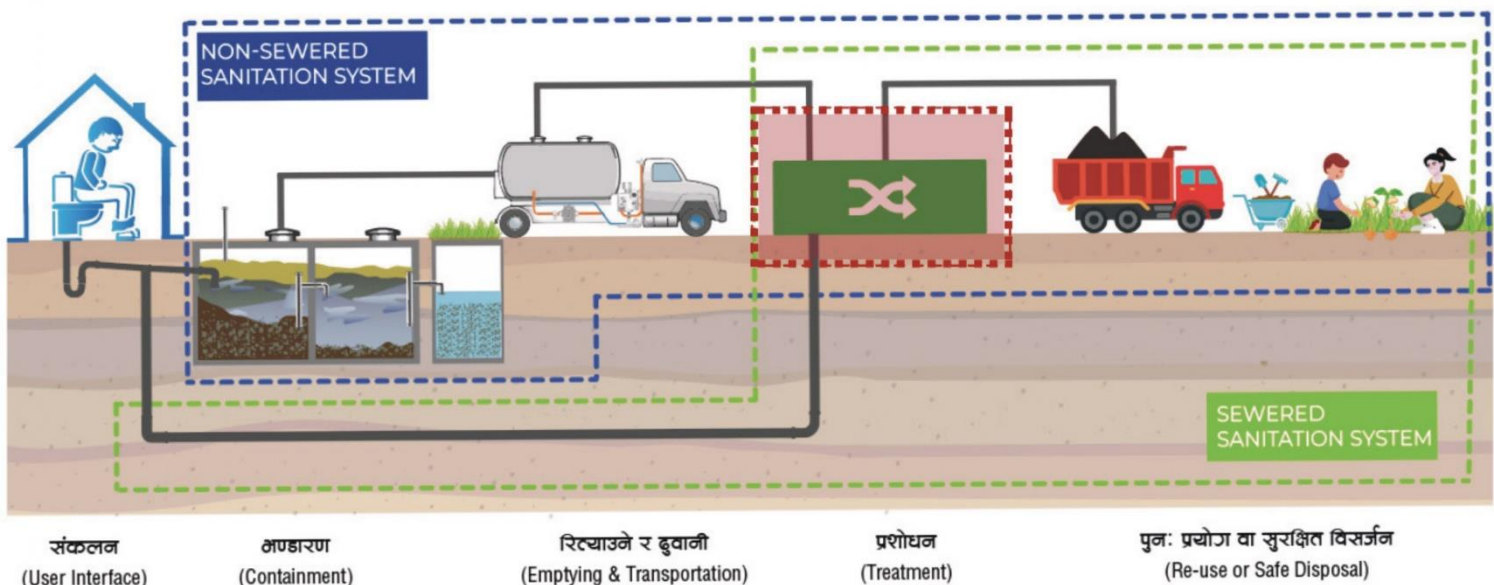




Government of Nepal
Ministry of Water Supply
National Water Supply and Sanitation Research,
Innovation and Capacity Development Center

Operation and Maintenance of Faecal Sludge Treatment Plant

Training Manual



2025

Material and Learning Application

For government, under authority of NWSSRICDC, this material is prepared by Environment and Public Health Organization (ENPHO) with the support from “CWISAN Thematic group” for Training Material Development and is to be used for training purposes only. Materials used in the package are for the reference to understand the concept and or to show the practices around the globe and at national level. The package development team do not claim for the materials used in the package as of their own but is the sole property of the respective organization.

Foreword

As Nepal's sanitation systems evolve to meet the growing demands of urbanization and environmental protection, Faecal Sludge Treatment Plants (FSTPs) have become essential infrastructure. However, the true effectiveness of these facilities depends not only on their construction—but on how well they are operated and maintained over time.



Despite the increasing number of FSTPs across the country, many struggle to perform at their intended capacity due to limited technical expertise, systemic challenges, and a lack of sustained operational support. Without robust operation and maintenance (O&M), even the best-designed facilities can fall into disrepair—undermining our progress toward safe, sustainable sanitation.

This training package is our strategic response to this gap. It represents a vital commitment to empower operational staff, technical experts, and managers with the essential, practical knowledge needed to keep this infrastructure functional and productive.

Over the coming sessions, you will delve into:

- Standard operating procedures, safety protocols, and preventive maintenance plans
- Troubleshooting guides, record-keeping templates, and monitoring systems
- Guidance on supply-chain readiness, cost control, and resource recovery opportunities

Beyond technical skills, the training supports a stronger enabling environment by emphasizing institutional supports such as contracts, budgeting, staff development, and regulatory compliance. By professionalizing FSTP O&M, we can reduce downtime, improve service continuity, and ensure treated sludge and effluent meet safety standards.

Your role in this effort is critical. By mastering FSTP operation, you help secure the infrastructure that underpins Nepal's sanitation future. I urge you to make the most of this opportunity to upskill, and to lead with professionalism, dedication, and a commitment to excellence. Our shared success in achieving Total Sanitation depends on it.

Ram Kumar Shrestha
Executive Director
NWSSRICDC

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Acronyms

Eco-San	Ecological Sanitation
ENPHO	Environment and Public Health Organization
FS	Faecal Sludge
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
GIS	Geographic Information System
GoN	Government of Nepal
HH	Household
ISO	International Organization for Standardization
ITN-BUET	International Training Network-Bangladesh University of Engineering and Technology
ODF	Open Defecation Free
PPE	Personal Protective Equipment
SDB	Sludge Drying Bed
SDG	Sustainable Development Goal
SFD	Shit Flow Diagram
SS	Sewered System
SSC	Sanitation Service Chain
SSP	Sanitation Safety Plan
ST	Stabilization Tank
STP	Sewerage Treatment Plant
SWM	Solid Waste Management
TN	Trainers' Note
ToR	Terms of Reference
TP	Treatment Plant
WWTP	Wastewater Treatment Plant

1 Introduction

This Trainer's Manual is to support people who facilitate or conduct the "Operation and Maintenance of FSTPs". This introduction section provides background on how to use the manual and lesson plan, tips that help plan for a successful training, and several tools to help delivering the training, including lessons plans and materials. The main objective of this trainer manual is to guide the trainer, for effective delivery of the training while conducting the sessions. The instruction on the manual goes hand on hand with the presentation slides. It is recommended that one adapt the tools to suit their style and the needs of the audience.

To this, this manual comes with other materials, a folder compiled of Power-point slide deck, slides compiled along with slide notes for the trainer's reference. For the effective delivery of the package, it is highly recommended to use the documents/ files simultaneously.

2 Training Overview

After the declaration of Nepal as open defecation free country on 13 Asoj 2076 (30 September 2019) Nepal's national targets on sanitation is driven by sustainable development goal 6; which is to progress towards achieving total sanitation. With 80% of on-site sanitation, sustainable management of faecal sludge will remain core task at hand to achieve total sanitation. However, with few cases from ground it's been realized that long-term functionality of faecal sludge treatment plant is real challenge in Nepal, especially in context of skilled human resource to operate the FSTP system and ensure its long-term functionality.

The resource person engaged in the development of the package, or the subject experts will be delivering relevant sessions to the targeted audiences.

This training package mainly consists of sessions related to global and national sanitation situation, human resources on the job of sanitation, detail information on Faecal Sludge Treatment Plant (FSTPs) existing in Nepal, day-to-day operation of FSTPs, overcoming the problems on operation of FSTPs, Routine maintenance of FSTPs, monitoring mechanism of FSTPs, Role of FSTP testing lab along with monitoring parameters, and cases from the successful model of FSM which focuses on O&M related matter.

2.1 Training Objectives

The general objective of the package is to develop the skill human resources to operate the FSTPs effectively and ensure the long-term functionality of FSTPs.

Specific Objectives

- To inform the essential knowledge required for the smooth day-to-day operation of FSTPs
- To able to design and implement robust monitoring system to ensure proper operation and regular maintenance of FSTPs.

2.2 Participatory Learning

Participatory learning styles are widely used for the active engagement of the participants throughout the training. Effective learning comes from shared experiences and participants learning from each other. Various methods for active engagement of participants are used for the delivery of the course content through interactive presentations, demonstrations, group discussions, case studies and assignment for further practice and discussion.

