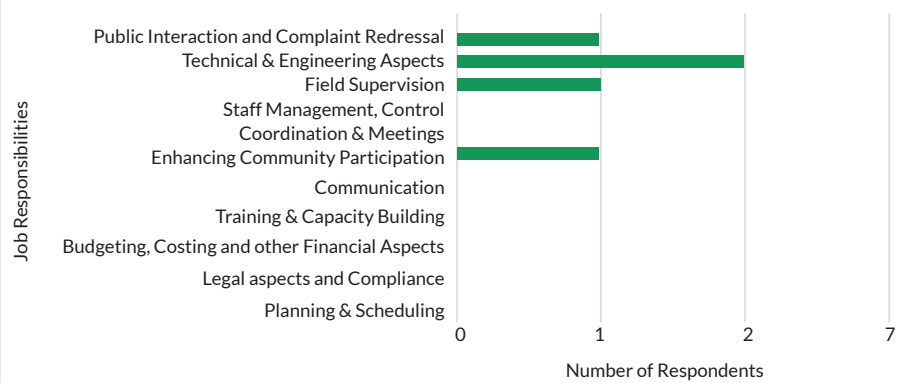


Figure 25: Job Responsibilities of the Mid-level Officials dealing with Underground Drainage in VMC as reported by the respondents



complaint redressal, staff management, planning, scheduling, and enhancing community participation. The legal compliance, financial aspects of the projects, and planning and scheduling of works is not a part of their job roles. Figure 25 shows the job roles taken up by the respondents in the water supply at VMC.The profile of the respondents was analysed to customise the training module corresponding to their job responsibilities and personal attributes. The following sections discuss the findings of the need assessment.

Sector Specific Assessment

The following section deals with the various aspects of Underground Drainage at VMC. The respondents were assessed on their knowledge and understanding of the six domains concerning wastewater, viz. Institutional and Legislative Framework, Technical and Engineering Aspects of Waste Water Treatment, Faecal Sludge and Septage Management, Financial Management, Community Engagement, and Project Management. In addition to this, their understanding of the city resilience for disasters and emergencies was also recorded. The relevance of the parameters under those six domains, concerning their jobs was recorded and their training priority was understood. The findings under the six domains are listed as under. The detailed findings for the Mid Level Staff and the methodology of analysis have been mentioned in Annexure 5.

Institutional and Legislative

The respondents have a good understanding of all the parameters covered under institutional and legislative framework related to wastewater management and underground drainage. Hence, no gap was identified, and no training would be required.

Technical and Engineering Aspects of Waste Water Management

The technical and engineering aspects of the wastewater supply and underground drainage are very important for the job that the mid-level officials perform. They have a good knowledge of the subject; however, they have suggested that would need training on the same.

Faecal Sludge and Septage Management

Currently, Vijayawada does not practice Faecal Sludge and Septage Management (FSSM), but certain projects are underway for FSSM.

The mid-level officials mentioned that they have a good level of understanding of the subject; however, they would like a brief training on FSSM.

Financial Management

Concerning financial management, the respondents mentioned that it is relevant to their job, and they have a good understanding of the subject. Hence, they suggested that they would not require any training.

Community Engagement

Like the financial aspect and management of the project, the respondents mentioned that it is highly relevant to their job role and they have a good understanding of the subject. Therefore, they suggested that no training would be required for the same.

Project Management and Private Partnerships

The various aspects of project management are relevant to the work that the Mid-level Officials perform. It was found that they have a good knowledge of the subjects, however, they have asked for a brief training on the project evaluation methods, and models of public-private partnerships.

The findings of TANA for the Mid-level Officials working for underground drainage in the Engineering Department have been summarised in Table 8.

Table 8: Summary of Training Needs for Mid-level Officials in Waste Water Sector at VMC

Domains/ Aspects	Training Need
Institutional and Legislative framework	No gap identified. No training required.
Technical and Engineering Aspects	Brief training on treatment technologies, and generation factors
FSSM	Brief training on Operation and Maintenance and Monitoring, Occupational hazards in handling of FSSM
Financial Management	No gap identified. No training required.
Community Engagement	No gap identified. No training required.
Project Management and Private Partnerships	Brief training on Project evaluation and models of Public-Private Partnerships

4.6.2.3 Solid Waste Management

The mid-level staff members dealing with the Solid Waste Management (SWM) were assessed on the legislative and institutional aspects of SWM, technical and engineering aspects waste management and waste disposal, financial management, community engagement and project management and private partnerships concerning various responsibilities and job roles of the respondents. Since the works of SWM are split among the Engineering Department and Public Health Department, staff members from both the departments were interviewed. These included Sanitary Inspectors, Sanitary supervisors, and Assistant Executive Engineer. Based on the assessment, the gaps in their skill sets and the training priorities were identified. A brief description of the respondents' profile is discussed in the following.

Age-Wise Classification

The respondents had an equal representation for the age groups of less than 30 years, 41-50 years, and beyond 50 years. Figure 26 shows the age group composition of the respondents working in the SWM sector in VMC.

Educational Background

All respondents working for solid waste management in VMC have a bachelor level degree. Figure 27 shows the educational background composition of the respondents among Mid-level Officials working for solid waste management in VMC.

Figure 26: Age wise composition of respondents for Solid Waste management at VMC

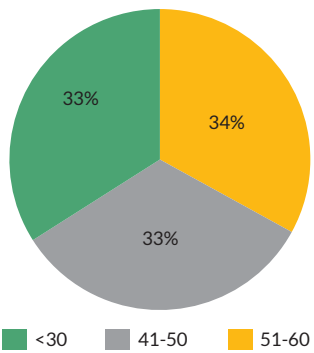


Figure 27: Educational Background of respondents working in solid waste management sector at VMC

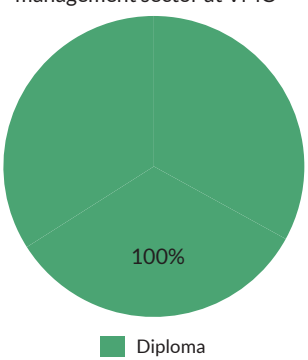


Figure 28: Year of Service of the respondents among mid-level functionaries working in solid waste management sector in VMC

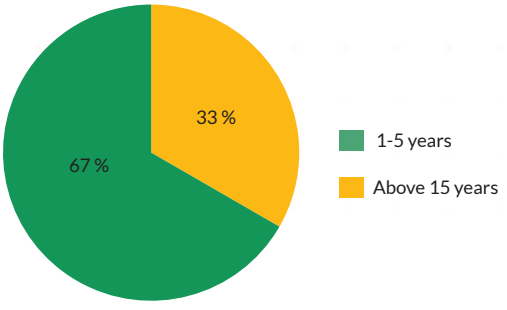
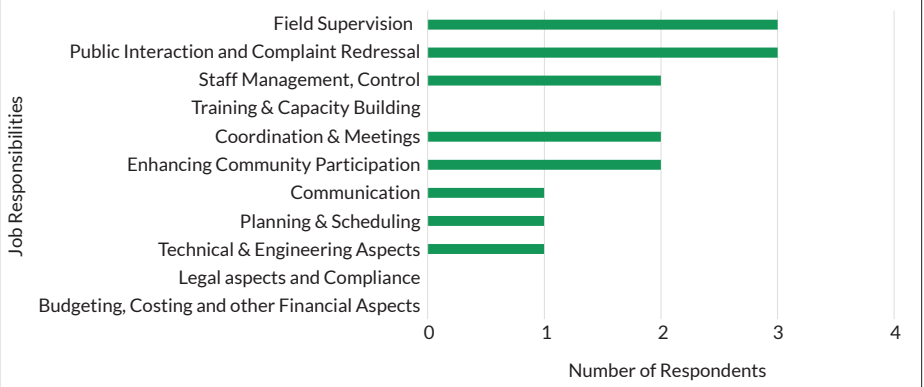


Figure 29: Job responsibilities of Mid-level Officials working in SWM in VMC



Years of Service

Most Mid-level Officials in both the departments of Engineering and Public Health that deal with SWM have substantial experience. Most respondents have above 15 years of experience. Figure 28 shows the years of experience of the Mid-level Officials dealing with SWM at VMC.

Responsibilities as part of the Job

Most officials working in Water Supply at VMC have to deal with the public and do complaint redressal, supply and conduct field supervision. Following this was staff management, coordination and meetings, and enhancing community participation. The legal compliance, financial aspects of the projects, and training and capacity building is not a part of their job roles. Figure 29 shows the job roles taken up by the respondents in the water supply at VMC.

The profile of the respondents was analysed to customise the training module corresponding to their job responsibilities and personal attributes. The following sections discuss the findings of the need assessment.

Sector Specific Assessment

The following section deals with the various aspects of Solid Waste Management at VMC. The respondents were assessed on their knowledge and understanding of the five domains concerning solid waste management, viz. Institutional and Legislative Framework, Technical and Engineering Aspects of Solid Waste Management and Waste Disposal, Financial Management, Community Engagement, and Project Management. In addition to this, their understanding of the city resilience for disasters and emergencies was also recorded. The relevance of the parameters under those five domains, concerning their jobs was recorded and their training priority was understood. The findings under the five domains are listed as under. The detailed findings for the Mid Level Staff and the methodology of analysis have been mentioned in Annexure 5.

Institutional and Legislative Framework

The respondents have a fair understanding of the topics about the Legislative and Institutional Framework. They suggested training on the legislative and institutional frameworks related to SWM.

Technical and Engineering Aspects of Solid Waste Management

The topics related to the value chain and its management in SWM are very relevant to the job roles of the respondents. Since public health department does not look after the transportation or disposal of the waste to landfill, the respondents from the Public Health department had a poor understanding of it and did not want any training either. Additionally, all respondents want a brief training on the value chain management.

Financial Management

Financial management is not a part of the job role for any respondents in both departments. They have a poor understanding of it, and they do not want any training of the same.

Table 9: Summary of Training Needs for Mid-level functionaries in Solid Waste Management Sector at VMC

Domains/ Aspects	Training Need
Institutional and Legislative framework	Required. They need an understanding of the legislative and institutional framework in SWM.
Technical and Engineering Aspects	Brief training on value chain management.
Financial Management	No gap identified. No training required.
Community Engagement	Brief training on the subject
Project Management and Private Partnerships	Brief training on the use of ICT in complaint redressal and public interaction and management.

Community Engagement

Community engagement is an important part of the work for the Mid-level Officials working in the solid waste management sector in VMC. They have a fair understanding of the topics and also require training in it.

