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SUSWA
SUSTAINABLE WASH FOR ALL

WATER USERS AND SANITATION COMMITTEE CAPACITY BUILDING PACKAGE

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NIRAS
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FOREWORD

The Government of Nepal has made sustained commitments to ensuring equitable and sustainable access to safe drinking water and sanitation services, in line with the Constitution of Nepal, which recognizes water and sanitation as fundamental rights. The sector is guided by a well-established policy and institutional framework, including the National Water Supply and Sanitation Policy (2014), the Water Supply and Sanitation Act (2022), and the federal structure that assigns clear roles to all three tiers of government. Within this framework, local governments are mandated as the primary water service authorities, while communities—through Water Users' and Sanitation Committees (WUSCs)—remain the backbone of service delivery in rural areas.

Community management has been, and continues to be, the cornerstone of Nepal's rural water supply model. It reflects a long-standing national approach that places responsibility, ownership, and accountability directly in the hands of users. However, as systems age and service expectations evolve towards higher levels of reliability and safety, there is a clear need to strengthen the technical, managerial, and institutional capacities of these community-based structures.

This capacity-building package has been developed by the Department of Water Supply and Sewerage Management (DWSSM) as a practical and structured response to this need. It represents the most comprehensive effort to date to equip communities with the knowledge, tools, and systems required to effectively operate, maintain, and sustain their water supply services. By strengthening competencies across governance, technical management, financial planning, and water safety, the package aims to enhance the overall performance and resilience of rural water systems also facing traditional and new challenges like disaster risks, and climate change.

At the same time, the Government of Nepal has recently piloted an important institutional innovation: the Service Support Center (SSC). This mechanism is designed to complement community management by providing structured technical support, facilitating access to maintenance services, and enabling local governments to more effectively fulfil their legal responsibilities as water service authorities. The SSC model represents a critical step towards bridging existing capacity gaps and ensuring that community-managed systems are not left unsupported when facing more complex operational challenges.

Together, these initiatives reflect a coherent approach to strengthening the entire rural water service delivery chain—from empowered communities to accountable local governments, supported by responsive technical systems. With these tools in place, it is expected that the functionality, reliability, and safety of rural water supply systems will significantly improve.

This effort is also aligned with Nepal's commitment to achieving Sustainable Development Goal 6, particularly the target of ensuring universal and equitable access to safely managed drinking water services. Moving beyond basic access, the focus is now firmly on service quality, continuity, and long-term sustainability.

DWSSM expresses its appreciation to all partners who have contributed to the development of this package. It is expected that this manual will serve as a key reference for practitioners across the country and support the continued strengthening of Nepal's rural water sector for the benefit of all citizens.

Kamal Raj Shrestha
Director General
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Director General

ABBREVIATIONS AND ACRONYMS

Abbreviation / Acronym	Interpretation
AMP	Asset Management Plan
CB	Capacity Building
CO	Community Organisations
CRM	Customer Relations Management
DAO	District Administration Office
DRP	Disaster Response Plan
DWS	Drinking Water Supply
EU	European Union
GEDSI	Gender Equality, Disability and Social Inclusion
GoF	Government of Finland
GoN	Government of Nepal
HH	Household
JMP	Joint Monitoring Programme
JSR	Joint Sector Review
LG	Local Government
MAP	Management Action Plan
M&E	Monitoring and Evaluation
MC	Management Committee
MP	Management Plan
MHM	Menstruation Hygiene Management
NGO	Non-Governmental Organisation
O&M	Operation and Maintenance
PAMS	Public Asset Management System
PIM	Project Implementation Manual
PP	Passport
PPT	PowerPoint Presentation
PWD	People with Disabilities
RVT	Reservoir Tank
SBS	Step by Step
SDG	Sustainable Development Goals
SUSWA	Sustainable WASH for All
SSC	Service Support Centre
ToT	Training of Trainers
UC	Users Committee
VLMW	Village Level Maintenance Worker
WA	Water Act
WASH	Water, Sanitation and Hygiene
WSS	Water Supply System (or Water Supply and Sanitation System, depending on the context)
WSP	Water Safety Plan
WUSC	Water Users and Sanitation Committee

GLOSSARY OF TERMS

The following list defines key terms used throughout the training manual:

WSS: A water supply system/scheme (or water supply and sanitation system, depending on the context).

WSS Asset: A physical water supply system component that has value, enables services to be provided, and has an economic life of greater than 12 months. This is also referred to as a Tangible Capital Asset (TCA) WSS.

WSS Inventory: A detailed list of all WSS assets owned and managed by a WUSC,including information like type, location, age, and condition.

WSS Management: The systematic process of maintaining, repairing, and replacing water supply infrastructure to ensure long-term service and sustainability.

WSS Management Action Plan (MAP): A document outlining the specific actions a WUSC will take to manage its WSS effectively, including maintenance schedules, budgets, and risk mitigation strategies.

WSS Asset Management Plan (AMP): A document that describes how one or more groups of WSSs are to be managed over a period of time in order to deliver an agreed upon standard of service.

WSS Renewal: Capital works including major upgrades, refurbishment, or replacement of existing infrastructure with that of equivalent capacity or performance capability (i.e., bringing the WSS to as near new condition as possible).

Annualized Replacement Value: The average cost for renewing a WSS (or group of WSSs) where cost is divided over the next 25 years, or over the full life expectancy of the WSS.

Asset Category: Also referred to as Asset Classes, these are major infrastructure groupings by system type. Different communities have different types of assets. Typical asset categories include water, sewer, roads and drainage, buildings, recreation, vehicles, and heavy equipment. Other categories could include solid waste, cemetery, airport, protective services, and IT.

Case Study: A detailed example of successful WSS management practices in a similar context, to inspire and guide WUSCs.

Capital Plan: A summary of the major and minor projects that involve restoration of capacity or function (deficiencies), replacement or rehabilitation of existing WSSs at the end of their life (renewal), system expansion (growth), or addressing other changes to the level of service being provided, such as changes in strategic direction corporately, or shifts in regulation or industry standards (levels of service).

Condition: A snapshot in time of a WSS's current state of repair.

Consequence: The magnitude of impact that a possible event or scenario has considering the financial, social and/or environmental effects. This is one of the two criteria used in assessing risk.

Criticality: The relative importance of a WSS in providing community services (i.e. the severity of the consequence from an WSS's failure or loss of function).

Depreciation: The decrease in the value of a WSS over time due to wear and tear.

Facility Condition Index (FCI): A measure of a facility's condition, calculated by dividing the cost requirements (cost to correct current deficiencies) by the current replacement value of the WSS.

Financial Planning: Budgeting for the costs of WSS management, including maintenance, repairs, and replacements.

Full cost recovery: Covering all the costs associated with providing a service, including capital, operation, and maintenance.

Historical Cost: The original cost paid to purchase or construct a WSS. Where this information is unavailable, an estimate can be made using the replacement value and the Consumer Price Index (CPI)/Engineering News Record (ENR).

Infrastructure: Assets that are generally made up of components to form complex systems (e.g. water systems, sewer systems, roads networks, drainage systems, and buildings).

Inventory: A record of key information about individual community-owned WWSs, and the collective systems they make up, including key attributes to support decisionmaking (e.g. age, material, size, condition, etc.).

Karnali Context: The specific challenges and opportunities related to WSS management in Karnali province, due to factors like limited resources, geography, and climate.

Level of Service: The level of service the municipality actually delivers to its customers. This measure reflects the quality or quantity of a given service for a particular WSS Asset category.

Level of Service Commitment: The level of service the municipality aims to deliver to its customers.

Lifecycle: The stages a WSS passes through during its useful life (e.g., construction » operations and maintenance » replacement).

Likelihood: The statistical probability or frequency of a possible event or scenario, typically considered within the lifespan of an WSS. This is one of the two criteria used in assessing risk.

Long Term Financial Plan: A plan to fund a community's long-term (20+ year) capital and operating needs by balancing these costs with available revenue, considering risk, criticality, levels of service and maintenance practices.

Maintenance: Regular upkeep and care of water supply and sanitation systems to prevent problems and ensure efficient operation.

Maintenance Management: A systematic approach to repairing and undertaking preventative work to optimize WSS life expectancies, manage risks and sustain target service levels.

Meta Cards: Cards used to facilitate discussions, reflections, and interactive learning experiences, typically containing prompts, questions, keywords or concepts to encourage participants to think critically and share insights.

Non-Renewal Capital Projects: Projects designed to increase current levels of service, e.g. through upgrading or expanding existing WSSs, conducting studies or assessments, or building new WSSs.

Peer-to-Peer Sharing: Learning from each other's experiences and successes, allowing WUSCs to share their knowledge and challenges with other communities.

Performance Measure: The means used to assess a level of service (e.g. direct measurement, customer survey, complaint, internal review).

Preventive Maintenance: Scheduled maintenance activities undertaken to prevent future failures.

Replacement Cost/Value: The funds required if a WSS had to be renewed or replaced, in today's dollars.

Remaining Life: The number of remaining years in which a WSS is expected to continue to be functional. When calculated simply, this is based on the attributes of an WSS, its expected useful life, and current age. A more accurate estimate would be based on observed WSS condition.

Cost Requirement: Summarizes expenses, which is sometimes referred to as revenue requirements, consisting of capital (renewal and new works), debt servicing, operational and maintenance activities.

Risk: The potential for undesirable outcomes resulting from an incident, event, or occurrence. This is made up of the consequence and likelihood of WSS failure or service disruption.

Risk Assessment: Identifying potential threats to water supply and sanitation systems, evaluating their likelihood and impact, and prioritizing mitigation actions.

Risk Matrix: A tool used to categorize risks based on their likelihood and impact.

Sustainability: The ability to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability Gap: The difference between revenue available over the long term and associated expenses in order to continue providing community services at a defined level. This is often annualized for comparison purposes.

SWOT Analysis: A strategic planning framework used to identify an organization's or project's Strengths, Weaknesses, Opportunities, and Threats.

Tangible Capital: As stated in PS 3150, tangible capital are non-financial components of a WSS having physical substance that:

- are held for use in the production or supply of goods and services, for rental to others, for administrative purposes or for the development, construction, maintenance, or repair of other tangible capital;
- have useful economic lives extending beyond an accounting period;
- are to be used on a continuing basis; and
- are not for sale in the ordinary course of operations.

Vulnerability: The susceptibility of a system to damage from external factors.

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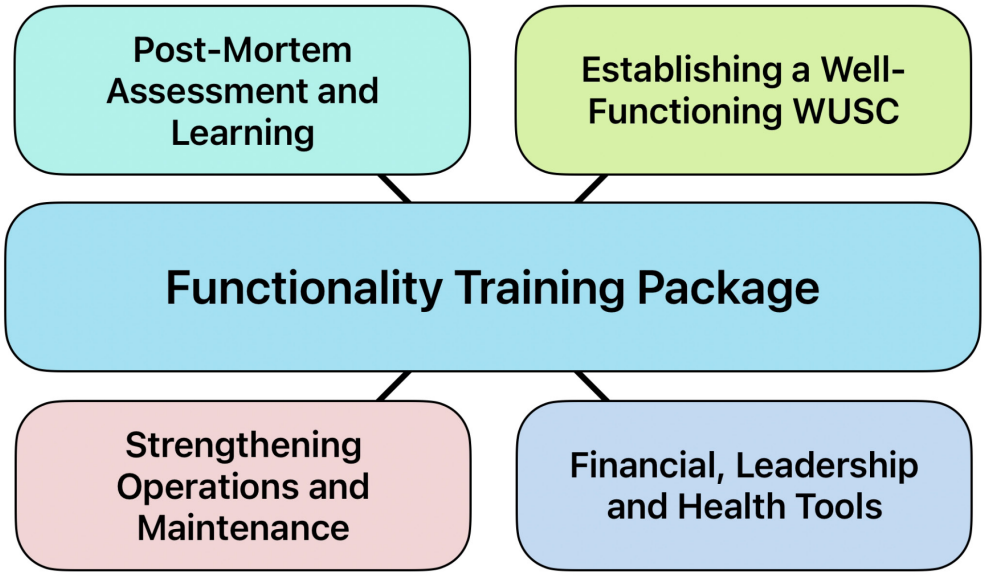

Volume 1: Training Plan

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1 Introduction to the Functionality Package

This functionality training package guides facilitators and trainers in providing Capacity Building (CB) to Water Users and Sanitation Committees (WUSC) to operate and maintain water supply schemes at the community level.

This functionality training package is organised into three volumes:

Functionality Training Manual Volume 1: Training Plan (this Volume)
Functionality Training Manual Volume 2: Training Knowledge
Functionality Training Manual Volume 3: Annexes

The training plan shown in Volume 1 includes practical information on the initial assessment and the training modules. Trainers and facilitators should use it to schedule and prepare their sessions in the field with the WUSCs. All the modules are interrelated and must be implemented in sequence, including a few days of interval between each module. Following the initial diagnostic phase, the training modules are clustered into three outcome areas, each of which focuses on a different aspect of WUSC empowerment:

Initial Assessment:	Understanding the context
Outcome Area 1:	Preparation of a well-functioning WUSC: the governance and rules
Outcome Area 2:	Empower the WUSC with operation and maintenance tools
Outcome Area 3:	Additional tools required by the WUSC: finance, leadership and health.

The training and reference materials in **Volume 2** help facilitators find the necessary information and refresh their knowledge. It is designed to go beyond the “how-to’s” presented in Volume 1 and into the fascinating “why’s”. This Volume unpacks the theoretical foundations of key concepts, giving a deeper understanding of why the tools and techniques presented in Volume 1 truly work; it is intended as a theoretical bootcamp, strengthening knowledge so that these concepts can be applied in real-world scenarios with confidence and nuance. However, the training package is designed for skilled facilitators with pre-existing knowledge of community-based water supply management. These contents are designed to support their own training preparations; the trainer/facilitator is not limited to the given material and may find and include other relevant reference materials to make the training effective for their particular group of trainees. Volume 2 also introduces the Support Service Centre (SSC).

Volume 3 comprises the annexes, templates, and tools referred to in the training manual, along with a few practical facilitation tips and the main reference documents on the policy framework of the WASH sector in Nepal.

2 SUSWA Project Background

This training package, prepared by the Sustainable WASH for All (SUSWA) Project Support Unit (PSU), is designed for delivery to local bodies, government agencies, and NGOs.

The SUSWA Project is founded on a bilateral agreement between the Governments of Nepal and Finland, with financial support from the European Union. Municipalities are the primary implementers of SUSWA and also contribute to project costs.

Working in the geographically challenging and hard-to-reach municipalities of Karnali, SUSWA aims to reconsider the functionality approach to address the root causes of water supply system (WSS) breakdown and service disruption.

In the project area, most water schemes are either poorly functioning or nonfunctional. WUSCs often lack the resources and capacity to address breakdowns - such as skilled maintenance workers, adequate funds, and spare parts. Furthermore, external factors that communities cannot tackle alone, such as weather-related disasters, significantly contribute to service interruptions.

Placing functionality at the centre of the response requires both organisational restructuring and the creation of effective operation and maintenance (O&M) systems, supported by reliable data and supply chains.

In Nepal, WUSCs are the sole entity in charge of maintaining and operating the WSS in rural areas. However, the WUSCs alone cannot cope with all internal and external factors that stretch/overcome their capacities and resources and must be helped by a network of close and remote support.

SUSWA aims to establish efficient, transparent, and accountable governance at the municipal level, ensuring safe, sustainable, and inclusive water services for all. This vision is built on three main pillars:

- Internalising the concept of lifetime services, and costs, of water systems
- Strengthening the capacities of the WUSCs
- Creating a supportive environment that comprises empowered Ward and Palika officers, and a provincial Service Support Centre.

3 Scope of the Manual

3.1 Target Audience

There are two categories of the target participants of this manual:

- WASH Unit staff, to facilitate all of the training modules to build WUSC capacities to operate and maintain WSSs at the community level.
- WUSC members, to use their learnings from the training to ensure sustainable WASH facilities for the users.

WASH Unit facilitators within Local Governments (LG) will be responsible for conducting training on WSS management to WUSC members who have basic knowledge and experience in managing water supply systems, primarily through user-driven repairs and maintenance. These facilitators are assumed to have some understanding of water supply systems but may not have extensive experience in formal WSS management practices. Tips for the facilitators and an overview of the learning cycle are provided in Annex 1.

It is to be noted that while the content within this manual focuses on equipping facilitators with the knowledge and skills to train WUSCs, it is also valuable for WASH Unit personnel to gain practical insights into WSS management challenges faced by WUSCs at the community level. This understanding will further strengthen their capacity to provide effective support and guidance to WUSCs in implementing WSS management practices.

3.2 Training Duration

The total duration of the training program is 13 days, with 2 days for a diagnostic assessment, 10 days focusing on the operation and maintenance of the WSS through 7 modules and a 1-day module on sanitation and hygiene topics. The training duration can be compressed/ expanded according to WUSC existing capacity and needs. Several interval days are recommended between each of the 8 modules.

3.3 Training Methodology

This training is based on a hands-on methodology. Trainers should not tell WUSC what to do but should facilitate the preparation of key diagnostic and maintenance plans including inventory lists, repair and maintenance schedules, action plans, etc. These are to be completed DURING the training sessions. Anything not completed should be prepared by the participants after that session and CHECKED by trainers before starting the next session.

This training module can be customized to fit the specific needs, preferences and context of the training program. The training facilitator will adapt it after a thorough study of the context

and along with small research on the following:

- Level of existing knowledge and experience of the targeted participants, specifically WUSC members, regarding WSS management.
- Context of the project area, existing support by the local government and other development partners.
- Integrate interactive activities, case studies, and role-playing into the training to enhance learning and engagement for practical learning purposes.
- Illustrations and specific examples related to the context where training is provided.

3.4 Training Evaluation

Evaluations on the effectiveness of the training should be carried out by:

- Pre- and post-training assessments to measure knowledge gain and skill development, prepared by the trainer; a sample pre-test questionnaire is provided in Annex 12.
- Observation of practical exercises and role-playing activities.
- Feedback surveys from participants and facilitators.

One-time training is often not sufficient – the trainers should ascertain whether refresher sessions and/or mentoring would be beneficial to the trainees on a case-bycase basis, and help enable this if practical.

4 Structure of the Manual

There are four parts of this training manual, with Parts I and II presented in Chapters 6 and 7 of this Volume, and Parts III and IV presented in Volume 2:

PART I: Summary of Training Packages: provides a preview into what the session holds, setting the stage for exploration and discovery.

PART II: Training Plans and Modules: provides an in-depth roadmap for delivering impactful training sessions, delving deeper than simple agendas, and providing a nuanced understanding of what needs to be covered, how to engage participants, and how to ensure the learning sticks.

PART III: Knowledge Foundations: Detailed Theoretical Explanations: unpacks the theoretical foundations of key concepts, providing a deeper understanding of why the tools and techniques used truly work. It acts as a theoretical bootcamp, strengthening the trainers' knowledge base and equipping them to apply these concepts in real-world scenarios with confidence and expression.

Part IV: Empowering WSS Management with the SSC: showcases the transformative resources and expertise the SSC offers WASH units and WUSCs. By harnessing the SSC's support, participants will significantly enhance their WSS management capabilities.

5 Training Reference Material

To support the learning journey and equip the trainer/participants with essential knowledge and tools, this training manual provides or suggests a variety of resources to compliment the contents of this manual:

A) Provided in the Manual:

Facilitator Guide: Practical tips and techniques for effectively delivering the training, including icebreakers, group discussions, and managing challenging situations.

Reading Materials, Reference Materials and Guiding Notes for each module.

Resource Package: A curated collection of relevant articles, websites, tools, and templates for ongoing reference.

B) Prepared by the Trainers/Facilitators to facilitate the training:

Engaging Activities and Visuals:

- Presentations: Clear and engaging slides with key takeaways.
- Interactive Exercises: Role-playing simulations, group projects, and case study analysis to apply theoretical knowledge.
- Flipcharts and Whiteboards: Encourage active participation and brainstorming.
- Handouts and Checklists: Summarize key points and provide practical tools.
- Brown Papers and Meta Cards: Interactive brainstorming tools for visualizing and discussing ideas.

C) Prepared by the Trainee Participants to facilitate the training:

Documents and Records:

- Documents providing baseline info such as population, WSS condition status, repair history, water quality testing results, tariff status, etc., and answers to any questions asked by the facilitator prior to each module, such that they are ready to work on real data in the training exercises.

The major reference materials for the WUSC capacity building are as below; a comprehensive library of documents is provided in Annex 2:

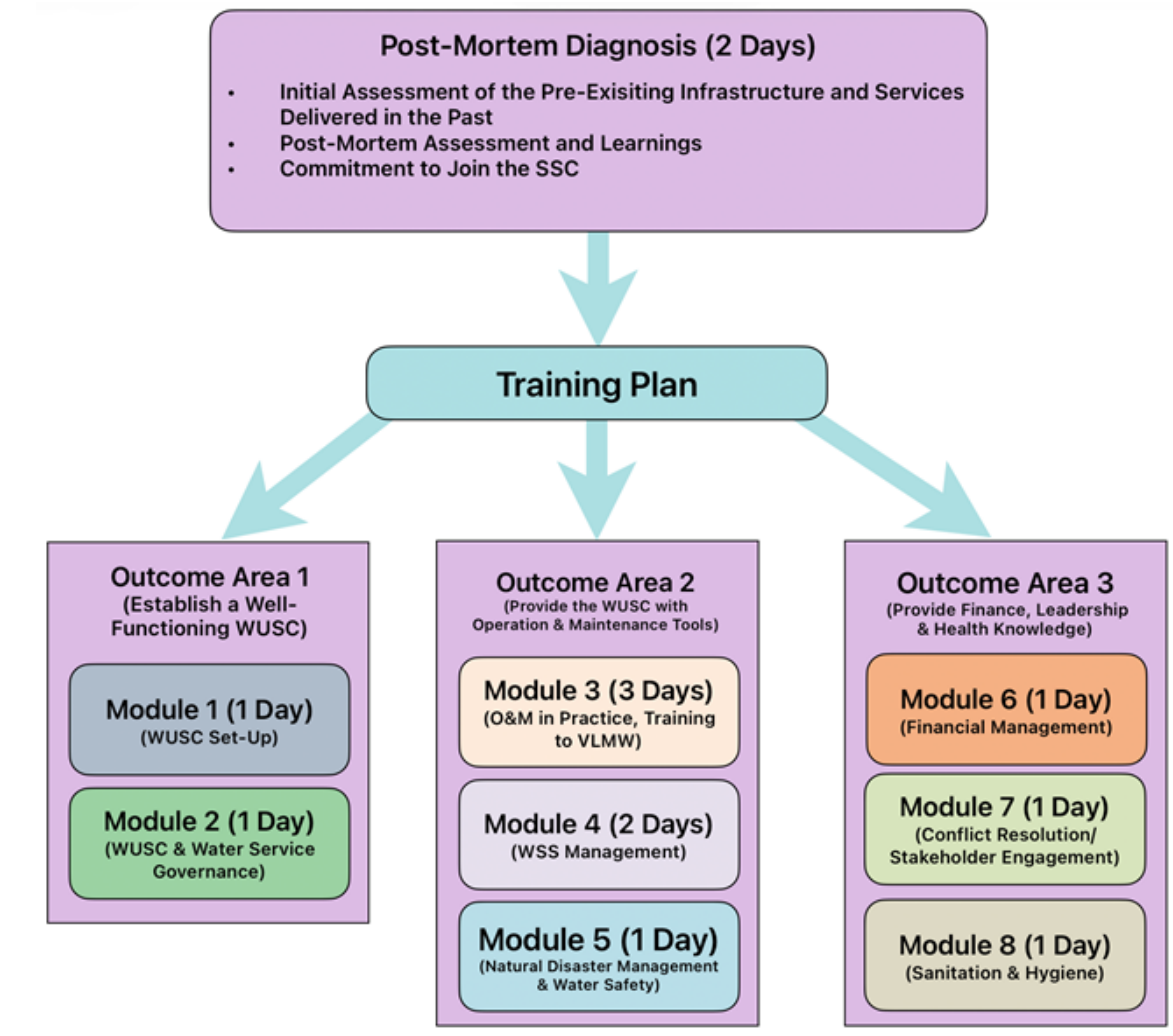
1. WASH Policy 2080, Ministry of Water Supply, Department of Water Supply and Sewerage Management, GoN
2. Water Quality Mandate, Ministry of Water Supply, Department of Water Supply and Sewerage Management, GoN

3. JSR Report 2023, Ministry of Water Supply, Department of Water Supply and Sewerage Management, GoN
4. National Sanitation Plan, GoN
5. Water Users Service Support Centre (SSC) Guidelines, WSSM
6. Project Implementation Manual, SUSWA
7. Step-by-step Manual, SUSWA
8. O&M Manual, SUSWA
9. VMW Manual, RVWRMP
10. UC Manual, RVWRMP
11. WASH Unit/Board Concept, RVWRMP

The reference materials are not limited to those indicated in Volumes 1, 2 and the Annexes of this package. The trainer/facilitators are encouraged to explore further reading materials from different sources and make their presentations accordingly. Experiences of the modality and methods from their previous training facilitations might be an additional asset to make their training effective.

6 Summary of Training Modules

The training program comprises a Diagnostic Phase/Post-Mortem Assessment and eight subsequent modules divided into three main outcome areas, as indicated in the following schematic:



The proposed contents/agendas and expected outputs from each of these modules are described in the following chapters. However, the exact contents/agendas of each of the modules should be dependent on the outcome of the diagnostic phase.

Facilitators are encouraged to adapt sessions to local contexts, in particular the evaluated experience/knowledge of the trainees, while maintaining the sequence of modules.

The facilitators' training plans should be interactive, reflective, and inclusive. GEDSI principles, real-life examples, and locally available resources should guide all exercises.

6.1 WUSC Initial Diagnostic Phase: Post-Mortem Analysis

Module / Duration	Contents / Agendas	Outputs
Participatory discussion and assessment (1 day)	Analysis of the water service provided in the community in previous years and in particular the lack of operation and maintenance on the existing infrastructure that has led to the current situation; what went well, what went wrong, and what can be done better in the future.	Learnings from existing assets, knowledge, and practices are gathered and utilized to customize the training based on the specific characteristics of the community.
Formal commitment and MoU signature (1 day)	Summary of the practices and community assets, and agreement on improving management in exchange for the new investment; signature of a formal commitment with the LG to join the SSC system and respect its rules.	Make a commitment to enhance management in the future. Signature of the SSC MoU with the LG.