Use of short sentences, pictures and illustrations, graphs, gestures, demonstrations, small group discussions and hands-on practice are highly recommended for the active learning. These methods will help all participants understand and remember the information better.

3 Training Planning

The following activities should be undertaken to get started with training planning and arranging logistics.

3.1 Trainers and the Planning Team

For each training:

- Choose a **training course coordinator** or anchor. This person should be present throughout the training and is responsible for overall coordination, timing, and mood of the training course. To this, he/she is also responsible for allocating sessions and preparing as necessary along with delegating responsibilities with deadlines.

- **Coordinate with Trainers** for the session delivery. This will probably be a mix of availability, expertise, style, and gender. It is beneficial to establish the strengths and weaknesses of each trainer and work to the strengths during the different training components.

- **Allocate sessions** (or part) for each of the chosen trainers – these trainers will be responsible for:
 - preparing for the sessions they are responsible for
 - ensuring that all resources for their sessions are collated and ready
 - collaborating with the other trainers – the role each trainer will have at each point in a day - delivering the assigned sessions, supporting other trainers for delivery of their sessions, must be planned and known to maintain the flow of the training, avoid confusion and embarrassment
 - ensuring the session runs on time

3.2 Selecting Participants

The anticipated primary target group for the training are day-to-day FSTP operators and government officials responsible for monitoring the FSTPs.

For the most effective training, it is important to take care of inviting participants by considering:

- **Number of participants.** It is important to choose the correct number of participants. You may want to have a small group to provide intensive training and support, or a larger group to have a wider range of participation. A common reason for training sessions failure is that too many participants attend. In the same case, a total number of **15 to 20 participants** are highly recommended so that everyone has the chance to fully participate in the training and also have a good range to share and learn the experiences.
- **Criteria for participation.** As this package is focused on day-to-day operation and maintenance of FSTP. This is the basic level training for the FSTP operators, thus, there needs to be criteria for participation. This is basically to make the learning more effective.
Some of the criteria for participation are as follow:
 - Participants should have work experience in FSTP as an operators or monitoring of FSTP

- Participants should have known the basic knowledge on how to conduct operation and maintenance of FSTP

3.3 Logistics Management

The training planning team (the trainers and the host) will need to determine the training logistics such as:

Pre-training

- What is the budget?
- Who will invite the participants and trainers and communicate with them?
- Who will organize and coordinate food and accommodation?
- Who will manage participant's travel?
- Who will organize the training site and set up?
- Who will purchase and organize the training equipment and materials?
- Who is responsible for pre-training registration?
- Who is responsible for onsite registration?
- Who is responsible for printing the participant's materials including training evaluation form?
- Who is responsible for facilitating the whole training?
- Who is responsible for the logistical arrangements, like banner preparation, stationeries?
- Who is responsible for coordination with trainers and resource person?

During the training

- Who will coordinate with the resource person?
- Who will check for the time management?
- Who will ensure internet and power facility?
- Who will check that snacks and food are ready at the appropriate times?
- Who will prepare the room in the morning and reorganize in the evening?
- Who will prepare the necessary flip charts for the day?
- Who is in-charge of checking participant list details, ensure attendance of all?
- Who is in-charge of preparing evaluations, certificates and USB sticks?

Post-training

- Who will type up the training evaluations?
- Who will clean up the training materials and space?
- Who is responsible for replacing materials if needed?
- Who is responsible for the reporting, consolidating participants' feedback, photos, and video documentation?
- Who is responsible to maintain communication and follow up with the participants?

4 Training Preparations

There are several things that you will need to do to get ready for the training.

4.1 Training Space

As there are various interactive activities inbuilt in the session, an open space for the group division and work is required for the activities in the training, a venue with the facility should be selected.

Visit the training site at least a couple of days before the event for finalizing the venue itself; specify and ensure all the requirements like rest room for women and men with adequate sanitary facilities like soap, sanitizer, tissues, dustbins, internet connection with appropriate bandwidth, seating

arrangements, etc. Visit the training site before the participants are due to arrive and set up your electrical equipment and materials. Try to identify potential sources of distraction in the room, both to yourself and participants, and make changes to mitigate them.

Seating arrangements have a big influence on the training. It is recommended to arrange the tables and chairs so that participants can make eye contact with one another and can break into small groups easily. Participants will also need to be able to view the facilitators/ trainers, the PowerPoint slides, and flipchart posters.

4.2 Equipment and Materials

You will need to gather and bring the following materials and equipment to the training.

Equipment	Materials
<ul style="list-style-type: none"> • Computer/ Laptop • Projector • Extension cord(s) (optional) • Camera • Speaker 	<ul style="list-style-type: none"> • Name tags • Markers • Pen • Paper- A4 size paper, meta-cards • Newsprint paper or large pieces of paper • Masking tape

Some equipment and materials are optional depending on how you use the lesson plans. Check the lesson plans and determine what equipment and materials you will need. Be aware that certain things may need to be purchased and gathered well in advance of the training, possibly prior to your arrival.

For all other materials required for individual sessions refer to the lesson plans.

4.3 Presentations Slides

This training includes presentation slides that can be used as a learning aid. Most presentation slides have suggested wording or scripts to use as you deliver the information (the slide notes in each presentation – also known as speaker's notes). As part of your preparation, you should look at each slide to make sure you understand how the whole presentation flows. The slide notes also give additional guidance on how to use a slide.

The timing allowances are based on the trainer following the speaker's notes at a moderate pace. Adding extra wording will take more time so be aware of impacts on other parts of the presentation or training.

5 Facilitating High Quality and Effective Trainings

The significance of the trainer/facilitator cannot be overstated. Training success is usually a function of how well it is facilitated. This entire trainer's manual provides guidance on what to deliver and makes suggestions as to how this might best be done. However, participants attending the training will differ, and their interaction will also shape the training and ultimately the learning experience. There are several qualities a trainer/facilitator should try to develop to achieve the most from a group of participants, many of whom will not know each other. The following is general advice which applies to this and other training you may facilitate.

Introduction: Introduce yourself to instil confidence that you are qualified to provide the training.

Serve the participant: Facilitating a training may be an achievement, but it is important to remain grounded and keep your focus on the participants. Your trainer/facilitator's role is to facilitate learning, not to only impart knowledge, get through the material or to tell participants what to do.

Respect and be respected: Attending a training will be costly for participants, or their organization, in both time and money. Respect their desire to learn and don't fabricate expertise. No question should be dismissed as irrelevant or stupid. If you don't know the answer, say so and seek out someone who can help respond or direct the participant to where they can find the answer.

Take charge when necessary, e.g., managing disruption: There may be times when you need to take charge. For example, when a participant is being disruptive – during a break, you could have a quiet word with the person in question to request an adjustment to their behaviour. Break-time could be moved earlier if the problem needs urgent attention.

Encourage questions: Any form of discussion, especially those developed through questions, should be actively encouraged. Participants are more likely to ask questions if they feel physically and socially comfortable, relaxed with their fellow participants and the facilitator. Therefore, you should work to build a rapport with participants as soon as possible. In addition to clarification and further detail, asking questions will help you to gauge the level of understanding, which in turn should influence what and how material will be delivered.

Be responsive: Participants' opinions and questions should not be seen as an unwelcome interruption, but as an opportunity to explore perceptions and to offer any clarification as needed. Consider opening the question up to the training for an answer. But keep an eye on the clock and encourage people to be brief.

Responding to wrong answers: During the training questions are asked to the participants. If they answer incorrectly, it is important first to check whether you have understood the answer by rephrasing and asking if that is what was meant. At this point, their answer can be rephrased to be more accurate but without deviating too much from the participant's answer. If their answer is still incorrect, then it is important not to simply dismiss the answer but to identify the thinking behind it and then work towards a correct answer. It is essential that the participant's view is always respected.

Honouring the answer: You can use a flipchart to record discussions or feedback from exercises. When you do this, it is important not to paraphrase their comment but instead write it down as stated. This ensures that their meaning is not lost and acts as a method of affirmation for the participant – that their opinion is worthy.

