

Year: 2022-2023

# COURSE DIRECTOR REPORT

Specialized Training on Integrated Wastewater and Septage Management  
(IWSM)

(26th – 28th September, 2022)

Course Director  
MANOJ PANDE

*Supported by:*  
National Institute of Urban Affairs (NIUA)

**Organized by**  
Urban Development Cell (CGG)  
Dr. R. S. T. Uttarakhand Academy of Administration,  
Nainital, – 263 001



Sanitation service chain (source: IRC)

# **COURSE TEAM**

**Sh. B. P. Pandey, IAS**

Director General – Dr. R.S.T. UAoA & CEO–CGG

**Sh. Prakash Chandra, PCS**

*Joint Director* Dr. R.S.T. UAoA & CGG

**Sh. Manoj Pande**

Incharge, UD Cell , Dr. R.S.T. UAoA – (Course Director)

**Smt. Sweta Pandey**

Training & Account Manager, UD Cell , Dr. R.S.T. UAoA

**Smt. Asha Joshi**

Training Manager, UD Cell–CGG , Dr. R.S.T. UAoA

## **Contact Address:**

Urban Development Cell (CGG)

Dr. R. S. Tolia Uttarakhand Academy of Administration

Nainital, 263 001

Phone – 05942- 237633, 236068, 236149, 235011,

Fax : 05942-237642m 237633

E-mail : [urbandevp.uaoa@gmail.com](mailto:urbandevp.uaoa@gmail.com),

Website : [www.uaoa.gov.in](http://www.uaoa.gov.in)

# **NIUA COURSE TEAM**

**Sh. Hitesh Vaidya**

Director, NIUA, New Delhi

**Dr. Mahreen Matto**

Team Leader

National Institute of Urban Affairs

**Sh. Doab Singh**

Programme Officer

National Institute of Urban Affairs

## **Ecosan Services Foundation , Pune TEAM**

**Sh. Dhawal Patil**

Faculty, Ecosan Services Foundation

**Ms. Radhika Boargaonkar**

Faculty, Ecosan Services Foundation

**Sh. Shivkumar Mulay**

Faculty, Ecosan Services Foundation

# Specialized Training on Integrated Wastewater and Septage Management

Date: 26th to 28th September, 2022

## TRAINING PROGRAMME REPORT

## **TITLE**

Specialized Training on Integrated Wastewater and Septage Management (IWSM)

## **PUBLISHER**

Urban Development Cell (CGG) Dr. R.S. Tolia UAoA, Nainital

## **RESEARCH PROJECT**

Sanitation Capacity Building Platform

## **GRAPHIC DESIGN**

Asha Joshi

## **ACKNOWLEDGEMENT**

We are thankful to NIUA for sponsoring the programme.

Ecosan Services Foundation and Department of ULBs/ Uttarakhand Jal Sansthan, Uttarakhand \ Peyjal Nigam.

## **CONTACT**

Urban Development Cell

Centre for Good Governance (CGG)

Dr. R. S. Tolia Uttarakhand Academy of Administration, Nainital

Phone – 05942-237633

E-mail – [urbandevp.uaoa@gmail.com](mailto:urbandevp.uaoa@gmail.com)



# **SPECIALIZED TRAINING ON INTEGRATED WASTEWATER AND SEPTAGE MANAGEMENT (IWSM)**



**26<sup>th</sup> to 28<sup>th</sup> September, 2022**



# CONTENTS

**INTRODUCTION.....**

**AGENDA.....**

**SESSIONS.....**

**Day 1, 26<sup>th</sup> September, 2022.....**

**Session 1:** Introduction to Urban Sanitation and Policies and Programmes

**Session 2:** Approaches and Methodology of Planning

**Session 3:** State Level Approaches for FSSM Planning

**Session 4:** Exercise: State Level FSSM Planning

**Session 5:** Liquid Waste Management

**Day 2, 27<sup>th</sup> September, 2022.....**

**Session 6:** Stakeholders Engagement – Tools and Programs

**Session 7:** Exercise: Sanitation in Informal Settlements

**Session 8:** Exercise: Public Sanitation

**Session 9:** FSSM: An Overview of Key Concepts

**Session 10:** Exercise: FSSM Planning

**Session 11:** Wastewater Treatment Technologies

**Day 3, 28<sup>th</sup> September, 2022.....**

**Session 12:** Financial Aspects of FSSM

**Session 13:** O&M Aspects of FSSM

**Session 14:** Exercise: O&M Cost of FSSM

**FEEDBACK.....**

Learning Outcomes

Training Content and Training Methods

Online Training Program Management

**LEARNING AND WAY FORWARD.....**

Agenda and Schedule, Content, Exercise, Resources, Assessment, Platform

**ANNEXURES.....**

Annexure 1: List of Resource Persons

Annexure 2: List of Participants

Annexure 3: Detailed Session wise Agenda

Annexure 4: Feedback Format

Annexure 5: Attendance Sheet

## Abbreviations

<b>AMRUT</b>	Atal Mission for Rejuvenation and Urban Transformation
<b>BIS</b>	Bureau of Indian Standards
<b>CEPT</b>	Center for Environmental Planning & Technology
<b>CSP</b>	City Sanitation Plan
<b>CW</b>	Constructed Wetlands
<b>DPR</b>	Detailed Project Report
<b>DTS</b>	Decentralised Treatment System
<b>ESF</b>	Ecosan Services Foundation
<b>FS</b>	Faecal Sludge
<b>FSSM</b>	Faecal Sludge and Serptage Management
<b>FSTP</b>	Faecal Sludge Treatment Plant
<b>GOI</b>	Government of India
<b>GOM</b>	Government of Maharashtra
<b>IHHL</b>	Individual Household Latrine
<b>IHS</b>	Indian Institute of Human Settlement
<b>NIUA</b>	National Institute of Urban Affairs
<b>O&amp;M</b>	Operation & Maintenance
<b>OWSSB</b>	Odisha Water Supply & Sewerage Board
<b>PBMC</b>	Port Blair Municipal Croporation
<b>PBC</b>	Pollution Control Board
<b>PMC</b>	Pune Municipal Corporation
<b>RAS</b>	Rapid Assessment Survey
<b>SCBP</b>	Sanitation Capacity Building Program
<b>STP</b>	Septage Treatment Plant
<b>SHG</b>	Self-help Group
<b>SOP</b>	Standard Operating Procedure
<b>STP</b>	Sewage Treatment Plant
<b>SWM</b>	Solid Waste Management
<b>ULB</b>	Urban Local Body



## AGENDA

Following is the day wise agenda of the training. A detailed session wise agenda is available in the annexure.