Project Management and Private Partnerships

Project Management is not an important aspect for the Mid-level Officials in VMC. It was found that they have a poor understanding of it. They also suggested that no training would be required. However, the respondents were interested in training related to management and technologies used in public interaction and complain about redressal and use of ICT in SWM.

The findings of TANA for the Mid-level Officials working for the solid waste management sector in the Engineering Department and Public Health Department have been summarised in Table 9.

4.6.2.4 General Preferences for Training Programme

To understand the logistical preferences of the Mid-level Officials at VMC, few questions exploring their preference for the language of training delivery, mode of delivery, duration of the programme, and the expectations for the same were asked. The findings related to the general aspects of the training programme, based on the cumulative responses of the three sectors are listed below.

Figure 30: Number of Capacity Building Programmes attended by Mid-level officials of VMC in the past three years

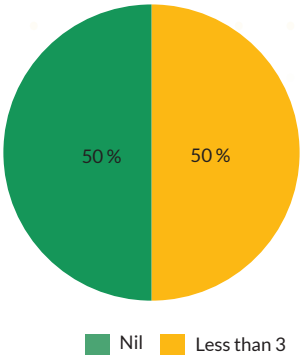
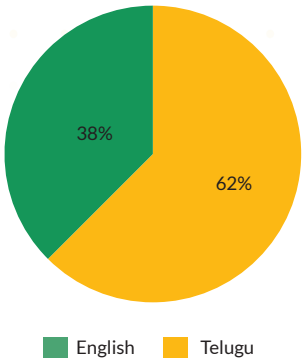


Figure 31: Preferred Medium of Instruction of mid-level officials at VMC



Exposure through Previous Programmes of Capacity Building

The Mid-level personnel working at GMC are regularly provided capacity building and training programmes. In the past three years, most respondents have attended one to three programmes. Half of the respondents have not attended any training programme in the past three years. Figure 30 shows the share of respondents who have attended any training programmes in the last three years.

The medium of instruction of Training Programmes

A large majority of the respondents are comfortable with English being the preferred medium of instruction of training programmes, followed by Telugu. Figure 31 shows the preference of language for the training delivery.

Duration of Training Programme

Most respondents suggested a 3-Day long training programme. This was followed by 1 Day being the preferred duration of the training programme. Figure 32 shows the share of respondents for their preferred duration of the training programme.

Figure 32 Preferred duration of training programme of the mid-level functionaries at VMC

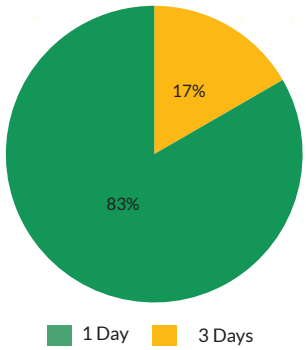
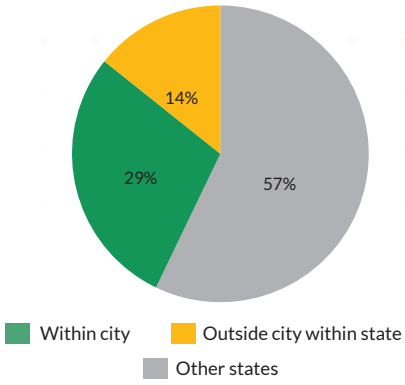


Figure 33 Preferred location of training programmes as suggested by the Mid-level Officials at VMC



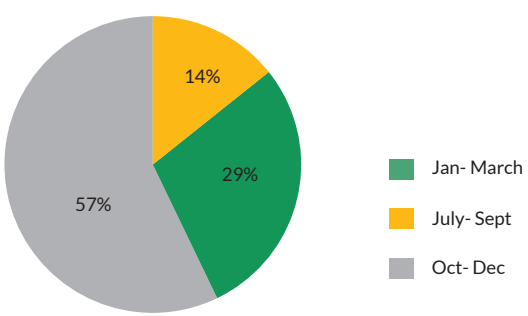
Location of Training Programme

Concerning physical training and exposure visits, questions were asked to assess the preference of the Mid-level Officials at VMC. Most respondents prefer a training programme within the city and any other city within the state. The least number of respondents suggested training programmes delivered outside the state. Figure 33 shows the share of respondents corresponding to their preference for the location of the training programme.

Time of Training Programme

Considering their schedule and commitments concerning their jobs, most respondents prefer the months of October to December to deliver the training programmes. The second most preferred time of training delivery was found to be the months of January, February

Figure 34: Preferred time of the training programme



and March. The month of July, August and September are the least preferred time for the training delivery. Figure 34 shows the details of the share of the preferred time duration of the training delivery.

Mode of Training Delivery

Most respondents suggest E-learning material and aids, exposure visits, workshop and seminars as the preferred mode of training delivery. Respondents suggested that ready reference material and workshops would also be a good mode of training. Figure 35 shows the choices of the respondents concerning the mode of training delivery.

Expectations of participants from the training programmes

The respondents are keen on knowledge enhancement and learning to improve service delivery. Since Community Engagement and Public Interaction is an important part of the job of the Mid-level Officials, commonly across the three sectors, the respondents expect

Figure 35: Preferred Mode of Training of Mid-level Officials in VMC

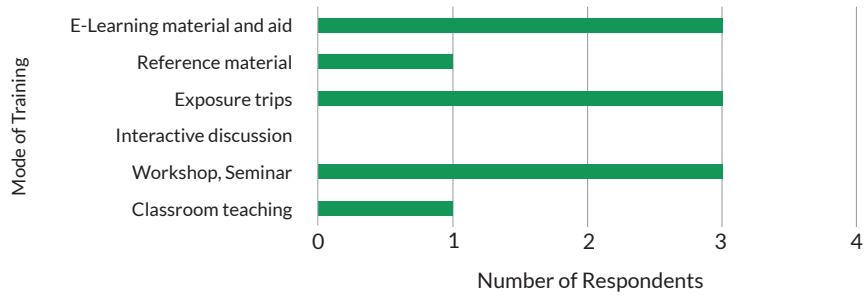


Figure 36: Expected Outcomes of the Training Programmes reported by the Mid-level Officials at VMC

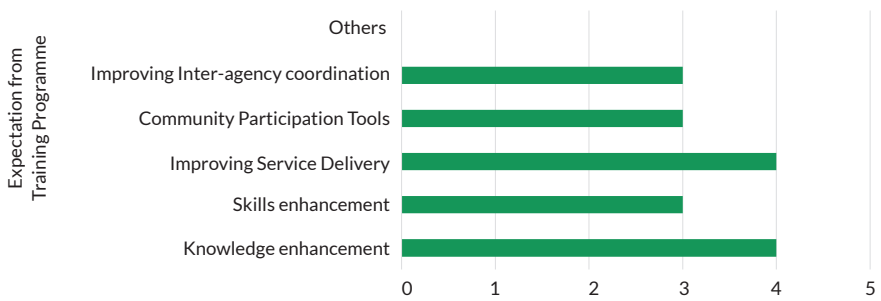


Table 10: Summary of general preferences for training programmes of Mid-level Officials at VMC

Parameter	Preference/Remarks
Exposure through Previous Programmes of Capacity Building	Well exposed to regular capacity building programmes
Medium of Instruction	English
Duration	3 Days
Time	October, November, December, followed by January, February and March
Location	Within City
Mode of Delivery	Online / E-Learning and Aids, Exposure Trips
Expected Outcomes	Knowledge Enhancement, Improving Service Delivery

Community Participation tools as part of the training programme. Similarly, Skill Enhancement is important expected outcomes of the training programmes. Figure 36 shows the preferred expected outcomes of the training programmes.

The general preferences of the training programme as discussed above are summarised in Table 10.

4.6.3 Training Needs- Ground Level Functionaries

The Ground Level Functionaries comprise the personnel working in the field performing the very fundamental jobs and have first-hand exposure to the issues of functioning and maintenance. These include functionaries working in the ULB and the personnel employed by the private parties. For understanding the training needs of the ground staff, we conducted 3 focus group discussion of 12 personnel, which comprises of Work Inspector, Tap Inspector, electrician, etc. to have a glimpse of the needs, issues and challenges they face in performing their day-to-day job responsibilities. The detailed findings have been mentioned sector-wise in the following sub-sections.

4.6.3.1 Water and Underground Drainage

In VMC, the Chief Engineer (CE) of the Engineering Department looks after the Water Supply and Underground Drainage. This Department is also responsible for the Solid Waste Management, to transport waste from the transfer station to landfill site. However, to assess the needs of the ground functionaries, online Focussed Group Discussions was conducted to understand their needs and the assistance they seek in Water supply and Underground

Figure 37: Ground-level functionaries of VMC who were a part of the FGD

Drainage. Figure 37 shows the members of the FGD. The following was observed among the personnel on the ground level.

Priorities of the Ground functionaries

The Ground level functionaries at VMC get constant support from their higher officials. However, they understand that there is a need to sensitise the public to conserve water. They are adept with technical knowledge and their experience in the field helps them perform their duties well.

Training needs

The Ground level functionaries suggested that training for new technologies in UGD would be helpful. Additionally, they need to train on how to interact and deal with the community in a better manner.

Mode and Medium of training

The participants of the FGD suggested that online training are a feasible medium for them, and they would be willing to contribute a certain amount of time daily in the evening for the training. Regional language, Telugu is the preferred medium of instruction for the Ground-level Functionaries.

4.6.3.2 Solid Waste Management

In Solid Waste Management, Public Health Department is responsible for the primary and secondary collection, segregation of municipal solid waste, cleaning of drainage channels and road sweeping. The Sanitary Supervisors takes oversees the implementation of sanitation and SWM activities through Sanitary

Inspectors (SI). Each SI has Sanitary Maistries appointed under him and each Sanitary Maistry has 10-20 Public Health workers (field workers) for implementing SWM and Sanitation in their respective areas. Sanitary Maistries implements works on the ground with the help of PH workers. The following has been found concerning the needs of the ground-level personnel and field-level workers working in the Department of Public Health.

The sanitary maistries and public health workers of VMC believed that they are well adept with the knowledge and support from the higher officials in carrying out their job responsibilities. They also believed that the coordination and support they get from the community also helps them to perform their job better. The workers also suggested a requirement of additional pushcarts and bins for better Waste Management.

Issues and Support Needed

The Ground Staff functionaries that were interviewed remarked that they get full support from their seniors, subordinates, and the citizens. Even during COVID-19 lockdown and the crisis, they got regular training from seniors, have regular health check-up and every support and guidance that was necessary. They do not have any difficulty performing their jobs.