Deviate, but not too much: The learning material supplied in this Trainer's Guide is only a starting point. Sharing first-hand experience and nationally relevant, practical examples to emphasize a point can solidify the subject material for some learners. Interjecting the theory sessions with 'real-life stories' should be encouraged. However, care should be taken to not deviate too much, or go over the time allocated time or confuse the participants.

Alternate delivery approaches: This Trainer's Guide has made suggestions as to how to deliver the material. If a trainer prefers to 'lecture' this is unlikely to result in achieving the learning objectives and is not an effective way to run the training. Each participant has a different way of learning; some prefer images, some individual thinking, some prefer to listen, others like reading, some doing group

work etc. The training needs to include a range of styles so that each participant has an opportunity to learn in their preferred style.

Work with passion: If the trainer/facilitator is enthusiastic about the material it is likely to engage the participants more.

Be confident with the material: Confidence will come as understanding of and familiarisation with the material is developed. Prior preparation is essential.

Stick to time: The timetables suggested are guidelines, but it is important that breaks, lunch and the end-of-day deadlines do not overrun unnecessarily. Appropriate arrangements for meals and refreshments are essential. Participants' learning is enhanced through regular breaks and in order to prevent participants from becoming overtired or demoralised it is important to start and end the day on time.

Help participants appreciate time management: Any overrun in time often comes from lengthy presentations by rapporteurs following group discussions. Make it clear at the start that presentations are time-bound, and people must learn how to present in allotted time. Trainer/facilitators should be very firm but friendly, and simply end presentations when the allotted time is up. Using a timer or buzzer will help.





Handling digital and electronic tools and equipment: Using the tools and equipment independently is one of the basic skills of the trainer. As a trainer, one should be aware on the digital and electronic tools and equipment that he/she uses during the training. Preparing before the training, knowing the equipment well - how it functions are few ideas to get started with handling the digital and electronic tools and equipment.






6 How to Use This Manual

This section explains the training agenda and individual sessions that have been developed to meet the participant learning expectations.

6.1 Lesson Plan





For each session of training, a lesson plan has been developed with the detailed guide for the trainer. Here is a list of the icons used in this Trainer Manual and their explanations.

	Learning Outcomes. Describes what the participants will be able to do by the end of the session to demonstrate increased knowledge, improved skills or changes in attitude.
	Time. The clock symbol appears next to the amount of time the session may take. This is an estimated time, and the session may be longer or shorter depending on how you facilitate it.
	Materials. Lists all the materials that will be required for the session.
	Preparation. The clipboard represents preparation that needs to be done prior to the session including materials required and things to prepare in advance.

	Introduction. The hook signals the introduction to a topic. The introduction connects participants’ personal experience to the topic of the lessons and motivates their interest.
	Main Activity. The puzzle appears at the beginning of a main learning activity.
	Trainer Notes (TN). The exclamation point appears to remind you of things to do or consider while facilitating the session.
	Handouts. This appears when there are handouts for the participants.
	Assignment. This appears when the participants are to go for a discussion on the task assigned to participants

6.2 Icons used in Power point

The following icons and images are used throughout the Power Points:

Icons/ Images	Explanation
	Group Activity
	Documentary show
	Case study
	Time

6.3 Learning Outcomes

The following learning outcomes describe what the participants will be able to do by the end of the training- training to demonstrate increased knowledge, improved skills, or changes in attitude. Each lesson plan refers to the specific learning expectations covered in that lesson.

Lesson Plan	Topics	Learning Outcomes
1	Training opening and Introduction	1. Introduce participants and trainers in participatory methods.

		2. Discuss the group's expectations and agenda for the training.
2	Setting the context: Overview on Sanitation Situation	1. Explain existing sanitation situation 2. Explain the role of FSTP operators for health impacts and the environment
3	Components of FSTPs	1. Explain types of treatment process involved in FSTPs and how they are achieved via treatment units 2. Explain about nature-based treatment and mechanical treatment 3. List the components of faecal sludge treatment plants
4	Day to day Preparation for smooth operation	1. Explain day-to-day preparation work that is required at FSTP to ensure smooth operation and maintenance. 2. List good housekeeping at FSTP and explain why it is important
5	System Operation	1. Explain how as an operator, ensure each of the units of FSTP operates smoothly 2. List the things to consider while operating FSTP 3. Explain challenges of FSTP operation and discuss possible solutions for the same
6	Routine Maintenance	1. Explain key maintenance activities to be done at FSTP 2. Explain general safety measures
7	Monitoring	1. Understand what and how to monitor for sustainable O&M of FSTP, as an FSTP operator

6.4 Training Agenda

The general outline of the training is as follows:

- **Training opening.** To welcome people and allow participants and trainers to get to know one another.
- **Individual lessons.** To focus on a selected topic. Each lesson includes an introduction, a main lesson, and a closing activity to review the content.
- **Breaks and lunch.** To keep people working and feeling positive, breaks are needed. Plan for a mid-morning and mid-afternoon break that allows people to use the washroom and have a snack. While planning your training it is also important to clarify with participants in advance as to whether food and snacks will be provided.
- **Review of previous day.** Start the day with a review of the material learned during the previous day. This also helps focus the participants and trainers' minds on the content of the training.
- **End of training closing.** The end of the training can be official or unofficial depending on what is appropriate. Certificates are typically handed out. The lesson plan "Training Closing" describes this session.
- **End of training evaluation.** To allow participants to assess the strengths and weaknesses of the training for further improvement. See the end of training evaluation for a template of this evaluation.

- **Organizer and trainers debrief.** A daily exercise to discuss what went well, what areas of the day can be improved and what needs to be done for the next day and in the future. A major debrief is held at the end of the training.

Environment and Public Health Organization
Operation and Maintenance of FSTPs
Training Schedule

Time	Day 1	Day 2
9:00 – 9:30	Training Opening	Review Day 1 Content
9:30 – 11:00	Overview on Sanitation Status	Routine Maintenance
11:00 – 11:15	Tea Break	
11:15 – 12:45	Components of FSTPs	Monitoring
12:45 – 1:45	Lunch Break	
1:45 – 3:15	Day to Day Preparation for smooth operation	Exposure visits and Interaction Teatime, Post test, Evaluation
3:15 – 3:30	Tea Break	
3:30 – 5:00	System Operation	
5:00 – 5:10	Day closing	Training Closing

Lesson Plan 1: Training Opening



30 minutes

Learning Outcomes



At the end of this session participants will be able to:

1. Introduce participants and trainers in participatory approach
2. Discuss the groups' expectations and agenda for the training

Materials



- Markers
- Meta-cards
- Newsprint paper
- Name Tags
- Pens (1 per person)
- Notebooks or paper (1 per person)

Preparation



- Review presentation slides and cue for presentation
- Set up a station for queries and or questions
- Prepare a meta-card/ flip chart with the heading, "Learning Expectations" and "Parking Lot"
- Write the "group agreement" on a flip chart paper
- Prepare the pre-test form (refer to annex); if going to use the virtual/ digital platform, make sure all participants have access to internet
- Print the card for icebreaker (refer to end of lesson plan)



Trainers' note: In some cases, a formal welcoming ceremony will start the training. Consult with your host beforehand to determine the protocol and the amount of time required. You may need to adjust your agenda accordingly.

Introduction

5 minutes



1. Introduce trainers, training hosts and other guests as appropriate and welcome participants.
2. Introduce the training and training format as:
 - a. *This Operation and Maintenance of Faecal Sludge Treatment Plants (O&M of FSTPs) covers the topics related to operation and maintenance of FSTP.*
 - b. *This training is designed for day-to-day FSTP operators and government officials responsible for monitoring of FSTPs.*
 - c. *This training is participatory. There are different types of participatory and interactive activities, video shows, questions and answers in various sessions.*
 - d. *The training focuses on the content related to O&M of FSTPs.*
 - e. *The training will be an informal event and can come up with ideas and or questions at any time of the event*
3. With the information, share the objectives of the training to participants.
4. Inform participants that the objectives are set to meet from the session covered and present the training structure to the participants.
5. Present the schedule and review the day agenda with participants, along with the breaks and lunch time.
6. Explain the building/workshop layout, bathroom location, emergency exits, first aid, and daily schedule.