**Table 1: Agenda of the Training of Trainers**

<b>DAY-1 (26<sup>th</sup> September, 2022)</b>		
<b>Time</b>	<b>Topic/Content</b>	<b>Resource Person</b>
<b>10:00 to 10:30 Hrs</b>	Registration	<b>Course Team</b>
<b>10:30 to 11:00 Hrs</b>	Inauguration, Setting ground rules, Understanding Expectation, Aims and Objectives of the training	<b>Director General, DRSTUAOA, NIUA, ESF</b>
<b>1100 to 12:00 Hrs</b>	Introduction to Urban Sanitation and Policies and Programmes	<b>Dhawal Patil</b>
<b>12:00 to 12:15 Hrs</b>	<b>TEA /COFFEE BREAK</b>	
<b>12:15 to 13:15 Hrs</b>	Approaches and Methodology of Planning	<b>Radhika Boargaonkar</b>
<b>13:15 to 14:15 Hrs</b>	<b>LUNCH BREAK</b>	
<b>14:15 to 15:15 Hrs</b>	State Level Approaches for FSSM Planning	<b>Shivkumar Mulay</b>
<b>15:15 to 15:45 Hrs</b>	Exercise: State Level FSSM Planning	<b>Dhawal Patil, Shivkumar Mulay &amp; Radhika Boargaonkar</b>
<b>15:45 to 16:00 Hrs</b>	<b>TEA /COFFEE BREAK</b>	
<b>16:00 to 16:45 Hrs</b>	Liquid Waste Management	<b>Dhawal Patil</b>
<b>16:45 to 17:00 Hrs</b>	Wrap up	
<b>DAY-2 (27<sup>th</sup> September, 2022)</b>		
<b>09:30 to 10:00 Hrs</b>	Recap Feedback	<b>NIUA</b>
<b>10:00 to 11:00 Hrs</b>	Stakeholders Engagement – Tools and Programs	<b>Dhawal Patil</b>
<b>11:00 to 12:00 Hrs</b>	Exercise: Sanitation in Informal Settlements	<b>Radhika Boargaonkar</b>
<b>12:00 to 12:15 Hrs</b>	<b>TEA /COFFEE BREAK</b>	
<b>12:15 to 13:00 Hrs</b>	Exercise: Public Sanitation	<b>Dhawal Patil, Shivkumar Mulay &amp; Radhika Boargaonkar</b>
<b>13:00 to 14:00 Hrs</b>	<b>LUNCH BREAK</b>	
<b>14:00 to 15:00 Hrs</b>	FSSM: An Overview of Key Concepts	<b>Dhawal Patil</b>
<b>15:00 to 15:45 Hrs</b>	Exercise: FSSM Planning	<b>Dhawal Patil</b>
<b>15:45 to 16:00 Hrs</b>	<b>TEA /COFFEE BREAK</b>	
<b>16:00 to 16:45 Hrs</b>	Wastewater Treatment Technologies	<b>Dhawal Patil, Shivkumar Mulay &amp; Radhika Boargaonkar</b>
<b>16:45 to 17:00 Hrs</b>	Wrap up	
<b>DAY-3 (28<sup>th</sup> September, 2022)</b>		
<b>09:30 to 10:00 Hrs</b>	Recap Feedback	<b>NIUA</b>
<b>10:00 to 11:00 Hrs</b>	Financial Aspects of FSSM	<b>Shivkumar Mulay</b>
<b>11:00 to 12:00 Hrs</b>	O&M Aspects of FSSM	<b>Radhika Boargaonkar</b>
<b>12:00 to 12:15 Hrs</b>	<b>TEA /COFFEE BREAK</b>	
<b>12:15 to 12:45 Hrs</b>	Exercise: O&M Cost of FSSM	<b>Dhawal Patil</b>
<b>12:45 to 13:00 Hrs</b>	Feedback and Wrap up	<b>DRSTUAOA, NIUA, ESF</b>

# SESSIONS

## Day-1, 26<sup>th</sup> September, 2022

A Face to Face “Specialized Training on Integrated Wastewater and Septage Management (IWSM)” was organized by Urban Development Cell, CGG, Dr. R. S. Tolia Uttarakhand Academy of Administration between 26<sup>th</sup> to 28<sup>th</sup> September, 2022. The programme was sponsored by National Institute of Urban Affairs with Technical Inputs from the team of NIUA and ESF. The participants of the programme were engineers, Sanitary Inspector from, Urban Development, Pey Jal Nigam and Jal Sansthan from of Uttarakhand.



Welcome address and Introduction: The training commenced with the welcome address by Mr.



B.P. Pandey, Director General, ATI Nainital. Course information and objective was set by Mr. Manoj Pande, Course Director. Mr. Doab Singh, Program officer, NIUA gave the formal introduction of the Sanitation Capacity Building Platform (SCBP). He elaborated on the objectives of the platform and the different types of training and faculty development

program conducted through the platform. Mr. Dhawal Patil, Lead Trainer, then introduced Ecosan Services Foundation (ESF). After that, he introduced the course outline, structure and objectives of the advanced training program on Integrated Wastewater and Septage Management (IWSM) under the Sanitation Capacity Building Platform (SCBP).



### **Session 2: Introduction to Urban Sanitation and Policies and Programmes** **Objective of the session was**

- To understand urbanization and its associated challenges in India
- To analyse the national urban sanitation policy framework
- To know the funding opportunities in FSSM

### **The points discussed in the session was**

- Urban Sanitation – National trend
- Issues and Challenges Urban Sanitation Sector in India
- Urban Sanitation Policy and Programs in India
- Funding opportunities for FSSM

### **Key facts discussed were**

- By 2030 an approximate of 60% of the world's population will be residing in the urban centres of the developing countries.
- Increasing urban population puts the national governments and ULBs under tremendous pressure.
- Cities are unable to plan and implement the sanitation infrastructure at the rate with which population is increasing.

- Funding for different functional group in sanitation service chain can be provided through national programmes like Swachh Bharat Mission (Urban) 2.0, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) mission, Jal Jeevan Mission (Urban).

This session acted as an introduction for understanding the Urban Sanitation and Policies and Programmes along with the different challenges which India face in sanitation sector. It gives information's on Urban Sanitation Policy and Programs in India under government authorities and various funding options for FSSM planning and implementation.

Summary of the session was

- By 2030 an approximate of 60% of the world population will be residing in the urban centres of the developing countries.
- Increasing urban population puts the national governments and ULBs under tremendous pressure.
- Cities are unable to plan and implement the sanitation infrastructure at the rate with which population is increasing.
- Funding for different functional group in sanitation service chain can be provided through national programmes like Swachh Bharat Mission (Urban) 2.0, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) mission 2.0

### **Session 3: Approaches and Methodology of Planning**

#### **Objective of the session was**

- Gain knowledge about the various approaches and tools used in faecal sludge management planning.
- Understand the importance of integrated planning for faecal sludge management.
- Understand what is included in the planning process for faecal sludge management.

#### **The points discussed in the session was**

- Approaches of Planning
- Tools for Planning
- Stages of Planning

#### **Key facts discussed were**

- Out of the many planning approaches, CSP and CWIS based approach is very comprehensive.
- CSP considers all the environmental services (utilities) and their interdependency.
- CWIS promotes social and economic equitable planning including centralized and decentralized approach.
- SFD is a good tool for communicating the need to planning in a project and brings the stakeholder together.
- Stages in planning with pilot projects helps to mitigate the risk of failure of infrastructure project.

This session talked about the approach, tools and stages of FSSM planning and its implementation using various tools and concepts to achieve sustainable FSSM model with safe solution.

Summary of the session was

- Out of the many planning approaches, CSP and CWIS based approach is very comprehensive.
- CSP considers all the environmental services (utilities) and their interdependence.
- CWIS promotes social and economic equitable planning including centralized and decentralized approach.
- SFD is a good tool for communicating the need to planning in a project and brings the stakeholder together.
- Stages in planning with pilot projects helps to mitigate the risk of failure of infrastructure project.