Table 11: Summary of Training Needs of Ground-level functionaries at VMC

SECTOR	GAPS IDENTIFIED	TRAINING NEEDS	TRAINING MODE	TRAINING MEDIUM
Solid Waste Management	None	Latest Technical assistance on operation and maintenance of the waste treatment plants	Offline/ Online	Regional Language
Water Management and Drainage	Public interaction and sensitisation	Public Interaction, New technologies in UGD	Online	Regional Language

Training Needs

The Sanitary Maistries suggested that since the VMC already has plants for Construction and Demolition Waste, and Waste to Energy Plant, they would like to know about operation and maintenance of the plants and learn latest technologies of the same.

Mode and Medium of training

The participants mentioned that they would prefer offline training. However, given the COVID-19 and the travel restrictions, they are feasible with online training and they would be willing to contribute a certain amount of time daily in the evening for the training. Regional language, Telugu is the preferred medium of instruction for the Ground-level Functionaries.

Table 11 provides an overview of the training needs assessed across various departments in the VMC dealing with water, wastewater and solid waste management sectors for the ground level functionaries.

4.7 Conclusion

The TANA findings of the various stakeholders explained in the previous sections are summarised as below:

(i) Although water supply is not a priority for Vijayawada, the Commissioner of VMC suggested a holistic development of water facility, integrating with wastewater and the Krishna river.

(ii) VMC currently has an FSSM facility under construction, which they are building through various schemes. The Senior officials are keen to gain some knowledge on the same to plan for the city considering those in future. The mid-level officials mentioned that they would need knowledge of it too.

(iii) Most officials in Vijayawada, like Guntur, have a fair understanding of their subject requirements, and training would be required to enhance their knowledge in the same and introduce new concepts, systems and technologies of their domains. The detailed analysis of the training priorities of the Mid-level Officials is discussed in Table 12, Table 13 and Table 14 for the three sectors of Water, Waste Water and Solid Waste

Management respectively. The tables have been summarised from the detailed tables in Annexure 5. The Priority has been marked as High if the majority of aspects under a particular parameter were preferred by the participants. The Priority has been marked as Medium if a brief training was preferred by the respondents on about half of the aspects under a parameter. The Priority has been marked as Low if the respondents suggested no training is required for a parameter.

(iv) A need was identified from both Mid-level Officials and ground-level functionaries to provide case study based training for operation and maintenance of services and facilities in their respective sectors.

Table 12: Summary of Training Needs for Mid-level Officials for Water Sector in VMC

Parameter	Training Needed	Training Priorities*
LEGISLATIVE AND INSTITUTIONAL FRAMEWORK		
Legislative Framework	Yes	
Institutional Framework	Yes	
Provisions and Elements of Water Management in Missions and Scheme	No	
WATER MANAGEMENT SYSTEMS		
Water Supply Systems	Yes	
Reduction of Water Losses	Yes	
Water Budgeting and Water Balance	Yes	
SCADA (Supervisory Control and Data Acquisition)	Yes	
IUWM	Yes	
FINANCIAL MANAGEMENT		
Sources to access funds (details of grants/loans at central, state, and local level)	No	
Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, etc.)	No	
Resource Mobilization	No	
Various Business Models	No	
Cost Recovery, Cost Efficiency & Financial Management	No	

Parameter	Training Needed	Training Priorities*
COMMUNITY ENGAGEMENT		
Need for Community Engagement, Water Use Efficiency	Yes	
Various Community Engagement Models and Structures	Yes	
Information, Education & Communication (IEC)	Yes	
PROJECT MANAGEMENT AND PRIVATE SECTOR PARTNERSHIP		
Project Planning, Monitoring & Control	Yes	
Various Models of PPP	Yes	
Public Interaction and Complaint Redressal System	Yes	
Use of ICT, GIS, RS and Technology in management of assets and resources	No	

** Green represents High Priority, Yellow represents Medium Priority, Blue represents Low priority*

Table 13: Summary of Training Needs for Mid-level Officials for Waste Water Sector in VMC

Parameter	Training Needed	Training Priorities*
LEGISLATIVE AND INSTITUTIONAL FRAMEWORK		
Legislative framework	Yes	
Institutional Framework	Yes	
Provisions and Elements of Water Management in Missions and Scheme	Yes	
WASTEWATER MANAGEMENT TECHNOLOGIES		
Need for wastewater management	Yes	
Wastewater Generation	Yes	
Wastewater Treatment	Yes	
Wastewater Disposal/Reuse	Yes	
Grievance Redressal System	Yes	
FAECAL SLUDGE AND SEPTAGE MANAGEMENT		
Faecal Sludge and Septage Management	Yes	
Occupational Hazards and Safety in handling Faecal Sludge	Yes	
Operation, Maintenance & Monitoring of Faecal Sludge Treatment Plants	Yes	
Grievance Redressal System	Yes	

Parameter	Training Needed	Training Priorities*
FINANCIAL MANAGEMENT		
Sources to access funds (details of grants or loans at central, state and local level, details of external funding agencies, institutions, the borrowing capacity of ULBs etc.	No	
Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, punitive measures, etc.)	No	
Resource Mobilization	No	
Various Business Models	No	
Cost Recovery, Cost Efficiency & Financial Management	No	
COMMUNITY ENGAGEMENT		
Need for Community Engagement, Water Use Efficiency	Yes	
Various Community Engagement Models and Structures	Yes	
Information, Education & Communication (IEC)	Yes	
PROJECT MANAGEMENT AND PRIVATE SECTOR PARTNERSHIP		
Project Planning, Monitoring & Control	Yes	
Various Models of PPP	Yes	
Public Interaction and Complaint Redressal System	No	
Use of ICT, GIS, RS and Technology in management of assets and resources	No	

** Green represents High Priority, Yellow represents Medium Priority, Blue represents Low priority*

Table 14: Summary of Training Needs for Mid-Level Functionaries for Solid Waste Management Sector in GMC

Parameter	Training Needed	Training Priorities*
LEGISLATIVE AND INSTITUTIONAL FRAMEWORK		
Legislative framework	Yes	
Institutional Framework	Yes	
Provisions for SWM in Missions And Schemes	Yes	
SOLID WASTE VALUE CHAIN MANAGEMENT		
Waste Segregation and Collection	Yes	
Wet waste management Technology and approaches	Yes	
Dry waste management approaches and technology	Yes	
Selection of Solid waste management technologies	Yes	

Parameter	Training Needed	Training Priorities*
Waste disposal – Sanitary landfill	No	
Occupational Health and Safety	Yes	
FINANCIAL MANAGEMENT		
Sources to access funds (details of grants or loans at central, state and local level, details of external funding agencies, institutions, the borrowing capacity of ULBs etc.	No	
Various stakeholders from a financing point of view	No	
Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, etc.)	No	
Resource Mobilization	No	
Various Business Models	No	
Cost Recovery, Cost Efficiency & Financial Management	No	
COMMUNITY ENGAGEMENT		
Need for Community Engagement	Yes	
Various Community Engagement Models and Structures	Yes	
Information, Education & Communication (IEC)	Yes	
PROJECT MANAGEMENT AND PRIVATE SECTOR PARTNERSHIP		
Project Planning, Monitoring & Control	No	
Public Interaction and Complaint Redressal System	Yes	
Use of ICT for management	Yes	

** Green represents High Priority, Yellow represents Medium Priority, Blue represents Low priority*

Based on the findings of the TANA conducted through interviews and assessments, a detailed curriculum is prepared customised for the Vijayawada Municipal Corporation and according to the needs of the three stakeholder groups. The detailed curriculum outline has been mentioned in Chapter 5.

5

FINDINGS AND RECOMMENDATIONS

5. Findings and Recommendations

One of the objectives of this study is to identify the gaps that exist in the knowledge and understanding, and determine the training needs of the ULB officials in the five pilot cities. This would guide the design of the customised curriculum modules that would be delivered to the officials of various cadres in the five cities. This chapter provides findings as a comparison of the ULBs in the four cities after interviewing the officials and analysing the results. This is followed by a curriculum outline, which forms the recommendations of this report, mentioning the topics for training delivery to the officials in the three sectors, customised for each city.

5.1 Findings of TANA

The findings of the TANA are summarised here in tables. Table 15 shows the priorities of the ULB as reported by the Commissioner. The priorities are mapped as per the preferences out of the three sectors of solid waste management, wastewater management and water management. For a comprehensive understanding, the tables below mention the findings of each sector with respect to the stakeholder group. Table 16 show the needs of the Vijayawada for the three sectors of solid waste management, wastewater management and water management.

Table 15: Priorities of the VMC as mentioned by the Commissioner

City	First Priority	Second Priority	Third Priority
Vijayawada	Waste Water Management	Solid Waste Management	Water Management

Table 16: Summary of gap analysis for the three sectors in VMC

Sector	Decision Makers	Mid-level Officials	Ground Level Functionaries
Solid Waste Management	No perceived gaps	• Legislative Framework around solid waste management • Community Engagement	Public Interaction O&M of treatment plants
Waste Water Management	No perceived gaps	• New treatment technologies • O&M of FSTP • Project evaluation and Project Monitoring	Public Interaction
Water Supply Management	No perceived gaps	• Provision for water management in various schemes • Overview of IUWM	Public Interaction

5.2 Recommendations

The training need findings provide the preliminary directions to design the training curriculum and the modules to be delivered. Formulating a training curriculum outline is one of the outcomes of this study. The outlines are based on the findings of TANA, including few new concepts and strategies like Disaster and Emergency Preparedness, IUWM, Demand Side Management and FSSM, etc., that would be relevant in the coming decades to tackle climate change resonating with the aim of GEF. The following section provides the training outlines for the four cities each outlined for the sectors and stakeholders.

5.3 Curriculum

Based on the findings and recommendations, the curriculum outlines for Vijayawada are prepared to mention in brief the topics that would be covered in the training. Broadly, the topics are similar across the cities, however, the contents under each topic would be dealt with varying depths depending on the identified city needs and demands. The curriculum outline mentioned below is a tentative programme. The detailed curriculum, however, might vary in terms of the session name and contents.

Table 17, Table 18 and Table 19 provide the curriculum outline for VMC for the sectors solid waste management, wastewater management and water management respectively.