7. Lead an introduction/icebreaker activity to help participants meet each other and introduce themselves to the group.

Introduction

10 minutes



1. Inform participants that they are going for an introduction. For this, they will provide with a card (one per person).
2. Also, inform participant they have to find a pair participant having the same card from the group of participants. They have to ask the fellow participant if they have same card like the one who is approaching. If they got the participant having similar card, they have to introduce themselves with each other and discuss about the significance of card in FSTP: What the card is about? and how it is relevant to FSTP or FSTP operator or O&M of FSTP.



- Trainer's note:** Trainer/ Facilitator may join for the activity with participants to break the ice.
3. Inform they should include their Name, Organization, FSTP of their working area. Inform they have only 3 minutes to find the partner and introduction with each other and discuss about the card.
 4. After the provided time, ask a pair of participants to introduce his/her fellow participant and about their card in the larger group.
 5. After all, have introduced their partners, ask participants to take seat next to their pair.

Learning Expectations

5 minutes



1. Explain to participants that they are now going to collect the expectations of participants from the training.
2. For this inform participants that each of them will get a meta-card and they have to write their learning expectation on it.
3. Inform participants that they do not have to mention their name on meta-card and write up their expectations openly.
4. Provide meta-cards to the participants and provide a minute to note their expectations.
5. Once participants have written their learning expectations, collect the meta-cards and read out all the expectations, without repetition, to the large group and paste the meta-cards in a flipchart paper with the heading, "learning expectations" or paste it on the wall creating a station with same heading.
6. Make sure to take out the meta-cards with expectations which are beyond the training objectives and paste it to "parking lot" and also inform that they could discuss the topic/ subject at the breaks or during off hours.
7. Inform participants that they will be revisiting the expectations at the end of the training.

Group Agreement

5 minutes



1. Explain to participants that for the best experience in the training, one should follow some norms and rules.
2. Inform participants to have a good learning in this training we should have some rules of the training. Collect responses from the participant about the training rules and write them in newsprint paper entitled with 'Group Agreement' and it where all participants can have a look.
3. Make sure to point out some of the major points that the participants should not be doing like the use of mobile during the session, side talk, and etc.

Assessment**10 minutes**

1. Explain to participants that they are going for an assessment.
2. Inform participants for this, each participant will get a pre-test form and they are to fill the form as per the knowledge they have.
3. Further, inform participants that similar kinds of questions will be used at the end of the session for the post-test to evaluate the overall learning.



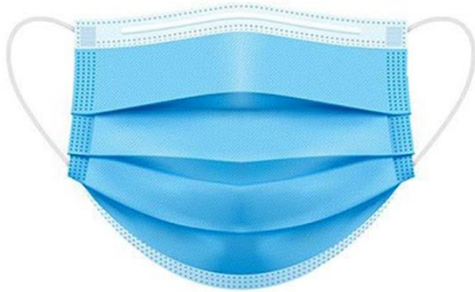
4. Hand a set of pre-test questionnaire to each participant and ask them to fill the form. If you are using a digital platform for the pre and post-test, share the link to participants. Make sure if all have access to the forms by reaching to participants.
5. Provide 5-7 minutes time for the activity. After the time, collect all the forms from participants.

Review**5 minutes**

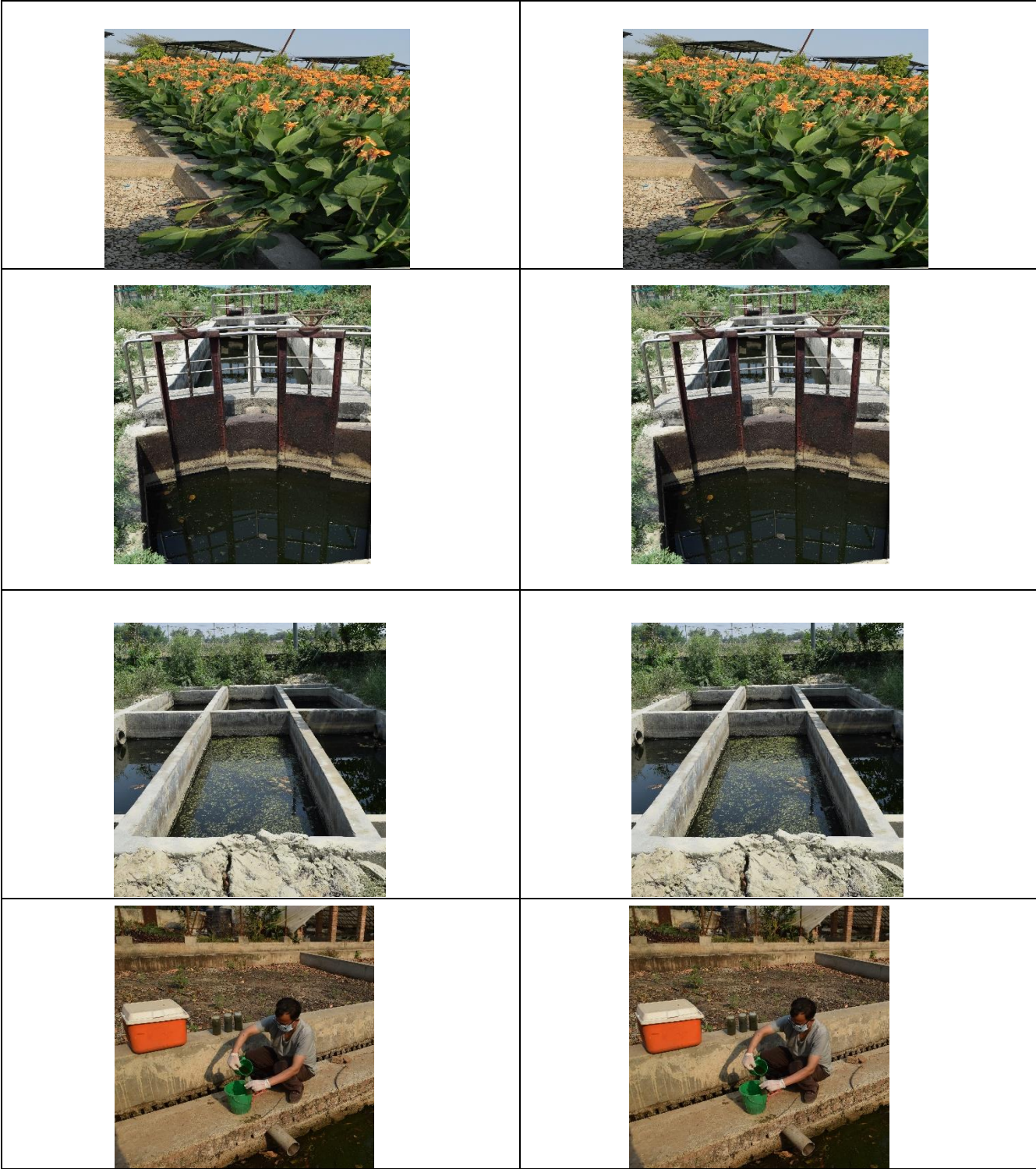
1. Ask if there are any thoughts or questions.