#### **Session 4: State Level Approaches for FSSM planning**

##### **Objective of the session was**

- To understand the approaches for state-wide scale-up for FSSM
- To understand the steps involved in implementation of FSSM across all ULBs

The points discussed in the session was

- State level implementation of planning approaches for FSSM
- Case studies

Key facts discussed were

- Each state needs to identify its strengths, weakness, opportunities, and threats while preparing a state investment plan to scale FSSM.
- The plan shall focus on utilizing the existing infrastructure as much as possible before deploying new infrastructure.
- For smaller ULBs, a safe disposal mechanism is a good sustainable option as O&M of collection, conveyance, and treatment facilities might not be affordable.
- Regional climatic conditions and understanding of demand and supply of the sanitation services should determine the capacity and technology in FSSM.

This session showcased details about state level implementation of planning approaches for FSSM. The stages to develop state investment plan for FSSM design and implementation. This session helped participants to understand the deferent strategy adopted by different states for developing and implementing FSSM strategy in the states.

Summary of the session was

- Each state needs to identify its strengths, weakness, opportunities and threats while preparing a state investment plan for scaling of FSSM.
- The plan shall focus on utilizing the existing infrastructure as much as possible before deploying new infrastructure.

- For smaller ULBs, safe disposal mechanism is a good sustainable option as O&M of collection, conveyance and treatment facility might not be affordable.
- Regional climatic conditions and understanding of demand and supply of the sanitation services should determine the capacity and technology in FSSM.

### **Exercise 1: Introduction to City Profile & Decentralised Wastewater Management**

#### **Session 5: Liquid Waste Management**

#### **Objective of the session was**

- To understand different levels of liquid waste management with respect to changing urban settings.
- To look in detail into different aspects of centralized and decentralized liquid waste management
- To understand tools and different aspects of planning of liquid waste management

#### **The points discussed in the session was**

- Levels of Wastewater Management
- Centralized Wastewater Management
- Decentralized Wastewater Management
- Planning of Sanitation Systems

#### **Key facts discussed were**

- Liquid waste management is crucial for maintaining environmental health.
- Different levels of management fit appropriately in different urban and rural scenarios.
- Planning of sanitation systems need to take into consideration affordability and long-term sustainability of infrastructure.
- Centralized and decentralized management compliments and provides maximum sanitation coverage.

The session acted as a stepping stone for the participants to understand various terminologies and apply the sanitation system approach to understand the current situation in the city and the identify the gaps.

#### **Summary of the session was**

- Liquid waste management in crucial for maintaining environmental health.
- Different levels of management fit appropriately in different urban and rural scenarios.
- Planning of sanitation systems needs to take into considerations affordability and long-term sustainability of infrastructure.
- Centralized and Decentralized management compliments and provides maximum sanitation coverage.

### **Day-2, 27<sup>th</sup> September, 2022**

Mr. Doab Singh and Ms. Jheelam Sarkar began the day by giving recap of previous day to the participants.

## **Session 6: FSSM: An Overview of Key Concepts**

### **Objective of the session was**

- Know the difference between wastewater, faecal sludge, and septage
- Understand types of sanitation system, components of a sanitation system, and faecal sludge and septage management (FSSM) value chain
- Learn the different methods of quantifying faecal sludge and septage (FSS) and types of desludging at a city level
- Gain knowledge about technical specifications to be followed in FSSM along the service chain

### **The points discussed in the session was**

- Difference between waste products
- Sanitation systems
- FSSM value chain
- Quantification of FSS
- Demand and scheduled desludging
- Technical specifications for quality assurance in FSSM

### **Key facts discussed were**

- Fecal sludge, septage and sewage are similar but not the same!
- Understanding ground challenges is key to planning FSSM
- Methods and challenges of quantification of Fecal sludge and septage
- Pros and cons of demand and scheduled desludging
- Maintain quality assurance to improve the sanitation service delivery

This session introduced participants to types of waste products in sanitation with different types of sanitation systems. The session provided insights into FSSM as a subject and further gives the background of the first stage of planning i.e., quantification of FSS. Different types of desludging and technical specifications with standards going to introduce to participants.

### **Summary of the session was**

- Faecal sludge, septage and sewage are similar but not same!
- Understanding ground challenges is key to planning FSSM
- Methods and challenges of quantification of faecal sludge and septage
- Pros and cons of demand and scheduled desludging
- Maintain quality assurance to improve the sanitation service delivery



## **Session 7: Stakeholders Engagement – Tools and Programs**

### **Objective of the session was**



- To understand the process of identification and characterisation of stakeholders
- To learn about stakeholder engagement and different tools involved in it
- To understand the IEC and BCC activities focussing FSSM planning

**The points discussed in the session was**

- Stakeholder Analysis-
  - Identification of stakeholders
  - Characterisation of stakeholders
  - Influence and interest
- Stakeholders' engagement-
  - Participation levels
  - Involvement tools
  - Milestones and cross-cutting tasks
  - Distributing and formalising roles and responsibilities.

**Key facts discussed were**

- Stakeholder analysis is a vital tool for understanding social and institutional context of a project
- Identification and characterisation of stakeholder's essential information about who will be affected by and will influence the project
- Stakeholder engagement ensures mitigation of future risks
- Stakeholder engagement plays a vital role in sustainability of the project

The main aim of the session was to highlight the importance of stakeholder management in FSSM to optimize the sanitation service chain and contribute to sustainability of the project.

Summary of the session was

- Stakeholder analysis is a vital tool for understanding social and institutional context of a project
- Identification and characterisation of stakeholder's essential information about who will be affected by and will influence the project
- Stakeholder engagement ensures mitigation of future risks
- Stakeholder engagement plays a vital role in sustainability of the project

Stakeholder analysis is a vital tool for understanding the social and institutional context of a project. Identification and characterisation of stakeholders provide early and essential information about who will be affected by and influence the project. Stakeholders' engagement plays a vital role in the sustainability of the project. It develops the stakeholders' skills, trust, and confidence needed to run the system.

**Exercise 2: Sanitation in Informal Settlements**

**Session 8: Situation Assessment – Introduction to Feasibility Assessment**

**Objective of the session was**

- Understand the importance of conducting an assessment of initial situation for planning of an FSSM project
- To know the different tools and methods for collecting relevant data and learn how to perform an initial situation assessment

**The points discussed in the session was**

- Sanitation situation assessment of Dehradun
- On-site sanitation and faecal sludge and septage management Kargi was discussed as case study.

This session gave a brief about the various methods to find out the design flow of sewage and sewage generation of the city. It also gives a brief idea about interception and diversion projects with its different components and design aspects of important components of sewer network. Case study of Dehradun and Kargi was explained in brief.



**Session 9: Wastewater Treatment Technologies**

**Objective of the session was**

- To understand the objectives and mechanisms of wastewater treatment
- To understand the different treatment stages in a wastewater treatment system
- To understand the technical aspects of non-mechanised and mechanised treatment technologies
- To understand the different sludge management units required to cater the solid stream in the wastewater treatment plant.

**The points discussed in the session was**

- Wastewater Treatment
  - Treatment Objectives
  - Treatment processes
  - Treatment stages
- Wastewater Treatment Technologies
  - Treatment Chain
  - Non mechanized treatment units
  - Mechanized treatment units
- Selection of Treatment Technology
- Sewage Sludge Management
- The objectives of wastewater treatment should be clear before considering different options for treatment.
- Wastewater treatment technologies consist of different components. In case of FSTP, design of secondary treatment units needs to be individually tweaked for liquid effluent treatment.

- Nitrification, denitrification, and aerobic treatment is needed in order to achieve high standards of treatment.

The aim of the session was to introduce to the participants different treatment principles and the preliminary and primary treatment units involved in wastewater treatment. While delivering the session, use of diagram and videos is recommended to show the working of these treatment units.