Table 17: Curriculum Outline for Solid Waste Management for VMC

Stakeholder Group	Session Name	Topic to be delivered / Session contents
Decision Maker	Overview of SWM	SWM value chain and Waste hierarchy, Overview of existing legal framework, convergence with other government missions
	Issues and Challenges	Issues and Challenges of the current practices (Planning, implementation and execution, O&M, etc.)
	Case Studies of new approaches	National and International approaches- SWM Centralized/Decentralized technologies, Role of IEC and ICT in SWM - Integrated control command centre, RFID tagging, online Monitoring of vehicles
	Successful SWM Models	Examples of Composting, Dry waste management, Bioremediation, MRF centres, Use of ICT, Innovations (waste to wealth products)
Mid-level Officials	Overview of SWM	SWM value chain and Waste hierarchy, Overview of existing legal framework, convergence with other government missions
	Issues and Challenges in SWM	• SWM value chain - Technologies (Cost-effective technologies, advantages and limitations, selection criteria, capacity, efficiency, CAPEX/ OPEX, Private Sector Partnership etc.) • Existing SBM ICT platforms, IEC tools • Successful SWM Models – Composting, Dry waste management, Bioremediation, MRF centres, Innovations • Health and Safety protocols- Use of PPE Kits
	Disaster Preparedness and Emergency Response	Management Strategies and operating Protocols and Guidelines during Emergencies and Disasters
Ground-level Functionaries	Context Setting	Issues and Challenges in SWM
	Guidelines and SOPs	Various standard operating procedures and Guidelines
	Occupational Health and Safety Measures	Use of PPE kits and health checkups
	SWM Workers as Change Agent	Community Engagement tools, Behavioral Change, Communication skills
	Emergency Response	Guidelines for handling, treatment and disposal

Table 18: Curriculum Outline for Waste Water Management for VMC

Stakeholder Group	Session Name	Topic to be delivered / Session contents
Decision Maker	Overview	Elements and components of Wastewater Management and FSSM
	Issues and Challenges	Issues and Challenges of the current practices (Planning, implementation and execution, O&M, etc.)
	National and International approaches	Centralized/Decentralized approaches on treatment, disposal, reuse and recycling of waste water
	New Available Technologies	Selection criteria, advantages and limitations, capacity, efficiency, CAPEX/OPEX etc.
Mid-level Officials	Overview	Elements and components of Wastewater Management and FSSM
	National and International approaches	Centralized/Decentralized approaches on treatment, disposal, reuse and recycling of waste water
	Project Management	DPR Handling, Contract Management, Financial Management, Procurement
	Disaster Preparedness and Emergency Response	Management Strategies and operating Protocols and Guidelines during Emergencies and Disasters
Ground-level Functionaries	Context Setting	Overview of Waste Water management and FSSM
	Guidelines and SOPs	Various standard operating procedures and Guidelines
	Sanitation Workers as Change Agent	Community Engagement tools, Behavioural Change, Communication skills
	Emergency Response	Guidelines for handling, treatment and disposal

Table 19: Curriculum Outline for Water Management for VMC

Stakeholder Group	Session Name	Topic to be delivered / Session contents
Decision Maker	Urban Water Management Landscape for India	Overview of Water Management Policies and Programmes at National and State Level
	Contemporary approaches for Water Management	IUWM, Water Audit, Water Budgeting, WSUD
	Technological Intervention for water management	SCADA, DMAs, Smart Technologies
Mid-level Officials	Urban Water Management Landscape for India	Overview of Water Management Policies and Programmes at National and State Level
	Contemporary approaches for Water Management	IUWM, Water Audit, Water Budgeting, WSUD
	Technological Intervention for water management	SCADA, DMAs, Smart Technologies
	Disaster Preparedness and Emergency Response	Management Strategies and operating Protocols and Guidelines during Emergencies and Disasters
Ground-level Functionaries	Context Setting	Overview of Waste Water management and FSSM
	Guidelines and SOPs	Various standard operating procedures and Guidelines
	Emergency Response	Guidelines for handling, treatment and disposal

6

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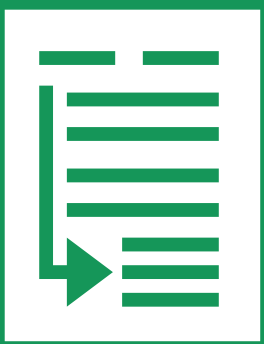
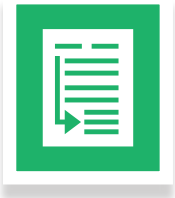


6. References



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7

ANNEXURES

Annexure I
TANA Questionnaire for Senior Officials

Project Title:

''Sustainable Cities Integrated Approach Pilot in India''

COMPONENT 3:

Partnerships, Knowledge Management and Capacity Building

The United Nations Industrial Development Organization (UNIDO) is implementing the SC-IAP programme in India along with the Ministry of Housing and Urban Affairs, Government of India. The core objective is to build resilience in five cities – Jaipur, Bhopal, Mysuru, Vijayawada and Guntur – by integrating sustainability concepts into urban planning and management strategies.

NIUA has been engaged by the UNIDO to conduct a Training and Assistance Need Analysis (TANA) for the ULB officials and elected representatives. This assessment will be conducted across Water, Waste Water and Solid Waste Management (SWM) sector in the city. The results of TANA will constitute the basis for developing a detailed training curriculum on Water, Waste Water and SWM. The designed training modules will help in enhancing the knowledge and build capacities of ULB officials towards sustainable city management. The content of these training modules will also contribute towards achieving the objectives of national level initiatives such as Smart Cities Mission, AMRUT, PMAY, NULM, NUHM and Swachh Bharat Mission. Development of the comprehensive training modules will be followed by a training and technical assistance program.

Name of the city .....

Date .....

Department .....

Cell .....

CONFIDENTIALITY STATEMENT

The information shared in this interview will be used only towards the analysis of the Training Need Assessment and shall not be shared for any other purpose. Only the researchers involved in this study will see your responses

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. If you do not want to participate, please return the questionnaire to the researcher. You also do not have to answer any question that makes you uncomfortable.

Please Sign below for your consent for the proceedings and/or the audio/video documentation of the same.

Name of the Respondent .....

Designation: .....

Signature .....

1. As per you, rank the priorities of the ULB at present out of the three sectors of Water, Waste Water and Solid Waste Management on a scale of 1 to 3, with 1 being of highest priority and 3 being of lowest priority.
2. In your ULB, what are the key issues pertaining to water, wastewater and solid waste management?
3. How is your relationship with the Elected Representatives and community in the wards in the ULB? How do you work together?
4. Please mention the challenges in Planning, Financing, Implementation, and Monitoring in these sectors.

	Water Supply Management	Wastewater Management	Solid Waste Management
Planning			
Financing			
Implementation			
Monitoring			

5. What are your suggestions for the aforementioned challenges in the sectors?
6. How do you consider this project can assist in developing the capacity of your ULB, based on your prior experience? (priorities/key areas for training)
7. As per you, who do you think are the key stakeholders?

Annexure 2
TANA Questionnaire for Department Heads

1. Provide list of Functional Representatives (designation –wise) for each of the departments under the specified Agencies: An example is given below:

SECTOR: SOLID WASTE MANAGEMENT / WASTE WATER MANAGEMENT / WATER MANAGEMENT					
AGENCY NAME:					
SL. No.	Department	Designation	Job Responsibilities	Total Staff	
				Permanent	Contractual
i.	PHED (An example)	Executive Engineer	• Project Planning and Execution • DPR Preparation • Tender Approval & Management		

2. List of projects operational in the city in your sector:

SECTOR: SOLID WASTE MANAGEMENT / WASTE WATER MANAGEMENT / WATER MANAGEMENT								
Sl. No	Project Name	Govt./ Bilateral & Multilateral Loans/ Funding Grants/ Others (if any)	Partners			Current status of Project Implementation		
			Funding	O&M	Technical	Planning	Under Construction	Functional/ Operational

3. Are there any NGOs or other private agencies working with the ULBs in your city?
   If Yes:

Sl. No	Name of the NGO/Private Agency	Point of Contact	Type (Private/ NGO/ RWA/ Others)	Sector(Solid Waste/ Waste Water/ Water Management)	Type of Work/ Project Name	Role

4. How many the RWAs (active/non-active)? What is your mode and frequency of engagement with them?
5. What are your key focus areas in your sector and why?
6. Do you have any suggestions for improvement in those areas?
7. Were there any capacity building trainings held for your staff earlier? Do you find them useful?
   a. Do you have any suggestions to improve the same?
8. How is the coordination of the Elected Representatives and community in these sectors?
   a. (If not, do you have any recommendations for improving the same?)
9. Are there any innovative or best practices in the city in your sector?

Annexure 3
TANA Questionnaire for Mid-Level Officials

Water Supply Management

A. GENERAL INFORMATION

1.	Name						
2.	Gender						
3	Age Group (in yrs)	<30	31-40	41-50	51-60	60<	
4.	Contact number (mobile)						
5.	Email						
6.	Educational qualification (Please tick the highest educational degree)	Higher Secondary	Senior Secondary	Diploma	Bachelors	Masters	Others (Specify)
7.	Field of Education						
8.	Department			Cell			
9.	Designation						
10.	Type of position	Permanent		Contractual		Others(Specify)	
11.	Number of Years of Experience in the current position	1-5 years	5- 10 years		10-15 years	Above 15 years	

12.	In your current position what are your responsibilities? (Tick as many relevant)	
	Planning & Scheduling	
	Legal aspects and Compliance	
	Technical & Engineering Aspects	
	Budgeting, Costing and other Financial Aspects	
	Communication	
	Field Supervision	
	Coordination & Meetings	
	Staff Management, Control	
	Training & Capacity Building	
	Enhancing Community Participation	
	Public Interaction and Complaint Redressal	
	Any Other (Please Specify)	

13. Have attended any training programmes/ workshops/conference in last three years regarding Water Supply and Management?
    a. Yes
    b. No

If Yes, Specify the following:

Name of the training programme/ workshop/ conference	Topic/ Subject	Year	Duration	Organized by	Sponsored by	Level of relevance to current Job function/ duties		
						Highly Relevant	Some what Relevant	Not Relevant

14. Please suggest your preferred medium for the training programmes?
    a. English
    b. Hindi
    c. Others(Specify)

15. What are your expectations from the training programmes?
   a. Knowledge enhancement
   b. Skills enhancement
   c. Improving Service Delivery
   d. Community Participation Tools
   e. Improving Inter-agency coordination
   f. Others (Specify)

16. Please suggest your preferred duration of training programmes
   a. One day
   b. Two days
   c. Three days
   d. Others(Specify)

17. Please suggest your preferred mode of training. You may tick more than one.
   a. Classroom teaching
   b. Workshop, Seminar
   c. Interactive discussion
   d. Exposure trips
   e. Reference material
   f. E-Learning material and aid
   g. Others (Specify)

18. Please suggest your preferred location of training programme
   a. Within city
   b. Outside city, within state
   c. Other states
   d. Any Other (Specify)

19. Please suggest your preferred time frame for attending the training programme?
   a. Jan-March
   b. April-June
   c. July-Sept
   d. Oct-Dec
   e. Other (Specify)