6.2 Outcome Area 1: Preparation of a Well-Functioning UC

Module / Duration	Contents / Agendas	Outputs
Module 1: Sustainable WUSC set up (1 Day)	WUSC for sustainability and WUSC development process; roles and responsibilities of WUSC members; meetings and plans.	Improved knowledge of participants (measured by preand post-training test); annual meeting planned and dated; functionality status update for LG as per LG needs completed; regulations of VMW; wages contract.
Module 2: WUSC and water service governance (1 Day	Introduction to good governance in WUSC; role of LG, WASH Unit and SSC in the governance of WSS; participation, transparency and GEDSI.	Improved knowledge of participants (measured by preand post-training test); WUSC registration completed.

6.3 Outcome Area 2: WSS Operations and Maintenance

Module / Duration	Contents / Agendas	Outputs
Module 3: O&M in practice; Practical training to VLMW (3 days)	Technical capacity to maintain and operate water supply systems. Planning of maintenance works.	Participant VLMW trained (measured by post-training tests).
Module 4: WSS Management (2 Days)	Create and maintain accurate records of all components of WUSC schemes. Identify threats to prioritize maintenance.	Develop and implement WSS MAPs.
Module 5: Natural disaster management and water safety (1 day)	Climate resilience and disaster risk management at WUSC level; Climate Resilient WSP+++ steps; WSP templates; revision and update of existing water safety maintenance and integral improvement plans; revision and update of existing water safety disaster response plans.	Revised and updated WSPs disaster response and incremental improvement plans.

6.4 Outcome Area 3: Additional Tools: Finance, Leadership and Health

Module / Duration	Contents / Agendas	Outputs
Module 6: Financial Management (1 Day)	Water Fee setting, collection and payment; Record keeping; Roles and responsibilities for financial management; Financial planning; Cost-sharing according to SSC rules; Petty cash management, cash storage and protection; Auditing and reporting.	Results of WUSC group exercise for water fee management and bookkeeping.
Module 7: Conflict Resolution and Stakeholder's Engagement (1 day)	Potential Conflicts and their effects; Identifying conflicts in WASH and WUSCs; Influence and position analysis; Stakeholder conflict risk analysis; Conflict mitigation & resolution strategies; Communication, outreach, and public engagement.	Improved knowledge of participants (measured by pre- and post-training test).

Module / Duration	Contents / Agendas	Outputs
Module 8: Water quality, Sanitation and Hygiene Training (1 day)	Concept of Water Quality, how to measure and how to ensure it. Practical water quality field tests; practical residual chlorine tests; replacement of chlorine cartridge; water quality standards. Sanitation, Hygiene and Total Sanitation: Indicators of Total Sanitation; tools for the improvement of Total Sanitation indicators; Methods of changing behaviour; Role of WUSC and other actors; Total Sanitation monitoring; WUSC plan of action.	Improved Capacity of WUSC on Water quality test, Chlorine management and residual chlorine measurement, Total Sanitation and WUSC plan of action.

7 Detailed Training Plan and Modules

Comprehensive Session Outlines

Comprehensive Session Outlines are in-depth roadmaps for delivering impactful training sessions. They delve deeper than simple agendas, providing a nuanced understanding of what needs to be covered, how to engage participants, and how to ensure learning sticks. The outlines provided are intended as blueprints for successful learning experiences, and detail session objectives, flow, activities, and helpful tips.

Each element is carefully chosen to:

- Maximize learning: By outlining key concepts, discussions, and activities, they ensure participants grasp crucial information and actively engage with the material.
- Maintain focus: The structured flow keeps the session on track, preventing digressions and ensuring all essential points are addressed.
- Accommodate different learning styles: Diverse activities like hands-on exercises, discussions, and visual aids cater to various learners, maximizing knowledge retention.
- Facilitate effective delivery: With a clear guide, facilitators can confidently navigate the session, adapt to unforeseen situations, and ensure a smooth and engaging experience for participants.
- Boost confidence and preparation: For facilitators, having a comprehensive outline reduces pre-session jitters and allows them to focus on facilitating interactions and enriching the learning experience.

Comprehensive Session Outlines are critical for maximizing the potential of the training program. They transform sessions from informative talks to immersive learning journeys, empowering participants to grasp complex concepts, develop practical skills, and ultimately, make a positive impact in their communities.

7.1 Post-Mortem Assessment and Learnings (1 or 2 Days)

Objective: The overall objective of the Post-Mortem assessment is to examine the community's management of the existing water. This phase comprises 1 or 2 days of participatory and critical review of the past community management and the commitment statement to join the SSC, adhere to its rules, and improve management practices.

Starting Pre-Conditions: Before the first day, when the facilitator or the WASH Unit members book the community meeting, they should share with the community the following simple pre-meeting questions:

- What are three things that went well during this (past) project?
- What are three things that did not go well during this (past) project?
- Do you have any suggestions on how we can improve for the next project?

The facilitator will recommend high participation (> 75% of the HH) in the anticipated community meeting and, in particular, will highlight the importance of participating for anyone who was involved at any step of the previous management, either in the old user's committee, as a maintenance worker, or simply a user.

The facilitator should insist that participants gather all the relevant information and past documents, such as the community books, registers, reports, plans and tools used by the previous committee. Those documents and tools should be available on the day of the Post-Mortem and carefully checked during the discussion.

Only when the pre-conditions are filled and the pre-meeting questions answered can the Post-Mortem assessment occur.

Post-Mortem Specific Objectives	Outputs
- To analyse the water service managed in the community in previous years and, in particular, the operation and maintenance of the existing infrastructure: what went well, what went wrong, and what can be done better in the future. - To identify existing resources (technical, financial) and human capacities that can be used in the new management. - To double-check the information gathered with the existing documents. - To confirm the commitment to improving community management and to join the SSC to prevent a recurrence of such failure.	- Learnings from past good and bad practices. - Analysis of existing assets, knowledge, and practices. - Customization of the training based on the specific characteristics of the community. - Public commitment to enhance management in the future and to join the SSC.

Material Needed: Existing documents gathered by the community, old maintenance tools, bank statements and any evidence/records of the past management.

Table of Sessions for the Post-Mortem Assessment:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening session: Objective and agenda of the meeting	Facilitator/Keynote Speaker	**Q&A:** Open floor for questions and clarifications.
30 Minutes	Community and SSC/ project introduction	Community speakers SSC brochure and informative tools	Self-introduction, presentation

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
90 Minutes	Identifying the Challenges and Failures What went well: telling good stories about the previous water system and its management: breakdown fixed, savings collected, water running, etc. What went wrong: sharing bad practices and failures about the previous water system and its management: breakdown not fixed, illegal connections, savings missing, lack of transparency and information, water not running, etc.	Group activity, discussions and presentations. Try to avoid using personal pronouns such as I, You , He, or They. Instead, encourage participants to focus on the facts. If a conflict arises that hinders a healthy discussion, pause and ask the community to address it among themselves. Afterwards, ask for a summary sentence to capture the facts, have participants share this "final sentence" with the group, and then resume the discussion.	**Group Activity:** Break into smaller groups (e.g. former members, former users, maintenance workers…) to discuss and list the challenges faced. **Group Presentations:** Each group presents their findings. **Facilitated Discussion:** Synthesize key challenges and failures. Recap and double-check any findings and facts mentioned; summarize them again until everyone agrees on it.
90 Minutes	Root Cause Analysis	SWOT analysis, fishbone diagram, Pareto chart, or root cause analysis, to analyse the data and find out the strengths, weaknesses, opportunities, and threats and the risk for that happening again	**Workshop Exercise:** Use tools like the Fishbone Diagram or 5 Whys to identify root causes of failures. **Group Discussion:** Share insights and validate findings. **Prioritization:** Evaluate and prioritize findings
60 Minutes	Building Community Engagement and Accountability		**Interactive Session:** Discuss ways to enhance community engagement and accountability. **Case Studies:** Review successful models from other communities.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Action points to improve the management, and commitment to join the SSC	Facilitator/Keynote Speaker Shared commitment, repeated by all key stakeholders (Ward Chair, LG representatives, community leaders, etc) one by one and finally signed on the meeting minutes or other paper suggested by the participants. Group picture of all participants holding the signed paper.	**Summary of Key Action Points:** Recap the day's recommendations and decisions on how to improve community management. **Recap of the SSC:** sharing of some key features of the SSC relevant to the day's action points. **Shared commitment:** signature of clear and engaging statements by all key stakeholders
30 Minutes	Closing Session	Facilitator/Keynote Speaker	**Summary of Key Takeaways:** Recap the day's discussions and outcomes. **Feedback and Evaluation:** Collect participant feedback on the workshop. **Closing Remarks:** Thank participants and outline next steps.

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions. A 2nd day is also available.

Based on the diagnostic phase's outputs, the facilitator may remove from the training plan any modules/contents from the training plan that have already been delivered by other projects or agencies; this functionality training builds on the EXISTING situation and capacities, improves but does not overlap, and corrects but does not replace. The facilitator must customize the training to the conditions of the WUSC and governance capacities to avoid too much duplication. The training should focus only on the capacity gap and refresh any content that needs to be repeated.

During the training, the role of local leaders and resources who emerged from the diagnostics to have played a positive role in the past committee must be valorised; capacities acquired in the past should be confirmed and integrated into the new structure. In particular, trained maintenance workers should be carefully interviewed and replaced only in case of a proven lack of commitment in the past.

However, periodic elections must always refresh roles and functions, whether to confirm the same leadership or to appoint a new one.

After training, the WUSC typically starts recording administrative and governance records in the WSS book; a sample of the scheme book used in SUSWA is available in Annex 7.

7.2 Module 1: WUSC Setup (1 Day)

Objective: The overall objective of this module is to establish WUSC for the smooth operation and sustainability of the WSS scheme.

Specific Objectives	Outputs
- To train the WUSC and WASH unit staff to set-up the WUSC in a sustainable manner. - To develop capacity on WUSC formation, role and responsibility and WUSC meeting. - To train groups able to conduct WUCS meetings and make decisions	- Improved knowledge of participants (measured by pre- and post-training test) - annual meeting planned and dated - functionality status update for LG, as per LG needs - regulations of VMW: wages, contract.

Material Needed: PPT Presentations, stationery, WUSC Manual, PIM, reading materials as needed, etc.

Table of Sessions for Module 1:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening session; Objective and Purpose of the training	Presentation on objective, Meta card	Self-introduction, presentation
30 Minutes	Pre-training test	Test format	Individual test
90 Minutes	WUSC for sustainability; Functionality status update for LG as per LG needs	PPT Presentation, Examples, Manual, participants to do registration and LG functionality update as per needs	Presentation, Discussion; conducting functionality status update for LG
60 Minutes	Role and responsibility of WUSC members and VLMW; Regulations of VMW; Wages, contract; GEDSI considerations	PPT Presentation, Manual	Exercise / compilation / presentation
60 minutes	WUSC meeting and plan: planning date and agenda for next annual meeting	PPT Presentation, Manual, Plan format	Group work and discussion; presentation
30 minutes	Post-training test	Test	Individual test
30 minutes	Closing	Speech	Speech

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

7.3 Module 2: WUSC and Water Service Governance (1 Day)

Objective: The overall objective of the module is to establish good governance in WUSC for sustainability of the WSS schemes.

Specific Objectives	Outputs
- To enhance capacity of WASH unit staff / trainer to conduct effective training in the field - To train WUSC on transparency, accountability, participation and inclusion in the overall scheme operation and WUSC management.	- Improved knowledge of participants (measured by pre- and post-training test) - WUSC registration completed

Material Needed: PPT Presentations, Stationery, WUSC Manual, PIM, reading materials as needed, etc.

Table of Sessions for Module 2:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening session/ objectives	Presentation on objective, Meta card	Self-introduction, presentation
30 Minutes	Pre-training test	Test template	Individual test
30 Minutes	Introduction to good governance	PPT Presentation	Presentation, Discussion
60 Minutes	Good governance in WUSC; Completing registration at LG office/ SSC	PPT Presentation, Examples, Manual	Presentation, Discussion; Completing registration at LG office/SSC.
90 Minutes	Role of LG, WASH Unit and SSC in the governance of WSS (as per LGOA-2074)	PPT Presentation, Manual	Exercise / compilation / presentation
60 minutes	Participation, transparency and GEDSI	PPT Presentation, Manual, Plan format	Group discussion presentation
30 minutes	Post-training test	Individual test	Individual test
30 minutes	Training evaluation and closing	Training evaluation checklist	Individual exercise, scoring

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

7.4 Module 3: Operation & Maintenance in Practice, Practical Training to VLMW (3 Days)

Objective: The overall objective of this module is to develop the technical capacity of WUSC to repair and maintain the WSS structures for a long-time benefit from the scheme, through classroom presentations and demonstrations and field practice.

Specific Objectives	Outputs
- To establish a local technical capacity VLMW in the WSS Scheme for minor repair and maintenance of the scheme structures for its functionality and sustainability - To enhance the capacity of WASH facilitators/ trainers to conduct technical training to the VLMW.	- Improved capacity of VLMWs measured through pre and post training tests

Material Needed: PPT Presentations, tools and WSS materials for practical exercise, WUSC Manual, PIM, tools and spare parts for practical exercise, reading materials as needed, etc.

Table of Sessions for Module 3:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
Day 1	Theoretical Day: Introduction of the sustainable measures		
30 Minutes	Opening / objective	Presentation on objective, Meta card	Self-introduction, presentation
60 Minutes	Masonry works of water supply schemes	PPT Presentation, VMW manual training manual	Presentation, Discussion
60 Minutes	Pipe threading, cutting, jointing and laying	PPT Presentation, VMW manual training manual	Presentation, Discussion
30 Minutes	Introduction and installation of pipe fittings Identification and implementation of water schemes	PPT Presentation, VMW manual training manual	Presentation, Discussion, Conclusion
90 Minutes	Water quality, source protection and mitigation of water source depletion	PPT Presentation, VMW manual training manual	Presentation, Discussion, Conclusion
60 Minutes	Identifying and implementation of leakage Adjusting water taps, valves and RVT outlets	PPT Presentation, VMW manual training manual	Presentation, Discussion, Conclusion

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Management and estimation of annual repair works Identify quality of construction materials and quality control	PPT Presentation, VMW manual training manual	Presentation, Discussion, Conclusion
30 Minutes	Day evaluation and closing		Presentation, Discussion
Day 2	Practical exercise on all sections of the WSS		
30 Minutes	Previous day evaluation and field preparation		Presentation, Discussion
90 Minutes	Practical exercise on Masonry works	VMW manual, Tools and spare parts	Practical exercise in the field
60 Minutes	Practical session on Pipe threading, cutting, jointing, laying	VMW manual, Tools and spare parts	Presentation, Discussion
60 Minutes	Practical exercise on pipe fittings	VMW manual, Tools and spare parts	Presentation, Discussion
60 Minutes	Source protection and mitigation of water source depletion	VMW manual, Tools and spare parts	Practical exercise in the field
60 Minutes	Identifying and implementation of water leakage Adjusting water taps; Managing valves and RVT outlets	VMW manual, Tools and spare parts	Practical exercise in the field
30 Minutes	Day evaluation and closing		
Day 3	Practical exercise and planning day		
90 Minutes	Identifying and implementation of water leakage Adjusting water taps; Managing valves and RVT outlets	VMW manual, Tools and spare parts	Practical exercise in the field
60 Minutes	Planning for annual repair works Identification of quality materials and quality control	VMW manual, Tools and spare parts	Practical exercise in the field

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
60 Minutes	Monitoring of all structures of the Scheme	VMW manual, monitoring tool	Practical exercise in the field
60 Minutes	Discussion and learning sharing of the field exercise		Open / plenary discussion
60 Minutes	Develop operation and maintenance plan	Planning format	Group discussion and presentation
30 Minutes	Training Evaluation	Evaluation sheets	Individual exercise
30 Minutes	Closing of the training		

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

A Maintenance Workers manual (prepared by RV-WRMP) is available in Annex 8.

7.5 Module 4: WSS Management (2 Days)

This is the core and the most important part of the training; the facilitator should ensure a large attendance from uc members and proper attention/time dedication. This content is complex and requires enough learning time and repetitions.

Objective: Enhance the capacity of WUSCs and relevant WASH Unit staff to systematically manage and maintain WSS effectively for long-term scheme sustainability.

Specific Objectives	Outputs
- Equip WUSCs with knowledge and skills for WSS inventory, assessment, and maintenance planning. - Build WASH Unit staff capacity to train and support WUSCs on WSS management. - Improve understanding of proper operation and maintenance procedures for WSS.	- Enhanced WUSC understanding of WSS management principles and their impact on water supply and sanitation services. - Improved WUSC capacity to create and maintain accurate inventories. - Ability to conduct risk assessments and prioritise maintenance actions for optimal performance. - Development of robust operation and maintenance systems for efficient resource allocation and long-term sustainability. - Enhanced collaboration and knowledge sharing among WUSCs through peer-to-peer learning and case study analysis. - Completion of draft MAPs outlining specific actions for effective WSS management within each WUSC.

Material Needed: Presentations (PPT slides or other visuals), Stationery (notebooks, pens, markers), Tools (templates and resources)

Table of Sessions for Module 4:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
Day 1			
SESSION 1 75 Minutes	Introduction to WSS Management	Presentation on objective, Meta card	Interactive activity: Identifying water supply components in your community. Group discussion: "What are your WUSC's biggest challenges in managing WSS?"

SESSION 1 Objectives:

- Understand the importance of WSS management for sustainable water and sanitation services.
- Identify the key components of WSS management (inventory, risk assessment, maintenance, financial planning) and their impact on communities.
- Recognize the unique challenges and opportunities in your Karnali context (limited resources, geography, climate).
- Develop a foundational understanding of WSS management terminology and practices.

Session Flow:

1. Opening and Context Setting (10 minutes):
- Welcome and Introduction: Warmly greet participants and introduce yourself. Briefly explain the purpose of the training and session objectives.
- Understanding Our Water WSSs: Initiate a discussion by asking participants to identify and name various water supply and sanitation WSSs in their communities.
- The Need for WSS Management: Explore the challenges faced when water WSSs are not managed effectively, highlighting issues like water scarcity, service disruptions, and health risks.

2. Unveiling the Benefits (15 minutes):
- Building Sustainability: Explain how effective WSS management leads to longer-lasting infrastructure, reduced resource needs, and improved service delivery.
- Investing in Community Health: Emphasize the link between proper WSS management and improved water quality, reduced sanitation-related diseases, and overall healthier communities.
- Empowering WUSCs: Highlight how strong WSS management practices enable WUSCs to operate more efficiently, make informed decisions, and access funding opportunities.

3. Demystifying the Components (20 minutes):
- The Essential Pillars: Introduce the key components of WSS management: inventory, risk assessment, maintenance, and financial planning.
- Inventorying WSSs: Explain the importance of creating and maintaining accurate WSS inventories, detailing key information like location, type, age, and condition.
- Identifying Risks and Prioritizing Actions: Briefly introduce different types of risks and their impact on water systems, focusing on risks relevant to Karnali, like natural disasters and limited resources.
- Maintaining for Smooth Operation: Discuss preventive, corrective, and emergency maintenance, emphasizing the importance of regular maintenance schedules.
- Financial Planning for Future Needs: Explain the need for budgeting and resource allocation for WSS management activities.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
4. Unique Challenges and Local Solutions (20 minutes): - Mapping the Karnali Landscape: Facilitate a group discussion to identify the specific challenges and opportunities posed by the Karnali context for WSS management. Consider aspects like remote locations, geographical constraints, resource limitations, and local practices. - Sharing Community Wisdom: Encourage participants to share their own experiences and successful strategies for managing water WSSs in their communities. - Building on Strengths: Discuss how existing local knowledge and practices can be integrated with WSS management principles for effective implementation. 5. Looking Ahead (10 minutes): - Next Steps and Future Sessions: Briefly preview the upcoming sessions in the training program, providing a roadmap for building upon the foundational knowledge gained. - Open Forum and Q&A: Allocate time for questions and address any specific concerns or points of interest raised by participants. - Closing and Encouragement: Thank participants for their active participation and express enthusiasm for their journey towards improved WSS management in their communities. **Additional Tips:** Interactive Activities: Use visuals, group discussions, and hands-on activities to keep participants engaged and actively learning. Local Case Studies: If available, share success stories of water WSS management from within Karnali or similar contexts to inspire participants. Culturally Sensitive Approach: Be mindful of local customs and languages, and ensure the session is accessible and inclusive for all participants. Building Trust and Rapport: Foster a safe and open environment where participants feel comfortable sharing their experiences and asking questions.			
SESSION 2 90 Minutes	Understanding Inventories and register	PPT Presentation	Group discussion: - Identifying potential challenges in conducting inventories in Karnali (e.g., remote locations, limited resources, recordkeeping practices). - Brainstorming practical solutions to overcome these challenges.
SESSION 2 Objectives: - Define WSS inventories and WSS registers, explaining their crucial role in WSS management. - Identify the essential information to be collected and recorded for each water and sanitation WSS (Location, type, age, condition, purchase/ construction date, warranty information, maintenance history etc.). - Explore different methods and tools for creating and maintaining WSS inventories, considering the Karnali context. - Understand the benefits of well-managed WSS inventories for decision-making, maintenance planning, and resource allocation.			

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology

Session Flow:

1. Setting the Foundation (10 minutes):
- Welcome participants and briefly recap key concepts from Session 1, emphasizing the importance of WSS management for sustainable water services.
- Introduce the concepts of WSS inventories and WSS registers, explaining their purpose and value in WSS management.

2. Unveiling the Treasure Map (20 minutes):
- Explain the key elements of a WSS inventory, including.
    - Unique identification numbers
    - Location
    - Type of WSS
    - Age
    - Condition
    - Installation date
    - Warranty information
    - Maintenance history
- Discuss different methods for collecting inventory data, such as physical inspection, record review, and community surveys.
- Highlight the importance of tailoring data collection methods to the specific context and resources in Karnali.

3. Bringing Order to the Chaos (25 minutes):
- Introduce the concept of a WSS register as a structured database for storing and managing inventory data.
- Demonstrate different tools for creating and maintaining WSS registers, such as spreadsheets, databases, or mobile apps.
- Discuss considerations for choosing appropriate tools based on digital literacy, resource availability, and data security in Karnali.

4. Insights for Action (20 minutes):
- Explain how WSS inventories and WSS registers support various WSS management activities, including:
    - Risk assessment and prioritization
    - Maintenance planning and scheduling
    - Budgeting and resource allocation
    - Performance monitoring and evaluation
- Share examples of how these tools have been used effectively in other water and sanitation projects.

5. Building the Habit (10 minutes):
- Emphasize the importance of regular updating and maintaining WSS inventories for their ongoing effectiveness.
- Provide tips for establishing routines and assigning responsibilities for inventory management within WUSCs.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology

6. Closing and Looking Ahead (5 minutes):
- Summarize key takeaways from the session.
- Encourage participants to start thinking about the WSSs they manage and the information needed for their inventories.
- Plan on the upcoming session on practicing on WSS register.

Additional Tips:
Interactive Inventory Game: Divide participants into small groups and give them a set of objects representing water and sanitation WSSs. Challenge them to create an inventory, assigning identifying numbers, locations, types, and basic condition assessments. This playful activity reinforces key concepts and allows for peer learning.
Mapping Activity: Provide participants with a map of their communities and ask them to mark the locations of different water and sanitation WSSs. This visual exercise helps them understand the importance of spatial data in WSS management.
Real-World Examples: Share case studies or local stories of communities successfully managing their WSSs through well-maintained inventories. This provides relatable context and showcases the real-world impact of these practices.
Address common challenges: Acknowledge and discuss potential challenges WUSCs might face in maintaining inventories, such as lack of resources, human resources, or technical skills. Brainstorm solutions and encourage participants to share their experiences.

SESSION 3 80 Minutes	Practice creating an inventory register	PPT Presentation, Manual, chart papers, brown papers, meta cards	Hands-on exercise: Participant's practice creating an inventory using the provided template or tool.

SESSION 3 Objectives:
- Understand the purpose and importance of WSS inventory registers in WSS management.
- Identify essential information to be recorded for each water and sanitation WSS.
- Gain hands-on experience in creating and using a practical WSS inventory template.
- Apply WSS inventory knowledge to a real-world water supply or sanitation system.

Session Flow:
1. Setting the Context (10 minutes):
- Welcome and Recap: Greet participants and briefly recap the key takeaways from the previous sessions, emphasizing the role of WSS inventories in WSS management.
- The Value of Inventory: Highlight the importance of WSS inventories for:
    - Informed decision-making
    - Effective maintenance planning
    - Tracking WSS conditions
    - Resource prioritization
    - Financial planning

2. Essential Information (15 minutes):
- Data for Action: Explain the key information that should be recorded in a WSS inventory, including:
    - Unique identification numbers
    - Location
    - Type of WSS
    - Age
    - Condition

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology

Purchase/Construction date
Warranty information
Maintenance history

- Demonstration and Discussion: Demonstrate how to use a provided inventory template or tool, explaining each field and its significance. Engage participants in discussions about potential challenges in data collection and strategies to overcome them.

3. Hands-on Practice (30 minutes):
- Group Exercise: Divide participants into smaller groups and assign each group a specific water supply or sanitation system (real or hypothetical).
- Inventory Creation: Guide participants through the process of creating a WSS inventory for their assigned system, using the provided template or tool.
- Support and Clarification: Circulate among groups to offer assistance, answer questions, and ensure accurate completion of the inventory.

4. Sharing and Reflection (15 minutes):
- Presentation and Feedback: Invite each group to present their completed WSS inventory to the larger group. Encourage constructive feedback and sharing of insights.
- Common Challenges and Solutions: Facilitate a discussion on common challenges faced during inventory creation and strategies to address them, such as:

Accessing WSS information
Identifying WSS boundaries
Managing data quality

5. Closing and Reinforcement (10 minutes):
- Key Takeaways: Summarize the key points and takeaways from the session, emphasizing the value of WSS inventories in WSS management.
- Encourage Continuation: Emphasize the importance of continuous inventory maintenance and updating as WSSs change over time.
- Additional Resources: Provide links or references to helpful tools and resources for WSS inventory management.
- Looking Ahead: Briefly preview the upcoming session on risk assessment and prioritization, building excitement for the next steps in the WSS management journey.