Reflections on Lesson

Cards for icebreaker







Lesson Plan2: Overview on Sanitation Status**Learning Outcomes**

At the end of this session participants will be able to:

1. Explain existing sanitation situation
2. Explain the role of FSTP operators for health impacts and the environment

Materials

- Session slides
- Meta cards
- Flip chart paper
- Marker

Preparation

- Review slides and make necessary changes as per the context
- Review slide notes for information on slides

Introduction**10 minutes**

1. Present introduction slide (slide 2) and ask the following questions to participants:
 - a. What is your main responsibility/ profession? *Expected answers: to regularly operate the FSTP*
 - b. Can you link yourself/ your profession with sanitation? *Expected answers: Yes*
 - c. If yes How? *Expected answers: FS is already a part of sanitation and FSTP operation contributes in the treatment of FS which otherwise would end to the open environment and or water bodies*
2. Further with slide 3, ask participants if they can link their role or profession with the pictures presented and how?
3. Linking to the responses from the participants inform that the main role of the FSTP operators is to operate and maintain the FSTP so that the designated volume of waste could be treated and contribute as much as possible to achieve the status of the second picture from the first.
4. Showing the picture of beautiful Cheonggyecheon river of South Korea. Cheonggyecheon River is a beautiful river that crosses the city center of South Korea; one of the largest and populated cities of the world. However, unlike the rivers of our cities, this river provides backdrop of a beautiful urban green space that not only attracts tourist but also supports in terms of flood resilience, enhanced biodiversity and reduced urban heat island. To learn more on the river and how it was revived, follow the link (<https://www.youtube.com/watch?v=-I5qMDCcvtI>).
5. Tell the participant that this should be the ultimate fate of a river, and an indicator of safe and sustainable sanitation. Click and emphasize that this should be our way forward, and this course will contribute to that ultimate goal and one can start it from the current status or where we are.
6. Present learning outcomes, where we are in training schedule and presentation outline of the session (slide 4, 5 and 6).

Sanitation Status**45 minutes**



1. Provide the definition of sanitation and faecal sludge management. Click and mention that these are among the key foundation for clean and green city. As a part of this course, from the broader context of sanitation, we will just focus on to fecal sludge management. Never the less, to have the consistent understanding of all the participants, we will learn on some background information sanitation in this session.
2. On slide 8 introduce participants on safely managed sanitation and improved sanitation facilities. Mention that improved sanitation facilities are part of overall safely managed sanitation. The photo of Cheonggyecheon river included in the slide (which is also included in introduction slide) is the indicator that a city has safely managed sanitation.
3. With slide 9, explain them offsite sanitation systems and onsite sanitation systems with the graphic presentation and flow diagram on slide 10.
4. With slide 11, on the graphics of onsite sanitation chain, highlight the treatment of liquid and solids area (under red circle), mention that over today and tomorrow we will discuss on this portion regarding O&M.
5. Present slide 12 and explain on Nepal's achievement on Sanitation (ODF declaration) and refer to the slide note.
6. With slide 13 (Sanitation status of Nepal), show the percentage on type of household sanitation system, from the multiple indicator cluster survey jointly conducted by Government of Nepal and UNICEF in the year 2019. Highlight the fact that majority of the household have septic tanks and also the percentage of people defecating openly.
7. On slide 14, summarize the actual situation of sanitation situation in Nepal with SFD graphic of Nepal. Link how the whole graph is dominated by color red which is a threat to the environment and human health. If we dive into deep, the actual portion of safe disposal is minimum.
8. With slide 1 around 85% population drinking faecally contaminated drinking water (MICS survey 2019). It indicates our sanitation situation right now is not proper and there is huge problem with it. Also, 89% population have on-site sanitation, 11% household is connected to sewer system. And just 2.1% of population's wastewater and faecal sludge is treated. Our situation is really grim and our rivers clearly indicates that with pointing the picture of Bagmati river included on the slide.
9. With slide 16, explain that we have achieved open defecation but we have accidentally promoted open disposal as a by-product.
10. Ask the participants do you feel that we have accidently promoted open disposal? Collect response. If yes why? If no why? Conduct some engaging discussion. Share that data shows **Nepal generates 2,925 cubic meters per day of fecal sludge** (In Pursuit of Safe Sanitation Services: Governing Fecal Sludge Management in Nepal, ADBI), of which almost 100% is haphazardly disposed, as few of the treatment plant constructed treat negligible sludge. Nevertheless, we have few FSTPs that have been constructed.
11. Ask them if they know some of them and engage them in discussion. Go to the link included on the slide to show the google map where all the FSTP's of Nepal are included. Click and how some to FSTPs which also include some information on the FSTP. Ask them how many functioning FSTPs are there? (slide 18)
12. Present photos of some of the FSTPs in Nepal from slide 18, 19 and 20.

Reason for non functionality of FSTPs**25 minutes**

1. Present slide 17 and emphasize, out of 17 FSTPs constructed, many of them are not functioning properly within few years of construction (only 8 of them are functioning). Show some of the out of operation FSTPs on slide 20.
2. Ask what could be the reason for not functioning of FSTPs? (slide 21) Collect participant response verbally.
Trainers' note: Trainer may note their response in white sheet paper and paste it somewhere where everyone can see it in off hours.
3. Present some of reasons of failures of FSTP (globally) as mentioned in the slide 22 (please refer the source mentioned in the slide).
4. Ask participants if any of the reasons are related to O&M of FSTPs. Collect responses from 2 to 3 participants and click and explain that many of them are directly or indirectly related to operation and maintenance practices.
5. Present reason for non-functionality from experiences of Nepal. (slide 23)
6. Ask the participants, as an FSTP operators, is there any point that they can mitigate in the non functioning of FSTPs. Collect response from 2 to 3 participants.
7. Carry on with the presentation and discuss how the operator can be responsible for the success and failure of the plant along with the health and environment as a whole.
8. On slide 25, explain how role of sanitation is crucial and need to be viewed upon as dignified formal job. Mention how course will deal with occupational health and safety issue of FSTP operators.

Review**10 minutes**

1. Ask 2 to 3 participant to share about their role as a FSTP operators in the upliftment of the public health and environment.
2. Collect responses and discuss further if needed.

Reflections on Lesson

Lesson Plan 3.1: Components of FSTPs**1.5 hour****Learning Outcomes**

At the end of this session participants will be able to:

1. Explain types of treatment process involved in FSTPs and how they are achieved via treatment units
2. Explain about nature-based treatment and mechanical treatment
3. List the components of faecal sludge treatment plants

Materials

- Session slides
- Meta cards
- Flip chart paper
- Marker
- Sets of FSTP components

Preparation

- Review slides and make necessary changes as per the context
- Review slide notes for information on slides
- Print out 4 sets of different components of FSTP

Session 3.1**Introduction****10 minutes**

1. Present introduction slide (slide 2) and share to the participants that we are going to do one exercise to check our knowledge of FSTPs so far.
2. Divide the participants into 4 groups, depending upon the number of participants. Provide each group with the printed set of different components of FSTP.
3. Instruct participants to discuss within group to identify each of the components given to them and write their names in meta-card and arrange these components in a chart paper with tape so as to show the process flow of FSTP. Give them 5 minutes for their group work.
4. Once they are done, ask them whether they were able to do as instructed. Was it difficult or not?? (Please note: Don't correct their arrangement at this moment of time). Ask each of the group to display the chart somewhere in the room. Tell them that we will revisit their work at the end of the session.
5. Present learning outcomes, training structure and presentation outline of the session (slide 3, 4 and 5). Explain to the participants that this session is designed so that all the participants have consistent understanding of FSTPs which is important to understand further sessions.

Components of FSTP**30 minutes**

1. Initiate the content of the session with slide 6 and 7, by explaining the participants on the objective of faecal sludge management and treatment objectives.
2. Activity on treatment objective

3. On slide 8, explain that before going further with the session it is crucial to understand that there are standards (developed by Government of Nepal) based on which we need to ensure that our wastewater or faecal sludge do not harm the environment. Government of Nepal's have also developed wastewater effluent standards for Nepal, however we have yet to develop standards for solid (dewatered sludge: ultimate product of FSTP) disposal or reuse standard guideline. However, WHO has develop general guideline on this, for us to follow unit GoN comes up with such standards.
 4. With slide 10, 11, 12 and 13) inform about the general types of units used during treatment of faecal sludge that are **nature-based units, mechanical units and hybrid FSTP**. (refer to the slide notes)
 5. Present the treatment process on slide 14. These treatment process define each step of treatment processes on FSTPs. For example, the initial step of FSTP treatment process is to settle down the heavier fraction which is done at solid-liquid separation phase. In the blue boxes, there are the names of the units which help us to achieve that corresponding process.
 6. The treatment processes are presented on slide 15, inform the participants that we will learn further about the treatment units that are used in FSTP as per these processes.
 7. Explain briefly on general work flow of FSTPs on slide 16. Inform them that the treatment objectives and treatment processes that we have mentioned on slide 14 and slide 15, are arranged to achieve step by step treatment of sludge to achieve desired outputs.
-