20. Of the following items, which do you identify important for training, to equip for future growth? You may choose more than 1

a. Water Quality, Source Augmentation, Water Reuse
b. Demand Side Management
c. Supply Side Systems and Management
d. Water Balance and Water Budgeting
e. Water Tariff and Pricing
f. Non-Revenue Water (NRW) and Unaccounted for Water (UFW) and its reduction
g. Rainwater Harvesting and Storm Water Management
h. Water Bodies Rejuvenation, Ground Water Management
i. Others

B. TRAINING NEEDS ASSESSMENT: WATER MANAGEMENT:

As per your level of knowledge and awareness rate yourself on the following parameters:

21. INSTITUTIONAL AND POLICY FRAMEWORK FOR WATER

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Awareness			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Legislative Framework**						
1.1	National water policy, 2012						
1.2	Water (Prevention and Control of Pollution) Act, 1974						
1.3	Environment (Protection) Act, 1986						
1.4	State Water Policy						
1.5	Municipal Corporation Act and other Municipal Acts						
2.	**Institutional Framework**						
2.1	Roles and Responsibilities of Government Institutions (State/City/ULB) in water						
2.2	Institutional Framework (State level/City Level/ ULBs)- Jal Shakti Ministry						
3.	**Provisions and Elements of Water Management in Missions and Scheme**						
3.1	Swachh Bharat Mission, 2014						

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Awareness			Training Needed	
			Good	Fair	Poor	Yes	No
3.2	Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015						
3.3	Smart Cities Mission, 2015						
3.4	14th & 15th Finance commission						
3.5	Any State Schemes						
4.	Others if any (specify)						

22. WATER MANAGEMENT SYSTEMS

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Water Supply Systems						
1.1	Types of Water Supply Systems (characteristics, features, requirements, selection methods, etc.)						
1.2	Available Treatment Technologies (technologies, selection criteria, treatment efficiency, land and infrastructure requirement, capex/Opex, etc.)						
1.3	Water Supply Networks -Technical and Engineering aspects						
2.	Water Reuse Systems and Requirements						
3.	Factors Affecting the selection of water management system (Estimating water demand, supply, existing infrastructure, cost, design, etc.)						
4.	Reduction of Water Losses						
5.	Water Budgeting and Water Balance						
6.	SCADA (Supervisory Control and Data Acquisition)						
7.	Others, if any (Specify)						

23. Do you wish to explore private sector participation for Rain Water Harvesting?

a. Yes
b. No

If Yes, Do you need any training for the same?

a. Yes
b. No

24. FINANCIAL MANAGEMENT

Sl. No	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Sources to access funds (details of grants/loans at central, state, and local level)						
2.	Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, etc.)						
3.	Resource Mobilization						
4.	Various Business Models						
	Cost Recovery, Cost Efficiency & Financial Management						
5	Others if any (Specify)						

25. COMMUNITY ENGAGEMENT

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Need for Community Engagement, Water Use Efficiency						
2.	Various Community Engagement Models and Structures						
3.	Information, Education & Communication (IEC)						
4.	Others if any (Specify)						

26. PROJECT MANAGEMENT AND PRIVATE SECTOR PARTNERSHIP

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Project Planning, Monitoring & Control**						
1.1	Preparation of Detailed Project Report (DPR) including physical and financial methods for cost estimate, budget, costing, legal compliances, EIA, etc.						
1.2	Tendering and Procurement						
1.3	Contract Management						
1.4	Technical and Engineering Aspects						
1.5	Administrative and Financial Management (Cost Recovery, Cost Efficiency)						
1.6	Operation, Maintenance and Monitoring						
1.7	Enforcement & Accountability						
1.8	Project evaluation						
2.	**Various Models of PPP**						
3.	**Public Interaction and Complaint Redressal System**						
4.	**Use of ICT, GIS, RS and Technology in management of assets and resources**						
5.	**Others if any (Specify)**						

27. Do you think systems are well prepared for the disaster and emergencies?
28. Was the cities response well prepared for the COVID 19 crisis?
29. Were there proper operating procedures laid out for the management and functioning?
30. 30. What would be your suggestions to improve?
31. Other Important Information / Remarks / Suggestions

Wastewater Management

A. GENERAL INFORMATION

1.	Name						
2.	Gender						
3.	Age (in yrs)	<30	31-40	41-45	51-60	>60	
4.	Contact number (mobile)						
5.	Email						
6.	Educational qualification (Please tick the highest educational degree)	Higher Secondary	Senior Secondary	Diploma	Bachelors	Masters	Others (Specify)
7.	Field of Education						
8.	Department		Cell				
9.	Designation						
10.	Type of position	Permanent	Contractual	Others(Specify)			
11.	Number of Years of Experience in the current position	1-5 years	5- 10 years	10-15 years	Above 15 years		

12.	In your current position what are your responsibilities?	
	Planning & Scheduling	
	Legal aspects and Compliance	
	Technical & Engineering Aspects	
	Budgeting, Costing and other Financial Aspects	
	Communication	
	Field Supervision	
	Coordination & Meetings	
	Staff Management, Control	
	Training & Capacity Building	
	Enhancing Community Participation	
	Public Interaction and Complaint Redressal	
	Any Other (Please Specify)	

13. Have attended any training programmes/ workshops/conference in last three years?
    a. Yes
    b. No

    If Yes, Specify the following:

Name of the training programme/ workshop/ conference	Topic/ Subject	Year	Duration	Organized by	Sponsored by	Level of relevance to current Job function/duties		
						Highly Relevant	Some what Relevant	Not Relevant

14. Please suggest your preferred medium for the training programmes?
    a. English
    b. Hindi
    c. Others(Specify)

15. What are your expectations from the training programmes?
    a. Knowledge enhancement
    b. Skills enhancement
    c. Improving Service Delivery
    d. Community Participation Tools
    e. Improvement Inter-agency coordination
    f. Others (Specify)

16. Please suggest your preferred duration of training programmes
    a. One day
    b. Two days
    c. Three days
    d. Others(Specify)

17. Please suggest your preferred mode of training. You may tick more than one.
    a. Classroom teaching
    b. Workshop, Seminar
    c. Interactive discussion
    d. Exposure trips
    e. Reference material
    f. E-Learning material and aid
    g. Others (Specify)

18. Please suggest your preferred location of training programme
    a. Within city
    b. Outside city, within state
    c. Other states
    d. Any Other (Specify)

19. Please suggest your preferred time frame for attending the training programme?
    a. Jan-March
    b. April-June
    c. July-Sept
    d. Oct-Dec
    e. Other (Specify)

B. TRAINING NEEDS ASSESSMENT: WASTE WATER MANAGEMENT:

As per your level of knowledge and awareness rate yourself on the following parameters:

20. INSTITUTIONAL AND GOVERNANCE FOR WASTEWATER AND SANITATION

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Awareness			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Legislative framework						
1.1	Environment (Protection) Act, 1986						
1.2	Water (Prevention and Control of Pollution) Act, 1974						
1.3	National Environmental Policy, 2006						
1.4	National Urban Sanitation Policy, 2008						
1.5	Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013						
1.6	Framework for municipal functions (Municipal act, Service rules, Building bye-laws, Municipal Bye-laws, etc.)						
1.7	CPCB/SPCB Guidelines						
1.8	NGT Rules						
1.9	State Urban Sanitation Policy and State Urban Sanitation Strategy						
2.	Institutional Framework						
2.1	Organization structure, Roles and Responsibilities of Government departments						
2.2	Roles and Responsibilities of other relevant stakeholders like SPCBs, NGOs, RWAs						
2.3	Inter Institutional Coordination mechanism, reporting						
2.4	National Rating Scheme for Sanitation (Swachh Survekshan)and Other protocols(ODF,ODF+,ODF++, Water+,etc.)						

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Awareness			Training Needed	
			Good	Fair	Poor	Yes	No
3.	Provisions and Elements of Water Management in Missions and Scheme						
3.1	Swachh Bharat Mission, 2014						
3.2	Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015						
3.3	Smart Cities Mission, 2015						
3.4	14th and 15th Finance Commission						
3.5	NULM and NUHM						
4.	Others if any (specify)						

21. WASTE WATER MANAGEMENT

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Waste Water Management						
1.1	Need for waste water management						
2.	Wastewater Generation						
2.1	Sources of waste water generation						
2.2	Available options for conveyance of waste water (types, features, limitations, selection criteria, etc.)						
2.3	Technical and Engineering aspects of types of conveyance systems (Infrastructure, capacity, capex/ opex, O&M, etc.)						

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
3.	**Waste Water Treatment**						
3.1	Types (Off-site sanitation system, Decentralized Wastewater Treatment (DEWATS), On-site sanitation system, etc.)						
3.2	Available Technologies (types, features, treatment efficiency, limitations, selection criteria, etc.)						
3.3	Technical and Engineering aspects of available technologies (Infrastructure, capacity, capex/ opex, O&M, etc.)						
4.	**Waste Water Disposal/Reuse**						
4.1	Awareness on associated health risks due to improper disposal						
4.2	Current practices of Waste water reuse						
5.	**Grievance Redressal System**						
6.	**Others(if any)**						

22. FAECAL SLUDGE & SEPTAGE MANAGEMENT (FSSM)

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Faecal Sludge and Septage Management**						
1.1	Need for FSSM						
1.2	Design and Construction Guidelines for various types of containment systems and desludging frequency						
1.3	Available Technologies for desludging of Septic Tanks (available equipment, advantages and limitations, selection criteria, capacity, efficiency, capex/opex etc.)						
1.4	Available options for transporting the faecal sludge and septage (Features, limitations, capacity, selection criteria, capex/opex, etc.)						
1.5	Available Treatment Technologies (technologies, selection criteria, treatment efficiency, land and infrastructure requirement, capex/ opex, etc.)						
1.6	Available Options for Disposal/Reuse						
2.	**Occupational Hazards and Safety in handling Faecal Sludge**						
2.1	Awareness on associated risks to health						

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
2.2	Mitigating measures (PPE, Training on use of tools/equipment, Training on standard operating procedures, etc.)						
3.	**Operation, Maintenance & Monitoring of Faecal Sludge Treatment Plants**						
3.1	Operation						
3.2	Asset Management						
3.3	Administrative/ Financial Management						
3.4	Monitoring and Record-keeping						
3.5	Managing volumes & schedules of FS collection						
3.6	Utilizing available local resources						
3.7	Storage & sale of end products						
4.	**Grievance Redressal System**						
5.	**Others, if any (Specify)**						