Additional Tips:
Visuals and Examples: Use visuals, such as pictures or diagrams, to illustrate different types of WSSs and inventory templates. Share examples of well-maintained inventories to inspire participants.
Local Context: Adapt the session to the specific types of water and sanitation WSSs commonly found in the Karnali region.
Technology Integration: If available, explore the use of digital tools or mobile apps for WSS inventory creation and management, considering the context and technology access in Karnali.
Group Dynamics: Encourage collaboration and knowledge sharing among participants during the hands-on exercise.
Accessibility and Inclusion: Ensure that the session is accessible to participants with varying levels of literacy and numeracy skills.
Connect to future sessions: Explain how the information they gather in this session will be used for upcoming activities like maintenance planning and risk assessment. This creates a sense of continuity and purpose for their learning.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
SESSION 4 85 Minutes	Assessing Risks and Prioritizing Actions	PPT Presentation, Manual, (identified scheme structures)	Simplified risk assessment method: Identifying critical and non-critical components. Role-playing activity: Prioritizing risks based on potential impact and likelihood. (Identifying and prioritizing risks in different Karnali communities) Group work: Identify possible risks in a local water supply system and prioritize actions using the risk matrix.

SESSION 4 Objectives:

- Identify different types of risks and their potential impact on water supply and sanitation systems (natural, technical, financial).
- Apply a simplified risk assessment methodology to analyze specific vulnerabilities in Karnali contexts.
- Prioritize maintenance actions based on the assessed risks and available resources.
- Develop an initial action plan for addressing identified risks in a local water system.

Session Flow:

1. Setting the Stage (10 minutes):

- Welcome and Recap: Greet participants and briefly recap the previous session on WSS inventories, highlighting its importance in risk assessment.
- Understanding Risk: Introduce the concept of risk in WSS management, emphasizing its role in proactive planning and preventive action.
- Local Lens: Focus on risks relevant to Karnali contexts, such as natural disasters, limited resources, vandalism, and technical breakdowns.

2. Recognizing the Threats (20 minutes):

- Categorizing Risks: Explain different types of risks: natural (floods, landslides, earthquakes), technical (equipment failure, leaks), financial (funding limitations, operational costs), development-related risks (threats like water infrastructure damage from road construction projects) and social/ environmental (vandalism, pollution).
- Impact Analysis: Discuss the potential impacts of each risk category on water quality, system functionality, and community health.
- Case Studies: Share real-life examples of how various risks have affected water systems in similar contexts or within Karnali itself.

3. Taking Control with Risk Assessment (25 minutes):

- Simplified Matrix: Introduce a simplified risk assessment methodology adapted for Karnali conditions. Explain the use of a risk matrix (likelihood x impact) to prioritize risks.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
- Hands-on Practice: Divide participants into smaller groups and assign each group a specific water WSS from their own community or a hypothetical system. - Group Assessment: Guide participants through the process of using the risk matrix to assess identified risks for their assigned WSS. Encourage discussions and sharing of perspectives. 4. Prioritizing for Action (20 minutes): - Criticality Rankings: Based on the risk assessment, help participants categorize risks as high, medium, or low priority for immediate, strategic, or future action planning. - Developing an Action Plan: Guide participants through the creation of a basic action plan for addressing the high-priority risks identified for their assigned WSS. Encourage them to consider: Specific maintenance tasks required Responsible individuals or teams Timelines for action Resource needs - Group Sharing and Feedback: Invite each group to share their initial action plans and provide constructive feedback to each other. 5. Closing and Looking Ahead (10 minutes): - Key Takeaways: Summarize the importance of risk assessment and prioritization in effective WSS management. - Continuous Improvement: Emphasize the need for ongoing risk monitoring and updating action plans as needed. - Next Steps: Briefly preview the upcoming session on setting up operations and maintenance systems, linking the risk assessment findings to practical maintenance planning. - Open Forum: Allow time for questions and address any concerns or points of interest raised by participants. **Additional Tips:** Interactive Activities: Use role-playing scenarios, group discussions, and real-life examples to engage participants and reinforce understanding. Local Relevance: Tailor the case studies and risk examples to be relevant to the specific challenges and vulnerabilities faced in Karnali communities. Visual Aids: Utilize charts, diagrams, and risk matrix templates to facilitate clear communication and understanding. Collaborative Learning: Encourage teamwork and knowledge sharing during the risk assessment and action planning exercises. Accessibility: Ensure the session caters to participants with diverse learning styles and knowledge levels.			
SESSION 5 85 Minutes	Setting up Operations and Maintenance Systems	PPT Presentation, training manual	Group work: Create a maintenance schedule for a specific WSS based on its condition and needs. Budgeting for maintenance costs: Exploring funding options and resource mobilization.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology

SESSION 5 Objectives:

- Understand the importance of establishing robust operations and maintenance systems for water supply and sanitation.
- Identify different types of maintenance (preventive, corrective, emergency) and their roles in WSS management.
- Develop effective maintenance schedules and assign responsibilities for efficient system operation.
- Explore budgeting and resource allocation considerations for sustainable O&M implementation (linkage with SSC).

Session Flow:

1. Setting the Stage (10 minutes):
- Welcome and Recap: Briefly welcome participants and recap key takeaways from previous sessions, particularly risk assessment and prioritization.
- The Power of Systems: Introduce the concept of OMS as the driving force behind effective WSS management, ensuring optimal system performance and minimizing service disruptions.

Types of Maintenance: The Toolbox for Success (20 minutes):
- Preventive Care: Explain the importance of preventive maintenance for early problem detection and prevention of major breakdowns. Discuss examples like routine inspections, cleaning, and lubrication.
- Corrective Action: Describe the role of corrective maintenance in addressing existing issues and preventing further damage. Highlight the importance of prompt action and effective repair strategies.
- Emergencies at Bay: Discuss the crucial role of emergency maintenance in responding to unexpected failures and minimizing service downtime. Emphasize preparedness and rapid response.

2. Scheduling for Smooth Operation (25 minutes):
- Tailoring Timelines: Explain the importance of developing customized maintenance schedules based on WSS type, risk assessment, and resource availability.
- Hands-on Practice: Divide participants into smaller groups and assign each group a specific water WSS from their community or a hypothetical system.
- Schedule Building Workshop: Guide participants through the process of creating a basic maintenance schedule for their assigned WSS, considering:
    - Frequency of preventive tasks
    - Trigger points for corrective actions
    - Emergency response protocols
    - Responsible individuals or teams
- Sharing and Feedback: Invite each group to share their maintenance schedules and provide constructive feedback to each other.

3. People and Resources: The Fuel for the Engine (20 minutes):
- Assigning Roles and Responsibilities: Discuss the importance of clearly defining roles and responsibilities for different maintenance tasks within the OMS.
- Building Capacity: Emphasize the need for training and capacity building for personnel involved in maintenance activities.
- Budgeting for Sustainability: Explore resource allocation and budgeting considerations for OMS implementation, including:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
- Budgeting for Sustainability: Explore resource allocation and budgeting considerations for OMS implementation, including: Cost estimations for maintenance tasks Funding options and partnerships Prioritization of needs 4. Closing and Implementation (10 minutes): - Key Takeaways: Summarize the importance of establishing a robust OMS for effective WSS management and service delivery. - Action Planning: Encourage participants to start developing their own initial OMS plans based on the learnings from the session. - Next Steps and Support: Briefly preview the upcoming sessions and offer resources and support mechanisms for OMS implementation in their communities. - Open Forum: Allow time for questions and address any specific concerns or challenges participants may have.			
Day 2			
10 Minutes	Opening of the day; recap of first day; objectives of second day	Presentation	Presentation; Discussion
SESSION 6 90 Minutes	Case Studies and Best Practices	Presentation, group discussion	Interactive Activities: Guided Analysis: Facilitate group discussions using guiding questions for each case study or shared experience. Key challenges faced by the WUSC? Specific strategies and practices contributed to their success? Factors enabled them to implement these practices effectively? How can these learnings be adapted to overcome similar challenges in your own WUSC?
SESSION 6 Objectives: - Identify key challenges and successful strategies in WS&S WSS management through diverse case studies. - Share and learn from peer experiences through interactive activities, building a network of support. - Develop concrete action plans to adapt best practices within your own WUSC, tailoring solutions to your specific context.			

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology

Session Flow:

1. Setting the Stage (10 minutes):
- Welcome and Introduction: Warmly greet participants and set expectations for the session. Briefly reiterate the significance of WSS management for sustainable water and sanitation services.
- The Power of Sharing: Emphasize the value of learning from each other's experiences through case studies and peer sharing. Highlight the diversity of WUSCs and the potential for cross-learning.

2. Showcasing Success Stories (20 minutes):
-Curated Case Studies: Present pre-selected case studies showcasing:
    A variety of regions, sizes, and types of WUSCs to ensure broader relevance.
    Diverse challenges and their innovative solutions in WSS management.
    Engaging visuals like pictures, charts, and short video snippets to bring the case studies to life.
- Facilitating Reflection: Briefly discuss each case study, posing questions that encourage participants to reflect on:
    The context and unique challenges faced by the WUSC.
    The specific practices that contributed to their success.
    The factors enabling effective implementation of these practices.

3. Interactive Insights & Peer Sharing (30 minutes):
- Group Discussions: Divide participants into smaller groups and assign each group a specific case study.
- Guided Learning: Facilitate group discussions using these guiding questions:
    What resonated most with you from this case study?
    Can you identify any potential challenges adapting these practices in your own WUSC context?
    What specific resources or strategies could be helpful for overcoming these challenges?
- Sharing and Building Bridges: Encourage participants to share their own experiences and insights related to the case study, connecting the lessons learned to their own situations.
- Rotating Perspectives: After a designated time, rotate the case studies among groups, allowing everyone to analyze and learn from different perspectives.

4. Action Planning Workshop (30 minutes):
- From Insights to Action: Guide participants through a workshop to develop concrete action plans for adapting best practices from the case studies within their own WUSCs.
- Tailoring Solutions: Provide templates or worksheets to help them identify:
    Specific actions aligned with their identified needs and challenges.
    Resources needed for implementation, including potential funding options or support networks.
    Potential obstacles and strategies for overcoming them.
- Sharing and Feedback: Encourage groups to share their action plans with each other and provide constructive feedback, fostering further refinement and collaboration.

Additional Tips:

Humour and Storytelling: Weaving in anecdotes and relatable experiences can keep the session engaging and memorable.
Celebrating Successes: Acknowledge the efforts and achievements of WUSCs in the case studies as well as during peer sharing, fostering a positive and motivational environment.
Safe and Inclusive Space: Ensure everyone feels comfortable participating, sharing their experiences, and asking questions, regardless of their background or knowledge level

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
Follow-up and Support: Share session materials, recordings, and resources after the session to support participants in implementing their action plans. Consider additional follow-up workshops or mentoring opportunities to provide ongoing guidance and support.			
SESSION 7 90 Minutes	WSS management Action Plan (MAP)	PPT Presentation, training manual	Group discussions: Guide discussions focusing on: - Identifying key takeaways and transferable practices from the case studies - Analyzing factors contributing to the success of the MAPs presented - Discussing potential adaptations for participants' own communities and WUSCs.

SESSION 7 Objectives:
- Understand the purpose and importance of developing a MAP for effective WSS management.
- Translate key learnings from previous sessions into concrete action points for your own WUSC.
- Develop a draft MAP framework outlining prioritized tasks, resources, timelines, and responsible parties.
- Share and refine MAPs in a supportive peer-to-peer environment.

Session Flow:
1. Setting the Stage (10 minutes):
- Welcome and Recap: Briefly welcome participants and recap key takeaways from previous sessions, particularly risk assessment, maintenance planning, and budget considerations.
- From Planning to Action: Introduce the MAP as a crucial tool for translating knowledge into practical measures and ensuring sustained implementation of WSS management best practices.

2. Diving into the Blueprint (15 minutes):
- Essential Components: Explain the key elements of an MAP, including:
  - Prioritized list of actions based on identified risks and needs
  - Specific tasks and activities for each action item
  - Responsible individuals or teams for each task
  - Timelines for completion
  - Resource requirements (material, financial, human)
- Monitoring and Evaluation: Highlight the importance of incorporating mechanisms for monitoring progress, evaluating effectiveness, and revising the MAP as needed.

3. Building Your MAP (30 minutes):
- Hands-on Workshop: Divide participants into smaller groups, ideally based on WUSC affiliation or similar WSS types.
- Action Planning Guide: Provide a template or worksheet to guide participants through the MAP development process.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology

- Facilitated Discussion: Support and guide each group as they identify their top priorities, define specific actions, assign responsibilities, and estimate resource needs for their MAP draft.
- Challenges and Solutions: Encourage groups to discuss potential challenges they might face in implementing their MAP and work together to identify solutions.

4. Sharing and Refining (25 minutes):
- Group Presentations: Invite each group to present their draft MAP to the larger session.
- Constructive Feedback: Encourage participants to provide constructive feedback on each other's MAPs, offering suggestions for improvement and sharing successful strategies.
- Collaborative Learning: Facilitate discussions and peer-to-peer learning as participants share insights and refine their action plans.

5. Closing and Next Steps (10 minutes):
- Key Takeaways: Recap the importance of having a clear and actionable MAP for successful WSS management implementation.
- Finalizing and Implementing: Encourage participants to finalize their MAPs after the session and begin the implementation process in their communities.
- Support and Resources: Offer ongoing support and access to resources, such as templates, tools, and potential funding options, to assist with MAP implementation. SSC support can also be expected.

Additional Tips:
Success Stories: Share examples of successful MAP implementation in other contexts or within Karnali region to inspire participants.
Adaptability and Flexibility: Emphasize the importance of tailoring the MAP to the specific needs and resources of each WUSC.
Collaboration and Support: Encourage ongoing communication and collaboration among participants within WUSCs and across communities for peer-to-peer support and knowledge sharing.
Monitoring and Evaluation: Provide guidance and resources for participants to develop practical monitoring and evaluation mechanisms for their MAPs.
Accessibility and Inclusion: Ensure the session caters to participants with diverse learning styles and knowledge levels.

SESSION 8 90 Minutes	Preparation of WSS Management Action Plan (1/2)	Presentation, Manual, chart papers, brown papers, meta cards	Practical exercise: Each WUSC develops a draft MAP outlining key WSS management tasks, responsible individuals, timelines, and resource requirements.

SESSION 8 & 9 Objectives:
- Apply learnings from previous sessions to develop a practical and comprehensive MAP for your own WUSC.
- Gain hands-on experience in defining clear and achievable action items, assigning responsibilities, and estimating resource needs.
- Practice communicating your MAP effectively to stakeholders and securing necessary support.
- Develop confidence in implementing and monitoring your MAP for lasting impact.

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
Session Flow: 1. Warm-up and Review (10 minutes): - Welcome participants and briefly recap key takeaways from previous sessions, emphasizing the significance of MAPs. - Conduct a quick review of MAP components and essential information to be included. 2. Diving into Specifics (20 minutes): - Introduce different approaches to prioritize actions within the MAP framework, such as risk matrix analysis, budget constraints, and community needs. - Discuss various types of action items and examples relevant to different stages of WSS management (inventory, assessment, maintenance, etc.). - Explore strategies for resource mobilization and budget allocation to support MAP implementation. 3. Hands-on Workshop (60 minutes): - Divide participants into their established WUSC groups from the previous session. - Provide them with revised MAP templates or worksheets incorporating feedback from session 7. - Guide them through a step-by-step process of refining their MAPs, focusing on: Finalizing prioritized action items with clear objectives and timelines. Specifying responsible individuals or teams for each action. Estimating resource requirements (material, financial, human) for each action. Identifying potential challenges and contingencies for smooth implementation. - Encourage participants to seek support from facilitators and each other during the process. **Additional Tips:** Case Studies and Examples: Share real-world examples of successful MAPs implemented by other WUSCs to inspire participants and provide practical insights. Role-Playing: Consider incorporating role-playing scenarios to simulate scenarios like MAP communication or resource negotiation, enhancing engagement and communication skills. Visual Aids: Utilize charts, diagrams, and MAP templates to facilitate understanding and provide clear references during the hands-on workshop. Flexibility and Adaptability: Encourage participants to tailor their MAPs to their specific contexts and priorities while adhering to key principles of effective WSS management.			
SESSION 9 90 Minutes	Preparation of WSS Management Action Plan (2/2)	Presentation, Manual, chart papers, brown papers, meta cards	Practical exercise: Each WUSC presents their MAP outlining key WSS management tasks, responsible individuals, timelines, and resource requirements.
Session Flow: 1. Peer-to-Peer Feedback and Refinement (70 minutes): - Invite each group to present their revised MAP to the larger session. - Guide constructive peer-to-peer feedback focused on clarity, feasibility, and effectiveness of the action plan. - Facilitate discussions and collaborative refinement of the MAPs based on the feedback received. 2. Communication and Advocacy (10 minutes): - Discuss strategies for effectively communicating the MAP to key stakeholders within the WUSC and the community.			

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
- Highlight the importance of advocating for resources and support needed for successful implementation. - Share tips for presenting the MAP persuasively and securing buy-in from decision-makers. 3. Closing and Looking Ahead (10 minutes): - Summarize the key learnings and achievements of the session. - Reiterate the importance of ongoing monitoring and evaluation of the MAP for adjustments and optimization. - Briefly preview resources and support mechanisms available to assist with MAP implementation beyond the training program. - Close the session by expressing confidence in participants' ability to put their MAPs into action and make a positive impact on their water and sanitation systems. Additional Tips: Celebrate Progress: Acknowledge and celebrate the effort and progress made by participants in developing their MAPs, boosting their confidence and motivation for implementation.			
SESSION 10 30 Minutes	Discussion on linkage to WSP; queries about steps; closing	Training evaluation checklist	Discussion; speeches
Closing Session - Key Takeaways: Summarize the key takeaways from the session, emphasizing the importance of continuous learning, peer support, and action-oriented approaches. - Sharing Resources: Provide a list of resources and helpful tools for further exploration of WSS management topics. - Celebration and Encouragement: Acknowledge the efforts of participants and celebrate their commitment to improving water and sanitation services through effective WSS management - Building Connections: Encourage participants to stay connected through online platforms or future workshops to sustain peer-to-peer learning and collaboration. - Farewell and Gratitude: Thank participants for their active engagement and express appreciation for their contributions to the session.			

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

7.6 Module 5: Natural Disaster Management and Water Safety (1 Day)

Objective: This module aims to develop the facilitation capacity of WASH Unit staff and WUSC on climate resilience, disaster management and water safety.

Specific Objectives	Outputs
- To improve module participants' understanding about climate resilience, disaster management, and water safety in WASH at WUSC level - Upgrade WSPs of participant WUSCs	- Revised and updated WSPs disaster response and incremental improvement plans

Material Needed: PPT Presentations, existing WSPs of participant WUSCs

Table of Sessions for Module 5:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening / introduction/ objective	Presentation on objective, Meta card	Self-introduction, presentation
30 Minutes	Climate resilience and disaster risk management at WUSC level	PPT	Presentation and discussion
60 Minutes	Review of Climate Resilient WSP+++ development process (Focus on steps of WSP)	PPT; SUSWA WSP manuals and materials	Presentation and discussion
30 Minutes	Recap of key WSP templates together; instructions to group work (see the following sessions)	PPT; SUSWA WSP manuals and materials	Presentation and discussion
75 Minutes	Facilitated revision and update of existing water safety maintenance and integral improvement plans	Existing WSPs; WSP planning templates	Facilitated group work
75 Minutes	Facilitated revision and update of existing water safety disaster response plans	Existing WSPs; WSP planning templates	Facilitated group work
60 Minutes	Presentation of revised plans; discussion	Presentation on PPT and orally	Presentation and discussion
30 Minutes	Closing of the training		Speech

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

7.7 Module 6: Financial Management (1 Day)

Objective: The overall objective of the module is to establish well-managed record keeping, accounting and financial management in the scheme.

Specific Objectives	Outputs
- To train the WUSC and WASH facilitators to enhance capacity on financial management in a transparent manner - To develop capacity on WUSC to maintain financial records as per the government rules	- Results of WUSC group exercise for water fee management and book- keeping and O&M Fund in bank or cooperative - O&M fund account managed in bank or cooperative - link to banks and cooperatives to be established

Material Needed: PPT Presentations, Stationery (scoring sheet, marker, Brown paper, stickers etc), WUSC Manual, PIM, reading materials as needed, etc

Table of Sessions for Module 6:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening and objectives	Presentation on objective, Meta card	Self-introduction, presentation
30 Minutes	Setting Water Fees; Water Fee Collection; Payment system	PPT Presentation WSP+++ water tariff manual	Presentation and discussion
30 Minutes	Record / Book Keeping & Financial Policy Defining Roles and Responsibilities for Financial Management	PPT; SUSWA WSP manuals and materials	Presentation and discussion
30 minutes	Financial planning / O&M / water tariff: O&M fund account managed in bank or cooperative - link to banks and cooperatives to be established	PPT Presentation, training manual, SSC guideline	Discussion on O&M roles among different stakeholders/refer SSC
30 Minutes	External support and cost-sharing according to SSC rules	PPT Presentation, Manual	Presentation, Discussion
30 Minutes	Petty Cash Management, Cash Storage and Protection	PPT Presentation, Manual	Presentation, Discussion, Exercises
30 minutes	Auditing and Reporting Cost Structure and Budgeting	PPT Presentation, Manual, Plan format	Group discussion presentation
90 minutes	WUSC group exercise for water fee management and book-keeping; O&M fund account managed in bank or cooperative - link to banks and cooperatives to be established	Book-keeping and water fee related formats	Facilitated group work, role playing
90 minutes	Presenting results of exercise; group discussions to help overall understanding	Presentations by groups	Facilitated presentations and discussion
30 Minutes	Evaluation and closing		Presentation, Discussion

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

Note: A practical calculator for water tariffs is provided in Annex 9.

7.8 Module 7: Conflict Resolution and Stakeholder Engagement (1 Day)

Objective: The overall objective of this module is to manage conflict in the WUSC and scheme through capacity enhancement of the WASH facilitator and WUSC.

Specific Objectives	Outputs
- To train the WUSC and WASH facilitators on conflict resolution. - To develop capacity on WUSC to manage local conflicts themselves	- Improved understanding measured by test results

Material Needed: PPT Presentations, Stationery, WUSC Manual, PIM, reading materials as needed, etc

Table of Sessions for Module 7:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening session	Presentation on objective, Meta card	Self-introduction, presentation
30 minutes	Pre-training test	Pre-training test	Individual test
60 Minutes	Potential Conflicts and their effects; Identifying types of conflicts in WASH and WUSCs	PPT Presentation	Presentation, Discussion
90 Minutes	Stakeholder Identification – Influence and Position Analysis	PPT Presentation, Examples, Manual	Group work, Presentation, Discussion
30 Minutes	Stakeholder Conflict Risk Analysis (WSP + 3X3 matrix and others)	PPT Presentation, Manual	Presentation, Discussion, 3X3 matrix of WSP3+
30 Minutes	Conflict mitigation & Resolution Strategies	PPT Presentation, Manual, Plan format	Presentation, Discussion
60 Minutes	Conflict Mitigation and management: Practical exercise	Instructions; role play steps	Role play; wrap up discussion
45 Minutes	Communication, Outreach, and Public Engagement	PPT Presentation, Manual, Plan format	Group discussion presentation

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
15 Minutes	Queries and clarification	List of pull agendas	Discussion / Conclusion
30 Minutes	Post-training test and closing	Test	Individual test; closing speeches

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

7.9 Module 8: Water quality, Sanitation and Hygiene (1 Day)

Objective: This module aims to develop the facilitation capacity of WASH Unit staff and WUSC to maintain sanitation and hygiene in the community.

Specific Objectives	Outputs
- To enhance the capacity of WASH unit staff and WUSC on Water Quality management, how to measure and how to ensure it. Practical water quality field tests; practical residual chlorine tests; replacement of chlorine cartridge; water quality standards. - Establish proper sanitation and hygiene practices in the community for better health and sustainability of the water and sanitation scheme.	- Water quality field test conducted, - Chlorine cartridge status checked and residual chlorine measured, - Total Sanitation Plan conducted/ updated

Material Needed: PPT Presentations, Stationery, Water quality and Chlorination brochures, Sanitation and Hygiene module, WUSC Manual, project guideline, reading materials as needed, etc

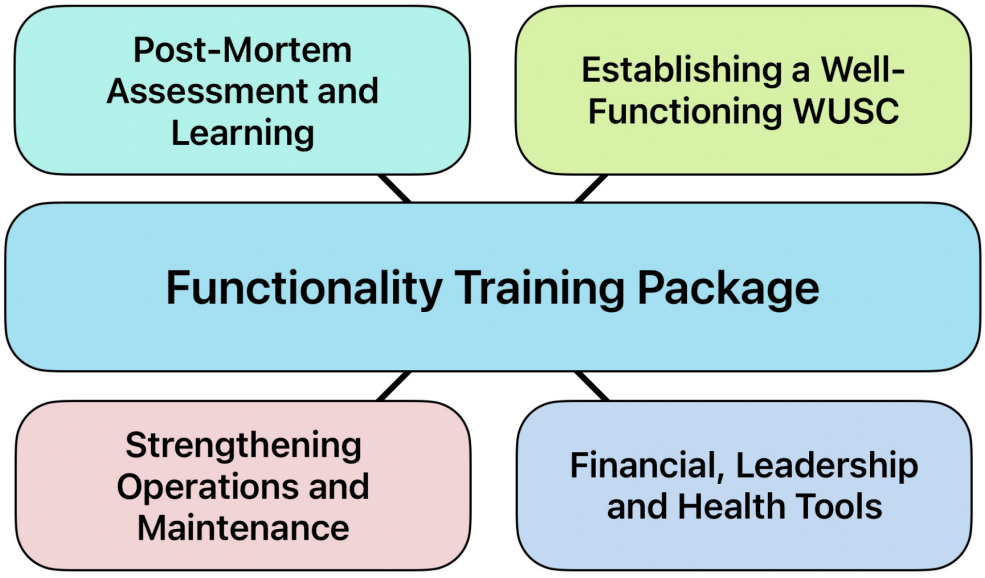
Table of Sessions for Module 8:

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
30 Minutes	Opening / introduction/ objective and Sanitation, Hygiene, current status at the community	Presentation on objective, Meta card, question & answer	Self-introduction, presentation
30 minutes	Concept of Water Quality, how to measure and how to ensure it. Water quality parameters in Nepal.	PPT	Question, answer, presentation

Session Time	Session Agenda / Content	Key Tools	Exercise / Methodology
2 Hours	Practical water quality field test exercise Practical residual chlorine test exercise Check and replacement of the chlorine cartridge simulation	Brochures Water quality and Residual chlorine field test kit Inline chlorination opener, and one chlorine cartridge	Interaction Field visit to RVT and inline chlorination Field visit to a point-of-use site for testing
30 minutes	Total Sanitation and indicators	PPT, question & answer	Presentation and discussion
60 minutes	Different technological options for household toilets	PPT, question & answer	Presentation/ Interaction
30 minutes	Some of the triggering tools to ensure compliance with the Total Sanitation indicators	PPT, question & answer	Presentation/ Interaction
30 minutes	Planning	PPT, question & answer	
30 minutes	Closing of the training		Speech

Note: The trainer will determine the time and schedule, including lunch and tea breaks, based on the importance and length of the sessions.

