

Lesson Plan 5: Maintaining Water Supply Schemes**2 hours****Lesson Description**

In this lesson, participants learn about different types of maintenance and explore the activities necessary to maintain water supply schemes over time. Participants will also create a plan for maintenance activities.

Learning Outcomes

By the end of this session, participants will be able to:



1. Explain different types of maintenance
2. List activities required for maintenance of water supply schemes
3. Create a plan for maintenance activities

Materials

- Flip chart paper
- Markers
- Tape

Preparation

- Read and prepare the lesson plan
- Write the session learning outcomes on flip chart paper
- Create meta cards with the 3 types of maintenance, 'Preventive maintenance', 'Corrective maintenance' and 'Reactive maintenance'

Introduction**5 minutes**

1. Ask participants to remember the earlier example of using a vehicle or machine.
2. Explain to them that, in same way as operating the vehicle or mobile phone, water supply schemes must be maintained as well.
3. Present the learning outcomes or lesson description.

Types of Maintenance**25 minutes**

1. Ask participants: "When we talk about maintenance of water supply schemes, what do we mean?" - *Maintenance is to do with the technical activities, planned or reactive which are needed to keep the system working. Maintenance requires skills, tools and spare parts.*

2. Inform participants that depending up on the time and function of maintenance activities, it can be divided into several types.
3. Ask participants to guess how many types of maintenance are there.
4. Explain to the participant that there are 3 types of maintenance. Again ask participants to guess these types of maintenance. As they guess the types, paste the meta cards with the types of maintenance at the front of the room.
 - a. Preventive maintenance
 - b. Corrective maintenance
 - c. Reactive or emergency maintenance
5. Inform participants that they are going to briefly discuss each of these types of maintenance.
6. For this, participants will be divided into 3 groups and in their groups they are to discuss the type of maintenance they receive, and what they think it means and requires. They can record their ideas on newsprint paper.
7. Also inform that they have 5 minutes for the discussion.
8. Divide participants into 3 groups and provide a meta card with one of the types of maintenance to each. Also provide them with newsprint paper and few markers and inform that their time starts now.
9. After the time, ask groups to present their outcomes and summarize the main points.

Identifying Maintenance Problems

15 minutes



1. Display the **PowerPoint** “Keeping the water flowing: Identifying maintenance problems” and discuss the first two slides.
2. Ask the participants: “What issues of maintenance do you see in this picture?” Have several volunteers offer ideas and discuss as a large group. Discuss both the problem as well as why it is a problem – what is the impact of this on operation and sustainability?
3. Show **Slides 3-4** and discuss the same. What is wrong with the picture, and why are these things issues?
4. Show **Slide 5**. Ask participants: “What is being done differently in this image?” Discuss their ideas as a large group. – *This image has a well-protected source and fenced area.*
5. Tell the participants in the next activity they will explore different maintenance activities that can be done to prevent or respond to these types of issues, and in the practical session they will practice using and applying different maintenance skills.

Planning for maintenance of water supply schemes

35 minutes



1. Inform participants that they are going to explore more on maintenance activities in the same groups.
2. Tell that participants that in their groups, they will discuss each type of maintenance. For each type, they should try to think of four things.
 - a. Different maintenance activities they need to conduct
 - b. How frequently each should be carried out

- c. What are tools or spare parts that they need to have for the maintenance
 - d. Who is the main responsible person for carrying out each
3. Tell the participants that they will get a blank table (See end of lesson plan) they can fill in to help them do this activity, and that they have 10 minutes.
 4. Take 3 pieces of flip chart paper, and post them at the front of the room. Write “Preventative maintenance” on one, “Corrective maintenance” on the second, and “Reactive/Emergency maintenance” on the third.
 5. Divide participants into their groups and give them one of the 3 corresponding tables to help them begin the activity. As participants discuss and note down their ideas, circulate the room and help clarify any confusion.
 6. After the time, ask a group to present their work and note down their main ideas on the first piece of paper at the front. Ask other groups to add more information on the topic and note it down as well.
 7. Repeat the activity for the groups doing the other types of maintenance
 8. When finished, review the 3 completed pieces of paper with the key points for each type of maintenance. Summarize each list and add anything missing from the list of activities in the trainer’s notes.