Steps of treatment process**10 minutes**

1. The slide 17 is about the first treatment process i.e. reception and preliminary treatment.
2. Slide 18, gives general introduction to reception and preliminary treatment and objective for the same.
3. On slide 19, ask participants what is it and how does it work? Collect a response and present further on slide 19. Explain about the screen and grit removal with few photos as examples in slide 20.
4. Slide 21, 22, and 23, explains about solid liquid separation with a photo (settling tank cum feeding tank of Lubhu FSTP)
5. Inform that, there will be session break and the remaining portion of this session will be continued in session 3.2

Lesson Plan 3.2: Components of FSTPs

Learning Outcomes



At the end of this session participants will be able to:

1. Explain types of treatment process involved in FSTPs and how they are achieved via treatment units
 2. Explain about nature-based treatment and mechanical treatment
 3. List the components of faecal sludge treatment plants
-

Materials



- Session slides
- Meta cards
- Flip chart paper
- Marker
- Sets of FSTP components

Preparation



- Review slides and make necessary changes as per the context
 - Review slide notes for information on slides
 - Print out 4 sets of different components of FSTP
-

Steps of treatment process

40 minutes

1. Slide 2, provides introduction to the process of sludge stabilization and why it is necessary. Slides 3, further add on to the stabilization process by discussing on Biogas digester as treatment unit which is generally used in Nepal to achieve sludge stabilization. (Refer to slide notes where ever relevant).
2. With slide 4, ask participant to volunteer to share on the biogas plant of Lubhu FSTP.
3. Slide 5 is about solid dewatering processes. Slides 6 to 10 discuss on how dewatering process could be achieved by natural dewatering units like unplanted sludge drying beds and planted sludge drying beds.

Trainer's note: Make sure to ask participants to share about each component before presenting. If participants have shared enough information, make sure to move to next slide.

4. Similarly, slides 11, discusses on mechanical dewatering units.
5. Slide 12, explains that liquid effluent from the dewatering units needs further treatment. With slide 13 and 14, introducing subsequent treatment process for liquid fraction i.e. liquid treatment
6. Slides 15 and 16 explains on Anaerobic Baffle reactor and slide 17 and 18 explains on Anaerobic filter as the units to treat liquid fraction of the sludge.
7. With slide 20, we enter into the next treatment process i.e. treatment to allow safe end use/disposal
8. Slide 20 and 21 explain about further treatment of liquid fraction via planted gravel bed also known as constructed wetland.

9. On slide 22, two processes for the final treatment of liquid fraction is shown which treatment at polishing pond or via chlorine disinfection.
10. On slide 23, co-composting is discussed as process to reduce pathogen from the dewatered sludge cake which could be safe to use as fertilizers. (Refer to slide note)
11. Slide 24, includes few points to be noted in context of Nepal.
12. On slide 25, we have a contextual video break. Please follow the instruction given on the slide note, before and after watching the video. This video summarizes key learning of the session.
13. On Slide 26, present the most simple and common layout of all the units that have been learnt under the session into full functioning FSTP, as summarizing what have been learnt.
14. Show how the units that are learned in this session have been combined to achieve a treatment process, in the context of Nepal; FSTP layout of Lubhu and Waling is presented on slides 27 and 28.

Trainer's note: Ask from participants to share any idea on the FSTPs of Lubhu and Waling. If participants can share any idea, make sure to provide an opportunity for the same.

15. Slide 29, introduces section on high technology treatment and provides examples in subsequent slides 30 and 31. The objective of these slides is to just aware the participants on some of the hi-tech FSTP in used elsewhere in the world.
16. To conclude the session, we repeat the same exercise done at the introduction of this session and in the same group. This time give them additional time (i.e, around 10 minutes) for the groupwork. Let each of the group present their work. (Please follow instruction included on the slide)

Reflections on Lesson

Lesson Plan 4: Day to Day Preparation for smooth operation**1.5 hrs****Learning Outcomes**

At the end of this session participants will be able to:

1. Explain day-to-day preparation work that is required at FSTP to ensure smooth operation and maintenance
2. List good housekeeping at FSTP and why it is important

Materials

- Session slides
- Meta cards
- Flip chart paper
- Marker

Preparation

- Review slides and make necessary changes as per the context
- Review slide notes for information on slides

Introduction**10 minutes**

1. Present introduction slide (on slide 2), click to show the picture of a mobile phones. Make it interactive by asking questions in slide notes.
 - a. if they all have their mobile phone? *Expected answer: yes*
 - b. What do they with their mobile phone on daily basis? *Expected answer: make calls, surf the internet, use various app*
 - c. For these things, you do certain activity like charging mobile, recharging the balance, downloading apps and etc.
2. Click again to show a picture of FSTP, which is clearly flooded and does not look as if its operating to its capacity. Ask the participants, how about this system, what do they think need for this system to function to its full capacity. Click and summarize that obviously similar inputs are required even though the size of the inputs might be much smaller. Add that if we want anything in this plant operating to its full potential, we need to take care of it which we term it as “smooth operation and routine maintenance (O&M)”.
3. On slide 3, show them two FSTPs one with proper O&M and with no O&M and indicate the importance of O&M.
4. Further click ahead to slide 4, and share that generally low O&M has been understood as no O&M. Generally, the FSTPs that has been constructed so far are the ones that require simple operation and low maintenance for obvious reason of financial constraint. However, due to some reason proper O&M planning are missing and proper planning and training are not prioritized to support O&M. To address the issue the training has been designed. (Also refer to slide notes) and with this session we enter into the world of O&M. This particular session sets foundation to O&M by discussing the preparations required for smooth O&M.
5. Present learning outcomes, training structure and presentation outline of the session (slide 5, 6 and 7).

Main Content**60 minutes**

1. Provide the definition of operation and the maintenance, on slides 8.
2. Before presenting slide 11 with importance of O&M, either collect responses from participants (individually) on the importance of O&M or go for a group work.
3. For the group work, divide participants into 3 to 5 groups and ask to discuss for 5 minutes on the importance of O&M and note the ideas on newsprint paper.
4. Divide participants into groups and provide newsprint and markers for the activity.
5. After the time, ask a group to present and ask other groups to add on missing points.
6. Present the importance of O&M on slide 10 as summary of the presentation, and present requirements of O&M plan. Please let the audience know it's good to understand O&M plan briefly as an operator. This will help us as an operator to prepare for our work.
7. With slide 13 on human resource for O&M, we enter into who is responsible for conducting O&M. Ideal HR team for smooth operation of FSTP is discussed on slide 13, as it is good know the HR structure for FSTP.
8. Inform participants that specific job description of care taker and plant maintenance technician are included on slides 14 and 15 respectively. Care taker in specifically discussed here as in case of Nepal, most of the responsibility of operation and maintenance is on care taker as FSTP operator. Also, plant maintenance technician role needs to be emphasized as their work is important for smooth operation. (Please refer to slide notes where ever relevant).
9. On slide 17 (Preparatory Activities), initiate engaging discussions with the participants on what they think could be the preparatory activities at FSTP once the faecal sludge is delivered and before it enters into the treatment systems?
10. Ask participants to discuss it in pairs and note if required on their notebooks. Provide 2 minutes for the activity.
11. Ask 3 to 4 pairs to share their discussion and inform that this could be good starting point for this section.
12. With slide 18 onwards till slide 28, we discuss the preparatory activities as part of daily routine works that FSTP operators should do as soon as it get call from de-sludgers on delivery of sludge.
13. Discuss how sampling is done for the on-site check/test. Screening for whether to accept the sludge or not is discussed.
14. On slide 27, take a response or two on things that need to be taken care of after emptying the truck load and present and discussed further with presentation.
15. On slide 29, initiate engaging discussions with the participants on What is housekeeping? Get some answers from the participants and click to show the definition. Also ask them what housekeeping work they think could be required at FSTP?
16. Again, ask to discuss in pairs for 2 minutes and collect 3 to 4pairs to share their ideas and present the slides on same topic. This could be good starting point for this section.
17. On slide 30, ask question on why good housekeeping is essential to be maintained, get some answers (2 to 3 responses). Click and explain the content.