SUSWA
SUSTAINABLE WASH FOR ALL



Volume 2: Training Knowledge

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1 Introduction to the Functionality Package

This functionality training package guides facilitators and trainers in providing Capacity Building (CB) to Water Users and Sanitation Committees (WUSC) to operate and maintain water supply schemes at the community level.

This functionality training package is organised into three volumes:

Functionality Training Manual Volume 1: Training Plan
Functionality Training Manual Volume 2: Training Knowledge (this Volume)
Functionality Training Manual Volume 3: Annexes

The training plan shown in Volume 1 includes practical information on the initial assessment and the training modules. Trainers and facilitators should use it to schedule and prepare their sessions in the field with the WUSCs. All the modules are interrelated and must be implemented in sequence, including a few days of interval between each module. Following the initial diagnostic phase, the training modules are clustered into three outcome areas, each of which focuses on a different aspect of WUSC empowerment:

Initial Assessment:	Understanding the context
Outcome Area 1:	Preparation of a well-functioning WUSC: the governance and rules
Outcome Area 2:	Empower the WUSC with operation and maintenance tools
Outcome Area 3:	Additional tools required by the WUSC: finance, leadership and health.

The training and reference materials in **Volume 2** help facilitators find the necessary information and refresh their knowledge. It is designed to go beyond the “how-to’s” presented in Volume 1 and into the fascinating “why’s”. This Volume unpacks the theoretical foundations of key concepts, giving a deeper understanding of why the tools and techniques presented in Volume 1 truly work; it is intended as a theoretical bootcamp, strengthening knowledge so that these concepts can be applied in real-world scenarios with confidence and nuance. However, the training package is designed for skilled facilitators with pre-existing knowledge of community-based water supply management. These contents are designed to support their own training preparations; the trainer/facilitator is not limited to the given material and may find and include other relevant reference materials to make the training effective for their particular group of trainees. Volume 2 also introduces the Support Service Centre (SSC).

Volume 3 comprises the annexes, templates, and tools referred to in the training manual, along with a few practical facilitation tips and the main reference documents on the policy framework of the WASH sector in Nepal.

2 Module 1: Sustainable WUSC Set-Up

Overview

The starting point of the WUSC set-up training is basic knowledge about the concept, methodology and process of a WUSC. A WUSC is a registered, legal and self-governing body of all users of a specific community WSS. According to the WASH Act 2049 Section 5, users of any WSS have the right to establish a WUSC, register it, and operate as an independent entity.

The WUSC serves as the executive committee responsible for the implementation, operation and maintenance of the WSS, as well as ensuring its sustainability. It's key responsibilities include:

- Management of the water and sanitation facilities within the community
- Facilitating reliable water quality services
- Operation and maintenance
- Promoting education and awareness on safe water use, sanitation and hygiene practices

This session forms the foundation of WUSC training, enabling participants to understand the basics of the WUSC concept. Facilitators are encouraged to expand on this content using appropriate materials, practical examples, and interactive methods to enhance learning effectiveness.

Objective: The overall objective of the module is to enable the establishment of WUSCs for the smooth running of WSS schemes and their sustainability.

The specific objectives are:

- To train the WUSC and WASH facilitators to set-up the WUSC in a Sustainable manner.
- To develop capacity on WUSC formation, roles and responsibilities and conduct WUSC meetings.

Material Needed: PPT Presentations, Stationary, WUSC Manual, PIM, other reading materials.

Steps and methodology:

- Start the session with a relevant game or story about the topic
- Facilitate plenary discussions and brainstorming on the topic
- Make a presentation on the WUSC concepts
- Ask questions for clarity

- Conclude the session, link to the next topic and encourage participation in the learnings process

Characteristics of Good Leadership

- Able to set appropriate goals and influence the group towards those goals
- Proactive in planning and self-initiating new/required actions
- Awareness in institutional development actions
- Skilled in coordination and relationship building
- An enabler of participatory decision making
- Provides direction and motivation for group work
- Creates an enabling environment to work
- Influences and guides the group
- Ensure GEDSI and fair performance
- Monitoring and evaluation of the group activities.

Role and Responsibility of WUSC

Having defined roles and responsibilities of the WUSC is crucial for the quality construction, regular operation and maintenance and sustainability of the water and sanitation scheme.

Roles of the Water Users' Committee

- Mobilize community members to participate in water source protection e.g., building fences around the source, regularly cleaning the surroundings of the water source etc.
- Keep an updated list of water users in their community/scheme
- Collect and keep contributions towards the construction cost and the O&M funds
- Regularly visit/monitor the condition and performance of the water source
- Mobilize community members to improve their sanitation and hygiene situation/ status
- Purchase any materials needed for repairs/maintenance of the water source
- Ensure regular maintenance of the water source, and report any major problems to the mason/hand pump mechanics/sub-county extension staff
- Pay for any repairs carried out by the maintenance workers/mechanics
- Supervise and provide support to the water source caretakers.

Role of the Chairperson

- Ensure proper use of the authority given by the users
- Chair the WUSC meeting and other community meetings as per need and routine
- Prepare agenda for the meeting
- Support to maintain minutes and implement the decisions
- Encourage users to be active to ensure better participation
- Make decisions with consensus of the users and other members
- Resource management and mobilization
- Coordination for collaboration with other agencies/stakeholders

- Provide direction for daily work
- Encourage participation of all Users with focus on GEDSI
- Take care of the WUSC property/maintain updated inventory of WSS
- Maintain monthly water functionality status of taps and share information to LG
- Assign VLMW and other staff in coordination with the WUSC members

Role of the Vice Chairperson

- Chair the meeting in the absence of the Chairperson
- Support the Chairperson to implement decisions
- Motivate and mobilize the members/users
- Provide support to ensure the implementation of the rules and regulations
- Ensure transparency in the WUSC
- Assist the Chairperson to ensure the GEDSI and participation of all
- Provide support to conduct meetings and decision-making
- Facilitate discussions on the meeting agendas
- Facilitate to make conclusions on decisions

Role of the Secretary

The secretary has a vital role in the WUSC. The secretary should have organisational skill, a strong ability to be organized, keep a clear head and keep track of everything from deadlines to essential files. They must have professional communication skills, clear and friendly communication.

The major roles of the secretary are:

- Implement the daily administrative activities
- Preparation for the WUSC meeting
- Set the agenda and communicate to all members before meeting
- Write the minutes and other record keeping
- Inform the decision to all members and users
- Maintain overall documentation related to the WSS and the WUSCs activities
- Prepare periodic progress reports
- Present the reports in the meetings
- Maintain staff related documents

Role of the Treasurer

- Maintain the financial related materials and cash
- Book keeping and accounting/fund management
- Manage all the financial records as per the government rules
- Support WUSC to develop financial related policies and rules ie O&M fund, income and expenditure, tariff collection etc
- Prepare financial reports and endorse them in the WUSC meetings
- Support financial audits and public audit events
- Manage funds for the operation and maintenance of the scheme
- Maintain records of the tools and spare parts

- Maintain store stock book/tools related to the WSS
- Make payment and record keeping of the staff

Role of the WUSC Members

- Implementation of the decisions of the WUSC meetings
- Monitoring of the schemes under construction and operation
- Working with and motivating the users to ensure quality works
- Participate in the regular meetings, discussions and decision-making processes
- Accountability to the users and for project quality
- Inform users about the progress of the schemes

WUSC meeting

The WUSC meeting is very important for the quality implementation of the water scheme and its sustainability. A WUSC meeting is a gathering of the WUSC members, with an agenda, related to the scheme and its sustainability; the meeting should have a specific agenda, followed by discussions and decisions.

Types of Meeting	Basics of the Meeting
- Regular monthly meeting - Progress review meeting - Periodic meeting - Emergency meeting - Agenda-based meeting - WUSC meeting - Users meeting - Mass meeting - General Assembly - Mother group/cluster level meeting	- Preparation, time, date and venue - Objective of the meeting - Attendance - Participation of all - Open discussion - Constructive feedback and opinion - Issue based discussions - Decision making - Minuting - Date of the next meeting - Closing by Chairperson

Facilitating a WUSC Meeting

The facilitator of the meeting should be very careful in the meeting; they should ensure and monitor the meeting process, and should not give any opinions that may influence the whole meeting process. The facilitator should monitor or ensure the following:

- All are informed about the meeting time, venue, date and agenda
- Proper attendance
- GEDSI and meaningful participation of all in the discussions and decision-making process
- Followed the basic requirements of the meeting
- Constructive discussions
- Identified roles and responsibilities of the WUSC team
- Preparedness for arising conflict and conflict resolution
- Participatory decision-making and roles of the leadership
- Minuting and recording
- Closing with setting of the next meeting

3 Module 2: Good Governance

Good Governance

Good governance is a process; its use often depends on the intended purpose, the people involved and the socio-political environment of the term. For institutions it means producing results that meet the needs of society by making the best use of resources at their disposal. Put another way, governance is the honest use of vested power for ensuring better results.
Good Governance in WUSC

Good governance in the WUSC is an important aspect to ensure sustainability of the WSS scheme. WUSC is a registered and legal institution organisation that represents the users. Good governance in the WUSC is therefore vital.

Principles of the Good Governance

Good governance is very important for any organisation. There are 8 major vectors of good governance in practice. If institutions can ensure they are addressing these indicators they can achieve good governance in their organisation and institutions:

1. **Participation:** Participation in the concept of good governance is an opportunity for everyone to voice their opinions through institutions or representations. In addition, everyone, without exception, has the right to freedom of association and expression.

2. **Rule of Law:** To implement good governance, the legal framework in the country must be enforced impartially, especially concerning human rights law.

3. **Transparency:** Transparency means that every policy taken and implemented by the

government must be carried out under existing rules and regulations. In addition, there must be a guarantee that any information related to the policy can be accessed by everyone, especially those who are directly affected by the policy.

4. **Responsiveness:** Good governance needs institutions and processes to attempt to serve all stakeholders within a reasonable time.

5. **Consensus Oriented:** This fifth principle is related to the decision-making process. When the decision-making process cannot accommodate everyone's wishes, then at a minimum, the decision must be a decision that can be accepted by the majority and does not harm anyone.

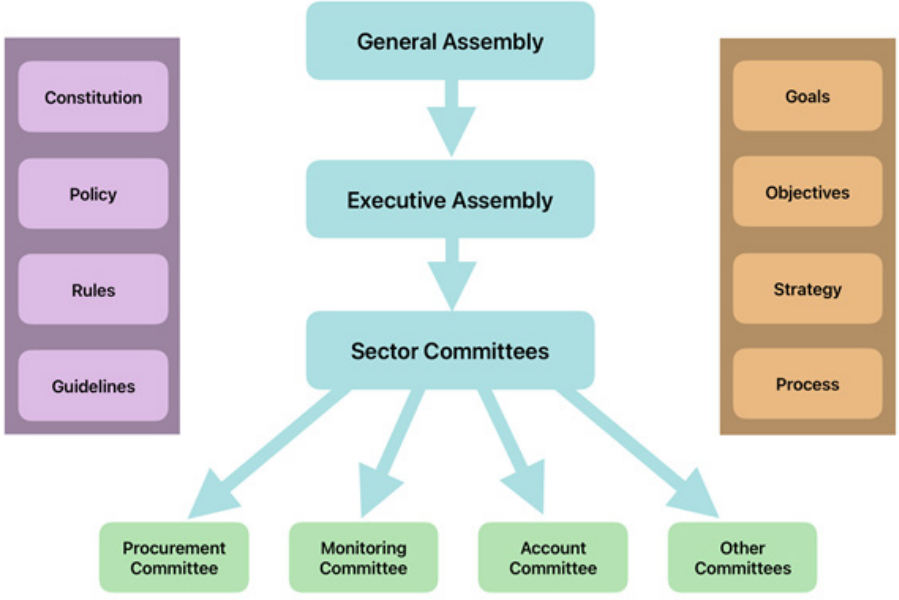
6. **Equity and inclusiveness:** Good governance ensures justice for the community. Everyone should have the same opportunity to maintain and improve their welfare.

7. **Effectiveness and efficiency:** Every decision-making process and its institutions must be able to produce decisions that meet every community need. Community resources must also be utilized optimally by the government.

8. **Accountability:** All institutions involved in good governance have full responsibility to the public for the sake of improving the quality of society.

WUSC Structure/Good Governance

WUSC is a legal institution formally registered according to the government legislation. It will usually comprise a General Assembly, Executive Assembly and various Sector Committees. It will be bound by a constitution, policy, state rules and guidelines, and should have goals, objectives, operational strategy and follow processes, to operate effectively:

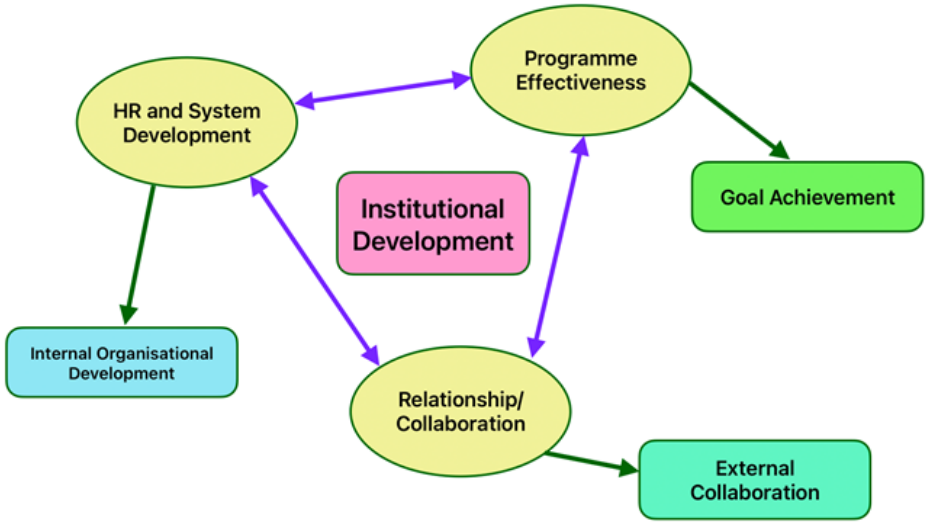


Institutional Development of WUSC

Institutional development of an organisation is an important part for the sustainability of the development work. The major organs of institutional development are:

- An organisation should have internal human, physical and system policy, guidelines and financial capacity to perform better in the development sector. This is called organisational development.
- An organisation that has better performance for better results/outcomes has programme efficiency, result oriented actions and better implementation.
- An organisation has a good coordination, collaboration and working relationship with external resource/sector organisations/agencies means a good external relationship.

The combination of an internal organisational development, programme efficiency and good external relationship indicate a good institutional development of WUSC, as visualised below:



Registration of the WUSC

WUSC is a legal, registered institution to operate the water and sanitation scheme. After the formation of the WUSC, it should be registered as per the government legislation. Based on the water resource act 2049, all water users' associations are registered and have their legal identity as an organisation.

Local government operation act 2074 -11 "Dha' mentions the right of LGs to regulate the water sector entities and -102 mentions the right to develop a local act for different sectors and implement accordingly. Under the act the LG will make a water and sanitation scheme management act or the WASH Act. The WUSC are registered under the respective LG act prepared for the WASH sector management and operation.

If the WUSC wants to act as an NGO, it can be registered in the District Administration Office (DAO) as per the organisation registration act 2034, revised act 2049.

LG Registration Process

- General assembly will authorize the WUSC to start the registration process
- The WUSC will make the decision for registration
- The WUSC assign a member to proceed the follow-up
- The WUSC will apply for the recommendation to the ward office
- The WUSC will apply for registration with the necessary documents and recommendation of the ward office
- The assigned member/ WUSC will make follow up to the LG for progress of the process.

WUSC Registration Process:

Documentation for Registration

- Constitution of the WUSC
- Meeting minute of WUSC regarding the decision on registration
- Application letter
- Citizenship of the Executive members
- PP size photo of all members
- Recommendation of the ward office

Role of LG, WASH Unit and SSC in the Governance of WSS

Role of the LG is very important for the sustainability of the water schemes and overall WASH sector. The LG, WASH unit and service support centres are the main stakeholders to ensure the operation and maintenance of water and sanitation facilities and its sustainability. The LG has the right to develop related acts and regulations for WUSCs in this regard. The roles of the major stakeholders are presented as follows:

Role of LG

- Form a WASH Board/WASH Management Committee (MC)
- Establish a WASH unit and link it with the Service Support Centre
- Policy and regulation support for WASH sector
- Develop operation and regulation act for the WASH facilities
- Make provision of O&M funds for repair and maintenance of the water systems
- Ensure the necessary service provisions
- Monitoring of the WASH activities
- Ensure all communities have safe drinking water and sanitation facilities
- Ensure data management, maintain updated inventory of the WSS/WASH sector

- Ensure proper implementation of the sustainability measures of the WSS schemes at LG level.

Role of WASH Unit

- Implementation of the decisions made by WASH Board/WASH MC and LG
- Work as a secretariate/implementing unit of LG for WASH Services
- Assist to develop policy, guidelines and regulations of LG
- Implementation of the LG WASH policies and regulations
- Data and information management of WASH sector
- Monitoring of the WSS and ensure sustainable management of the scheme
- Information management and reporting on WASH
- Prepare list of WSS with disaggregated data of beneficiaries
- Facilitate the WUSC registration and capacity building
- Monitoring of VLMW and capacity building
- Mobilize budget for operation and maintenance of the scheme
- Monitoring of the regular activities of the WUSC/scheme
- Ensure incentive policies in the water tariff and other expenditures for ultra poor and disadvantaged people
- Ensure quality of the water and support to make it functional
- Facilitate WUSC network and SSC
- Recommend rewards for encouragement
- Support to implement the WASH plan and budget of the LG
- Progress update and share/discuss in the sector meeting

Role of Service Support Centre (SSC)

- Technical support: Providing expert advice and guidance on O&M of water supply infrastructure.
- Monitoring and oversight: Regularly tracking the functionality and performance of water systems, identifying issues, and ensuring timely repairs.
- Network facilitation: Connecting stakeholders, including municipalities, WUSCs, government agencies and technical experts, to share knowledge and resources.
- Capacity building: Training local communities and water user committees on O&M best practices, financial management, and problem-solving techniques.
- Data collection and reporting: Gathering data on water supply functionality, service levels, and challenges to inform decision-making and policy development.
- Advocacy and awareness: Promoting the importance of sustainable water management and encouraging community participation in water service delivery.
- Conflict resolution: Mediating disputes between stakeholders and facilitating collaborative solutions to water-related issues.
- Innovation and technology adoption: Introducing new technologies and approaches to improve water service efficiency and cost-effectiveness.
- Financial sustainability: Supporting communities in developing and implementing strategies for effective revenue generation and resource management for O&M activities.

Role of the WUSCs

- Submit up to date contact list of WUSC members, VLMWs to the wards and LGs
- Submit the inventory data and information about the functionality of water taps and scheme to ward and LG
- Update the status of caretaker/VLMW
- Prepare and share O&M status and progress of the WUSCs
- Coordination and collaboration with ward/LG for obtaining necessary support
- Ensure maintaining functionality of the schemes in the community
- Mobilize community people for the operation and maintenance of the WSS (small/ minor repairs)
- Affiliate with the WUSC network at the LG level
- Participate in the capacity building activities organised by the LG and other stakeholders
- Collect all the scheme level data for inventory and submit to the LG WASH unit.

Participation

Participation requires a freedom of associations and expression on the one hand and an organised civil society on the other. Good governance requires fair legal frameworks that are enforced and impartial.

Participatory governance is based on individuals having a voice on decision-making that affects them. In a WSS, WUSC and users are the keys to ensure the quality of construction work and make the scheme sustainable. So, participation of all users is an important aspect to ensure sustainability, which is best achieved through public meetings and deliberative forums.

Participation in the WUSC and a WSS requires all having equal involvement, having their voices heard, all are aware and satisfied with the decisions and actions. All the groups by gender, caste/ethnicity and PWDs must be engaged in and benefit from the whole process of the WSS scheme implementation. The participation of all creates joint effort, ownership, contributions, and self-dignity that contributes to the sustainability of the WSS scheme for getting long-term benefits.

In principle, all have to participate, or have the opportunity to participate, in all steps and stages of the project/scheme implementation without any kind of discrimination in the community. The stages requiring participation are:

Problem Identification: This step uses extremely open-ended tools and activities to explore and discover the real problems in the community. Participation of all is important in this stage.

Problem Analysis: In this step the group goes through the analysis of the problems and identifies the extent of the problem and the real impact of the problem. The problems might be related to the particular group, gender, caste, ethnicity. So, participation of all is helpful to make better analysis of the problem.

Planning for Solutions: In this step the group goes through the solutions and the planning. They identify the possible solutions, relative impact of each of the solutions on the problem and possible resources that would be needed for each solution.

Selection of the Options: After identifying all possible solutions, the group prioritizes them through group discussions. The community groups/members should select the options having better overall impact for the problem. Based on the participatory discussion and decision, the preferred solution can be identified. So, this is an important step of WUSC to ensure the participation of all.

Planning for Change: Once the problem-solving option is identified, the participatory planning for action is commenced. The participation of all users in a WSS for all steps will be helpful to implement the actions; in this step the WUSC needs to facilitate the participatory planning approach to implement sustainability measures for the WSS.

Participatory Monitoring: Before or during the early stages of implementation, a plan is put in place to assist the community to monitor and evaluate the progress, impact, success and failure of the implementation process. The plans that are included should make provisions for taking corrective actions if required. During this step, participation of all users is important to ensure quality implementation.

Participatory Evaluation: After implementation of the operation and maintenance of the scheme, whether successful or not, the community should go through a frank and participatory evaluation of the process. This will help them identify whether any further actions are required. It will also assist them to learn from the process to improve future development processes.

The WUSC capacity to facilitate the participatory process in the WSS helps ensure the sustainability of the scheme. The process ensures that all are participating in the process, all have concerns about the sustainability of the scheme and all will install the feeling of ownership of the users.

The WUSC should also facilitate the participation of WASH stakeholders, LG and agencies/ projects that are working in the WASH sector. This process will help to identify the real problems, find proper solutions and seek resources for implementation of the prioritized actions.

The WASH facilitators should be more aware about the participatory process to ensure the participatory process in the WUSCs. The trainer/facilitators should facilitate the process during construction of the scheme, preparing the rules and regulations for the sustainability and the implementation of the WUSC plan with provision of participatory monitoring and evaluation.

Transparency, Auditing and Reporting

WUSC is an independent entity and a community level institution, formed for managing the construction, operation and maintenance of a WSS. To run the WUSC smoothly with the trust of all users, financial transparency is a major aspect of good governance.

Transparency is the quality of being easily seen through, while transparency in a scheme, in a governance context refers to being open and honest. Transparency is a one major principle of good governance including integrity, being realistic, legal compliance, equity, independency and security.

A practice of sharing financial information with all beneficiaries and the stakeholders is called financial transparency. The process promotes a transformative shift in culture, equipping members and staff with the knowledge and tools to participate in the process and products.

Financial transparency helps to show the investors how much risk is involved with the financing for the scheme, develop trust, increase participation, produce better results and the sustainability of the produced service. Financial transparency is needed to increase work performance, trust, boost confidence and enable effective decision making and collaboration and cordiality, both internally and externally.

The major benefits of transparency are:

- Improved users/community/WUSC member relationships
- Increased trust of the users and stakeholders
- Increased participation and public engagement
- Reputation of the WUSC and model for others
- Better decision-making processes

- Increased capacity of scheme management and sustainability
- Increased opportunity for service expansion
- Resource opportunity

While maintaining financial transparency, financial auditing is an important aspect to fulfil the legal obligations of the account and government. A financial audit provides an independent professional opinion on the fairness and reliability of an organization's financial statements. Financial management is an important part of any organisation.

The financial process involves:

- Proper financial record keeping and accounting
- Maintaining transparency among the WUSC and users
- Financial auditing and preparing financial reports
- Public auditing and presenting/endorsing the financial report from the general assembly.

4 Module 3: VLMW Practical Training

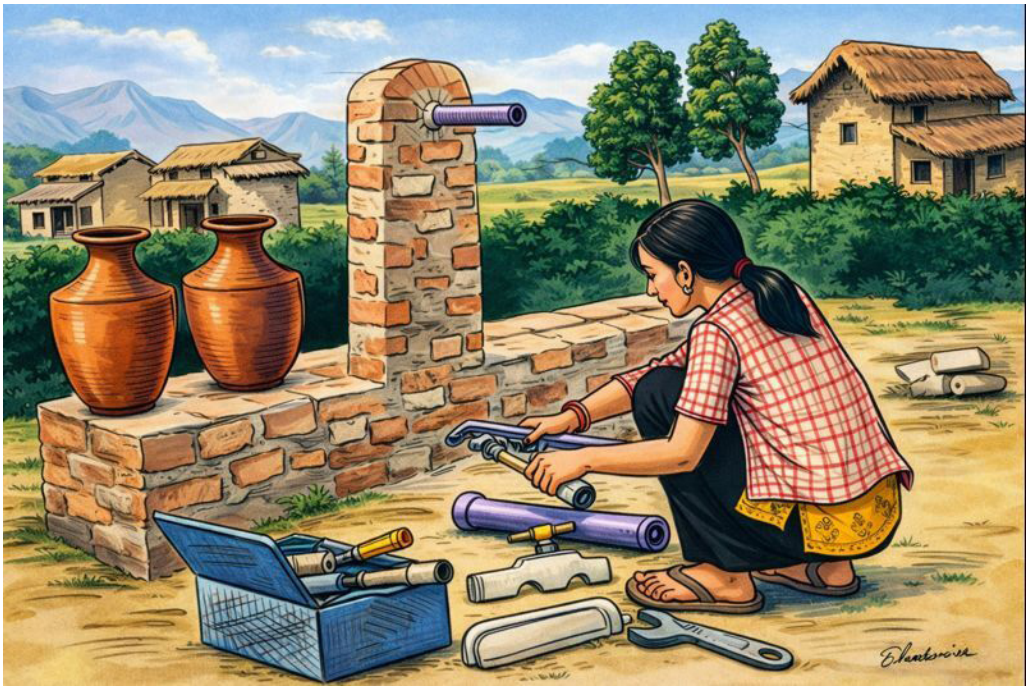
A Maintenance Workers Manual (prepared by RV-WRMP) is available in Annex 8.