Summary of the session was

- Objectives of wastewater treatment should be clearly understood before considering different options for treatment
- Non-mechanised and mechanised options are possible with respect to feasibility of the wastewater treatment system
- Capital cost of the project should not be the driving principle for selection of wastewater treatment technology
- Appropriate sewage sludge management is necessary for further reduction of pollution load in the environment



### Exercise 3: Public Sanitation & FSSM Planning

#### Valediction.

The valedictory session was chaired by the Course Director Sh. Manoj Pande who gave a brief of the overall programme and introduced the resource persons and the faculty from the NIUA to the chair. The course director requested the participants to provide their views and feedback on the programme. All the participants who evinced their views were satisfied with the structure and contents of the programme. The programme ended with a vote of thanks by the Course Director Academy.



FEEDBACK

## Participants Profile

### Gender

Gender	Male	Female
Number	16	02
Percentage (%)	89.00%	11.00%

### Age

Age	20-30	31-40	41-50	51-60
Number	02	06	05	5
Percentage (%)	11.00%	33.00%	27.7%	27.7%

### Job Related Information

Job Related Experience	Below 5	5-10	10-20	20-30	30 & above
Number	08	03	04	02	01
Percentage (%)	44.4%	16.6%	22.00%	11.05%	5.5%

### Organisation

Department	Pey Jal Nigam	Jal Sansthan	ULBs
Number	02	08	08
Percentage (%)	11.05%	44.4%	44.4%

### Post/Level

Post	AAE	AE	PE	JE	SE	Clerk
Number	03	01	02	06	03	03
Percentage (%)	16.06%	5.5%	11.05%	33.00%	16.06%	16.06%

### Districts

District	Nainital	Tehri Garhwal	Champawat	Dehradun	Pauri Garhwal	Udham Singh Nagar	Chamoli	Uttarkashi
Number	04	01	01	06	01	03	01	01
Percentage (%)	22.00%	5.5%	5.5%	33.00%	5.5%	16.6%	5.5%	5.5%

## Feedback

At the end of the training programme the participants were requested to provide their feedback both verbally as well in pre- designed forms. While providing their opinion regarding the programme during the valedictory session most of the participants were satisfied with the course content, the structure of the programme, the facilities provide at the academy and the sessions taken by the resource persons.

The feedback forms submitted by the participants were also compiled and analysed, the findings of which are as under.

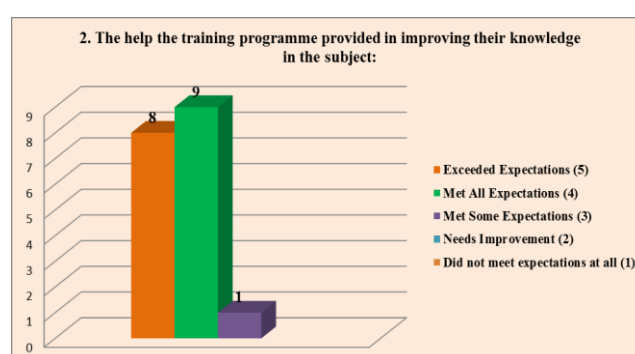
## Training Management

1. Level of organisation of training programme with respect to the objectives laid down:		
Rating	Exceeded Expectations (5)	9
	Met All Expectations (4)	9
	Met Some Expectations (3)	
	Needs Improvement (2)	
	Did not meet expectations at all (1)	



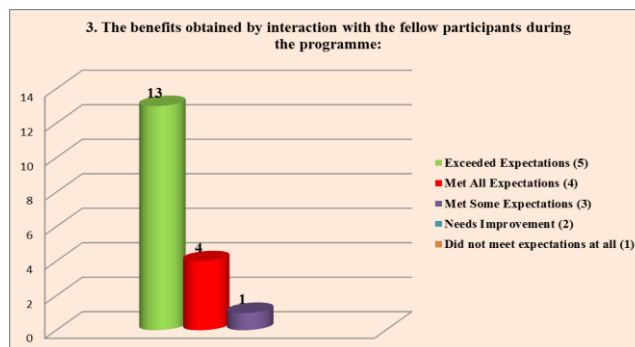
More than 50.00% (9 out of 18) of the participants found the programme to have Exceeded Expectations while 50.00% (09out of 18) found it to have met All Expectations.

2. The help the training programme provided in improving their knowledge in the subject:		
Ratting	Exceeded Expectations (5)	8
	Met All Expectations (4)	9
	Met Some Expectations (3)	1
	Needs Improvement (2)	
	Did not meet expectations at all (1)	



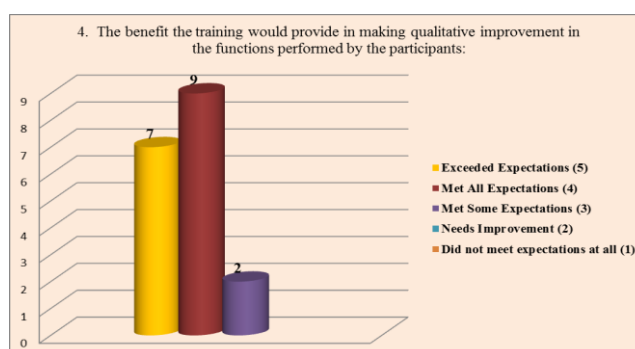
44.5% (8 out of 18) found that the programme Exceeded Expectations. while 50 % (9 out of 18 met All Expectations and 5.5% (1 out of 18 met Some Expectations.

3. The benefits obtained by interaction with the fellow participants during the programme:		
<b>Rating</b>	Exceeded Expectations (5)	<b>13</b>
	Met All Expectations (4)	<b>4</b>
	Met Some Expectations (3)	<b>1</b>
	Needs Improvement (2)	
	Did not meet expectations at all (1)	



72% (13 out of 18) found the programme Exceeded Expectations, 22.5% (4 out of 18) found the programme met All Expectations and 5.5% (01 out of 18) found it to have Met Some Expectations.

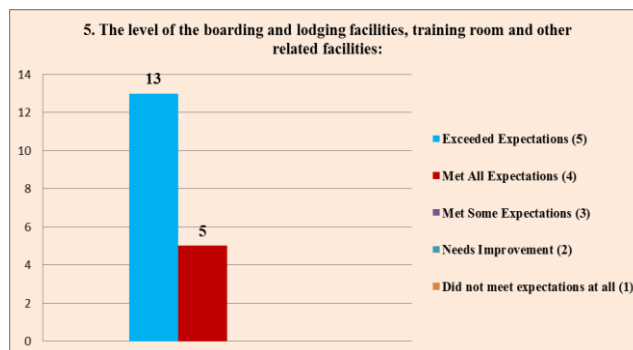
4. The benefit the training would provide in making qualitative improvement in the functions performed by the participants:		
<b>Rating</b>	Exceeded Expectations (5)	<b>7</b>
	Met All Expectations (4)	<b>9</b>
	Met Some Expectations (3)	<b>2</b>
	Needs Improvement (2)	
	Did not meet expectations at all (1)	



39% (7 out of 18) found the programme Exceeded Expectations, 50% (9 out of 18) found the programme met All Expectations and 11% (02 out of 18) found it to have met Some Expectations.