18. Slides 32 till slides 38 discuss different housekeeping practices to keep FSTP's environment safe and avoid any hazards.

Exercise**20 minutes**

1. On slide 39, we undertake group exercise to internalize the learnings of the session.
 - Divide the participants into 3 to 5 groups depending on the number of participants.
 - Ask them to work in a group (for around 5 to 10 minutes), to list 3 things that they have learnt from this session, why do they think it is important? What will happen if it's not taken into considerations?
 - Let each of the group present for around 2 minutes
2. Conclude the session.

Reflections on Lesson

Lesson Plan 5: System Operation**1.5 hrs****Learning Outcomes**

At the end of this session participants will be able to:

1. Explain how as an operator ensure each of the units of FSTP operates smoothly
2. List the things to consider while operating FSTP
3. Explain challenges of FSTP operations and discuss possible solutions for the same

Materials

- Session slides
- Meta cards
- Flip chart paper
- Marker

Preparation

- Review slides and make necessary changes as per the context
- Review slide notes for information on slides

Introduction**5 minutes**

1. Present introduction slide (slide 2) and show a video on operation of FSTP as narrated by FSTP operator.
2. Tell them, in this session we are going to discuss on how we ensure that different unit of FSTP works as per its working objective.
3. Present learning outcomes, training structure and presentation outline of the session (slide 3, 4 and 5).

Content of session**60 minutes**

1. Recall the definition of operation from the earlier session, and few important points which is contextual for Nepal on slide 6.
2. With slide 7 we enter into discussing step by step operation at FSTP.
3. We start with operations at the reception and preliminary treatment step on slide 8.
4. On slide 9, inform that before any operating procedure, operator should wear proper personal protective equipments.
5. On slide 11 operation need of screen chamber is included and before presenting the information ask participants, "What should one check for in the screen chamber?"
6. Take one to two responses from participants and present the information on slide 11.
7. On slides 13, operations at settling tank as solid liquid separation units is discussed.
8. With slide 15 inform about the sludge stabilization and before presenting slide 15 with information, take responses from participants if they are aware of any of the activity. After the responses, present the information and discuss as required.
9. With slide 17, we enter the operations of dewatering units. On slides 17, 18, 19 and 20, operation of unplanted sludge drying bed is discussed with some photos.

10. Take a response from participants and present information on slides 21 and 22, operation of planted sludge drying bed is discussed with photo.
11. With slides 24, we enter into operation at the liquid treatment stage. On slides 24, 25 and 26, operation of anaerobic baffled reactor (with AF; similar) is discussed with some photos.
12. With slide 27, we enter into the operation of the steps of treatment to allow safe end use/disposal. On slide 28 and 29, we present operation of planted gravel filter with a photo respectively. While, on slide 30 and 31 we present operation of co-composting unit.
13. With slides 32, we enter into other day to day operation that is important to be taken care at FSTP. Take responses from participants and present slides 33, 34 and 35 discusses about the sludge storage facility, while slides 36 discusses about stock management at FSTP site.
14. With slide 37 on responsibility of FSTP operator, inform participants that the day to day operation activities are directly linked with the responsibility of the operators.
15. On slide 38, there is quick activity on various tools used in FSTP. The activity is planned for 10 minutes. At first, the participants are divided into 3 to 5 groups, ask each group to list various tools with their purpose, that they have been using for FSTP operations. Provide them 5 minutes to discuss and include their work in the flipchart. After 5 minutes, ask one of the groups to present their work, and ask other groups to add on to their list if they have missed out.
16. Present slides 40, 41, and 42, we explain about different tools that supports overall operation of each unit of FSTP.
17. With slide 43, inform participants that they are going for another group activity. For this participants will be divided into 3 to 4 groups and in their groups they are to discuss and list the challenges that they faced while operating FSTP.

Trainer's note: Make sure to have one participant in a group who could write or just ask groups to discuss briefly. If there are fresh operators without prior experiences, you may ask to think about the possible challenges that they might face while operating FSTP.

18. After the discussion, ask groups to present briefly and inform that you will be summarizing the information with further slides.
19. After the presentation from groups, inform participants that all these challenges discussed/ presented by the groups can be categorized into 3 and will be discussing it. (slide 44)
20. Present slides 45-47 discuss challenges during the FSTP operations. These points are good to know for the operators. While presenting on each category of challenges, make sure to discuss on the possible way-out or solutions for such challenges.
21. On slide 48, there is the video on FSTP of Lamahi municipality. This video summarizes what we learn in this session. (Please refer to the slide notes)

Exercise
20 minutes

22. On slide 49, we undertake group exercise to internalize the learnings of the session.
 - Divide the participants into 5 groups (1. Sludge Reception Area, 2. Settling Tank, 3. Sludge Stabilization, 4. Drying Bed, 5. Anaerobic Baffled Reactor)
 - Each group: (In tabular form)
 - List of operations (need to be done by operator) in each unit

- Tools needed
 - Safety measures required
 - Provide 15minutes for group work and 5 minutes presentation from each group
23. Conclude the session.

Reflections on Lesson

Lesson Plan 6.1: Routine Maintenance**1.5 hrs****Learning Outcomes**

At the end of this session participants will be able to:

1. Explain key maintenance activities to be done at FSTP
2. Explain general safety measures

Materials

- Session slides
- Meta cards
- Flip chart paper
- Marker

Preparation

- Review slides and make necessary changes as per the context
- Review slide notes for information on slides

Introduction**5 minutes**

1. Present introduction slide (slide 2), initiate the session by informing the participants that you are going to tell them a story (just to make it a bit interesting) which goes as:
 “Let me tell you story of two sisters, both had a big gardens, and one day both went to market and got themselves a mango sapling each. Click to show them the photo of sapling being planted. They planted the same in their respective gardens. Years gone by, let's see how their trees are now. Click and show them the photos of two trees; one bearing ripe, juicy mango with beautiful color. But the other one is in the verge of death, barely any leaf let alone a fruit, dried branches, very very sick looking tree. Now ask them what went right and what went wrong here respectively. Try to connect with maintenance as much as possible. After getting some answers, click and show what all the maintenance activities went into the first one – Fertilizer, timely pruning, pests control and guarding against anyone picking mangoes. Click and show what went in the other one – absolutely nothing, it was neglected. Emphasize the importance of maintenance here. And share that in this session we will talk about maintenance activities required in FSTPs.
2. Present learning outcomes, training structure and presentation outline of the session (slide 3, 4 and 5).

Routine Maintenance**55 minutes**

1. On slide 6, inform the participants to recall the “what maintenance is?” as we have already discussed it in one of the previous sessions. Get some answers from the floor. Click and set a context to the session by recalling the definition and explain few other points on maintenance included on slide 6 and 7.
2. With slide 8, we enter into the slides that discusses on the repair and maintenance of few of the key equipments that are commonly used at FSTPs in Nepal.

3. For this inform participants that they are going for group activity. Divide participants into 5 groups and assign a topic to each group and ask to come up with the required activities for assigned topic.
4. Provide 5 minutes time for the activity. As a facilitator make sure there is someone in group who can write the discussed points or ask groups to discuss and present verbally.
5. Slides 9 to 16; discusses on those equipments and before presenting the information ask groups to present their discussion and present the relevant slides:
 - Screens (on slide 9)
 - Gas flow meteres (on slide 10)
 - Electrical fixtures and lights (on slide 11)
 - Valves (on slides 12, 13, 14)
 - Roof of sludge drying beds (on slide 15)
 - Summary (on slide 16)

Trainer's note: Facilitator/ trainer may avoid the points presented by participants and discuss further points only.

6. Conclude the session.
-

Lesson Plan 6.2: Routine Maintenance

Learning Outcomes



At the end of this session participants will be able to:

1. Explain key maintenance activities to be done at FSTP
 2. Explain general safety measures
-

Materials



- Session slides
- Meta cards
- Flip chart paper
- Marker

Preparation



- Review slides and make necessary changes as per the context
 - Review slide notes for information on slides
-

Routine Maintenance

30 minutes

1. Ask participants the question on slide 2 and note the points on white board or newsprint paper and present slides 2 onwards till slide 19, we discuss on the maintenance activities that needs to be done on each units of the FSTP, with details on how it is to be done, when it is to be done and what are the tools need to do them.