Part 1 Theoretical Part of the Operation and Maintenance Elements

VLMW Selection and Mobilization

Building technical capacity at local level is necessary to make a WSS sustainable. Technical capacity of the VLMW is an important part of for the operation and maintenance of the WSS. WUSC should select appropriate people for VLMW training. The following characteristics should be considered while selecting the VLMW:

- Mature and honest
- Willing to work in the community
- No plans to leave the village for a long time
- Having some technical knowledge
- Able to understand the technical terms about WSS
- Interested in social service
- Ability to read and write
- Knowledge of local language
- GEDSI representation



The major role of the VLMW is to provide assistance to the WUSC in overall sustainability of the scheme, repair and maintenance of the WSS, regular monitoring of the water distribution, and other roles provided by the WUSC of the scheme. The VLMW mainly performs the

following duties for proper operation and sustainability of the project:

- Participate in the WUSC meeting
- Maintain all of the WSS components
- Manage the tools and spare parts
- Inspection of the structures from the intake/source to tap
- Regular check the pipeline and fittings, clean the structures
- Repair small problems and communicate to the WUSC in case of major repairs
- Contribute in the O&M plan of the WUSC
- Provide more attention during the rainy seasons
- Support to implement the WSP
- Encourage the users for productive and not wasteful use of the water

Introduction of Maintenance Tools and Spare Parts

The VLMW needs to know the types and use of tools used in the WSS construction and necessary for the regular operation and maintenance. In this session the trainer will introduce the necessary tools for the construction and operation/maintenance of the WSS scheme. Spare parts are important for regular operation and maintenance of the scheme. The VLMW should know about the necessary spare parts for regular maintenance of the scheme structure. This session also introduces the necessary spare parts used for the WSS, and is the preparatory session for the upcoming practical session.

Main Tools used in WSS Construction and Maintenancey:

Introduction of the WSS System, Structures and Construction Materials

VLMW should know the structures of the WSS as a part of the operation and maintenance. There are 2 types of WSS:

- Gravity flow system
- Pumping/Lifting system
  - Artesian pumping system
  - Energy based lift
  - Hydraulic energy-based lift

There are many types of WSS structures, and materials used for their construction, including:

Types of WSS Structures	Main Construction Materials used
- Overhead tank - Source: spring source, stream source, wetland source - Intake - Interruption chamber - Air valve chamber - Washout valve chamber - Crossing - Distribution chamber - Water treatment plant - Main pipe line - Distribution pipeline	- HDDP pipe / GI pipe - Stone, Sand, Aggregate - Steel rod - Chicken wire - Plastic sheet - Wire nets - Binding wire - Forma - Nails - Paint - Barbed wire

Introduction of Masonry Works

Masonry work is the craft of building a structure with brick, stone, or similar materials, which are often laid in, bound and pasted together by mortar, including mortar plastering. There are many types of masonry works such as stone masonry, brick masonry, block masonry, veneer masonry, gabion masonry, composite masonry, reinforced masonry, bagged concrete masonry etc.

The VMW should know about the basic masonry work of the WSS structures to help them for minor maintenance of the scheme, through a brief introduction followed by a practical session.

Introduction of the O&M Activities

Operation of the WSS requires timely and daily operation of the components of the water supply system such as headworks, treatment plant, machinery and equipment, transmission mains, service reservoirs and distribution system.

An O&M plan involves planning for and executing activities such as operating the system, monitoring system performance, making repairs, hiring and training the operators, testing the system after any changes are made and tuning the system. All the structures of the system need regular maintenance. To execute the O&M plan, the VLMW needs to know about the structure of the system. This session briefly introduces the type and focus areas of

maintenance of the system structures and possible needs of repair and maintenance. The VMW should know the following area of maintenance activities:

- Pipe threading, cutting, jointing and laying
- Installation of pipe fittings
- Identification and implementation of water source protection and mitigation of water source depletion
- Identification and implementation of water leakage
- Adjusting water taps
- Managing valves and reservoir tank (RVT) outlets
- Management and estimation of annual repair works
- Identification of quality construction materials and quality control

Part 2 Practical Exercise of the VLMW

The theoretical part of the training will introduce the role of the VLMW, introduction of the WSS structures, tools, spare parts, masonry work and other general knowledge about the maintenance of the water supply scheme.

After the theoretical part of the VLMW training, practical exercise will be conducted in the second part of the training. The main objective of the practical exercise is to ensure the participants are able to conduct repair works through a learning method. The trainer will explain about the practical works before going to the field.

The practical exercise will be conducted in the following area of the WSS scheme.

1. Masonry works of water supply schemes
2. Pipe threading, cutting, jointing and laying
3. Introduction and installation of pipe fittings
4. Identification and implementation of water source protection and mitigation of water source depletion
5. Identifying and implementation of water leakage
6. Adjusting water taps
7. Managing valves and RVT outlets
8. Management and estimation of annual repair works
9. Identification of quality construction materials and quality control

Note: the above is a brief introduction of the module; the Trainer/facilitator should refer to Annex 8 VMW manual for preparation of their training.

5 Module 4: WSS Management

WSS management equips WUSCs with the knowledge and tools to transform their WSSs from fragile networks into dependable sources of life, health, and prosperity. This shift begins with proactive planning, where efficient resource allocation empowers communities to work together. The result is consistently flowing water, vibrant communities, and a sustainable future.

For WUSCs, the MAP acts as a guiding light; it replaces reactive repairs with proactive care, preventing costly breakdowns and extending the water system's lifespan. Leaky pipes are fixed before they burst, rusty pumps replaced before they seize, and resources are wisely channelled towards service improvement, not emergency scrambling. The MAP becomes the roadmap to predictable water flow, healthier communities, and long-term financial stability for WUSCs.

In essence, WSS management isn't just about pipes and pumps; it's about unlocking the potential for thriving communities. It's about building a future where clean water flows freely, empowering your WUSC with financial stability, environmental responsibility, and a culture of continuous improvement. By embracing its power, you transform your village from a place of flickering taps to a vibrant hub of health, prosperity, and self-reliance. The journey starts with a single step, a commitment to WSS management, and the ripple effect it creates will nurture your community for generations to come.

Session1 – Unveiling the Power of WSS Management for Water and Sanitation

Contents of this session are:

1.1 Why is WSS management important?
1.2 Key components of WSS management
1.3 Highlight unique challenges and opportunities in Karnali context

1.1. Why is WSS Management Important? A Ripple Effect of Benefits

Imagine a vibrant community where crystal-clear water flows freely from every tap, a testament to thriving health and well-being. This isn't just a picture-perfect postcard; it's the tangible outcome of effective WSS management for water supply and sanitation systems. But why is it so crucial? Let's explore the ripple effect of benefits it brings.

What is WSS Management?

WSS management is the systematic process of optimizing the whole-life value of a WSS, from acquisition to disposal, while mitigating risks and achieving operational and financial objectives.

WSS management aims to ensure the efficient, sustainable, and cost-effective operation and maintenance of water supply and sanitation systems. This involves activities like:

- Inventorying and mapping: Creating a detailed record of all WSSs, including their location, condition, age, and replacement cost.
- Risk assessment: Identifying potential risks and vulnerabilities that could impact the performance of the system.
- Developing a maintenance plan: Scheduling preventive maintenance activities to extend the life of WSSs and prevent breakdowns.
- Financial planning: Securing funding for ongoing maintenance, repairs, and upgrades.
- Monitoring and evaluation: Tracking the performance of the system and making adjustments to the plan as needed.

Why is WSS Management Important?

WSS management plays a crucial role in ensuring sustainable access to clean water and sanitation for everyone. By applying best practices and adapting them to the specific context of water and sanitation systems, communities can achieve significant improvements in health, well-being, and environmental sustainability. WSS management helps maximize both the financial and the service value of physical WSSs, with effective management leading to several benefits for communities, including:

- Reliable access to clean water and sanitation: Less downtime and fewer disruptions in service.
- Improved public health: Reduced prevalence of waterborne diseases.
- Reduced costs: Avoiding costly repairs and replacements through preventive maintenance.
- Environmental sustainability: Efficient use of water resources and fewer infrastructure projects.
- Resilience to climate change and other risks: Well-maintained systems are better equipped to withstand challenges.

WSS management refers to the coordinated series of activities that monitor and maintain things of value - in our case, physical WSSs. This involves balancing risk, cost, opportunities and performance to fully and effectively realize the value of an WSS over its entire lifespan.

International Organization for Standardization, ISO 55000:2014 - WSS Management (Geneva, ISO, 2014), p. 14

Benefits of WSS Management

- Reliable Water Flow, Empowered Communities: WSS management equips WUSCs with tools and strategies to optimize its water systems. Imagine saying goodbye to unreliable, unpredictable water supply. Proper maintenance prevents breakdowns, ensuring consistent access to this life-sustaining resource for families and communities. This translates to fewer disruptions, reduced dependence on alternative sources, and ultimately, empowered WUSCs capable of managing their water systems with confidence.

- Reduced Costs, Sustainable Future: Leaky pipes, malfunctioning pumps, and neglected infrastructure lead to costly repairs and replacements. WSS management takes a proactive approach, prioritizing preventative maintenance. By addressing minor issues before they escalate, repair costs are minimized, freeing up resources for other community needs. This shift from reactive to proactive management paves the way for a financially sustainable future for the WUSC and its water system.
- Healthy Families, Thriving Communities: Access to clean, reliable water is intricately linked to improved public health. When waterborne diseases are minimized, families spend less on healthcare, and children can attend school regularly. Improved water quality also reduces risks of hygiene-related illnesses, leading to a healthier, more productive community. The positive impact of effective WSS management ripples through every aspect of community life.
- Environmental Stewardship, Preserving Resources: Water is a precious resource, and WSS management helps people to use it wisely. Efficient infrastructure minimizes water losses through leaks and wastage, contributing to environmental sustainability. By extending the lifespan of existing WSSs, the need for new construction is reduced, minimizing the environmental footprint. Ultimately, WSS management empowers people to be responsible stewards of water, ensuring it flows for generations to come.

Core functions underpin successful WSS Management:

Life Cycle Assessment: Understanding the various stages of an WSS's life (acquisition, operation, maintenance, renewal/disposal) and their associated costs and risks.

Risk Management: Identifying, assessing, and mitigating potential threats to WSS performance and service delivery, like equipment failures, natural disasters, and financial constraints.

Maintenance Optimization: Implementing cost-effective maintenance strategies (preventive, corrective, condition-based) to extend WSS life and ensure reliability.

Financial Planning: Securing necessary funds for capital investment, operational expenses, and long-term maintenance needs.

Lifeblood of Infrastructure: Introducing Life Cycle Management

Imagine a water supply and sanitation system as a complex network of vital components, each with a specific job. Ensuring this network operates smoothly and efficiently over its entire lifespan is crucial. This is where Life Cycle Management (LCM) comes in. LCM is a structured approach to managing WSSs - those vital components - throughout their journey:

Stage 1: Planning: Carefully defining the needs, purpose, and expected life of each WSS before acquiring it.

Stage 2: Acquiring: Selecting the right WSS in the most cost-effective way, whether through purchase, construction, or other means.

Stage 3: Operating & Maintaining: Implementing proactive strategies to keep the WSS functioning at its peak, including regular operations and maintenance, inspections, and updates.

Stage 4: Disposing: Responsible retirement of the WSS when it reaches the end of its life, minimizing environmental impact and potentially generating revenue through recycling or repurposing.

By actively managing each stage, LCM delivers numerous benefits:

- Maximized service delivery: WSSs operate reliably and efficiently, ensuring uninterrupted water flow and sanitation services.
- Cost savings: Proactive maintenance prevents costly breakdowns and extends WSS lifespan, reducing replacement costs.
- Resource preservation: LCM minimizes waste and promotes material sustainability through responsible disposal and potential reuse.
- Resilient infrastructure: Well-maintained WSSs are better equipped to withstand challenges and disruptions, ensuring long-term service for future generations.

1.2. Navigating the Roadmap: Key Components of WSS Management for WSS

Imagine your WUSC like a ship sailing towards a vibrant future where reliable water flows freely. To reach this destination, you need a sturdy vessel and a detailed map—that's where the key components of WSS management come in. These are the essential tools that guide your journey, ensuring your water system operates efficiently, sustainably, and serves your community to the best of its capacity.

With an inventory as a map, every decision becomes informed and impactful. This data holds valuable sources of hidden insights, revealing a system's strengths and vulnerabilities, and guiding future actions towards:

Prioritizing repairs: Identify the leaky pipes before they burst, the rusty pumps before they seize, ensuring reliable water flow for the community.

Investing wisely: Allocate precious resources to where they're needed most, whether it's upgrading treatment facilities or extending pipelines to remote areas.

Predicting future needs: Understand the age and condition of the WSS, anticipating replacements before they become emergencies.

Maximizing return on investment: Track spending on maintenance and repairs, identifying areas for improvement and optimizing resource utilization.

Respond to community needs: Understand water usage patterns and identify underserved areas, ensuring equitable access for all.

Comply with regulations: Easily track permits, licenses, and safety certifications, safeguarding the community and the environment.

Collaborate with stakeholders: Share data with government agencies, donors, and NGOs, fostering transparency and attracting valuable support.

The five key components of WSS management are:

1. **Inventory:** Mapping the Landscape: The first step is understanding what one has. WSS management begins with a comprehensive inventory of all WSS infrastructure, including pumps, pipes, tanks, toilets, and treatment facilities. This inventory should detail the location, condition, age, and any relevant information about each WSS.

2. **Risk Assessment:** Identifying Weaknesses, Prioritizing Actions: Just like a doctor diagnosing a patient, WSS management involves risk assessment. This process helps identify potential vulnerabilities and prioritize maintenance needs. Imagine isolating potential cracks in a bridge's foundation before they threaten its stability. By understanding the risks associated with each WSS, resources can be allocated for preventive maintenance, ensuring timely interventions before breakdowns occur.

3. **Maintenance:** Preserving Value, Extending Life: Regular maintenance is the lifeblood of a water system. WSS management emphasizes preventive maintenance, such as cleaning filters, replacing worn-out parts, and conducting routine inspections. Imagine regularly checking the bridge's cables and supports to ensure they remain strong. By consistently investing in maintenance, the lifespan of WSSs can be extended, maximizing their value and minimizing the need for costly replacements.

4. **Financial Planning:** Securing the Future, Investing Wisely: Effective WSS management requires responsible financial planning. This involves estimating future maintenance costs, budgeting for necessary repairs and upgrades, and exploring sustainable financing options. Imagine ensuring the bridge has a dedicated maintenance fund to address future needs. By planning ahead and securing resources, the system's financial sustainability is safeguarded, and unexpected financial burdens can be prevented.

5. **Continuous Improvement:** Monitoring and Evaluation (M&E): M&E acts as the watchful eyes and nimble hands of successful WSS management. Imagine constantly tracking data from a water system, analysing performance, and adapting to changing needs. M&E isn't just collecting numbers; it's about identifying leaks before they burst, prioritizing maintenance for maximum impact, and ensuring resources reach those who need them most. M&E plays a crucial role in ensuring the ongoing efficiency, sustainability, and responsiveness of your infrastructure. Think of it as the feedback loop that constantly guides actions, optimizes resource allocation, and keeps water flowing freely like a well-tuned orchestra.

These five key components, when combined, form the backbone of effective WSS management. By mastering these essential elements, a WUSC is transformed from a vessel adrift in uncertainties to a well-equipped ship, confidently navigating towards a future of reliable water, happy communities, and sustainable progress.

1.3. Navigating Uncharted Waters: Unique Challenges and Opportunities in Karnali's Water Supply

Imagine navigating a raging mountain river – that's the essence of water supply in Karnali. It's a land of breathtaking beauty, but also steep topography, fragile ecosystems, and limited resources. These factors create a unique set of challenges and opportunities for WUSCs in the region, demanding innovative solutions and unwavering resilience.

Challenges:

Geographic Constraints: Rugged terrain and unpredictable weather pose logistical nightmares for infrastructure development and maintenance. Reaching remote villages with pipes and equipment becomes a daunting task.

Climate Vulnerability: Erratic rainfall patterns and glacial melt lead to seasonal water fluctuations, making it difficult to maintain consistent supply through the year. Droughts and floods further test the system's resilience.

Limited Resources: Karnali faces financial constraints, restricting investments in advanced technologies and skilled personnel. This makes managing a complex water system even more challenging.

Community Engagement: Bridging the gap between technical expertise and traditional practices requires effective communication and community participation. Ensuring equitable access and ownership is crucial for long-term sustainability.

Opportunities:

Untapped Potential: Karnali is blessed with abundant natural resources, including glacial meltwater and micro-hydropower potential. Harnessing these resources sustainably can power pumps and provide reliable water access.

Innovation Hub: The challenges present opportunities for pioneering approaches. Gravity-fed systems, rainwater harvesting, and water-efficient technologies can be adapted to overcome geographical limitations.

Community Champions: Local knowledge and traditional practices hold immense value. Collaborating with communities, empowering women, and building local capacity can create a sense of ownership and ensure sustainable management.

Policy Landscape: Emerging policies on water rights and management offer a supportive framework for WUSCs. Advocacy and participation can shape these policies to better address Karnali's specific needs.

By understanding the unique context, embracing innovation, and forging strong partnerships, WUSCs can transform these rapids into stepping stones towards a future where every drop count, and clean water flows freely through every household, nurturing health, prosperity, and resilience in the heart of the Himalayas.

Session 2 – Understanding WSS Inventories/WSS Register

Contents of this session are:

2.1 Importance of WSS inventory for informed decision-making
2.2 Category of water and sanitation asset and key information to record for each WSS

2.1. Importance of WSS inventory for informed decision-making

A critical first step in the WSS management journey is to take stock of the WSSs.

How WSS Inventories Guide Your Course: WSS inventory isn't just a static list; it's a dynamic tool that propels you towards efficient, sustainable water management. Whether you're a seasoned WUSC or just starting your journey, remember – effective WSS management starts with a detailed, reliable map. Get ready to become masters of record-keeping and proactive caretakers of your water resources!

WSS inventory implies a systematic record of all the physical WSSs owned or managed by an organization. A water system is a complex network, with each pump, pipe, and even the hidden spring playing a vital role. A WSS inventory is the detailed map of this network, providing guidance in prioritizing maintenance and ensuring uninterrupted water flow. Robust inventory systems empower to:

- Make informed decisions: Prioritize repairs, allocate resources wisely, and invest in the right areas for maximum impact.
- Preventative maintenance: Identify weak spots before they erupt, ensuring reliable water flow for the community.
- Track performance and progress: Monitor how a system is functioning, identify areas for improvement, and adapt strategies.
- Enhance accountability: Demonstrate transparency to the community and stakeholders, building trust and fostering collaboration.

Illustration:

Imagine your WSS inventory as a detailed map of your water system. Each element, from the source to the taps in your homes, is represented by a symbol. Color-coding these symbols, as suggested by UNDESA's toolkit (https://financing.desa.un.org/document/un-handbook-infrastructure-WSS-management), provides a visual snapshot of your system's health – green for healthy, yellow for needing attention, and red for urgent repair. This map empowers you to proactively address potential issues, ensuring uninterrupted water flow.

With an inventory acting as a chart, every decision becomes informed and impactful. Think of it as a treasure trove of data, revealing a system's strengths and vulnerabilities, guiding towards:

Prioritizing repairs: Identify the leaky pipes before they burst, the rusty pumps before they seize, ensuring reliable water flow for the community.

Investing wisely: Allocate precious resources to where they're needed most, whether it's upgrading treatment facilities or extending pipelines to remote areas.

Predicting future needs: Understand the age and condition of the WSS, anticipating replacements before they become emergencies.

Maximizing return on investment: Track spending on maintenance and repairs, identifying areas for improvement and optimizing resource utilization.

But the benefits go beyond just technical solutions. An inventory empowers to:

Respond to community needs: Understand water usage patterns and identify underserved areas, ensuring equitable access for all.

Comply with regulations: Easily track permits, licenses, and safety certifications, safeguarding your community and the environment.

Collaborate with stakeholders: Share data with government agencies, donors, and NGOs, fostering transparency and attracting valuable support.

Interaction Topic: Importance of WSS Inventory for Informed Decision-Making:

- Highlight the benefits of having a comprehensive inventory:
- Understanding the WSSs, you have and their condition.
- Prioritizing maintenance and repairs.
- Making informed investment decisions.
- Tracking WSS performance over time.
- Enhancing accountability and transparency.
- Ensuring compliance with regulations.
- Facilitating knowledge transfer and handovers.
- Tailor examples to the Karnali context, showcasing how inventory data can inform decisions about challenging terrain, limited resources, and community engagement.

2.2. Category of water and sanitation asset and key information to record for each WSS

Think of your water system as a vibrant ecosystem, its elements interdependent and crucial for smooth flow. To understand this crucial resource, we need to delve deeper into the interconnected ecosystem of the river flowing through your community, its health intertwined with sanitation infrastructure. Meticulously recording all key information for both water and sanitation WSSs category, you transform your water inventory from a simple list into a treasure map. Unlocking a future where every drop count, every toilet functions safely, and your community flourishes on clean water and good health.

The water and sanitation system lies at the heart of your community. But beneath the surface of flowing water and clean bathrooms lies a complex infrastructure – a network of interconnected WSSs crucial for its seamless operation. This session unlocks the secrets of this network, giving guidance through the essential categories of water and sanitation assets and the key information needed to meticulously record for each.

Remember!
Your inventory isn't just a static list; it's a dynamic tool for optimizing water and sanitation management. Update it regularly, ensuring it reflects your system's evolution.

Let's delve into the two primary categories of WSSs that make up this intricate network:

Water WSSs

Intake infrastructure

Location (river source, springs, etc.), type (dams, weirs, canals), capacity, condition, monitoring data (water levels, quality)

Conveyance and storage

Network layout (maps, GPS), pipe material and diameter, pump details (capacity, pressure), tank size and condition, leakage data

Treatment facilities

Type of treatment (filtration, chlorination, etc.), capacity, maintenance records (filter changes, chemical supplies), performance data (water quality testing results)

Distribution network

Main pipeline details (material, diameter, pressure), branch line layout, household connection types and condition, meter readings, water pressure measurements.

Other relevant WSSs

Meter types and calibration records, valve locations and functionality, hydrant accessibility, standby generator capacity and maintenance log.

Sanitation WSSs

Household Sanitation

Type of toilet (pit latrine, improved latrine, composting toilet), location, condition, maintenance needs, user satisfaction surveys.

Community Sanitation

Type of sewage system (septic tanks, centralized systems), location of treatment facilities, capacity, maintenance records, environmental impact assessment.

Solid Waste Management

Collection points, disposal methods (landfill, composting, recycling), transportation vehicles, safety protocols, community awareness programs.

To ensure effective WSS management, it's crucial to systematically record the following key information about each WSS:

Location: Precise GPS coordinates or detailed maps for easy identification and maintenance access, particularly important for remote areas and hidden infrastructure.

Type and Specifications: Clearly define types (e.g., pit latrine depth, septic tank volume) for efficient maintenance and planning.

Material and Age: Understanding materials (concrete, plastic) and age helps predict lifespan and prioritize replacements.

Condition: Standardized rating systems (functional, needs repair, unsafe) ensure clear communication and effective maintenance allocation.

Purchase Date and Warranty: Tracking warranties facilitates claiming replacements and reduces unforeseen costs.

Maintenance History: Records of repairs, upgrades, and cleaning create a timeline for proactive maintenance.

Having adequate data on the location, condition, performance and finances of WSSs allows governments to anticipate the resources that need to be set aside for repair, renewal and replacement over the long term, particularly for critical WSSs.

Source: UNDESA's toolkit - UN handbook on IAM https://financing.desa.un.org/document/un-handbook-infrastructure-WSS-management

Operational Data: For centralized systems, monitor sewage flow rates, treatment efficiency, and environmental parameters.

Cost Information: Track construction, maintenance, and disposal costs for informed budgeting and resource allocation.

Regulatory Compliance Status: Ensure permits, licenses, and safety certifications are up-to-date for safe operation and environmental compliance.

Community Feedback: Include user surveys and feedback on functionality, access, and sanitation practices for continuous improvement.

Session 3 – Practice creating a WSS inventory register

Through this practical exercise, participants will actively apply the inventory template and grasp its real-world advantages. This hands-on experience will equip WUSCs with the essential skills and knowledge to successfully create and maintain comprehensive WSS inventories, ultimately contributing to the efficient management of their water and sanitation systems. By the end of the session, participants will be able to:

1. Distinguish between various types of water and sanitation assets.
2. Accurately record key information for each WSS in a standardized inventory register.
3. Leverage the inventory register for effective WSS management.
4. Extract insights from the inventory data to identify potential issues and prioritize maintenance needs.

3. Unlocking Efficiency: How WSS Inventory Empowers Proactive Water Management

Beneath your bustling community flows a hidden network, veins thrumming with the lifeblood of clean water. Pipes whisper through unseen alleys, pumps beat a steady pulse, and treatment plants hum their diligent tune. But to keep this symphony smooth, you need a map – an WSS inventory. This session unlocks that map, transforming it from a list to a compass, revealing age, condition, and potential hiccups before they disrupt the flow. Learn to navigate this intricate network, prioritize repairs with precision, and ensure your community thrives on the healthy rhythm of clean water. Ready to become the maestro?