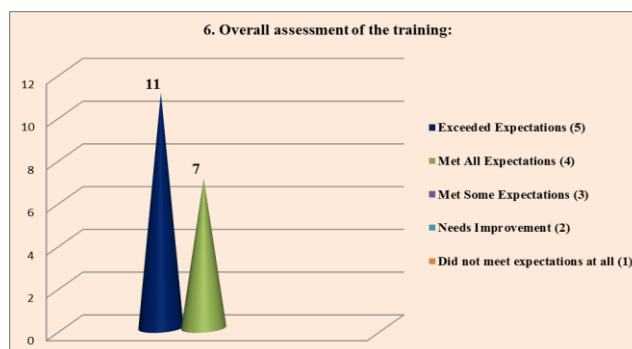


5. The level of the boarding and lodging facilities, training room and other related facilities:		
<b>Rating</b>	Exceeded Expectations (5)	<b>13</b>
	Met All Expectations (4)	<b>5</b>
	Met Some Expectations (3)	
	Needs Improvement (2)	
	Did not meet expectations at all (1)	



72% (13 out of 18) found the programme Exceeded Expectations, 28% (5 out of 18) found the programme met All Expectations.

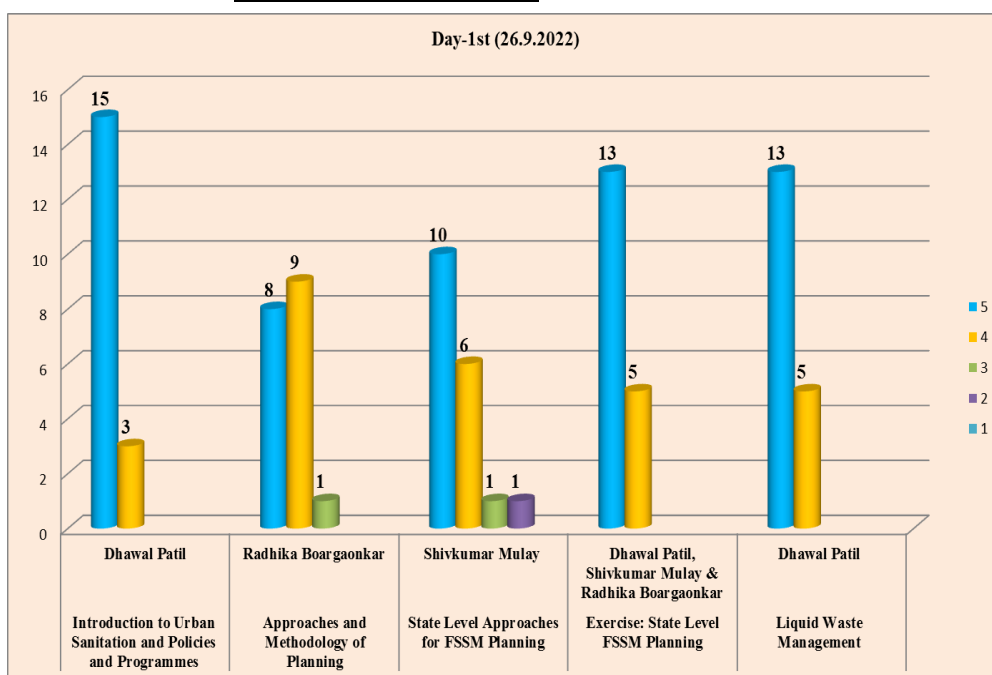
6. Overall assessment of the training:		
<b>Rating</b>	Exceeded Expectations (5)	<b>11</b>
	Met All Expectations (4)	<b>7</b>
	Met Some Expectations (3)	
	Needs Improvement (2)	
	Did not meet expectations at all (1)	



61% (11 out of 18) found the programme Exceeded Expectations, 39% (7 out of 18) found the programme met All Expectations.

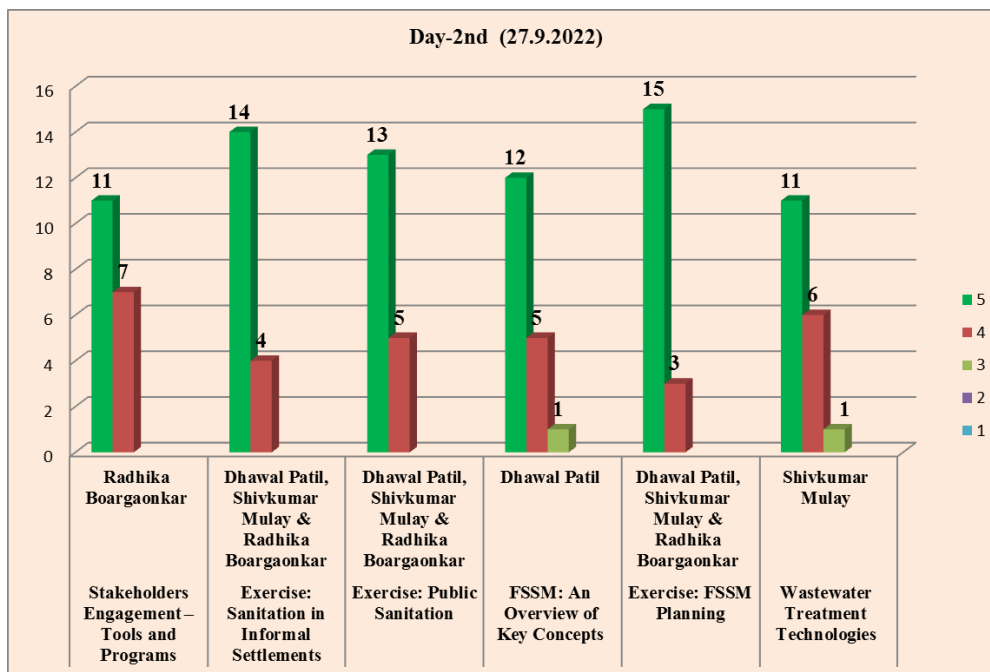
## Sessions taken by the resource persons

Day-1st (26.9.2022)						
Subject	Resource Persons	5	4	3	2	1
Introduction to Urban Sanitation and Policies and Programmes	Dhawal Patil	15	3			
Approaches and Methodology of Planning	Radhika Boargaonkar	8	9	1		
State Level Approaches for FSSM Planning	Shivkumar Mulay	10	6	1	1	
Exercise: State Level FSSM Planning	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	13	5			
Liquid Waste Management	Dhawal Patil	13	5			