Creating plan for maintenance activities

20 minutes



1. Ask participants to think about their own water supply schemes.
2. Ask them to think about the points where and what they need to maintain.
3. Give them a minute or two to think about current status of their water supply schemes.
4. Based up on the previous activities exploring the preventive, corrective and reactive maintenance activities, and the current scenario of their water supply schemes, inform participants that they are going to work together to create a plan for maintenance activities.
5. Inform participants for the activity, they are going to work in their same groups and they can refer to the list of activities set earlier for each of the type of maintenance.
6. Also inform participants that they will have 10 to 15 minutes time for the activity. Provide a table format for each group to create plan for maintenance.

Trainer note: Make sure the list of activities for the types of maintenance are easily seen by the groups for the group activity.

Review

10 minutes



1. Inform participants that they are going to do a review activity.
2. For the activity, participants will be divided into new groups of 3. In their groups, participants are to discuss provided questions one at a time. For each question they will have 2 to 3 minutes.

3. Divide participants into groups of 3. And ask following questions one at a time for discussion. You may need to write them on flip chart paper or the board.
 - a. What do they understand by maintenance?
 - b. What do they understand by corrective maintenance with examples
 - c. What do they understand by preventive maintenance with examples
 - d. What do they understand by reactive maintenance with examples

Trainer note: If possible, ask a group or two to share their discussion after each question

Reflections on Lessons

Trainer Notes

Types of maintenance

- a. **Preventive maintenance:** Includes work that is planned and carried out on a regular basis to maintain and keep infrastructure in good condition. It can include such things as network inspection, flushing of pipelines, cleaning and greasing of mechanical parts, and replacement of items with a limited lifespan. It sometimes also includes minor repairs and replacement as dictated by routine examinations.
- b. **Corrective maintenance:** Replacing or repairing something that was done incorrectly or that needs to be changed. Ex. Replacing a large dimension pipe with smaller dimensions to maintain water pressure for distribution.
- c. **Reactive or emergency maintenance:** A reaction to a crisis, system breakage or public complaint. It normally occurs because of failures and the malfunctioning or breakdown of equipment. In order to mitigate reactive and highly expensive maintenance, preventive maintenance should be done regularly.

Common Types of Maintenance Activities

- Check water source periodically and ensure it is protected
- If a pump is used, perform regular checks and adjustments of fuel, oil, filters, etc.
- Regularly replace engine oil and pump oil, if applicable
- Check all valves, tanks, lines, and pipes for leaks and breaks
- Check stand-posts or tap-stands for leaks and breaks
- In case of high leakage, initiate leakage detection
- Repair all leaks and breaks
- Clean concrete aprons and drainage areas
- Test the water for microbiological contamination
- Measure the water output periodically
- Check stocks of fuel, spare parts, and tools
- Keep records of maintenance activities
- Keep records of repairs
- Keep records of fuel, spare parts, and tools
- Flush pipes periodically
- Rehabilitate parts of the system which have broken or stopped functioning
- Develop schedules for maintenance activities

Planning for maintenance of water supply schemes

Preventive Maintenance Activities			
Activities	How frequently/ at what interval?	What tools or spare parts they need?	Who is main responsible for the activity?

Corrective Maintenance Activities			
Activities	How frequently/ at what interval?	What tools or spare parts they need?	Who is main responsible for the activity?

Reactive Maintenance Activities			
Activities	How frequently/ at what interval?	What tools or spare parts they need?	Who is main responsible for the activity?

Creating plan for maintenance activities

Type of maintenance	Activities	How frequently?	Tools or spare parts?	Who is responsible?
Preventive				
Corrective				
Reactive				