Inventory template

To support hands-on learning, participants will be provided with a clear and concise template for the WSS inventory register. The template should include appropriate fields for all relevant information, such as:

- WSS Type: Category (e.g., intake structure, pump, pipe, toilet)
- ID Number: Unique identifier for each WSS
- Location: GPS coordinates or descriptive location details
- Description: Specific details about the WSS (e.g., material, size, capacity)
- Age: Installation/purchase date or estimated age
- Condition: Current condition (e.g., good, fair, poor)
- Operational data (flow rates, pressure, etc.)
- Warranty Information
- Maintenance History: Past repairs, upgrades, or service dates
- Remarks/Notes: Any additional relevant information.

A model inventory template is provided in Annex 3.

Public Asset Management System (PAMS)

Across Nepal, local, provincial, and federal government offices use PAMS for basic inventory, tracking office supplies, land, building, vehicles etc. This initial step is important, but PAMS' true potential remains untapped. Integrating major infrastructure like roads, bridges, and crucial water systems would transform resource allocation and maintenance planning for local communities. Imagine a future where officials harness PAMS' full power to build stronger, more resilient Nepal.

Practical Exercise

Develop a practical exercise using the standard template. This could involve:

- Dividing participants into groups and assigning them to investigate specific components of their own water supply system, such as intake structures, pumps, tanks, and distribution networks.

- Encourage participants to use actual data from their own system whenever available, supplementing with mock scenarios when necessary.
- Guiding them through the process of recording information in the template.
- Facilitating group discussions on challenges encountered while recording information, best practices for data collection, and potential applications of the completed inventory.
- Analysing completed inventories to identify potential issues or prioritizing maintenance needs based on the recorded information.

Start creating your own WSS inventory today and experience the benefits of improved WSS management for your water and sanitation system!

Session 4 – Assessing Risks and Prioritizing Actions

Contents of this session are:

4.1 Types of risks and their impact on water supply systems (natural, technical, financial).
4.2 Assessing the likelihood and impact of different risks (Risk matrix). Introduce a simplified risk assessment methodology adapted for Karnali conditions.
4.3 Prioritizing maintenance actions based on risk assessment
4.4 Developing an action plan for addressing identified risks

4.1. Types of risks and their impact on water supply systems (Natural, Technical, Financial).

Imagine your water and sanitation system as a delicate dance between a crystal goblet and a blooming flower. Each depends on the other for their beauty and purpose. This session empowers you to anticipate lurking shadows that could stain the glass or wilt the blossom – be it a storm's fury, a pump's weariness, or an empty treasury. By understanding and prioritizing these risks, you ensure a graceful duet continues to nourish your community.

Protecting the lifeline of a community demands foresight and vigilance. This session equips participants to identify and prioritize risks lurking within their water supply and sanitation systems – from natural disasters to financial constraints. Remember, clean water and proper sanitation are two sides of the same coin; compromised quality in one can easily disrupt the functionality of the other.

Types of Risks:

From nature's fury to infrastructure's silent decay, diverse threats lurk within water and sanitation systems, waiting to disrupt its vital flow, compromise water quality, and jeopardize the community's health. By illuminating these unseen shadows, vulnerabilities can be prioritised, robust defences built, ensuring the resilient pulse of clean water continues to nourish the community.

Natural risks: These ever-evolving threats can strike suddenly, impacting both water availability and treatment, demanding constant vigilance and proactive adaptation. Different types of natural risks are:

- Climate change: Floods, droughts, extreme weather events affecting water availability and treatment. Increased frequency and intensity of droughts can strain water resources, while floods can overwhelm treatment plants and contaminate waterways.
- Natural disasters: Earthquakes, landslides, floods causing physical damage to infrastructure. Earthquakes can rupture pipes and damage critical infrastructure, while landslides can block access to vital water sources.
- Development related risks: Include risks from development works like road construction. Disrupting pipelines, excavation activities impacting wells, or landslides burying essential facilities during the road construction phase.
- Waterborne diseases: Contamination from natural sources like algae blooms or animal waste. Blooms of harmful algae can produce toxins that compromise water quality, while heavy rains can increase runoff carrying animal waste into water supplies.

Technical risks: Aging infrastructure and human error act as silent saboteurs, jeopardizing both water quality and sanitation functionality, requiring efficient maintenance and skilled operation. Different types of technical risks are:

- Ageing infrastructure: Leaks, breakdowns, and inefficient operation impacting water quality and supply. Corroded pipes can lead to leaks and contamination, while outdated treatment technologies may struggle to remove emerging contaminants.
- Power outages: Disruptions to pumping and treatment processes, leading to compromised sanitation and potential contamination. Extended blackouts can interrupt pumping and treatment processes, causing overflows and potential sewage backups.
- Operational errors: Human mistakes during maintenance or treatment leading to quality issues. Accidental discharge of chemicals or improper maintenance procedures can compromise water quality, posing health risks.

Financial risks: Resource constraints are the invisible chains, limiting upgrades and repairs, potentially compromising public health and straining operational sustainability, demanding creative solutions and responsible management. Different types of financials risks are:

- Insufficient funding: Limited resources for maintaining infrastructure, preventing upgrades, and potentially compromising quality. Lack of resources can prevent timely repairs and upgrades, leading to inefficient systems and increased risk of failures.
- Economic instability: Inflation or budget cuts affecting operation and maintenance costs, impacting service delivery. Inflation can drive up the cost of operating and maintaining systems, impacting service delivery and potentially leading to water scarcity.
- Non-payment of bills: Reduced revenue impacting system maintenance and investment in improvements.

Low or inconsistent revenue can create a vicious cycle of inadequate maintenance and declining service quality, further discouraging payment.

Impact on Water Quality and Sanitation Functionality:

The following describe the impacts of risks and risk of interconnectedness of water quality and sanitation.

1. **Interconnected Threat:** The ripples of risk go far. Floods can contaminate water through debris, straining treatment and impacting sanitation functionality. Conversely, failing infrastructure in the sewer system can pollute waterways, compromising water quality and hindering efficient treatment. Recognizing these intertwined vulnerabilities is crucial for building a resilient system.
2. **Cascading Consequences:** Imagine a domino effect. Cracks in pipes, fury of storms – each risk whispers to its neighbour, disrupting quality and functionality. A power outage halts pumping, leaving untreated water vulnerable to bacteria. This contaminated water then floods the sanitation system, causing overflows and posing health risks. Each risk holds the potential for cascading consequences, jeopardizing both water quality and sanitation functionality.

Specific Examples:

Climate change: Droughts can decrease water availability, leading to concentration of pollutants and reduced flushing in sewer systems, increasing health risks.

Ageing infrastructure: Corroded pipes can leach lead and other contaminants into drinking water, while cracks in sewer lines can allow raw sewage to seep into the environment.

Financial constraints: Lack of resources for maintenance can result in malfunctioning treatment plants, leading to increased turbidity and potentially harmful bacteria in the water supply.

Analyse how each type of risk can directly or indirectly affect water quality and sanitation functionality.

Provide examples of potential consequences (e.g., increased turbidity, fecal contamination, reduced treatment efficiency).

Emphasize the interconnectedness: contamination in water supply impacting sanitation systems and vice versay.

4.2. Assessing the likelihood and impact of different risks (Risk matrix). Introduce a simplified risk assessment methodology adapted for Karnali conditions.

Unseen threats lurk within our water and sanitation systems, jeopardizing clean water, hindering sanitation, and ultimately, the health of our community. But fear not! Today, we arm ourselves with a weapon against these hidden foes – the simplified Risk Matrix. This powerful tool helps us analyse their presence, measure their impact, and prioritize those demanding immediate attention. Get ready to uncover the shadows in our system, assess their vulnerabilities, and build a resilient community where every drop flows clean and strong.

Identifying the possible risks and assessing their likelihood and impact is needed. By prioritizing threats based on their potential damage and feasibility of mitigation, resources can be channelled wisely, focusing on immediate needs. Risk assessment is a careful process of looking at a system or situation to:

- Identify potential problems: Try to find all the things that could go wrong and disrupt how things work.
- Understand how likely those problems are to happen: Think about how often each problem usually happens and if there's anything making it more or less likely.
- Figure out how serious the problems would be: Consider how much damage or trouble each problem would cause if it did happen.
- Make a plan to address the most important problems: Decide which problems need the most attention and create a strategy to prevent them or reduce their impact.

Risk Assessment is like a doctor checking a patient's health: They look for signs of illness, try to understand how serious the problems are, and then make a plan to keep the patient healthy.

Risk Matrix

Risk Matrix is a simple tool that helps visualize and prioritize risks. It looks like a grid or table with two main parts: Likelihood and Impact.

Impact/Effect (Consequence): How severe the impact of a risk would be if it occurred. The result or effect of an incident occurring

Probability (Likelihood): How likely it is that the risk will actually happen. Chance that an incident occurs.

Risk = Likelihood x Consequence

The measure of the likelihood that an incident will occur and the consequence if it does.

How it works:

1. **Identify risks:** List out all the potential problems or hazards that could affect the water system.
2. **Score effects:** For each risk, assign a score (usually 1-4) to represent how severe the consequences would be. High numbers mean serious consequences.
3. **Score probabilities:** Assign a score (usually 1-5) to represent how likely each risk is to occur. High numbers mean a higher chance of happening.
4. **Calculate risk scores:** Multiply the effect score by the probability score for each risk. This gives a "risk score" that reflects the overall level of concern.
5. **Prioritize risks:** Use the risk scores to rank the risks from highest to lowest. This helps focus on addressing the most critical issues first.

Visualizing risks: The risk matrix displays these scores in a grid, with effect scores on one axis and probability scores on the other. Risk scores are often color-coded, with red representing high-risk items, yellow for moderate risks, and green for low-risk items. This makes it easy to see which risks demand the most attention.

Likelihood Analysis

Type of event / Likelihood	1 - Very Low	2 - Low	3 - Moderate	4 - High	5 - Very High
Acute event	Not likely to occur in period	Likely to occur once between 30-50 years	Likely to occur once between 10-30 years	Likely to occur at least once per decade	Likely to occur once or more annualy
Chronic event	Not likely to become critical in period	Like to become critical in 30-50 years	Like to become critical in 10-30 years	Like to become critial within a decade	Will become critical within next 5 years

Illustrations:

1. Sunny Days and Storm Clouds: Assessing Risks to Keep Your Water Flowing

Think of your water system like a town constantly facing different weather conditions. Heavy storms (high consequence) are rarer than sunny days (low consequence), but both have their chances of occurring (probability). By checking the "risk weather forecast" (the matrix), you can prepare for the most likely and impactful storms (high-risk situations) to keep your town thriving.

2. Imagine a busy kitchen:

Risks: A fire starting on the stove, a knife cut, a spill on the floor, running out of ingredients.

Effect scores: A fire would have a high effect score (serious consequences), while a small spill would have a low one.

Probability scores: A fire is less likely if you're careful and attentive (low probability), while spills are more common (higher probability).

Risk scores: Multiplying effect and probability gives a risk score for each hazard. A fire, despite its low probability, would still have a high risk score due to its severe consequences.

Prioritizing actions: The chef would focus on preventing fires first (installing a fire alarm, keeping a fire extinguisher handy) while also addressing other hazards to ensure a safe and efficient kitchen.

Karnali-specific risks: Consider adding an additional illustration focused on risks specific to Karnali's water systems. This could include landslides, earthquakes, or limited resources etc.

Risk level examples (Nepal)

Source: UN handbook on IAM https://financing.desa.un.org/document/un-handbook-infrastructure-WSS-management

Risk Level	Example
Extreme	Intensification of rainfall events (likelihood 3–5) will lead to more frequent instances of flash flooding in mountain valleys, causing damage to WSSs and increasing loss of life (consequence 4–5).
High	Intensification of rainfall events will increase slope destabilization causing more landslides (likelihood 3–4), threatening WSSs and people, and partially damming valley streams (consequence 4).
Moderate	Higher temperatures will increase the frequency and intensity of wildfire events (likelihood 3), damaging local land in proximity to the city (consequence 3)
Low	More frequent drought conditions (likelihood 3) will reduce the quality of recreation fields (consequence 1).

Key points to emphasize:
The risk matrix helps visualize and prioritize risks, even when they're not equally likely to occur.

It's important to consider both the potential consequences and the likelihood of a risk when assessing its overall level of concern. By focusing on high-risk items first, one can make the most effective use of resources and efforts to protect a water system.

Adapting a general risk matrix to Karnali's unique needs necessitates considering its specific challenges and limitations. Below is a simplified methodology tailored to local conditions:
Vulnerability Mapping: Focus on identifying WSSs and locations most susceptible to risks like landslides, earthquakes, flooding, or aging infrastructure. This can involve community participation and local knowledge of vulnerable areas.
Resource-Aware Scoring: Adjust the consequence scoring system to account for limitations. For example, a pipe leak might warrant a higher score due to limited repair resources in Karnali compared to urban areas.
Likelihood Considerations: Modify the probability scores based on historical data and local context. Factors like earthquake frequency, monsoon intensity, or community maintenance practices can influence likelihoods.
Community Ownership: Encourage community involvement in identifying and prioritizing risks, leveraging their understanding of local conditions and needs. This fosters a sense of ownership and promotes sustainable risk management practices.
Flexibility and Iteration: Recognize that risks evolve, and adaptation is crucial. Regularly update the risk matrix with new information, adjust resource allocation as needed, and consider local feedback to maintain its effectiveness.

This simplified approach, tailored to Karnali's environment and limitations, empowers communities to proactively manage their water systems by focusing on the most critical and feasible risks first.

4.3. Prioritizing maintenance actions based on risk assessment

Leaks are mischievous pickpockets, while pump failures are sudden storms threatening the stalls. Your risk assessment is a keen stall guard, identifying the biggest troublemakers and prioritizing to keep the flow of clean water steady and safe. Arming yourselves with wrenches and vigilance, you focus on fixing the most disruptive stalls and repairing potential weak spots to keep the marketplace of clean water secure.

Building on the risk assessment, the focus moves to taking action: translating risk scores into prioritized maintenance activities to keep a water system running smoothly.

Remember:
High-risk items (with a higher risk score) deserve immediate attention and resources.

Prioritization Steps:

1. **Sort the Risk List:** Arrange the identified risks from highest to lowest risk score. This gives a clear picture of which issues demand the most urgent action.
2. **Consider Feasibility:** While focusing on high-risk issues, also be mindful of feasibility. Can one readily access resources and expertise to address those critical issues now? If not, consider temporarily prioritizing moderately high-risk actions that are more feasible in the meantime.
3. **Match Actions to Risks:** Identify appropriate maintenance actions for each risk. For example, a high risk of pipe bursts might call for immediate inspection and potential replacement, while a moderate risk of pump malfunction might warrant regular monitoring and preventive maintenance.
4. **Develop a Maintenance Plan:** Create a concrete plan outlining the prioritized maintenance actions, timelines, responsible individuals, and resource allocation. This ensures a coordinated and focused approach to addressing risks.
5. **Monitoring and Adaptation:** Remember, risks and priorities can change. Regularly monitoring of the water system, updating the risk matrix as needed, and adapting maintenance plans accordingly ensures continual improvement and efficient resource allocation.

Karnali Context:

In Karnali, consider these additional factors when prioritizing:

- Resource limitations: Be mindful of limited access to materials, equipment, and skilled personnel. Prioritize actions that require readily available resources or can be undertaken with community involvement.
- Seasonal variations: Adapt the maintenance plan to address risks that are more likely during specific seasons, like landslides in monsoon or pipe freezing in winter.
- Community participation: Involve the community in prioritizing and even taking part in feasible maintenance activities. This fosters ownership and promotes sustainable water management practices.

4.4. Developing an action plan for addressing identified risks

Developing an action plan is like building a sturdy wall around the market. You prioritize critical repairs, like fixing leaky stalls and reinforcing weak roofs, to keep the flow of clean water steady and safe. This roadmap, with clear roles and timelines, ensures everyone works together to keep the vital water market thriving.

An action plan tackles identified risks head-on. Clear goals are set, with prioritized actions based on urgency and feasibility. Each risk gets a specific plan of attack: who does what, by when, with what resources. Regularly monitoring progress and adapting as needed ensures one can plug leaks and weather storms, safeguarding the WSS.

1. Define Clear Objectives:

- What specific issues need addressing with the action plan?
- How to measure the success of the efforts made?
- Be specific and measurable to track progress and ensure actions are aligned with priorities.

2. Prioritize Actions:

- Use the risk assessment to identify the most critical risks that need immediate attention.
- Consider feasibility of actions, resource availability, and potential impacts when prioritizing.
- Balance urgency with practicality to ensure efficient resource allocation.

3. Develop Specific Actions:

- Clearly define the concrete steps or activities to be taken for each risk.
- Assign responsibilities, deadlines, and resources needed for each action.
- Be detailed and actionable to ensure clarity and accountability.

4. Communication and Monitoring:

- Communicate the action plan to all stakeholders involved in risk management.
- Regularly monitor progress against deadlines and adjust the plan as needed.
- Ensure transparent communication and adapt to changing circumstances to maintain effectiveness.

5. Continuous Improvement:

- Review the effectiveness of the action plan regularly.
- Learn from experiences and incorporate feedback to improve future risk management procedures.
- Foster a culture of continuous improvement to ensure a proactive approach to addressing risksy.

This action plan, with its prioritized risks and clear action steps, lays the groundwork for the comprehensive WSS Management Action Plan (MAP) we'll be building in the next session. By addressing immediate risks now, we pave the way for diving deeper into specific maintenance, repair, and replacement activities to safeguard our valuable WSSs. Join us next session as we transform this roadmap into a detailed MAP for long-term water system security!

Session 5 – Setting up Operations and Maintenance Systems

Contents of this session are:

5.1 Types of Maintenance (Preventive, corrective, emergency)
5.2 Schedules and Frequencies for different Maintenance Tasks
5.3 Building a Robust Maintenance System: Roles, Records, and Plans

This session builds a strong foundation for the water system's resilience. Different maintenance types will be explored, from preventing leaks to tackling emergencies, and schedules will be crafted to keep things running smoothly. Roles are assigned, ensuring everyone knows their part. By keeping detailed records and leveraging the WSS inventory and risk assessment, personalized maintenance plans can be created, safeguarding the water flow now and into the future.

5.1. Types of Maintenance

Now, picture this: a leak starts trickling in the village square, while a pump sputters on the hillside. These are just two whispers of trouble within your water system. But fear not! Today, we explore the different types of maintenance, like vigilant watchmen and skilled healers, that keep these whispers from becoming deafening roars.

Before assembling a team of watchful villagers and defining their responsibilities, they need to be equipped with the right tools. In this session the diverse forms of maintenance and care are explored – from regular checks and timely repairs to swift interventions – ensuring every pipe, pump, and valve plays its vital role in keeping our community's lifeblood flowing strong.

Definitions and Examples:

Preventive Maintenance: Proactive care to prevent issues and prolong equipment lifespan, like regular servicing or replacing parts before they fail. Regularly scheduled inspections and minor maintenance activities, such as changing filters, lubricating equipment or cleaning sewers. Imagine it as regular checkups for a car, catching small problems before they snowball into bigger breakdowns.

Examples:

- Routine inspections: Visually checking pipes for leaks, cracks, or corrosion.
- Cleaning and lubrication: Maintaining filters, pumps, and valves to ensure smooth operation.

- Monitoring data: Analysing sensor readings to identify potential problems before they become critical.

Corrective Maintenance: Fixing existing problems after they occur to restore functionality and prevent further damage, like repairing leaks or replacing malfunctioning components (repairs to defects or failure of minor components). Think of it as patching a leak in a roof to stop further water damage.

Examples:

- Repairing leaks: Sealing cracked pipes, replacing faulty gaskets, fixing valve malfunctions.
- Replacing worn components: Changing old filters, worn-out bearings, or malfunctioning sensors.
- Troubleshooting malfunctions: Diagnosing and fixing pump failures, pressure drops, or contamination issues.

Emergency Maintenance: Immediate response to critical infrastructure failures or potential health risks to prevent immediate and severe damage, to prevent disaster and protect public health, like a major pipe break or contamination event. Picture it as calling an ambulance for a sudden water main break or a rapid response to a potential contamination event.

Emergency maintenance is not the same as Reactive Maintenance, which typically involves fixing equipment after it has already failed or malfunctioned. While both are reactive in nature, emergency maintenance deals with immediate dangers, while reactive can involve addressing smaller issues that haven't yet escalated.

Examples:

- Fixing major leaks: Emergency pipe repair to prevent flooding or contamination.
- Addressing pump failures: Ensuring continuous water flow with temporary solutions or backups.
- Preventing contamination events: Rapid response to potential contamination sources to protect water quality.

Deferred Maintenance: Maintenance that should have been performed but was not undertaken as planned. It is a liability as it means that an WSS will not achieve its design service life. While not technically a separate type of maintenance, it reflects a strategy of delaying necessary repairs or maintenance activities. Essentially, it's the opposite of preventive maintenance and can often lead to a reactive approach. Deferred maintenance comes into play in following situation:

- Financial constraints: Systems might lack resources to address all maintenance needs promptly, leading to postponed repairs and accumulating problems.
- Lack of prioritization: Maintenance activities might be deemed less urgent compared to other operational demands, resulting in delays and potential escalation of issues.
- Misunderstandings about risks: Underestimating the consequences of postponing maintenance can lead to unexpected failures and larger repair costs later.

The consequences of deferred maintenance can be significant:

- Increased costs: small problems neglected today can become expensive repairs later, leading to higher overall maintenance costs.
- Reduced reliability: Water systems with deferred maintenance are more prone to failures, disruptions, and potential health risks.
- Safety concerns: Degraded infrastructure can pose safety hazards to workers and the public.

Type of Maintenance	Benefits	Drawbacks
Preventive	- Saves money in the long run by avoiding costly repairs. - Extends equipment lifespan. - Ensures reliable water supply.	- Requires regular time and resources commitment - May involve investing in tools and technologies. - Not always applicable to all equipment.
Corrective	- Restores functionality and prevents further damage. - Can be cheaper than emergency repairs. - Provides valuable data for future preventive maintenance.	- Costs more than preventive maintenance if problems become severe. - Can lead to disruptions in water supply. - Relies on prompt identification of issues.
Emergency	- Prevents immediate health risks and major infrastructure damage. - Protects public safety and minimizes environmental impact. - Requires quick and decisive action.	- Most expensive type of maintenance. - Can cause temporary disruptions and inconveniences. - May not always be fully preventable.

Choosing the Right Type - Factors to Consider:

- Equipment age and condition: older equipment might require more corrective maintenance, while newer might benefit from preventive focus.
- Risk assessment: Prioritize areas with higher risks of failure or contamination for proactive care.
- Operational priorities: Balance preventive activities with reactive needs and resource availability.
- Maintenance history: Analyse past problems and repairs to guide future maintenance strategies.

Decision-making tools:

- Risk matrices: Rank equipment or infrastructure based on potential impact and probability of failure.
- Cost-benefit analysis: Compare long-term savings from prevention with upfront costs and potential repair expenses.
- Predictive maintenance technologies: Utilize sensor data and analytics to predict problems and schedule preventive interventions.

Local Relevance:

- Consider resource constraints and adapt examples to reflect locally available tools and materials.
- Focus on common equipment types in your area and tailor maintenance guidelines accordingly.
- Incorporate local knowledge and practices of traditional water management methods.

Interactive Activities:

Case studies: Discuss real-world scenarios where different types of maintenance were used, prompting participants to analyse and evaluate choices made.

Group discussions: Divide participants into groups and assign them different types of maintenance to research and present on benefits, drawbacks, and best practices.

Role-playing scenarios: Simulate situations where participants act as maintenance personnel deciding on the appropriate intervention for different problems.

Responsible operation and planned routine maintenance of physical WSSs is critical to maximizing service life; providing the required level of service to the community at the lowest possible life cycle cost; avoiding or mitigating the consequences of WSS failure; and improving resilience to the impact of hazards. WSS failure and a reduction in the level of service also increase financial and reputational risks to the WSS owner (i.e. a government or an organization). Selecting materials or purchasing equipment without considering future O&M expenses can have a significant impact on our ability to sustain a WSS's service delivery.

5.2. Schedules and frequencies for different maintenance tasks

Imagine your car – you wouldn't drive it recklessly without regular tune-ups, oil changes, and tire rotations. Similarly, our water system thrives on a structured care schedule.

Even the most reliable machine needs a well-timed routine care, and a water system is no different. To keep it running smoothly, the frequency and timing of various maintenance tasks must be planned meticulously. This session delves into the crucial rhythm of water system maintenance, exploring how different tasks are scheduled to meet their unique needs and prevent disruptions.

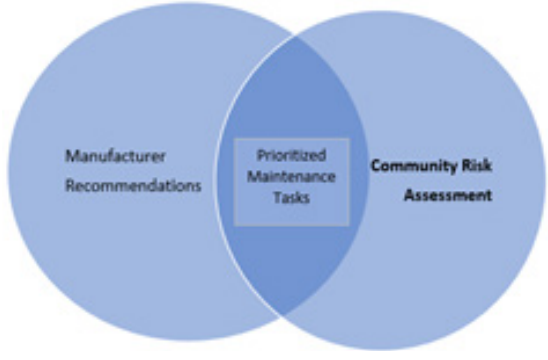
High-risk equipment, like aging pipes or critical pumps, might demand more frequent attention, while robust elements like newer valves might thrive on less frequent but thorough inspections. Equipment age, manufacturer recommendations, and potential risks, along with environmental conditions like seasonal fluctuations, need to be analysed to craft optimal schedules for each component.

Tips for Implementation:

- Start with a basic plan and refine it over time and involve all stakeholders in the scheduling process.
- Communicate schedules effectively to all involved parties.
- Track progress and make adjustments as needed.
- Use technology to automate and streamline scheduling processes.

This session goes beyond offering a fixed timetable. It will help equip participants with practical tools and frameworks to prioritize tasks, allocate resources effectively, and anticipate potential disruptions. By the end, they'll be able to confidently create a tailored maintenance plan for a water system, ensuring it plays its vital role in the community's well-being with unwavering reliability.

Frameworks for Determining Frequency:



- **Manufacturer Recommendations:** Analyse equipment age, manufacturer recommendations (consult manuals or suppliers), and potential risks (involving community members and local experts) to prioritize critical components and establish optimal maintenance schedules considering impact on water availability, health, and daily life.
- **Preventive Maintenance Focus:** Emphasize regular cleaning, inspection, and minor repairs to prevent costly breakdowns and ensure continuous service.
- **Seasonal Adjustments:** Adapt maintenance frequencies for tasks affected by monsoon rains, droughts, or winter conditions.