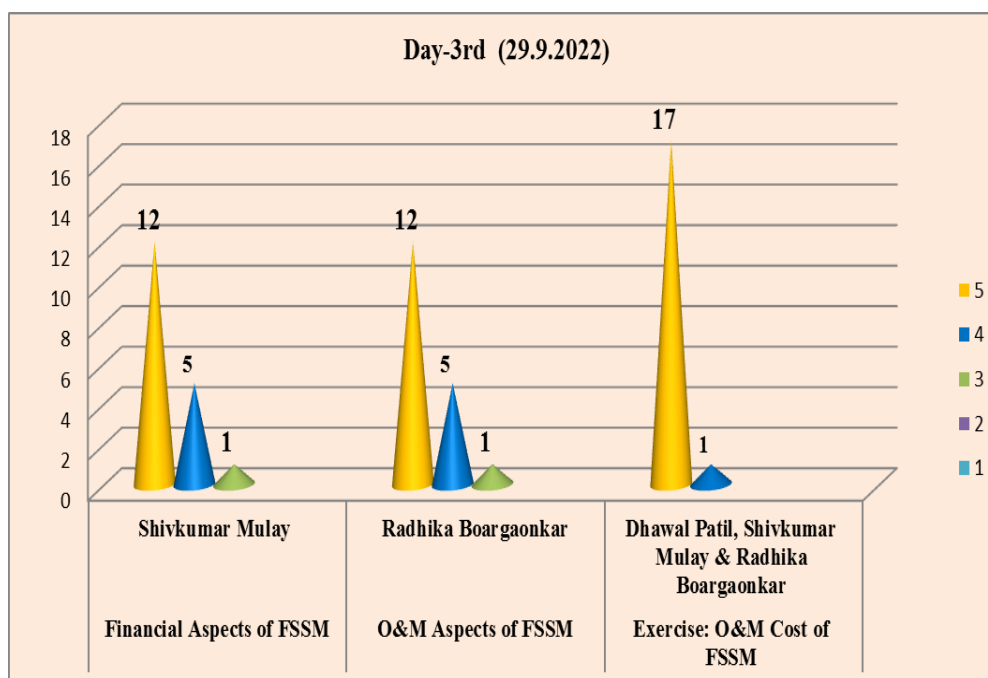
The Exceeded Expectations scores for the 05 sessions were around 66.00 % (59 out of 90×100). The Met All Expectations scores for the 05 sessions were around 31.00 % ( 28 out of 90 ×100). The Met Some Expectations scores for the 05 sessions were around 2.00 % ( 2 out of 90 ×100) and The Needs Improvement scores for the 05 sessions were around 1.00 % ( 1 out of 90 ×100).

Day-2nd (27.9.2022)						
Subject	Resource Persons	5	4	3	2	1
Stakeholders Engagement – Tools and Programs	Radhika Boargaonkar	11	7			
Exercise: Sanitation in Informal Settlements	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	14	4			
Exercise: Public Sanitation	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	13	5			
FSSM: An Overview of Key Concepts	Dhawal Patil	12	5	1		
Exercise: FSSM Planning	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	15	3			
Wastewater Treatment Technologies	Shivkumar Mulay	11	6	1		



The Exceeded Expectations scores for the 06 sessions were around 70.00 % (76 out of 108×100). The Met All Expectations scores for the 06 sessions were around 28.00% (30 out of 108 ×100). The Met Some Expectations scores for the 06 sessions were around 2.00 % ( 2 out of 108 ×100).

Day-3rd (29.9.2022)						
Subject	Resource Persons	5	4	3	2	1
Financial Aspects of FSSM	Shivkumar Mulay	12	5	1		
O&M Aspects of FSSM	Radhika Boargaonkar	12	5	1		
Exercise: O&M Cost of FSSM	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	17	1			



The Exceeded Expectations scores for the 03 sessions were around 77.00 % (41 out of 54×100). The Met All Expectations scores for the 03 sessions were around 21.00% (11 out of 54 ×100). The Met Some Expectations scores for the 03 sessions were around 2.00 % (1 out of 54 ×100).

## Testimonials by the participants

The table below presents some of the valuable comments that have been shared from the participants in their feedback forms.

S.N.	Name of the Participants	Organization	Testimonial
1.	Mr. Rahul Singh Tolia	Jal Sansthan	<ul style="list-style-type: none"> <li>Drinking Water supply management</li> <li>I will improve me in wastewater management and coordinate all other (ULB) and beneficiary household.</li> </ul>
2.	Ms. Anuradha Joshi	Jal Sansthan	<ul style="list-style-type: none"> <li>Field Visit of STPs site required.</li> <li>Planning for FSSM.</li> </ul>
3.	Mr. Trivendra Joshi	Jal Sansthan	<ul style="list-style-type: none"> <li>STP की Treatment process का Video बनाकर दिखाना चाहिए ताकि STP के विषय में विस्तृत जानकारी मिल सकें।</li> <li>अपने शहर को सुंदर एवं स्वच्छ बनाने में सहयोग करेंगे।</li> </ul>
4.	Mr. Pankaj Upadhyaya	Jal Sansthan	<ul style="list-style-type: none"> <li>अपने साथियों को प्राप्त जानकारी से अवगत कराएंगे ताकि इसका लाभ लोगों को मिले।</li> <li>नजदीक में स्थित किसी भी STP का भ्रमण कार्यक्रम होना चाहिए।</li> </ul>
5.	Mr. Yogendra Prasad	Jal Sansthan	<ul style="list-style-type: none"> <li>Video clip का उपयोग ज्यादा से ज्यादा किया जाए एवं operational or under construction STP के बारे में विस्तार से बताया जाए।</li> <li>Video clip का एवं PPTs का उपयोग ज्यादा किया जाए।</li> <li>Field visit हो सके तो बहुत अच्छा रहेगा।</li> <li>Discussion ज्यादा होना चाहिए।</li> <li>अभी मेरे अंडर में STP नहीं है लेकिन भविष्य में मेरे द्वारा FSSM एवं Stp को संचालन करने में आसानी होगी एवं ग्रामीण में भी इसके लिये जागरूक कराया जा सकता है।</li> </ul>
6.	Mr. Shishpal Singh	Jal Sansthan	<ul style="list-style-type: none"> <li>भविष्य में यदि प्रशिक्षण कार्यक्रम होता है तो फिल्ड पर कार्य करने की जानकारी होनी चाहिए।</li> <li>प्रशिक्षण कार्यक्रम को अधिक प्रभावशाली बनाने के लिये Video के माध्यम से कार्यक्रम होना चाहिये।</li> </ul>
7.	Ms. Monika Bisht	Jal Sansthan	<ul style="list-style-type: none"> <li>Some videographic presentation should be used for more information with less learning session.</li> <li>I thought some field visit should also include to get brief illustration or by modeling method.</li> <li>In our field it is used for planning &amp; O&amp;M of our STP in our city.</li> </ul>
8.	Mr. Dharmendra Prasad	Peyjal Nigam	<ul style="list-style-type: none"> <li>Wastewater disposal हेतु कार्ययोजना बनाने में।</li> </ul>
9.	Mr. Deepak Vatsa	Peyjal Nigam	<ul style="list-style-type: none"> <li>For designing STP for above 1.00 MLD.</li> </ul>
10.	Mr. Pritam Singh	ULBs	<ul style="list-style-type: none"> <li>Ground water Climate Change.</li> <li>Training is very good but at same time there should be exposure visit for practical knowledge &amp; success story.</li> </ul>
11.	Mr. Laxman Singh Bohra	ULBs	<ul style="list-style-type: none"> <li>नगरीय क्षेत्रों में पैदा हो रहे कूड़े के प्रबन्धन एवं डम्पिंग मार्ग पर एकत्रित कूड़े के वैज्ञानिक दृष्टि से निस्तारण किये जाने हेतु पालिकाओं के मेयर एवं अध्यक्षों के साथ प्रशिक्षण कार्यक्रम आयोजित होने चाहिये।</li> <li>भविष्य में पालिका के अध्यक्षों एवं अधिशासी अधिकारियों को सम्मिलित करना चाहिए।</li> <li>प्रशिक्षण में प्राप्त जानकारी सभासदों एवं अधिकारियों के साथ वार्तालाप कर उपयोग में लाया जायेगा।</li> </ul>
12.	Mr. Dheerendra Dutt	ULBs	<ul style="list-style-type: none"> <li>इस तरह के प्रशिक्षण समय-समय पर दिये जाने आवश्यक है।</li> </ul>