23. Do you wish to explore private sector participation for FSSM?
    a. Yes
    b. No

    If Yes, Do you need any training for the same?
    a. Yes
    b. No

24. Specify the various value chain points across FSSM for which you wish to explore private sector participation?

25. FINANCIAL MANAGEMENT

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Sources to access funds (details of grants or loans at central, state and local level, details of external funding agencies, institutions, borrowing capacity of ULBsetc.						
2.	Various stakeholders from financing point of view						
3.	Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, punitive measures, etc.)						
4.	Resource Mobilization						
5.	Various Business Models						
6.	Cost Recovery, Cost Efficiency & Financial Management						
7.	Others if any (Specify)						

26. COMMUNITY ENGAGEMENT

SL. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Need for Community Engagement						
2	Various Community Engagement Models and Structures						
3.	Information, Education & Communication (IEC)						
4.	Others if any (Specify)						

SL. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Project Planning, Monitoring & Control**						
1.1	Preparation of Detailed Project Report (DPR) including physical and financial methods for cost estimate, budget, costing, legal compliances, EIA, etc.						
1.2	Tendering and Procurement						
1.3	Contract Management						
1.4	Technical and Engineering Aspects						
1.5	Administrative and Financial Management (Cost Recovery, Cost Efficiency)						
1.6	Operation, Maintenance and Monitoring						
1.7	Enforcement & Accountability						
1.8	Project evaluation						
1.9	Human Resource Management						
2.	**Various Models of PPP**						
3.	**Public Interaction and Complaint Redressal System**						
4.	**Use of ICT, GIS, RS and Technology in management of assets and resources**						
5.	**Others if any (Specify)**						

27. Project Management and Private Sector Partnership
28. Do you think systems are well prepared for the disaster and emergencies?
29. Was the cities response well prepared for the COVID 19 crisis?
30. Were there proper operating procedures laid out for the management and functioning?
31. What would be your suggestions to improve?
32. Other Important Information / Remarks / Suggestions

Solid Waste Management

A. GENERAL INFORMATION

1.	Name						
2.	Gender						
3.	Age Group (in yrs)	<30	31-40	41-50	51-60	>60	
4.	Contact number (mobile)						
5.	Email						
6.	Educational qualification (Please tick the highest educational degree)	Higher Secondary	Senior Secondary	Diploma	Bachelors	Masters	Others (Specify)
7.	Field of Education						
8.	Department			Cell			
9.	Designation						
10.	Type of position	Permanent		Contractual		Others(Specify)	
11.	Number of years of Experience In The Current Position	1-5 years	5- 10 years		10-15 years	Above 15 years	

12.	In your current position what are your responsibilities? (Tick as many relevant)	
	Planning & Scheduling	
	Legal aspects and Compliance	
	Technical & Engineering Aspects	
	Budgeting, Costing and other Financial Aspects	
	Communication	
	Field Supervision	
	Coordination & Meetings	
	Staff Management, Control	
	Training & Capacity Building	
	Enhancing Community Participation	
	Public Interaction and Complaint Redressal	
	Any Other (Please Specify)	

13. Have attended any training programmes/workshops/conference in last three years regarding Solid Waste Management?
    a. Yes
    b. No

If Yes, Specify the following:

Name of the training programme/ workshop/ conference	Topic/ Subject	Year	Duration	Organized by	Sponsored by	Level of relevance to current Job function/duties		
						Highly Relevant	Some what Relevant	Not Relevant

14. Please suggest your preferred medium for the training programmes?
    a. English
    b. Hindi
    c. Others (Specify)

15. What are your expectations from the training programmes?
    a. Knowledge enhancement
    b. Skills enhancement
    c. Improving Service Delivery
    d. Community participation tools
    e. Improving Inter-agency coordination
    f. Others (Specify)

16. Please suggest your preferred duration of training programmes
    a. One day
    b. Two days
    c. Three days
    d. Others(Specify)

17. Please suggest your preferred mode of training. You may tick more than one.
    a. Classroom teaching
    b. Workshop, Seminar
    c. Interactive discussion
    d. Exposure trips
    e. Reference material
    f. E-Learning material and aid
    g. Others (Specify)

18. Please suggest your preferred location of training programme
    a. Within city
    b. Outside city within state
    c. Other states
    d. Any Other (Specify)

19. Please suggest your preferred time frame for attending the training programme?
    a. Jan-March
    b. April-June
    c. July-Sept
    d. Oct-Dec
    e. Other (Specify)

As per your level of knowledge and awareness, rate yourself on the following parameters:

20. INSTITUTIONAL AND POLICY FRAMEWORK FOR SOLID WASTE MANAGEMENT

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Awareness			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Legislative Framework**						
1.1	National Urban Sanitation Policy, 2008						
1.2	Solid Waste Management rules						
1.3	Plastic Waste Mgmt rules						
1.4	C & D Waste Mgmt rules						
1.5	E- Waste Mgmt rules						
1.6	Bio- medical waste Mgmt rules (relevant parts)						
1.7	Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013						
1.8	Emergency Response Sanitation unit						
1.9	National Safai Karamcharis Finance & Development Corporation (NSKFDC)						
1.10	National Rating Scheme for Sanitation (Swachh Survekshan, ODF++, Water Plus)						
1.11	State level State SWM Policy and Strategy						
1.12	SWM Bye-Laws						
2.	**Institutional Framework**						
2.1	Roles and Responsibilities of Government Institutions (State/City/ ULB) in solid waste management ex –MOEFCC, MoHUA, SPCB's, CPCB, CPHEOO, NGT etc.						
2.2	Institutional Framework (State level/ City Level/ULBs)						
3.	**Missions and Schemes**						
3.1	Swachh Bharat Mission, 2014						
3.2	Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015						
3.3	Smart Cities Mission, 2015						
3.4	National Urban Livelihood Mission						
4.	**Others if any (specify)**						

21. SOLID WASTE VALUE CHAIN MANAGEMENT

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Waste Segregation and Collection**						
1.1	Types of Waste streams (characteristics, features, etc.)						
1.2	Transportation of waste -Technical and Engineering aspects, transfer stations						
1.3	Available Technologies (technologies, selection criteria, treatment efficiency, land and infrastructure requirement, capex/Opex, etc.)						
1.4	Mainstreaming of waste pickers in waste management (Human resource management)						
1.5	Use of ICT in Collection and Transportation						
2.	**SWM technologies (technical and engineering aspects) (Composting, Windrow Composting, Aerated Static pile composting, In-vessel composting, Anaerobic composting, Vermi Composting, Biomethanation, Incineration and energy recovery, Pelletization/Refuse Derived fuel system, Pyrolysis and Gasification, Plasma Pyrolysis, Sanitary Landfill)**						
2.1	Wet waste management Technology and approaches						
A.	Composting techniques						
(i)	Types (Advantages & Disadvantages, Treatment efficiency, land requirement, selection criteria, etc.), Technical and Engineering aspects and Capex, Opex and Revenue aspects						
B.	Biomethanization						
(i)	Types (Advantages & Disadvantages, Treatment efficiency, land requirement, selection criteria, etc.), Technical and Engineering aspects and Capex, Opex and Revenue aspects						
2.2	Dry waste management approaches and technology						
(i)	Material recovery facility						

Sl. No.	Parameters	Relevance w.r.t. to Job role (Rate 0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
(ii)	Types (Advantages & Disadvantages, Treatment efficiency, land requirement, selection criteria, etc.), Technical and Engineering aspects and Capex, Opex and Revenue aspects						
(iii	Recycling/ Reuse/Recovery technologies						
(iv)	Potential Buyers						
3.	**Selection of Solid waste management technologies**						
3.1	(Estimating waste generation volume, existing infrastructure, cost, etc.)						
3.2	Available SWM technologies (Types, features, treatment efficiency, selection criteria)						
3.3	Technical and engineering aspects of available technologies						
4.	**Bulk waste generators (BWG) management**						
4.2	Bulk Waste Generator Identification/ Verification Process, compliance process, Types of BGG (Institutions, hotels, RWA's), Available technologies for BWG,						
5.	**Waste disposal – Sanitary landfill**						
5.1	Planning, Designing and Construction of Secured landfill (Site selection, CAPEX, OPEX)						
5.2	Methods of Land Closure and Capping						
5.3	Planning and Designing Leachate Treatment Facility						
6.	**Occupational Health and Safety**						
7.	**Circular Economy models in Waste management (Closing the loop concept)**						

22. Do you wish to explore private sector participation for SWM?
    a. Yes
    b. No

If Yes, Do you need any training for the same?
    a. Yes
    b. No

23. Specify the various value chain points across SWM for which you wish to explore for private sector participation?

24. FINANCIAL MANAGEMENT

Sl. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Sources to access funds (details of grants or loans at central, state and local level, details of external funding agencies, institutions, borrowing capacity of ULBs etc.						
2.	Various stakeholders from financing point of view						
3.	Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, etc.)						
4.	Resource Mobilization						
5.	Various Business Models						
6.	Cost Recovery, Cost Efficiency & Financial Management						
7.	Others if any (Specify)						

25. COMMUNITY ENGAGEMENT

SL. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	Need for Community Engagement						
2.	Various Community Engagement Models and Structures						
3.	Information, Education & Communication (IEC)						
4.	Others if any (Specify)						

26. PROJECT MANAGEMENT AND PRIVATE SECTOR PARTNERSHIP

SL. No.	Parameters	Relevance level w.r.t your job responsibility (0 to 5)	Level of Knowledge & Understanding			Training Needed	
			Good	Fair	Poor	Yes	No
1.	**Project Planning, Monitoring & Control**						
1.1	Preparation of Detailed Project Report (DPR) including physical and financial methods for cost estimate, budget, costing, legal compliances, EIA, etc.						
1.2	Tendering and Procurement						
1.3	Contract Management						
1.4	Procuring, Installation & commissioning/ setting up SWM projects						
1.5	Technical and Engineering Aspects						
1.6	Administrative and Financial Management (Cost Recovery, Cost Efficiency)						
1.7	Operation, Maintenance and Monitoring						
1.8	Enforcement & Accountability						
1.9	Project evaluation						
1.10	Human Resource Management						
2.	**Various Models of PPP**						
3.	**Public Interaction and Complaint Redressal System**						
4.	**Use of ICT for management**						
5.	**Others if any (Specify)**						

27. Do you think systems are well prepared for the disaster and emergencies?
28. Was the cities response well prepared for the COVID 19 crisis?
29. Were there proper operating procedures laid out for the management and functioning?
30. What would be your suggestions to improve?
31. Other Important Information / Remarks / Suggestions

Annexure 4
TANA Questionnaire for Ground staff

1. What are your future aspirations with the job?
2. What do you think is the status of the ULB in terms of sanitation and water supply?
3. How is your interaction with the community and residents? How frequently do you interact? What is your mode of communication?
4. What support do you currently get from the community and what are your expectations from them?
5. What support do you need from government officials and other superiors to perform your responsibilities better and efficiently?
6. What support do you need from your subordinates to perform your responsibilities?
7. What support do you need from other departments to perform your responsibilities?
8. What are your strengths while performing your job?
9. What are the difficulties you face in doing your job?
10. Have you received any kind of training before? (What kind and when) Were they useful?
11. What are the areas in which you would like to be trained for?
12. What kind of training would you prefer - face-to-face or virtual? Do you think exposure visits to good practice sites is useful? Why and how?
13. What is the right duration for training (face-to-face) and virtual?