Unplanted sludge drying bed (on slides 3, 4, 5)

Planted sludge drying bed (on slide 6, 7, 8)

Anaerobic Baffled Reactor and Anaerobic Filter (on slides 10, 11, 12)

Planted Gravel Filter / Constructed Wetland (on slide 13, 14)

Polishing pond (on slide 15)

Vent pipes (all the units/modules with vent pipes (on slides 16)

General replacing of broken pipes and fixing of damaged structures (on slide 17)

Trainer's note: To make it participatory, facilitator/ trainer may ask questions before presenting and get a response or two.

2. Slide 18, discusses why routine inspection is importance for routine maintenance.
 3. With slide 19, which discusses on general safety measures, conclude the session.
-

Exercise



4. On slide 20, we undertake group exercise to internalize the learnings of the session.
 - Divide the participants into 5 groups (1. Sludge Reception Area, 2. Settling Tank, 3. Sludge Stabilization, 4. Drying Bed, 5. Anaerobic Baffled Reactor) (Preferably same group as in exercise of earlier session; Recommended to also share the handouts to conduct the exercise)

- Each group: (In tabular form)
 - List of maintenance activities that is done in each unit
 - Frequency of conducting those activities
 - Tools needed
 - Provide 30 minutes for group work and 5 minutes presentation from each group
5. Conclude the session.

Reflections on Lesson

Lesson Plan 7: Monitoring**1.5 hrs****Learning Outcomes**

At the end of this session participants will be able to:

1. Understand what and how to monitor for sustainable O&M of FSTP, as an FSTP operator

Materials

- Session slides
- Meta cards
- Flip chart paper
- Marker

Preparation

- Review slides and make necessary changes as per the context
- Review slide notes for information on slides

Introduction**10 minutes**

1. Ask the participants them “What are the things to monitor for long term functionality and sustainability of FSTP”
2. Distribute the metacards and get responses from the participants. Read out few of the cards and stick all of them on the flipchart and display them where they can be seen. Inform them, that we will further learn on monitoring of FSTP in this session.
3. Present learning outcomes, training structure and presentation outline of the session (slide 3, 4 and 5).

Monitoring**30 minutes**

1. On slide 6, ask them the definition of monitoring, collect some of their answer. Click to show the definition. Then ask what is our goal here? Get some answer. Click and share our goal in this particular session is to monitoring of O&M. Again ask them why?, and after getting few of their answers, click to show its because we want to ensure O&M to be continued for the long run and it ensure smooth operation of FSTP.
2. Share few further points on monitoring on slide 7.
3. On slide 8, ask further “What do we want to monitor?” Get their answers and click to show what we are going to discuss in this session: Process monitoring and Performance monitoring. These two types of monitoring will indicate whether FSTP’s O&M is going in right direction
4. With slide 9, we enter into record keeping which is key foundation of process monitoring. Here, explain that the proper record keeping is the first step of monitoring and this will systematize the monitoring activity.
5. Introduce some of the key important records that are to be maintained at the FSTP daily, weekly and yearly.

6. Continuing the presentation on monitoring slide 15, ask participants what are some of the points for 'Daily O&M checklist for treatment modules'. Collect few responses from participants and note it on white board/ newsprint paper and present the table.
7. Similarly, repeat the process of asking participants, noting down their ideas and presenting in slide 16 and 17.
8. On slide 18, discuss on performance monitoring and explain that one of the ways it could be done is by testing the samples. Also, note that the role of the operator is to just support in the planning and timely performance monitoring by sending the samples for lab testing.
9. Slide 19, presenting the pictures of an FSTP, ask where should the sampling starts from or what would be the first sampling point.
10. Collect responses and as they give correct answer or after 2 tries, present point one.
11. Similarly, repeat the process up to point 8 showing different sampling points where sampling should be collected at FSTP.
12. On slide 21, there are some parameters that need to be tested at lab to understand the treatment status. Please mention that, the solid sample and the liquid sample at the end of the treatment unit should ultimately meet the Nepal discharge standard for wastewater. Present slide 22, to show the parameters and discharge standards as stipulated by Government of Nepal. If it is not the case, we need to intervene on the FSTP to make it better performing.
13. Slide 23, shows how the lab test results could be maintained in the record.
14. On slide 25, explain the expected outcome of M&E.

Exercise
50 minutes


15. On slide 25, we undertake group exercise to internalize the learnings of the session.
 - Divide the participants into 5 groups (Preferably same group as in exercise of earlier session; Recommended to also share the handouts to conduct the exercise)
 - Group activity: For any general/their respective FSTPs) plan how will you establish monitoring system (use appropriate formats/checklist as shown in the session)
 - Provide 25 minutes for Group work and allocate 5 minutes for presentation by each of the group
16. Conclude the session.

Reflections on Lesson

Lesson Plan 8: Training Closing**30 minutes****Learning Outcomes**

At the end of this session participants will be able to:

1. Complete post-test
2. Evaluate whether learning expectations were met
3. Complete a final evaluation

Materials

- Training closing PowerPoint
- Evaluation sheets
- Post-test questionnaire
- Certificate
- Camera for group photo

Preparation

- Print the post-test questionnaire or prepare a digital form
- Print the training evaluation sheet or prepare a digital form
- Print and prepare the certificates
- Prepare the learning expectations from the opening session
- Choose a place for a group photo



In some cases, a formal closing ceremony will end the training. Consult with your host beforehand to determine the protocol and the amount of time required. You may need to adjust your agenda accordingly.

Revisiting Expectations**5 minutes**

1. Inform participants that they are going for the closing of the training.
2. Inform participants that before wrapping up the session, they are going to check how much the training have covered their expectations.
3. Either bring the sheet with all the expectations from participants to the front of the hall or move to the station with all the expectations.
4. Revise all expectations collected in the opening of the training.

Post-test**5 minutes**

1. Inform participants that they are now going for a post-test.
2. For this, participants will get a set of questionnaires and participants are to answer the questions.

3. Inform participants that they will get 10 minutes time for the activity and provide the questionnaire to each participant.

Training Evaluation

10 minutes



1. Explain that participants are going to evaluate the training and for this a final evaluation form has been prepared for them. Explain that their feedback will help direct updates to the lessons, and so the more specific information they can provide would be better.
2. Hand out the final evaluation for the participants to complete before they leave the workshop or if you are using a digital platform, provide the link.
3. If you plan to follow up over email, tell participants that a summary of the evaluations will be included in the final workshop report that will be emailed to everyone. Collect evaluations from participants before they leave the room.
4. Inform participants, after the evaluation, that you are going to take 2 representative voices- one of a male and another from a female.
5. Now ask a participant to volunteer to express their experience in the training. After, again ask another participant of next sex to share his/her experience.

Certificate Distribution

5 minutes



1. Explain participants that they are now going for the certificate distribution, and they will be doing the certificate distribution in an informal way.



- Trainer's note:** Before that, if you are going for the formal closing, arrange the set-up for formal closing. And ask for the closing remarks from the designated guests in appropriate sequence and before closing distribute the certificate and ask for a closing remark.
2. For this, inform participants that they are to hand-over the certificate to fellow participants like in a formal setting.
 3. Ask a participant to volunteer at the beginning, once the volunteer is at the front of the hall, announce the name of participant from a random sequence of the certificate.
 4. Now, before handing over the certificate to fellow participant, ask the volunteer to share a good point of the participant along with words of congratulations on the completion of the training and best wishes.
 5. Again, announce the name of other participant and the participant who received the certificate get the chance to share the point of the next participant along with congratulations and wishes.
 6. Repeat the process till all certificates are distributed.



- Trainer's note:** To give the certificate distribution look like formal one, a facilitator may assist on announcing the name from the certificate and bringing the certificate on a tray.

Closing and Group Photo

5 minutes



1. In an informal setting, ask a participant to announce the end of the training like in a formal training.
2. And ask participants to join for a group photo after the training.

Reflections on Lesson

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