	<b>Semwal</b>		<ul style="list-style-type: none"> <li>जिस प्रकार से यहाँ पर कार्यक्रम पढ़ाया गया उस अनुभव को अपने कार्यालय के अन्य सफाई निरीक्षकों एवं सभी कामिकों को बताया जायेगा।</li> </ul>
<b>13.</b>	<b>Mr. Kamal Singh</b>	ULBs	<ul style="list-style-type: none"> <li>भविष्य में इस तरह के प्रशिक्षण समय-समय पर होते रहने चाहिये।</li> <li>FSTP प्लान्ट बनवाने STP Plant treatment के रिकार्ड सही तरह से रखना।</li> </ul>
<b>14.</b>	<b>Mr. Atrinarayan Tiwari</b>	ULBs	<ul style="list-style-type: none"> <li>In Future training may include a site visit to existing project so that each and every aspect of the training can be understood with good practical knowledge.</li> </ul>

## **Learnings and Way Forward**

In order to conduct the programme during the times of Covid19 epidemic detailed SOPs have been prepared in the academy. As the programme was residential in nature all the participants were asked to carry a Covid19 negative report. There was a lukewarm response initially because of the stringent procedures at the academy but after repeated requests made to the HODs of the departments 23 participants joined the programme. The participants underwent a medical examination before the start of the training programme and only after that they were allowed to sit in the programme. Few participants whose Covid19 negative report were not available during the time were isolated from others in the Academy quarantine facility.

## **Agenda and Schedule**

The programme was conducted in face to face mode therefore interaction between the experts and the participants was high. In the first half of the first day some participants report was pending. The academy had foreseen this eventuality therefore a separate facility to isolate these participants was planned. These participants were connected with the class online through Zoom call through which they were able to interact with the experts. Once the participant's reports were available they were shifted to the class immediately.

The detailed training modules with the schedule has been tailor made for the target audience. The purpose of the programme, the learning objectives and the structure of the module is well defined and PPTs, learning notes and exercise have been well documented.

It was felt that many participants had limited knowledge of the definitions, terminologies and working of STPs and therefore requested for tour to STPs to have a better understanding. The exercises required more time and attention from the resource persons and a longer period course can also be considered. The participants were also of the view that the length of the training programme be increased to include a visit to STP site.

## **Content**

The content comprises of PPTs, case studies and exercise for a better understanding of the subject. The purpose of the course is to allow the engineers to understand the design of a co-treatment facility and the processes involved and also the impact of co treatment in functioning of STPs. As the participants were from Hindi speaking state of Uttarakhand the delivery by the experts was kept mixed with both Hindi and English spoken in the class. The feedback forms were also made in Hindi for better understanding. It is felt that the overall module can also be translated in Hindi.

## **Exercises**

The exercise forms a very important part of the training programme as it allows the engineers of pre-feasibility assessment and detailed assessment of co-treatment at STPs. It is felt that more time be given to this so that the participants are confident of calculations. Detailed assessment part requires continuous recap of the theoretical concepts, hence sometimes the participants required individual attention of the resource person.

## **Resources**





It was felt that while conducting exercises participants require individual attention and clearing of their doubts and concepts. The exercises could initially be done in form of group work with an expert assigned to each group followed by individual calculations. The facility for the participants who were quarantined because the reports were not available can be upgraded to have larger screens and better audio and microphone facility.

# ANNEXURE



## Annexure 1:

### List of Resource Persons

S.N.	Name of Resource Person	Organization	Role	Profile Photo
1.	Mr. Manoj Pande	DRST, UAoA Nainital	Course Coordination & Moderator	
2.	Mr. Dhawal Patil	Ecosan Services Foundation	Lead Trainer	
3.	Ms. Radhika Boargaonkar	Ecosan Services Foundation	Lead Trainer	
4.	Sh. Shivkumar Mulay	Ecosan Services Foundation	Lead Trainer	

## Annexure 2:

### List of Participants

The following table presents the details of the officials, staff with whom we have discussed about the design of Faecal Sludge and Septage Management (FSSM).

S.N.	Organization Name	Nominations	Email ID
1.	Uttarakhand Pey Jal Nigam	Mr. Dharmendra Prasad	E mail:dpukjn@gmail.com
2.	Uttarakhand Pey Jal Nigam	Mr. Deepak Vatsa	E mail:deepakvatsa.ujn@gmail.com
3.	Uttarakhand Jal Sansthan	Mr. Pankaj Upadhyaya	E mail:pankajupadhyaya001@rediffmail.com
4.	Uttarakhand Jal Sansthan	Mr. Trivendra Joshi	E mail:trivendrajoshi7@gmail.com
5.	Uttarakhand Jal Sansthan	Mr. Pooran Chandra Pandey	
6.	Uttarakhand Jal Sansthan	Ms. Anuradha Joshi	E mail:anujoshi476@gmail.com
7.	Uttarakhand Jal Sansthan	Mr. Yogendra Prasad	E mail:yogedhundiya@gmail.com
8.	Uttarakhand Jal Sansthan	Mr. Rahul Singh Tolia	E mail: <a href="mailto:rahulsinghtolia@gmail.com">rahulsinghtolia@gmail.com</a>
9.	Uttarakhand Jal Sansthan	Ms. Monika Bisht	E mail:monarawat28@rediffmail.com
10.	Uttarakhand Jal Sansthan	Mr. Shishpal Singh	E mail: <a href="mailto:mesrajeshgupta@gmail.com">mesrajeshgupta@gmail.com</a>
11.	ULBs	Mr. Dinesh Prasad Uniyal	E mail:uniyaldineshprasad@gmail.com
12.	ULBs	Mr. Laxman Singh Bohra	
13.	ULBs	Mr. Ravindra Negi	
14.	ULBs	Mr. Kamal Singh	E mail: <a href="mailto:kamalchauhan1183@gmail.com">kamalchauhan1183@gmail.com</a>
15.	ULBs	Mr. Dheerendra Dutt Semwal	
16.	ULBs	Mr. Pritam Singh	E mail:npptehri80@gmail.com
17.	ULBs	Mr. Udayveer Singh	E mail: <a href="mailto:singhodayveer624@gmail.com">singhodayveer624@gmail.com</a>
18.	ULBs	Mr. Atrinarayan Tiwari	E mail: <a href="mailto:nagarnigamkashipur@gmail.com">nagarnigamkashipur@gmail.com</a>

## Annexure 3:

### Detailed Session Wise Agenda

Date	Session	Topic/ Content	Resource Person	Duration (Min)
26 <sup>th</sup> September, 2022	1.	Introduction to Urban Sanitation and Policies and Programmes	Dhawal Patil	1 Hrs
	2.	Approaches and Methodology of Planning	Radhika Boargaonkar	1 Hrs
	3.	State Level Approaches for FSSM Planning	Shivkumar Mulay	1 Hrs
	4.	Exercise: State Level FSSM Planning	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	45 minit
	5.	Liquid Waste Management	Dhawal Patil	45 minit
27 <sup>th</sup> September, 2022	6.	Stakeholders Engagement – Tools and Programs	Radhika Boargaonkar	1 Hrs
	7.	Exercise: Sanitation in Informal Settlements	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	1 Hrs
	8.	Exercise: Public Sanitation	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	45
	9.	FSSM: An Overview of Key Concepts	Dhawal Patil	1 Hrs
	10.	Exercise: FSSM Planning	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	45
28 <sup>th</sup> September, 2022	11	Wastewater Treatment Technologies	Shivkumar Mulay	45
	12	Financial Aspects of FSSM	Shivkumar Mulay	1 Hrs
	13	O&M Aspects of FSSM	Radhika Boargaonkar	1 Hrs
	14	Exercise: O&M Cost of FSSM	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar	1 Hrs

## Annexure 4: Feedback Format

नोट : कृपया प्रश्न क्र० 01 से 06, 11 के सन्दर्भ में (✓) अंकित कर एवम् शेष बिन्दुओं पर लिखित में अपने सुझाव दें। आपके सुझाव हमारे भविष्य के प्रशिक्षण कार्यक्रमों को और अधिक लाभप्रद बनाने हेतु सहायक सिद्ध होंगे।

संस्थान का नाम : डॉ. आर, एस, टोलिया उत्तराखण्ड प्रशासन अकादमी, नैनीताल  
(शहरी विकास प्रकोष्ठ, सी.जी.जी.)