- **Reliability-Centred Maintenance (RCM):** Analyse equipment failure modes and select maintenance actions that effectively prevent failures.
- **Condition-Based Maintenance (CBM):** Use sensor data to monitor equipment health and trigger maintenance when needed, optimizing schedules based on real-time performance.
- **Industry Best Practices:** Benchmark maintenance schedules against those of similar systems or industries.
- **Regulatory Requirements:** Adhere to any mandatory maintenance standards or reporting obligations.

Scheduling Tools:

- **Visual Calendars:** Create simple, visible calendars or charts using paper, whiteboards, or locally available materials. Mark important maintenance tasks, deadlines, and progress in a clear and understandable format for all involved. Gantt Charts can also be used.
- **Community-Based Project Management:** Adapt traditional project management techniques to manage maintenance using local knowledge and resources. Assign tasks to community members, track progress through regular meetings, and celebrate milestones together.
- **Spreadsheets:** If computers are accessible, use basic spreadsheets to track tasks and schedules. Free software options are available.
- **Maintenance Management Software (CMMS):** Comprehensive systems for tracking WSSs, scheduling tasks, generating work orders, tracking inventory, and analysing maintenance data.
- **Project Management Tools:** Adaptable for managing maintenance projects, assigning tasks, and tracking progress.

Additional Considerations:

- **Resource Constraints:** Plan maintenance realistically, considering available personnel, tools, and budget.
- **Community Engagement:** Involve community members in maintenance planning and execution to foster ownership and shared responsibility.
- **Training and Knowledge Sharing:** Provide training on basic maintenance tasks to local technicians or community members. Share knowledge through workshops, demonstrations, or peer-to-peer learning.
- **Simple Data Collection:** Track maintenance history using simple logs or notebooks. Use this information to identify trends, inform future schedules, and measure effectiveness.
- **Continuous Improvement:** Regularly review schedules and adjust based on experience, feedback, and changing needs. Encourage community participation in evaluation and adaptation.

Choose tools and frameworks that align with the system's complexity, available resources, and data management capabilities. Remember, effective maintenance scheduling is an ongoing process that requires continuous evaluation and adaptation to ensure optimal performance and reliability.

Interactive Activities:

Schedule Simulation: Divide participants into small groups and assign them different water system components. Each group creates a maintenance schedule for their assigned component, considering frequency, type of tasks, and resource constraints. Then, groups swap and review each other's schedules, offering feedback and suggestions.

Priority Puzzle: Present participants with a list of urgent and non-urgent maintenance tasks. Divide them into teams and provide limited resources (e.g., budget, personnel). Teams strategize and collaboratively decide which tasks to prioritize within the constraints, justifying their choices and discussing the potential consequences of each decision.

Risk Assessment Game: Create a role-playing scenario where participants act as a maintenance team faced with potential threats to the water system, like seasonal flooding or equipment malfunctions. Challenge them to assess risks, prioritize tasks, and adjust their maintenance schedule accordingly.

Tailoring content based on audience level:

- **Beginner audience:** Focus on core types of maintenance, such as daily checking of gauges, weekly cleaning of filters, and monthly inspections of pipes. Use simple terms and visually represent schedules (e.g., calendars, charts).
- **Intermediate audience:** Delve into equipment-specific requirements, discussing factors like manufacturer recommendations, risk assessments, and environmental considerations. Introduce tools for prioritizing tasks and managing resources.
- **Advanced audience:** Explore sophisticated maintenance strategies, like predictive maintenance with sensor data analysis and risk-based decision-making tools. Discuss optimizing schedules for cost-effectiveness and efficiency.

Local Relevance:

- Adapt examples and considerations to the specific context of your audience's water system. Include locally available equipment, common maintenance practices, and potential environmental or infrastructure challenges.
- Encourage participants to think about local resources and limitations when creating and implementing maintenance schedules.
- Discuss collaboration with relevant stakeholders, like community members, authorities, and equipment suppliers, to optimize schedules and ensure efficient maintenance.

5.3. Building a Robust Maintenance System: Roles, Records, and Plans

Imagine your water system as a bustling village. Pipes are its veins, pumps its beating heart, and clean water the lifeblood flowing through it all. This session equips you with the tools to build a strong team of watchmen, responsible for regular patrols, mending cracks before they burst, and knowing exactly where to send the villagers when unexpected storms hit. With clear roles, detailed logs, and a map of priorities, you'll keep your village of water thriving, healthy, and ready for anything.

Building a robust maintenance system requires clearly defined roles, meticulous record-keeping, and a practical plan aligned with the WSS inventory and risk assessment. By investing in these efforts, the water system can be safeguarded against costly breakdowns, ensuring its long-term sustainability, and ultimately deliver clean water to the community.

Roles and Responsibilities:

- Clearly define: Who does what? Assign specific maintenance tasks and responsibilities to team members or departments. This ensures accountability and avoids confusion.
- Consider expertise: Match tasks to individual skills and strengths. Utilize technical expertise for complex repairs while delegating routine checks to trained personnel.
- Communication is key: Establish clear communication channels for reporting issues, sharing updates, and coordinating maintenance activities.

Note: Consider giving examples of specific roles, like lead technician, inspector, or maintenance coordinator, and the tasks associated with each.

Importance of Record-Keeping:

- Track it all: Maintain detailed records of all maintenance activities, including dates, tasks performed, materials used, and any observations.
- Identify trends: Analyse records to identify recurring problems, track equipment performance, and predict future maintenance needs.
- Improve over time: Utilize records to learn from past experiences, refine maintenance schedules, and optimize resource allocation.

Note: Mention the types of records beyond activity logs, like equipment history, parts inventory, and training logs.

Engaging Your Audience:

Add visuals: Consider using diagrams, flowcharts, or pictures to illustrate roles, record-keeping practices, and different types of maintenance plans.

Share real-world examples: Provide case studies or anecdotes of how well-defined roles, records, and plans have benefited water systems.

Interactive activities: Consider group discussions, role-playing exercises, or brainstorming sessions to engage participants in building their own maintenance system plans.

Local Waters, Local Solutions: Building Resilient Water Systems Together

Reliable water isn't just a luxury; it's the heartbeat of our community. But keeping that flow steady isn't magic – it's dedicated O&M, Operations and Maintenance. And just like our streets and fields, our O&M needs to be homegrown, rooted in the tools, materials, and knowledge right here.

Forget fancy foreign examples. Think bamboo fences instead of steel bars, clay pots instead of plastic filters. Our elders hold a treasure trove of wisdom about managing water – let's tap into that rich wellspring!

But book smarts have their place, too. Equipping our team with the ABCs of O&M – preventing leaks before they start, fixing troubles with nimble hands, and responding to emergencies with lightning speed – is key. It's like building a toolbox of water warrior skills!

And here's where things get exciting. Let's ditch dry lectures and bring O&M to life. Case studies closer to home than a textbook, stories of local heroes keeping water flowing in times of trouble – that's how we make O&M real. Open discussions, sharing ideas and experiences, turn O&M into a community effort, not just a technician's job.

By tailoring O&M to our unique needs and weaving in local knowledge, we build resilience from the ground up. Strong O&M isn't just about pipes and pumps; it's about families, elders, and friends working together to secure our water future, drop by precious drop.

So, the next time you see someone checking a well or fixing a tap, remember: they're not just maintaining our water system, they're weaving a tapestry of water security for generations to come. Every leak plugged, every pipe mended, is a thread in that vital fabricy.

Developing a Simple Maintenance Plan:

- Leveraging WSSs: Utilize an existing WSS inventory to prioritize maintenance needs based on criticality and risk assessment.
- Scheduling smartly: Establish specific schedules for preventive, corrective, and emergency maintenance tasks based on equipment types, manufacturer recommendations, and identified risks.
- Flexibility is key: Design a plan to be adaptable to changing circumstances and unexpected events. Be prepared to adjust schedules and priorities as needed.

Note: Provide examples of different types of maintenance schedules (weekly, monthly, annual) and tools for managing them (calendars, spreadsheets, software).

Benefits of developing a maintenance plan:

- Improved efficiency: Clear roles, organized records, and a well-defined plan streamline maintenance operations, saving time and resources.
- Enhanced reliability: Proactive and documented maintenance prevents equipment failures and minimizes downtime, ensuring a reliable water supply.
- Cost-effectiveness: Early detection and timely interventions avoid costly repairs and replacements, optimizing maintenance budgets.

Notes:

- *Quantify the potential time and resource savings with well-defined roles and records.*
- *Highlight the impact on water quality and public health by preventing breakdowns*
- *Show how proactive maintenance can avoid high repair costs and extend equipment lifespan.*

Session 6 – Case Studies and Best Practices

Contents of this session are:

- Present pre-selected case studies showcasing diverse success stories in WSS management.
- Peer-to-Peer Sharing: Invite WUSCs to share their own experiences and successes in managing WSSs.

Sharing Success Stories: Learning from Each Other's WSS Management Journey
This session isn't just about learning best practices in abstract. It dives into inspiring case studies of typical WUSCs who have achieved remarkable results in managing their water supply systems. By examining their challenges, successes, and the strategies they used, practical insights can be gained to help develop concrete action plans to replicate their achievements within the participants' WUSCs.

Importance of this session: Sharing and learning from each other's experiences is a powerful tool for overcoming common challenges and improving water supply services. This session provides a platform for WUSCs from diverse regions, including Karnali and other Nepal hills, to connect, share their journeys, and co-create solutions. Together, participants can learn from each other's successes and develop tailored approaches to optimize their WSS management and ensure consistent, reliable water for their communities.

Replication and Action Plans: Learning from successful WUSCs is only half the story. The real value lies in translating those learnings into tangible action plans for participants own contexts. During this session, best practices will be analysed and practical, step-by-step plans to adapt them within WUSCs will be developed. This ensures that the insights gained from each other's journeys don't stay in abstract discussions but lead to concrete improvements in WSS.

Problem-Solving Skills: Delving into the experiences of different WUSCs, helps to hone problem-solving skills. By analysing different approaches to overcoming challenges, participants can learn to think critically, identify creative solutions, and adapt them to their unique situations. This session provides the tools and mindset to tackle WSS management challenges with confidence.

Sample Case Studies for Water Supply Management:

1. Community-Managed Water Supply in Jumla, Karnali:

Project: Rural Village Water Resources Management Project (RVWRMP) Phase III, supported by the Government of Nepal, the European Union, and the Government of Finland.

Success Story: Established a community-owned and managed water supply system using local resources and trained volunteers. Reduced dependence on external support and improved water availability for over 1,000 people.

Website: https://doli.gov.np/doligov/ (Information on RVWRMP III in Nepali)

Document: "Inclusive Growth: Impact Stories from Nepal" by Asian Development Bank (see pg. 8 for Jumla case).

2. Rainwater Harvesting and Micro-Irrigation in Dolakha:

Project: Integrated Water Resource Management Project, supported by the International Fund for Agricultural Development (IFAD).

Success Story: Introduced rooftop rainwater harvesting and micro-irrigation systems for rural households. Increased water security for agriculture and improved household incomes.

Website: https://www.ifad.org/en/

Document: IFAD project reports on the Nepal project.

3. Spring Rehabilitation and Recharge in Sindhupalchowk:

Project: Nepal Water Conservation Foundation (NWCF) and Koshi Basin Programme.

Success Story: Rehabilitated and recharged dried-up springs using traditional water harvesting techniques. Improved water availability for communities and revived local ecosystems.

Website: https://waternepal.org.np/

Document: NWCF annual reports and research publications

4. Solar-Powered Water Pumps in Gorkha:

Project: Rural Water Supply and Sanitation Sector Project, supported by the Asian Development Bank (ADB).

Success Story: Installed solar-powered water pumps in remote villages. Reduced reliance on electricity grid, decreased operational costs, and ensured reliable water supply for communities.

Website: https://www.adb.org/

Document: ADB project reports and case studies

5. Gorkha Water Management Initiative (GWMI) Phase II (2020-2024):

Project: Implemented by Gorkha Municipality with support from USAID and SNV Netherlands Development Organisation.

Focus: WSS Management System development, including comprehensive WSS inventory, O&M planning, preventive maintenance procedures, and capacity building for WUSCs.

Highlight: Demonstrating a holistic approach to WSS management, leading to improved system efficiency and reduced downtime.

Website: https://snv.org/: https://snv.org/

6. Community-Managed O&M in Dolakha:
Project: Integrated Water Resource Management Project (IFAD)
Implementation Year: Project started in 2009 and continued through 2019.

7. Solar-Powered Water Supply System in Gorkha:
Project: Nepal Water Supply and Sanitation Sector Project (ADB)
Implementation Year: Project phases spanned from 2010 to 2020. Specific implementation for solar systems within Gorkha might require further research.

8. Improved Naulas in Far West Nepal:
Project: Various local initiatives (e.g., ADB-supported programs)
Implementation Year: These initiatives have been ongoing for several years, with some newer rehabilitation projects undertaken in the last 5-7 years.

9. Digital WSS Management in Kathmandu Valley:
Project: Kathmandu Valley Water Supply Management Improvement Project (World Bank)
Implementation Year: Project launched in 2022, with digital WSS management implementation still ongoing.

Additional Resources:

- Nepal Water Supply and Sanitation Sector Project website: https://www.adb.org/projects/35173-015/main
- Department of Local Infrastructure (DoLI) website: https://doli.gov.np/doligov/
- International Water Association (IWA) website: https://iwa-network.org/ (Resources on community-managed water systems)
- RWSSP-WN Project (Western Nepal): This project offers various case studies on WSS management and O&M in different districts. https://www.rwsspwn.org.np/ Project phases commenced in 2017 and continue through 2025, offering various case studies with implementation dates throughout this period.

Linking with MAP Session:
We can structure the concrete action plan development in the Case Studies session to seamlessly connect with the next session on MAP. This ensures a cohesive learning experience and maximizes the practical benefits for participants.

Session 7: WSS Management Action Plan (MAP)

Contents of this session are:

- Introduction to MAP: Purpose and Benefits
- Describe the essential sections of a MAP
- Available resources to support MAP implementation

What is MAP?

This session introduces the MAP as a crucial tool for effective management of critical water supply and sanitation WSSs. The MAP serves as a roadmap for optimizing WSS performance, ensuring service delivery, and minimizing risks. It guides strategic decision-making and resource allocation for water and sanitation systems.

MAP acts as a powerful compass for optimizing crucial WSSs. It's more than just a self-assessment tool; it compares knowledge, practices, and documentation against desired goals, pinpointing gaps and charting actions to bridge them. Imagine this MAP as a tailored investment map, guiding local governments and agencies to prioritize areas for funding and maximize their impact on a chosen critical WSS.

Benefits of MAP

- **Improved service reliability:** The MAP proactively identifies and addresses potential threats to WSS performance, minimizing unexpected disruptions and outages.
- **Enhanced WSS lifespan:** Implementing the MAP's maintenance and improvement actions extends the life of your critical WSSs, reducing replacement costs and long-term investment needs.
- **Cost optimization:** The MAP prioritizes actions based on their impact and resource requirements, allowing for efficient allocation of budget and resources.
- **Increased accountability:** The MAP clarifies roles and responsibilities for WSS management tasks, promoting transparency and effective collaboration among stakeholders.
- **Sustainable water and sanitation services:** By focusing on efficient resource utilization and environmental considerations, the MAP contributes to ensuring the long-term sustainability of WSSs.

Essential Sections of an MAP

The MAP is structured into key sections outlining strategies and actions:

- **Critical WSS Identification:** Defining the most critical WSSs based on factors such as public health impact, accessibility, and potential for improvement.
- **Performance Goals:** Setting clear and measurable objectives for WSS management efforts, aligned with community needs and development priorities.
- **Gap Analysis and Risk Assessment:** Evaluating current practices, identifying gaps in performance or criticality, and assessing potential risks associated with those gaps.
- **Action Plan:** Prioritizing and outlining specific actions with clear responsibilities, timelines, and resource requirements to address identified gaps and mitigate risks.
- **Monitoring and Evaluation:** Establishing methods and metrics to track progress towards achieving goals, ensuring the effectiveness of the MAP and informing future adjustments.

Suggestions for tailoring the MAP for WUSC in Karnali region:

1. Focus on Karnali-specific context:

- Stakeholders: Consider including community-based organizations, traditional water management groups, and relevant development partners alongside government stakeholders.
- Constraints: Tailor the list of constraints to reflect the challenges of the Karnali region, such as limited resources, infrastructure limitations, and geographic features.

2. Adapt the action plan:

- Actionable steps: While the template provides a good framework, break down the actions into specific, measurable, achievable, relevant, and time-bound (SMART) steps with clear owners and deadlines.
- Resource availability: Be realistic about available resources and prioritize actions that can be done with existing resources or readily mobilizable support.
- Traditional knowledge: Consider incorporating elements of traditional water management practices used in Karnali communities, where applicable.

3. Localize the language:

- Use clear and concise language that is easily understood by stakeholders with varying levels of technical expertise.
- Translate key terms and concepts into local languages if necessary.

4. Use existing resources:

- Leverage existing tools and templates developed by other organizations working in Karnali, such as RWSSP-
- WN and RVSSP-WN.

  Adapt the annexed template to fit existing reporting formats and tools used by local water user committees.

5. Ensure ownership and participation:

- Actively involve stakeholders in the MAP development and implementation process.
- Build capacity through training and workshops to equip stakeholders with the necessary skills for WSS management.

Additional relevant points

Consider including a section on climate change adaptation and resilience, as this is a major concern in Karnali.

Provide clear monitoring and evaluation indicators to track progress and measure the effectiveness of the MAP.

Remember: The MAP should be a dynamic document that evolves over time. By regularly reviewing and updating it, you can ensure it remains relevant and effective in achieving your water supply management goals in Karnali.

Session 8 & 9: Preparation of WSS Management Action Plan (MAP)

Contents of this session are:

- Guide participants through a step-by-step process of creating their own MAPs using the provided tools and templates.
- Offer individual guidance to WUSCs facing specific challenges in MAP development.

Step-by-Step MAP Creation:

- Breakdown the process into clear, manageable steps: Start with defining the critical WSS, then move on to goal setting, gap analysis, action planning, and monitoring. Use the provided templates and tools at each step, demonstrating their application with practical examples.
- Integrate interactive activities: Break up the presentation with group discussions, exercises where participants apply the tools to their own context, and role-playing scenarios to address common challenges.
- Leave room for questions and troubleshooting: Allocate time throughout the session for participants to ask clarifying questions and share their specific issues. Encourage an open and collaborative atmosphere to maximize learning outcomes.

Individual Guidance for WUSCs:

- Create a dedicated support session or breakout group: Offer additional time for WUSCs facing specific challenges to receive personalized guidance. Encourage them to come prepared with their questions and concerns.
- Use case studies and best practices: Share examples of how other WUSCs have overcome similar challenges using the MAP framework. This can inspire participants and provide practical solutions.
- Facilitate peer-to-peer learning: Encourage WUSCs to share their experiences and offer advice to one another. This can foster a collaborative learning environment and build a network of support.

Additional Tips:

- Referring to the previous session, highlight the benefits of MAP: Make the participants understand how creating a MAP can directly benefit their communities, such as improved water quality, reduced service disruptions, and more efficient resource utilization. Connect the training to real-world benefits for participants and their communities. Showcase how MAPs can improve service delivery, optimize resource utilization, and contribute to long-term water and sanitation sustainability.
- Emphasize ownership and action: Encourage participants to take ownership of their MAPs and actively implement the identified actions. Provide them with resources and support to continue the process beyond the training session.
- Collect feedback and adapt: After the session, gather feedback from participants to evaluate its effectiveness and identify areas for improvement. This will help you continuously refine your training materials and approach.

WSS Management Plan (MP) and WSS Management Action Plan (MAP)

There is different terminology for WSS management. Some agencies are using the term MP as well. The choice between using MAP or MP depends on the specific context, organizational needs, and available resources. Both can be valuable tools for improving WSS management practices, but understanding their differences is crucial for choosing the most appropriate approach.

Main differences of MP and MAP -

- **Scope:** An MAP is often a simplified, action-oriented version of an MP, designed for specific contexts or communities with limited resources. It focuses on essential elements for immediate action, rather than an in-depth, comprehensive analysis.
- **Level of detail:** An MP typically goes into greater detail, covering aspects like financial planning, risk management, WSS lifecycles, and complex maintenance schedules. It's more suited for larger organizations or complex WSS systems.
- **Flexibility:** MAPs often prioritize flexibility and adaptability, allowing adjustments based on changing needs and resource availability. MPs might be more rigid due to their comprehensive nature.
- **Target audience:** MAPs might be specifically designed for community-based organizations or local water user committees, while MPs could be used by larger utility companies or government agencies.

By including a well-structured and informative recap, the value and impact of the training can be significantly enhanced, ensuring that participants leave with a clear understanding and a strong impetus to apply their newfound knowledge.

Reinforces Key Concepts: Recaps highlight the most important takeaways from each session, solidifying knowledge and understanding for participants.

Enhances Retention: Reviewing key points aids in memory consolidation, increasing the likelihood that participants will remember and apply what they've learned.

Provides a Reference Tool: Recaps serve as a concise summary for future reference, allowing participants to quickly refresh their knowledge without rereading the entire manual.

Promotes Action: By re-emphasizing the practical steps involved in MAP development, recaps encourage participants to take action and apply their learnings in their work.

Creating an effective recap

- **Structure:** Organize the recap logically, mirroring the structure of your training sessions. Use clear headings and subheadings to guide readers.
- **Key Points:** Highlight the most important concepts, definitions, tools, and techniques from each session. Emphasize practical takeaways and action steps.
- **Bullet Points or Lists:** Use bullet points or numbered lists to present information concisely and improve readability.
- **Visuals:** Incorporate relevant diagrams, charts, or infographics to visually reinforce key points and enhance understanding.
- **Call to Action:** Conclude with a strong call to action, encouraging participants to apply their knowledge and skills in their work.

Steps:

- Briefly summarize the overall purpose and goals of the training.
- Provide brief summaries of each session, highlighting key concepts and takeaways.
- Re-emphasize the importance of WSS management for water and sanitation services.
- Encourage participants to continue their learning journey and actively implement MAPs in their communities.
- Provide resources for further information and support.

Most important takeaways from each session

Day 1 Focus: Understanding the Fundamentals of WSS Management

Session 1 - Importance of WSS Management: We learned how effective WSS management ensures sustainable water supply and sanitation, improves community health, and optimizes resource utilization.

Sessions 2 & 3 - Inventorying WSSs: We understood the importance of creating and maintaining accurate WSS inventories, including key information like location, type, age, and maintenance history.

Session 4 - Risk Assessment & Prioritization: We explored different types of risks (natural, technical, and financial) impacting water systems and practiced prioritizing maintenance actions based on their potential impact and likelihood.

Session 5 - Building Maintenance Systems: We discovered various types of maintenance (preventive, corrective, and emergency) and the importance of establishing schedules, responsibilities, and records for effective maintenance management.

Day 2 Focus: Implementing WSS Management in Practice

Session 6 - Learning from Others: We explored successful WS&S WSS management practices through case studies and peer-to-peer sharing, identifying challenges faced and strategies for overcoming them.

Session 7 - Developing MAPs: We introduced the WSS Management Action Plan (MAP) as a crucial tool for planning and budgeting WSS management activities. We explored its key sections and available resources for development and implementation.

Sessions 8 & 9 - Taking Action: We actively practiced creating draft MAPs for our own WUSCs, outlining prioritized tasks, responsible individuals, timelines, and resource requirements.

6 Module 5: Natural Disaster Management and Water Safety

Recap of Climate Resilient Water Safety Plan (WSP+++)

Concept: A Water Safety Plan (WSP) looks to secure water quality and quantity as well as ensuring reliable services now and in the future. It contributes to sanitation and hygiene and is needed for multiple use of water and livelihood purposes. WSP+++ supplements this by also addressing climate change adaptation and disaster risk reduction (+), operation and maintenance (O&M) and water tariff collection (++), and social inclusion (+++). Funds are needed for regular O&M costs, salary of the Village Maintenance Workers (VMW), repairs, and replacement of components. User participation and commitment are essential to ensure sustainability.

Steps:

Step 1 - Team Formation: At the first step, the scheme users will form a WSP Team dedicated for preparation, monitoring and verification of WSP+++. Members of the WSP Team shall take responsibility for implementation of activities identified in the WSP+++, although other users (not members of the WSP Team) or groups can be named responsible for implementing specific activities. The WSP Team must coordinate with other stakeholders to obtain the necessary resources needed in implementing the WSP+++ and related activities. The WSP team is formed in a community meeting and should consist of at least five members of which at least two are women. The members should comprise users only and include the WUSC chairperson and a VMW.

Step 2 - System analysis: The WSP team draws a map of the WSS with its catchment and service area. The map includes descriptions of: Water source and its immediate environment, water discharge, seasonal changes, assumed recharge areas and runoff & its impact such as landslides and locations damaged by floods; scheme structures and their purpose; how the water is stored and distributed; how the water is treated; land use and any signs of degradation (e.g. landslides, deforestation, road building, overgrazing, erosion, etc.). Is farmland affected by drought? Do all users get water of adequate quality and quantity when needed? Is there enough water for multiple use, such as livestock and home gardens? Is there a special demand of water from professionally engaged farmers? Do all users have toilets? Are they used? Is handwashing possible and practiced? How is drinking water stored at home?

Step 3 - Identifying Hazards and Control Measures: The WSP team visits the whole scheme from source to taps to verify the findings from Step 2. They observe both environmental and human-made risks to the reliability of water services. Finally, they discuss options for control measures and improvements. Guiding questions for the walk: How is the water quality at source (bacterial contamination, turbidity, taste, smell)? How is the source discharge? Has it

changed from past years? Has anyone kept any records on these changes? Are the structures in a good condition and working properly? Are any of the pipelines exposed? Are there repeated issues, such as leakages or pipe bursts? Are there possible ways of contamination through the scheme (source, pipelines, reservoir tanks or their covers, taps, etc.)? Is there a risk from extreme weather, such as floods? Are any of the structures in danger from events such as flooding, road building, landslides, or erosion? Is there a risk of source depletion from droughts? Are there signs of catchment degradation? (Slopes with degraded vegetation have poor capability to retain water, thus preventing groundwater and spring recharge). How is the water stored in households? Is there enough water for handwashing, gardening, and livestock? Do all the households have toilets? Are they being used properly? Are there any significant increases in water demand from farming or other activities?