Annexure 5
Detail findings of TANA for Vijayawada Municipal Corporation

The detail findings of the TANA for the Mid-level Officials are tabulated in this annexure. It has been prepared for the three sectors of Water, Waste Water, and Solid Waste Management separately. The frequency of responses is mapped cumulatively. The numbers under the relevance column are the total number of people who responded in numbers between 0-2 or 3-5 for that respective parameter, with 0 being completely irrelevant and 5 being highly relevant to their job role. The numbers mentioned under 'Level of Understanding' column are the number of people who responded that they have a 'Good', 'Fair' or 'Poor' understanding of the corresponding parameter. The total number of respondents saying that they would require training for that particular parameter. The higher of the two numbers listed under relevance becomes results in the total; the parameter is taken as relevant if there is a higher number under '3-5' column, else it is listed as not relevant. A similar logic has been followed to find the general level of understanding of the respective parameters. The column with the highest of the numbers under 'Good', 'Fair' and 'Poor' renders the 'Level of Understanding' under the 'Total'. A training priority is estimated from the higher of the columns under 'Training Needed' column.

Table 20: Detail Training Needs of Water Sector

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
1.	LEGISLATIVE AND INSTITUTIONAL FRAMEWORK										
1.1	**Legislative Framework**										
1.1.1	National water policy, 2012	1	2	2		1	1	2	No	Poor	No
1.1.2	Water (Prevention and Control of Pollution) Act, 1974		3	3				3	Yes	Good	No
1.1.3	Environment (Protection) Act, 1986	1	2	2		1	1	2	No	Poor	No
1.1.4	State Water Policy		3	1	1	1	2	1	Yes	Poor	No
1.1.5	Municipal Corporation Act and other Municipal Acts		3	1	1	1	2	1	Yes	Poor	No
1.2	**Institutional Framework**										
1.2.1	Roles and Responsibilities of Government Institutions (State/City/ULB) in water		3	3			1	2	Yes	Good	No
1.2.2	Institutional Framework (State level/City Level/ULBs)- Jal Shakti Ministry		3	2		1	1	2	Yes	Poor	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
1.3	Provisions and Elements of Water Management in Missions and Scheme										
1.3.1	Swachh Bharat Mission, 2014		3	2	1		1	2	Yes	Good	No
1.3.2	Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015		3	2	1			3	Yes	Good	No
1.3.3	Smart Cities Mission, 2015		3	2	1		1	2	Yes	Good	No
	14th & 15th Finance commission		3	2	1		1	2	Yes	Good	No
2.	WATER MANAGEMENT SYSTEMS										
2.1	Water Supply Systems										
2.1.1	Types of Water Supply Systems (characteristics, features, requirements, selection methods, etc.)		3	3				3	Yes	Good	No
2.1.2	Available Treatment Technologies (technologies, selection criteria, treatment efficiency, land and infrastructure requirement, Capex/Opex, etc.)		3	3				3	Yes	Good	No
2.1.3	Water Supply Networks -Technical and Engineering aspects		3	3				3	Yes	Good	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
2.2	Water Reuse Systems and Requirements	1	2	2	1	1	1	2	Yes	Good	No
2.3	Factors Affecting the Selection of a water management system		3	3				3	Yes	Good	No
2.4	Reduction of Water Losses		3	3				3	Yes	Good	No
2.5	Water Budgeting and Water Balance		3	3				3	Yes	Good	No
2.6	SCADA (Supervisory Control and Data Acquisition)		3	3				3	Yes	Good	No
2.7	IUWM		3	2	1	1	2	1	Yes	Good	Yes
3.	FINANCIAL MANAGEMENT										
3.1	Sources to access funds (details of grants/loans at central, state, and local level)	2	1	1	1	1	1	2	No	Poor	No
3.2	Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, etc.)	2	1	1	1	1	1	2	No	Poor	No
3.3	Resource Mobilization	2	1	1	1	1	1	2	No	Poor	No
3.4	Various Business Models	2	1	1	1	1	1	2	No	Poor	No
3.5	Cost Recovery, Cost Efficiency & Financial Management	2	1	1	1	1	1	2	No	Poor	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
4.	COMMUNITY ENGAGEMENT										
4.1	Need for Community Engagement, Water Use Efficiency		3	2	1		1	2	Yes	Good	No
4.2	Various Community Engagement Models and Structures		3	2	1		1	2	Yes	Good	No
4.3	Information, Education & Communication (IEC)		3	2	1		1	2	Yes	Good	No
5.	PROJECT MANAGEMENT AND PRIVATE PARTNERSHIPS										
5.1	Project Planning, Monitoring & Control										
5.1.1	Preparation of Detailed Project Report (DPR) including physical and financial methods for a cost estimate, budget, costing, legal compliances, EIA, etc.		3	2	1		1	2	Yes	Good	No
5.1.2	Tendering and Procurement	1	2	2		1		3	Yes	Good	No
5.1.3	Contract Management	1	2	2		1		3	Yes	Good	No
5.1.4	Administrative and Financial Management (Cost Recovery, Cost Efficiency)		3	2	1			3	Yes	Good	No
5.1.5	Operation, Maintenance and Monitoring		3	3				3	Yes	Good	No
5.1.6	Enforcement & Accountability		3	1	1	1		3	Yes	Poor	No
5.1.7	Project evaluation		3	3				3	Yes	Good	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
5.2	Various Models of PPP	1	2	1	1	1	1	2	Yes	Poor	No
5.3	Public Interaction and Complaint Redressal System		3	3				3	Yes	Good	No
5.4	Use of ICT, GIS, RS and Technology in management of assets and resources	2	1	2	1		1	2	No	Good	No

Table 21: Detail Training Needs of Waste Water Sector

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
1.	LEGISLATIVE AND INSTITUTIONAL FRAMEWORK										
1.1	Legislative framework										
1.1.1	Environment (Protection) Act, 1986		2	2				2	Yes	Good	No
1.1.2	Water (Prevention and Control of Pollution) Act, 1974		2	2				2	Yes	Good	No
1.1.3	National Environmental Policy, 2006		2	1	1			2	Yes	Good	No
1.1.4	National Urban Sanitation Policy, 2008		2	1		1	1	1	Yes	Good	Yes
1.1.5	Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013		2	2				2	Yes	Good	No
1.1.6	Framework for municipal functions (Municipal act, Service rules, Building bye-laws, Municipal Bye-laws, etc.)		2	2				2	Yes	Good	No
1.1.7	CPCB/SPCB Guidelines		2	2				2	Yes	Good	No
1.1.8	NGT Rules		2	2				2	Yes	Good	No
1.1.9	State Urban Sanitation Policy and State Urban Sanitation Strategy		2	1		1	1	1	Yes	Good	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
1.2	**Institutional Framework**										
1.2.1	Organization structure, Roles and Responsibilities of Government departments		2	1		1	1	1	Yes	Good	Yes
1.2.2	Roles and Responsibilities of other relevant stakeholders like SPCBs, NGOs, RWAs		2	1	1		1	1	Yes	Good	Yes
1.2.3	Inter-Institutional Coordination mechanism, reporting		2	1	1		1	1	Yes	Good	Yes
1.2.4	National Rating Scheme for Sanitation (Swachh Survekshan) and Other protocols (ODF, ODF+, ODF++, Water+, etc.)	1	1	1		1		2	Yes	Good	No
1.3	**Provisions and Elements of Water Management in Missions and Scheme**										
1.3.1	Swachh Bharat Mission, 2014		2	1	1			2	Yes	Good	No
1.3.2	Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015		2	1	1			2	Yes	Good	No
1.3.3	Smart Cities Mission, 2015		2	1	1		1	1	Yes	Good	Yes
1.3.4	14th and 15th Finance Commission		2	1	1			2	Yes	Good	No
1.3.5	NULM and NUHM		2	1	1			2	Yes	Good	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
2.	WASTEWATER MANAGEMENT										
2.1	Need for wastewater management		2	2			1	1	Yes	Good	Yes
2.2	Wastewater Generation										
2.2.1	Sources of wastewater generation		2	1	1		1	1	Yes	Good	Yes
2.2.2	Available options for the conveyance of wastewater (types, features, limitations, selection criteria, etc.)		2	1	1		1	1	Yes	Good	Yes
2.2.3	Technical and Engineering aspects of types of conveyance systems (Infrastructure, capacity, Capex/Opex, O&M, etc.)		2	1	1		1	1	Yes	Good	Yes
2.3	Waste Water Treatment										
2.3.1	Types (Off-site sanitation system, Decentralized Wastewater Treatment (DEWATS), On-site sanitation system, etc.)		2	1	1		1	1	Yes	Good	Yes
2.3.2	Available Technologies (types, features, treatment efficiency, limitations, selection criteria, etc.)		2	1	1		1	1	Yes	Good	Yes
2.3.3	Technical and Engineering aspects of available technologies (Infrastructure, capacity, Capex/Opex, O&M, etc.)		2	1	1		1	1	Yes	Good	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
2.4	**Wastewater Disposal/Reuse**										
2.4.1	Awareness of associated health risks due to improper disposal		2	2				2	Yes	Good	No
2.4.2	Current practices of Wastewater reuse		2	2				2	Yes	Good	No
2.4.3	Grievance Redressal System		2	2				2	Yes	Good	No
3.	FAECAL SLUDGE AND SEPTAGE MANAGEMENT										
3.1	**Faecal Sludge and Septage Management**										
3.1.1	Need for FSSM		2	2				2	Yes	Good	No
3.1.2	Design and Construction Guidelines for various types of containment systems and desludging frequency		2	2				2	Yes	Good	No
3.1.3	Available Technologies for desludging of Septic Tanks (available equipment, advantages and limitations, selection criteria, capacity, efficiency, Capex/Opex etc.)		2	2				2	Yes	Good	No
3.1.4	Available options for transporting the faecal sludge and septage (Features, limitations, capacity, selection criteria, Capex/Opex, etc.)		2	2				2	Yes	Good	No
3.1.5	Available Treatment Technologies (technologies, selection criteria, treatment efficiency, land and infrastructure requirement, Capex/Opex, etc.)		2	1	1		1	1	Yes	Good	Yes
3.1.6	Available Options for Disposal/Reuse		2	1	1		1	1	Yes	Good	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
3.2	**Occupational Hazards and Safety in handling Faecal Sludge**										
3.2.1	Awareness of associated risks to health		2	1	1		1	1	Yes	Good	Yes
3.2.2	Mitigating measures (PPE, Training on the use of tools/equipment, Training on standard operating procedures, etc.)		2	1	1		1	1	Yes	Good	Yes
3.3	**Operation, Maintenance & Monitoring of Faecal Sludge Treatment Plants**										
3.3.1	Operation procedures		2	1		1	1	1	Yes	Good	Yes
3.3.2	Technical and Engineering		2	1		1	1	1	Yes	Good	Yes
3.3.3	Asset Management		2	1		1	1	1	Yes	Good	Yes
3.3.4	Administrative/Financial Management		2	1		1	1	1	Yes	Good	Yes
3.3.5	Monitoring and Record-keeping		2	1		1	1	1	Yes	Good	Yes
3.3.6	Managing volumes & schedules of FS collection		2	1		1	1	1	Yes	Good	Yes
3.3.7	Utilizing available local resources		2	1		1	1	1	Yes	Good	Yes
3.3.8	Storage & sale of end products		2	1		1	1	1	Yes	Good	Yes
3.4	**Grievance Redressal System**		2	2				2	Yes	Good	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
4.	FINANCIAL MANAGEMENT										
4.1	Sources to access funds (details of grants or loans at central, state and local level, details of external funding agencies, institutions, the borrowing capacity of ULBs etc.)	1	1	1		1		2	Yes	Good	No
4.2	Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, punitive measures, etc.)	1	1	1		1		2	Yes	Good	No
4.3	Resource Mobilization	1	1	1		1		2	Yes	Good	No
4.4	Various Business Models	1	1	1		1		2	Yes	Good	No
4.5	Cost Recovery, Cost Efficiency & Financial Management	1	1	1		1		2	Yes	Good	No
5.	COMMUNITY ENGAGEMENT										
5.1	Need for Community Engagement, Water Use Efficiency		2	2				2	Yes	Good	No
5.2	Various Community Engagement Models and Structures		2	2				2	Yes	Good	No
5.3	Information, Education & Communication (IEC)		2	2				2	Yes	Good	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
6.	PROJECT MANAGEMENT AND PRIVATE PARTNERSHIPS										
6.1.1	Project Planning, Monitoring & Control										
6.1.2	Preparation of Detailed Project Report (DPR) including		2	2				2	Yes	Good	No
6.1.3	Tendering and Procurement		2	2				2	Yes	Good	No
6.1.4	Contract Management		2	2				2	Yes	Good	No
6.1.5	Administrative and Financial Management (Cost Recovery, Cost Efficiency)		2	2				2	Yes	Good	No
6.1.6	Operation, Maintenance and Monitoring		2	2				2	Yes	Good	No
6.1.7	Enforcement & Accountability		2	2				2	Yes	Good	No
6.1	Project evaluation		2	2			1	1	Yes	Good	Yes
6.2	Various Models of PPP	1	1	1		1	1	1	Yes	Good	Yes
6.3	Public Interaction and Complaint Redressal System		2	2				2	Yes	Good	No
6.3	Use of ICT, GIS, RS and Technology in management of assets and resources	1	1	2				2	Yes	Good	No