प्रशिक्षण का शीर्षक : *Specialized Training on Integrated Wastewater and Septage Management (IWSM)*

प्रशिक्षण अवधि : 26 से 28 सितम्बर, 2022 (तीन दिवसीय)

प्रतिभागी का नाम व पद: .....

### GRADING SCALE: ग्रेडिंग स्केल:

5	Exceeded Expectations उम्मीद से बढ़कर
4	Met All Expectations सभी अपेक्षाएँ पूरी हुई
3	Met Some Expectations कुछ अपेक्षाएँ पूरी हुई
2	Needs Improvement सुधार की जरूरत
1	Did not meet expectations at all कोई अपेक्षाएं पूर्ण नहीं हुई

### किसी 01 ग्रेडिंग स्केल पर (✓) करें

1. कार्यक्रमों के उद्देश्यों के अनुरूप प्रशिक्षण कार्यक्रम का आयोजन किस स्तर का था?	5	4	3	2	1
2. यह प्रशिक्षण कार्यक्रम आपके स्वयं के ज्ञानार्जन में कितना सहायक होगा ?	5	4	3	2	1
3. प्रशिक्षण के दौरान सहयोगी प्रतिभागियों आपसी वार्ता आपके लिए कितनी लाभदायक रही?	5	4	3	2	1
4. यह प्रशिक्षण कार्यक्रम आपके द्वारा संपादित किये जाने वाले कार्यों में गुणात्मक सुधार की दृष्टि से कितना लाभदायक होगा ?	5	4	3	2	1
5. कार्यक्रम के दौरान प्रशिक्षण कक्ष, आवास, भोजन, परिवहन एवं अन्य सम्बन्धित व्यवस्थाओं का स्तर कैसा था?	5	4	3	2	1
6. सम्पूर्ण प्रशिक्षण के बारे में आपका आंकलन:	5	4	3	2	1

7. निम्नांकित प्रमुख सत्रों का उपयुक्त कॉलम में(✓) अंकित कर मूल्यांकन करें :

विषय	वार्ताकार	How you rate the Speaker/Facilitators on a scale of 1 to 5 (5 being the best)				
		5	4	3	2	1
प्रथम दिवस— दिनांक: 26.09.2022						
Introduction to Urban Sanitation and Policies and Programmes						
Approaches and Methodology of Planning						
State Level Approaches for FSSM Planning						
Exercise: State Level FSSM Planning						
Liquid Waste Management						
द्वितीय दिवस— दिनांक: 27.09.2022						
Stakeholders Engagement – Tools and Programs						
Exercise: Sanitation in Informal Settlements						
Exercise: Public Sanitation						
FSSM: An Overview of Key Concepts						
Exercise: FSSM Planning						
Wastewater Treatment Technologies	Dhawal Patil, Shivkumar Mulay & Radhika Boargaonkar					
तृतीय दिवस— दिनांक: 28.09.2022						
Financial Aspects of FSSM						
O&M Aspects of FSSM						
Exercise: O&M Cost of FSSM						

7. आपकी राय में कार्यक्रम के सबसे उपयोगी विषय कौन-कौन से थे? (क्रमवार लिखें)

8. क्या कोई सत्र कम महत्व का लगा ? कृपया कारण सहित इंगित करें।

9. आपकी राय में इस प्रशिक्षण कार्यक्रम में सम्मिलित सत्रों के अलावा किन अतिरिक्त विषयों पर भविष्य में जानकारी दिया जाना उपयोगी होगा ?

10. भविष्य में इस विषय पर आयोजित किये जाने वाले प्रशिक्षण को और अधिक प्रभावशाली व ज्ञानवर्धक बनाने हेतु आपके सुझाव ?

11. प्रशिक्षण कार्यक्रम की अवधि के बारे में आपकी क्या राय है ?

03 दिन पर्याप्त हैं

अवधि बढ़ायी जानी चाहिए

12. आप इस प्रशिक्षण कार्यक्रम से जानकारी को किस प्रकार से अपने शहर में उपयोग करेंगे?

हस्ताक्षर : .....

दिनांक : 28 सितम्बर, 2022




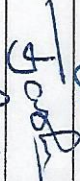









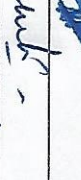
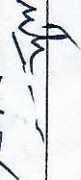
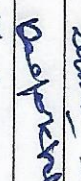
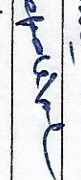
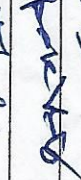
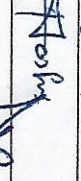

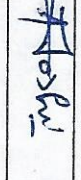

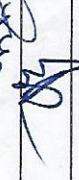


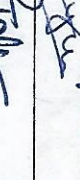










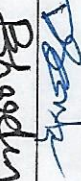


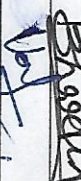


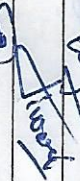
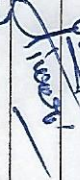
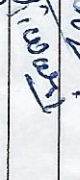

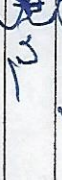

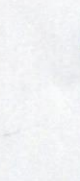


## **Annexure 5: Attendance Sheet**



## Dr. R. S. Tolia Utarakhand Academy of Administration Nainital

Date: 26 to 28 September, 2022

## (Attendance Sheet)

S.N.	Name	Designation	26.09.2022 (Monday)	27.09.2022 (Tuesday)	28.09.2022 (Wednesday)
1.	Mr. Pankaj Upadhyaya	Additional Assistant Engineer			
2.	Mr. Trivendra Joshi	Additional Assistant Engineer			
3.	Mr. Pooran Chandra Pandey	Additional Assistant Engineer			
4.	Mr. Dinesh Prasad Uniyal	Assistant Engineer			
5.	Mr. Dharmendra Prasad	Project Engineer			
6.	Mr. Deepak Vatsa	Project Engineer			
7.	Ms. Anuradha Joshi	Junior Engineer			
8.	Mr. Laxman Singh Bohra	Junior Engineer			
9.	Mr. Yogendra Prasad	Junior Engineer			
10.	Mr. Rahul Singh Tolia	Junior Engineer			
11.	Ms. Monika Bisht	Junior Engineer			
12.	Mr. Ravindra Negi	Junior Engineer			
13.	Mr. Kamal Singh	Sanitary Inspector			
14.	Mr. Dheerendra Dutt Semwal	Sanitary Inspector			
15.	Mr. Pritam Singh	Sanitary Inspector			
16.	Mr. Udayveer Singh	Clerk			
17.	Mr. Atrinarayan Tiwari	Account Clerk			
18.	Mr. Shishupal Singh	Clerk	