Table 22: Detail Training Needs of Solid Waste Management Sector

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
1.	LEGISLATIVE AND INSTITUTIONAL FRAMEWORK										
1.1	Legislative framework										
1.1.1	National Urban Sanitation Policy, 2008	2	1		2	1	3		No	Fair	Yes
1.1.2	Solid Waste Management rules		3	1	2		2	1	Yes	Fair	Yes
1.1.3	Plastic Waste Management rules		3		2	1	2	1	Yes	Fair	Yes
1.1.4	Construction & Demolition Waste Management rules		3		2	1	2	1	Yes	Fair	Yes
1.1.5	E-Waste Management rules	1	2		2	1	2	1	Yes	Fair	Yes
1.1.6	Biomedical waste Management rules (relevant parts)	2	1		2	1	2	1	No	Fair	Yes
1.1.7	Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013		3		2	1	2	1	Yes	Fair	Yes
1.1.8	Emergency Response Sanitation unit		3		2	1	3		Yes	Fair	Yes
1.1.9	National Safai Karamcharis Finance & Development Corporation (NSKFDC)	1	2		1	2	2	1	Yes	Poor	Yes
1.1.10	National Rating Scheme for Sanitation (Swachh Survekshan, ODF++, Water Plus)		3	2	1		2	1	Yes	Good	Yes
1.1.11	State SWM Policy and Strategy		3	2	1		2	1	Yes	Good	Yes
1.1.12	SWM Bye-Laws		3	1	2		3		Yes	Fair	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
1.2	**Institutional Framework**										
1.2.1	Roles and Responsibilities of Government Institutions (State/City/ULB) in solid waste management ex –MOEFCC, MoHUA, SPCB's, CPCB, CPHEOO, NGT etc.	1	2	1	1	1	3		Yes	Poor	Yes
1.2.2	Institutional Framework (State level/City Level/ULBs)		3		3		2	1	Yes	Fair	Yes
1.3	**Provisions for SWM in Missions And Schemes**										
1.3.1	Swachh Bharat Mission, 2014		3	3			2	1	Yes	Good	Yes
1.3.2	Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015	2	1		1	2	2	1	No	Poor	Yes
1.3.3	Smart Cities Mission, 2015	3				3	2	1	No	Poor	Yes
1.3.4	National Urban Livelihood Mission	2	1		1	2	2	1	No	Poor	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
2.	SOLID WASTE VALUE CHAIN MANAGEMENT										
2.1	Waste Segregation and Collection										
2.1.1	Types of Waste streams (characteristics, features, etc.)		3	3			1	2	Yes	Good	No
2.1.2	Transportation of waste -Technical and Engineering aspects, transfer stations	1	2	2	1		1	2	Yes	Good	No
2.1.3	Available Technologies (technologies, selection criteria, treatment efficiency, land and infrastructure requirement, Capex/Opex, etc.)		3	2	1		3		Yes	Good	Yes
2.1.4	Mainstreaming of waste pickers in waste management (Human resource management)		3	3			2	1	Yes	Good	Yes
2.1.5	Use of ICT in Collection and Transportation		3	3			2	1	Yes	Good	Yes
2.2	Wet waste management Technology and approaches										
2.2.1	Composting techniques		3	1	2		2	1	Yes	Fair	Yes
2.2.2	Biomethanation	2	1	1	1	1	2	1	No	Poor	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
2.3	**Dry waste management approaches and technology**										
2.3.1	Material recovery facility	1	2	2	1		2	1	Yes	Good	Yes
2.3.2	Types (Advantages & Disadvantages, Treatment efficiency, land requirement, selection criteria, etc.), Technical and Engineering aspects and Capex, Opex and Revenue aspects	2	1	1	2		1	2	No	Fair	No
2.3.3	Recycling/ Reuse/Recovery technologies	1	2	1	2		2	1	Yes	Fair	Yes
2.4	**Selection of Solid waste management technologies**										
2.4.1	Available SWM technologies (Types, features, treatment efficiency, selection criteria)	1	2		3		2	1	Yes	Fair	Yes
2.4.2	Technical and engineering aspects of available technologies	2	1		2	1	1	2	No	Fair	No
2.4.3	Bulk waste generators (BWG) management	1	2	1	1	1	3		Yes	Poor	Yes
2.5	**Waste disposal – Sanitary landfill**										
2.5.1	Planning, Designing and Construction of Secured landfill (Site selection, CAPEX, OPEX)	2	1	1	1	1	1	2	No	Poor	No
2.5.2	Methods of Land Closure and Capping	2	1		2	1	1	2	No	Fair	No
2.5.3	Planning and Designing Leachate Treatment Facility	2	1		1	1	1	2	No	Poor	No

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
2.6	Occupational Health and Safety		3	1	2		2	1	Yes	Fair	Yes
3.	FINANCIAL MANAGEMENT										
3.1	Sources to access funds (details of grants or loans at central, state and local level, details of external funding agencies, institutions, the borrowing capacity of ULBs etc.	3				3		3	No	Poor	No
3.2	Various stakeholders from a financing point of view	3				3		3	No	Poor	No
3.3	Understanding types of Financial Transfers (Tariff Regulations or Local Revenue Sources, etc.)	3				3		3	No	Poor	No
3.4	Resource Mobilization	3				3		3	No	Poor	No
3.5	Various Business Models	3				3		3	No	Poor	No
3.6	Cost Recovery, Cost Efficiency & Financial Management	3				3		3	No	Poor	No
4.	COMMUNITY ENGAGEMENT										
4.1	Need for Community Engagement	1	2		2	1	3		Yes	Fair	Yes
4.2	Various Community Engagement Models and Structures	1	2		2	1	3		Yes	Fair	Yes
4.3	Information, Education & Communication (IEC)	1	2		2	1	3		Yes	Fair	Yes

Sr. No.	Parameter	Relevance		Level of understanding			Training Needed		Total		
		0 to 2	3 to 5	Good	Fair	Poor	Yes	No	Relevance	Level of Understanding	Training Required
5.	PROJECT MANAGEMENT AND PRIVATE PARTNERSHIPS										
5.1	Project Planning, Monitoring & Control										
5.1.1	Preparation of Detailed Project Report (DPR) including physical and financial methods for a cost estimate, budget, costing, legal compliances, EIA, etc.	3				3		3	No	Poor	No
5.1.2	Tendering and Procurement	3				3		3	No	Poor	No
5.1.3	Contract Management	3				3		3	No	Poor	No
5.1.4	Procuring, Installation & commissioning/ setting up SWM projects	3				3		3	No	Poor	No
5.1.5	Technical and Engineering Aspects	3				3		3	No	Poor	No
5.1.6	Administrative and Financial Management (Cost Recovery, Cost Efficiency)	3				3		3	No	Poor	No
5.1.7	Operation, Maintenance and Monitoring	3				3		3	No	Poor	No
5.1.8	Enforcement & Accountability	2	1		1	2		3	No	Poor	No
5.1.9	Project evaluation	3				3		3	No	Poor	No
5.2	Human Resource Management	2	1	1		2		3	No	Poor	No
5.3	Public Interaction and Complaint Redressal System		3	2	1		2	1	Yes	Good	Yes
5.4	Use of ICT for management		3	1	2		2	1	Yes	Fair	Yes

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