Step 4 - Implementation via incremental improvement plan: After identifying the hazards and risks to ensuring safe supply and safe quality drinking water, the WSP team shall discuss and decide on the control and mitigation measures to prevent the hazard, to minimize the risks and to adapt to the changes (e.g. more intense droughts and floods). Short-term and long-term activities should be identified and the need of internal or external support should be assessed.

Short-term plan (Format 6a of SUSWA WSP to be used for planning – as shown in Annex 10) will consist of regular (day-to-day) activities and minor improvement measures that can be implemented with WUSC´s own resources (without external support). The short-term plan should focus on prevention of water contamination through various control measures. Similarly, simple activities for preventing natural hazards and reducing risks (e.g. awareness raising, control of deforestation, prevention of future water catchment degradation, implementation of simple technologies) should be included in the short-term plan.

Long-term plan (Format 6b of SUSWA WSP to be used for planning, as shown in Annex 10) should include major mitigation and adaptation activities to natural hazards, as well as major repair and upgrading works of water supply system. Implementation of the long-term activities may require outside support (whether technical or financial) or long-term saving by the users; such requirements should be already mentioned in the plan.
Both short- and long-term plan shall be prepared based on discussion on the above matters. Questions related to ‘who’ and ‘by when’ need to be answered with clear roles and responsibilities. Specific responsible person(s) shall be assigned rather than assigning a group or team of people for each of the planned activities.

The WSP+++ prepared by the WSP Team shall be approved in a community meeting in which the users and committee members shall commit to its implementation. Short-term measures shall be implemented immediately and/or on regular basis (e.g. regular maintenance, control of deforestation).

Step 5 - Disaster response plan: The goal of disaster response planning is to improve the capacity of WUSCs to effectively respond to and rapidly recover from occurred hazards and disasters that already caused failures in water service delivery and water safety. This happens through providing the WUSCs with a practical step-by-step guideline against the most typical disaster caused by natural hazards. In this way, the WUSCs are prepared for the disaster in advance, and they have an action plan in the case of the most likely events. The ultimate goal is that a WUSC that has experienced a nature-induced disaster can rapidly recover the previous service. The most common type of disasters related to natural hazards are:

- Water quality issues and contamination
- Inadequate or distracted service of water to users
  - Damage on water systems and their foundations
  - Sudden source depletion or degradation
  - Freezing of water system structures
- Decreased sanitation and hygiene due to damaged toilets

The disaster response plan gives instructions to WUSCs on how to manage and recover service levels in case of these occurrences. Disaster response action plan consists of the 1) immediate response; and 2) mid-term response. The action plan must cover the above-mentioned most common types of disasters, and be documented in the given format below:

IMMEDIATE RESPONSE (0 DAYS TO 14 DAYS):

Step-by-Step No.	What will be done? (Action description)	Who does or organizes the action? (Responsible person)	Who provides funding and labour? (Resources)	How long after the disaster takes place? (Timeline)
1				

MID-TERM RESPONSE (2 WEEKS ONWARDS):

Step-by-Step No.	What will be done? (Action description)	Who does or organizes the action? (Responsible person)	Who provides funding and labour? (Resources)	How long after the disaster takes place? (Timeline)
1				
2				

Step 6 - Reporting, revision and monitoring: WSP team meets regularly to monitor control measures, review the situation and plan for updates. They review water tariff collection, source measurements and water quality results as well as listen to user feedback. Then they plan for any improvements to the WSP and the O&M plan.

Natural Hazards:

Natural hazards and natural disasters are related but are not the same: A natural hazard is the threat of an event that will likely have a negative impact. A natural disaster is the negative impact following an actual occurrence of natural hazard that significantly harms a community.

One has to remember that so-called natural hazards are not really only 'natural' but they are human-induced via e.g., climate and land use changes. Human land use changes make terrain vulnerable to natural hazards, and the human-induced climate change makes extreme weather events more likely, which increases the risk of natural hazards and thus also disasters. The typical climate-related natural hazards involve heavy rain and thunderstorms, floods, landslides, droughts, depleting water levels, and extreme cold waves and snow storms. Earthquakes are natural hazards that are not induced by climate.

WASH infrastructure is always to some extent vulnerable to natural hazards: Sudden water source depletion or degradation cause inadequate supply of water-to-water users and it may trigger contamination of the water system. Heavy rain and thunderstorms may cause turbidity of water and damage to electrical water system components. The turbidity may cause water quality issues and contamination. Floods cause soil erosion that may damage water system structures, their foundations and expose pipelines. The flooding may also damage water system structures or wash away toilets. Droughts may cause inadequate supply of water for the water users and the lesser water in the system cause water quality issues and contamination. Landslides may damage water system structures, their foundations and exposing pipelines, and damage toilets. Earthquakes may damage water systems and toilets as well. Cold weather may cause distracted water service provision due to frozen tap stands, pipelines, water tanks, valves, and other structures. Ice accumulated inside pipelines can crack them, damaging the system.

7 Module 6: Financial Management

Financial Management in WSS/WUSC

Financial management is an important aspect for the sustainability of the WSS. As previously mentioned, WUSC is an independent entity, responsible for implementing, operating and maintaining water schemes following procedures for organisational management and financial management. The operational unit of the WUSC is fully responsible to maintain all aspects of the financial management.

There are at least two important situations when the users/community are required to make contributions, namely 1: towards the construction of the WSS and 2: for routine operation and maintenance of the scheme for sustainability. These contributions are required as a part of WUSC policy to ensure community ownership of the WSS scheme.

Construction Fund

The construction fund is an approved fund from the support agency to implement the construction works of the scheme. There are provisions for the community contribution, LG contribution, and other stakeholders' contribution in the scheme. Once the design and cost estimate is completed for a proposed WSS, the potential funding source to implement the scheme must be identified. There might be several agencies/ stakeholders that can contribute to the project. The beneficiaries' community/users have to contribute to the project, with all records maintained by the WUSC. The % contributions made will vary depending on the chosen technology. The contribution pattern will be recorded as follows:

SN	Agencies	Contribution	Remarks
1	Doner agency	… %	
2	LG	… %	
3	Community / Users	… %	
4	Other stakeholders	… %	

Operation and Maintenance Fund

After completion of the construction and commissioning with public audit, a proper O&M plan and fund to make the project sustainable is needed. Proper O&M of the scheme is the responsibility of the community. The community members/users need to collect funds that can be used to pay for the regular O&M activities of the scheme i.e. salary of VLMW, tools and spare parts, repairs of the structures etc.

O&M funds can be raised/managed by the community from different ways and sources, such as:

- Saving amount from the community contribution during construction
- Collection of a small amount from the labour wages while paid work of the construction
- Monthly water fee collection amount
- Fee from external visitors
- Some amount from the community occasions/festivals
- Charging from any new migrated HHs
- % of the income by the users from using the water
- Interest amount of the mobilization of the fund in the community
- Support amount from the LG and other stakeholders for scheme maintenance
- Punishment amount from the users as per the O&M fund management rules and regulations.
- Other sources

Setting Water Fees/O&M Fund

Provision for the sustainability of the scheme is a regular part of WUSC's responsibilities from the beginning of the construction work. The community should set a water fee from all users for operation and maintenance of the scheme for the long term benefit of the scheme. The tariff collection must include costs for the WSP+++ (refer to the WSS management module of the WUSC capacity building).

In rural areas, generally, there are 2 types/methods of water fees collection:

1. General Method (flat rate)

Set a fix amount monthly that should be collected by the community. For example: the WUSC proposes Rs 100 per month per HH for operation and maintenance fund.

The process of the water fee setting:

- Propose a unit amount
- Discussion in the WUSC meeting
- Conduct mass meeting of users
- Discuss on the unit amount
- Make agreement of all users
- Finalize an amount for monthly water fees
- Make common understanding on some points of rules and regulation of the fund collection and management.

2. Unitary Method (flat rate as per O&M cost)

Set a x % of the construction cost and proportionate distribution to the number of users. For example:

- The total construction investment of the WSS is Rs.2500000.
- The operation and maintenance are 2% per year =Rs.50000.
- There are 25 beneficiary HHs of the scheme.
- The annual water fee for an individual HHs is 50000/25= 2000, so the monthly water fee is Rs.167 per HH.

The process to set the water fee is as follows:

- WUSC meeting and prepare a proposal
- Mass meeting/general assembly
- Discussion on the fee setting and amount
- Agreed decision from the mass meeting
- Prepare rules and regulation of the fee collection
- Implementation of the O&M activities

(Note: further methods and calculations are presented in the Module 3: WSS Management under the financial planning and water tariff fixation section)

Water Fee Collection

Water fees is one of the major sources of O&M funds and a major part of financial management. The WUSC should set an amount of water fees from rules and regulations for water fee collection. The process of the water fee collection is:

- Set a water fee from individual users
- Endorse from the general assembly
- Prepare a O&M rules and regulations
- Set a day and time of the monthly fee collection
- Collect the water fee from the water users
- Proper record keeping of income and expenditures
- Conduct periodic public audit of the income and expenditure and endorsement from the users

Formation of O&M Regulation

The WUSC will prepare an O&M fund management regulation under the provision of the constitution of the WUSC. The WUSC will form a regulation with the participation of all users of the WSS. GEDSI consideration should be addressed in the overall process and the document while preparing and implementation. The process to form an O&M regulation is as follows:

- WUSC Meeting and form a draft committee
- Prepare a O&M regulation Draft and present to the WUSC
- WUSC meeting will review and finalize the draft regulation
- Conduct general assembly/users mass meeting
- Present the draft regulation and discuss on each point
- After discussion on the whole document, formal endorsement from the general assembly
- Implementation of the regulation and periodic review as per need

The O&M regulation is an operation document for scheme management and financial management of the scheme. The WUSC is responsible for implementing the regulation with participation of all users. The O&M regulation document includes:

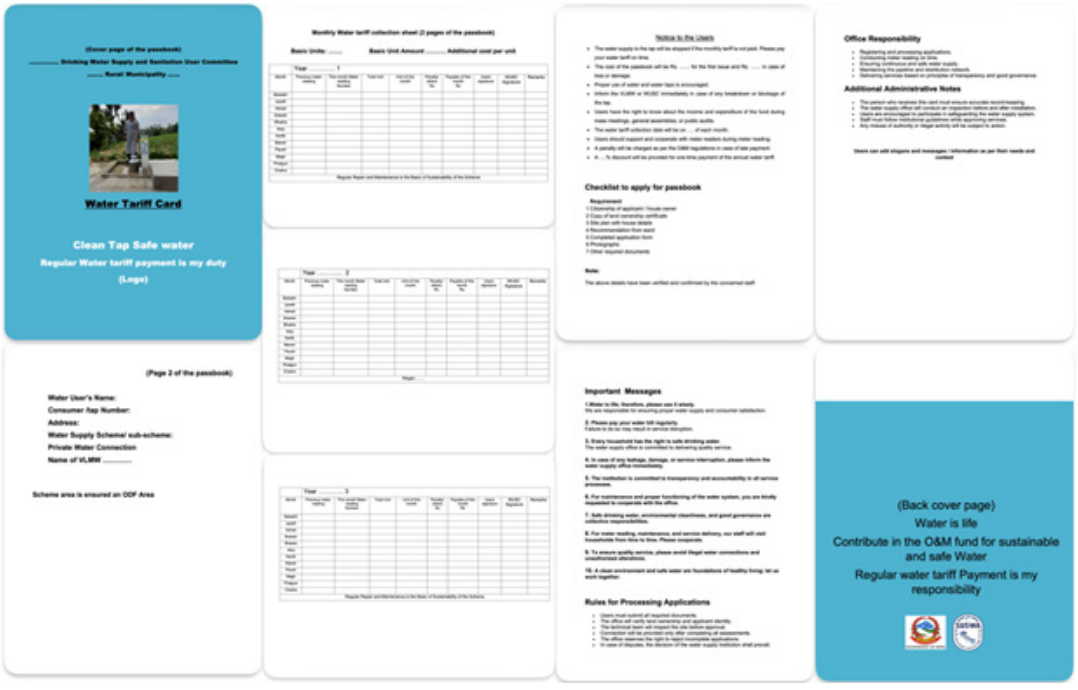
- Establishment of O&M fund, water fee setting, collection and mobilization
- VLMW selection process, appointment and mobilization

- Regular water tariff collection
- Rules of fund collection and penalty
- Necessary tools for repair and maintenance
- Spare parts for maintenance with cost/charges
- Regular meeting and review the regulations
- O&M and water safety plan, WUSC general assembly and other basics of scheme sustainability
- Expenditure of the fund and mobilization of the fund
- Record keeping and maintain transparency

(Refer to the Draft WUSC constitution in Annex 11).

O&M Fund Collection Passbook

The WUSC will design a passbook for Users records of the fund collection/ payment. External support might be needed to design the passbook and facilitation support to implement the regulation and the passbook system. The sample of the pass book is presented in the following figure:



Record Keeping & Financial Policy Document

The WUSC will prepare a financial policy regulation under the financial rules of the Government. As per the financial policy the WUSC will keep proper records of the income and expenditure of the fund and conduct annual financial audits. All the income and expenditure will be done according to the WUSC meeting and decisions.

The major records of the financial management are to be maintained and as part of a financial policy document. The financial policy documents are the main guide to record income and make expenditures.

There are 2 types of financial transactions based on the financial policy document of the WUSC: Operation and records of capital expenditure, and operation and records of operational expenses.

Capital Expenses (CapEx): Capital expenditures are a WUSC's major, long-term expenses for one-time investment for long-time benefits. In the case of WSS, the cost/expenditure in the structures, materials and other fixed assets are capital expenses (CapEX).

Operational Expenses (OpEx): Operational expenses are the day-to-day expenditure of the WUSC for regular operation and maintenance and the daily office operations.

Proper record keeping is very important, with financial audits, financial reports and public audits of the income and expenditure to be conducted. The record keeping and reporting of the financial status shows the progress of the WUSC for scheme sustainability. The samples of the account keeping formats are:

Bank Account

Date	Particulars	Deposited amount (Cr.) Rs.	Withdraw amount (Dr) Rs.	Balance Rs.

Income and Expenditure Account (Cash account)

SN	Particulars	Date	Income	Expenditure	Balance	Signature

Store book (Expendable Materials Record)

SN	Date	Particulars	Purchased quantity	Expenditure quantity	Balance	Signature

Store Book (Record)

Name of the scheme:
Address:

SN	Date	Particulars	Purchased quantity	Expenditure quantity	Balance	Signature

WUSC will develop a format of financial report with the facilitation of WASH facilitators to present in the general assembly/mass meeting for the public audit.

The above formats are only samples. Financial experts will contribute in this part and orient to the WASH facilitator to facilitate the WUSC.

Defining Roles and Responsibilities for Financial Management

Financial management helps WUSC to plan, organise and govern financial activities to keep the activities towards quality and sustainability of the WSS. A key role of the WUSC financial person/treasurer/account officer is decision-making for the financial management proper day-to-day operation of the fund with proper records.

The financial rules and regulations of the WUSC require the control of the financial operation of the scheme and its O&M fund, procurement fund and to maintain proper records.

To ensure the sustainability of the scheme, the important factors are involvement in strategic decisions, good leadership of the WUSC, identifying and balancing the needs of relevant areas, stakeholders and overall finance including internal and external factors.

Financial management has a crucial role for the sustainability of the scheme. This is directly related to the water integrity and concern of the people/users. The responsible person from the WUSC should be very careful and make clear records of the financial decisions and operations. The proper implementation of the financial management role by the authority helps to maintain trust among the users, participation of all users in operation and maintenance and good functioning of the scheme and WUSC.

The major roles of financial management are as follows:

- Financial decision and control
- Financial planning for regulation activities in the WSS
- Capital management
- Allocation and utilization of financial resources
- Cash flow management
- Disposal of surplus
- Financial reporting
- Risk and hazard management (*fiduciary risk)

Financial managers/treasurer/account officer performs tasks that are specific to their WUSC duties in participation, transparency, accountability and inclusion that makes the scheme sustainable.

For example, WUSC must be aware of issues regarding the area of operation and maintenance of the scheme and financial management and proper budgeting for O&M activities.

External Support and Cost-Sharing according to SSC Rules

The role and value of the external support and cost sharing for the construction, major repairs, rehabilitation of the scheme, and capacity building of the WUSC is an important part of the scheme sustainability.

The Service Support Centre (SSC) concept is introduced to establish a support mechanism in the WASH sector. The SSC is an entity to provide supplementary support to the WASH sector and its sustainability. SSC will be operated and managed in coordination with the local government to provide drinking water and sanitation services by empowering the water service system in an individual, national, province and LG level support.

According to the national water, sanitation and hygiene draft policy, the aim of the SSC is to provide remote technical support and facilitation roles to assist LG WASH units and WUSCs in the operation and maintenance of all water supply infrastructure under their responsibility. This process will include supporting the monitoring and reporting of the functionality status of all water points every month to provide the minimum level of data required to achieve effective maintenance of water supply infrastructure.

The role of the SSC is to support WUSC for sustainability of the WSS scheme in an inter-relative support mechanism at different levels of the government as per the federal system. The major roles of the SSC in the WASH sector are:

- Ensure inter-relation among the WASH sector agencies
- Ensure and update the WASH inventory
- Develop support mechanism to the WUSC
- Monitoring of the scheme and functional support mechanism
- Financial management of the WSS implementation and operation and maintenance of the scheme.
- Strengthen the WASH units to ensure proper support to the WUSC

Financial management is one of the major roles of the SSC. The SSC will manage financial support the WUSC/WSS to construct new service, repair and maintenance, repair and rehabilitation and capacity building support for sustainability. The following table provides an example for recording the cost sharing and external support planning to the WSS/WUSC for better WASH facilities:

WUSC/ WSS	External Support /Cost Sharing					
	SSC (different level)	LG	Donor Agencies	WUSC	Govt. WASH Sector Agencies	Other Stakeholders

Petty Cash Management, Cash Storage and Protection

WUSC has to manage the overall fund for construction of the scheme and the operation and maintenance activities. In the financial process, petty cash is an important part to maintain the day-to-day expenditure in the scheme.

Petty cash is a small amount of cash that is managed in the WUSC to pay for minor daily expenses and needs. The WUSC will make a decision for the amount of the petty cash as a minor running cost. In principle, the petty cash amount should be small for safety, trust and ease of management.

Petty cash management is a record keeping system to track the use of petty cash that WUSC uses to handle small expenses that arise over the course of the daily operations, such as reimbursement of claims, payments for meetings, tea etc.

The petty cash will be managed by the assigned person by the WUSC i.e. cashier, accountant, treasurer as per the type and status of an organisation.

The best way of petty cash management:

- Assigning the Cashier
- Finance the petty cash account
- Ensure the funds are secured
- Set up the policy/rules and regulations for the user of the petty cash
- Log every petty cash disbursement
- Request for receipts
- Timely settlement in the main account
- Ensure the proper use, records and reporting of the petty cash operations
- Reload the petty cash fund as per need.

Cost Structure and Budgeting

Cost structure and budgeting for the construction and O&M is one of the important aspects under the financial management of the WUSC. Budget structures define a framework in which individual budgets are established, maintained, tracked and controlled. Each budget structure is composed of budget levels that define the budget hierarchy of the structure. Budgeting is the process of allocating finite resources to the prioritised needs of an organisation. In most cases, for a government entity, the budget represents the legal authority to spend money.

Budgeting and Cost for the WSS

Water supply systems are networks whose edges and nodes are either water sources, pipe junctions or end users. Their function is to provide end users with potable water with a sufficient pressure level. The budgeting of the water supply and sanitation project is depending on its structures, length of pipeline, number of tap-stands and availability of the skilled and unskilled labour.

There are two types of cost structure and budgeting in the WSS. WUSC is responsible for the financial management of the scheme with proper utilization of the budget.

Budget/Cost for Construction of the Scheme

Construction budget of the scheme is the cost for planning and implementation of the WSS scheme. Generally, this comprises the cost for source protection, intake, pipeline, RVT, water tap and other structures according to the technical design.

Budget for Operation and Maintenance

Operation and maintenance of the scheme is very important after the construction of the scheme. WUSC is fully responsible to make all arrangements for the sustainability of the scheme. The WUSC should manage the budget for the day-to-day operations of the scheme. The budget should be managed by themselves as per the sector/type of the expenditures. The example areas of cost and possible sources are:

Area of expenditure for O&M	Source of fund/ budget
- Cost for the tools/ Spare parts - VLMW salary - Stationery and office cost - Records and reporting	- Water tariff / O&M fund - Support from the local government - Support from the external WASH agencies - Penalty and punishment amount

Financial Planning with Tariff Fixation

How much is spent on a WSS should be established through discussions with the community. Generally, expenditure for operational expenses is incurred on the following items (depending on the size and nature of the WSS, there may be other items:

1. System extension cost
2. Human resources cost (salaries and allowances for caretaker, meter reader and manager/account)
3. Stationeries
4. Utilities (electricity – unsubsidized amount, communications)
5. WUSC meeting
6. Minor purchases (buying Tools, replacement of valves, water meters, etc.)
7. Water quality equipment
8. Contribution to the Local Government's major O&M fund
9. Other Unforeseen costs.

Similarly, the following are the possible sources of income for the WSS:

1. Water tariff
2. Membership fee (one-time)
3. Tap connection charge (one-time) per household
4. O&M fund from the Local Government including subsidized amount.

The total annual operation cost and income of the WSS should be established. A worksheet in excel is developed to calculate the operation cost and possible income for the drinking water system, as shown in Annex 9.

Guideline for using the Expenses and Income Worksheet

The guideline to fill this sheet is briefly explained below. Only the highlighted cells of the worksheet have to be filled in.

Expenses (Operation Cost)

In order to calculate the yearly expenses (operational costs), the following steps should be followed:

Under the operation cost, many headings are considered. The first heading is **'System Extension Cost'**. If there is a plan of system extension in a particular year, allocate the budget/cost for that in the cell under the 'Yearly Cost' heading column.

1. **Human Resources Cost:** There is a provision of 3 kinds of human resources in the sheet under human resources. If the proposed human resources title suits the WUSC's system, fill their monthly remuneration. If the title is not suited to one's requirements, change the title and put their monthly salary accordingly. In yearly cost for human resources, 13 months is considered, including festival allowance. The annual cost will automatically be calculated.

2. **Stationeries:** The cost required for stationeries such as paper, register, letter pad, ball pen, receipts etc. is considered under stationeries. One should fill the average monthly cost for stationeries in the heading of 'Monthly Cost' and it will automatically be calculated for a yearly cost under the heading of 'Yearly Cost'.

3. **Utility Cost:** This cost generally refers to electricity and communication costs. The charge for electricity is just for the use of a bulb, fan, heater, computer and printers. Here, the electricity charge for pumping the water is not considered. The communication cost includes the charge for telephone, photocopy and internet. Under the 'Monthly Cost' heading, one should fill the average monthly cost for utilities. Then, the yearly cost under the 'Yearly Cost' heading is automatically calculated.

4. **WUSC Meeting:** There is a practice of holding WUSC meetings monthly. There are expenses for the WUSC meeting for light refreshments (tea and cookies for the WUSC members) in the meeting. One should fill the average monthly cost for the WUSC meeting under the heading of 'Monthly Cost', and it will automatically be calculated under the heading of 'Yearly Cost'. If the WUSC meeting is not held on a monthly basis, then multiply the unit cost for the WUSC meeting by the total number of meetings in a year. The formula in the cell under the Yearly Cost should be fixed.

5. **Minor Purchases (Buying Tools, Replacement of Valves, Water Meters, etc.):** This cost is for minor purchases of tools and replacement of valves etc. Though there is no need to purchase tools and others every month, it is put to estimate the yearly cost. Therefore, one should enter the required annual cost directly under the heading of 'Yearly cost' or estimate the average monthly cost under 'Monthly Cost' to automatically calculate the required yearly cost.

6. **Water Quality Equipment and Kit:** It should be ensured that the quality of distributed water is safe and potable. Therefore, it is essential to assess water quality at least twice a year, before and after the monsoon. The cost of water quality Equipment and Kit has been calculated in the same manner as for 'Minor Purchases'.

7. **Contribution to the Local Government's Major O&M Fund:** 3 LGs of the Purnima Project have endorsed the WASH directive, which envisioned that the WUSC would take care of minor maintenance, and Gaonpalika will take the responsibility of major maintenance, including replacement of parts. It further envisioned that WUSC has to contribute up to 30% of their water tariff amount to the major maintenance fund established by Gaonpalika. It is not feasible for WUSC to contribute 30% at the infant stage (it is a matter of mutual understanding between WUSC and Gaonpalika). There should be an understanding of increasing the contribution gradually. The agreed percentage of contribution amount should be filled in the column on the right side of the sheet. This data is linked with the next sheet named 'Cash Flow Worksheet', which is explained in cash book chapter.

8. **Other Unseen Costs:** Despite considering all possible expenses, there might be other unseen costs in the WSS. A cost should be be provisioned to cover those unseen costs. One should put the tentative (average) unseen monthly cost under the heading of monthly cost and it will automatically calculate yearly cost under the heading of 'Yearly Cost.'

Income

The above section deals with establishing how much money is needed to systematically operate the WSS to achieve the expected service level. That amount could not be spent without a regular source of income for the WSS. Unfortunately, no one can always provide a full grant or assistance. Therefore, the WUSC should identify sources of income for the continuity of the WSS. Income sources may vary depending on the size of the WSS, the community's social structure and the location of the system. In general, the income sources can be as follows:

1. **Collected Water Tariff:** The major source of income for drinking water system is the water tariff. The collected amount from the tariff depends on the quantity of water sold to the users.
    a. If we know the unit of water sold per month, the total monthly water tariff amount would be the product of the unit of water sold and the water tariff rate. The method of fixation of water tariff is explained separately, below.
    b. If we do not know how many water units are sold per month, we need to calculate the amount of water to be sold. We need to fill the total households served, the average family size and water use per capita in the given sheet. Quantity of water will be calculated automatically.

2. **Membership Fee (One-time):** This is another source of income. This is a one-time income over the life of the system. Many WUSC levied the membership fee to each beneficiaries' households. Fill the membership amount in the heading of 'Rate'. The amount collected from membership fee will be calculated automatically.

3. **Tap Connection Charge (One-time) per household:** This is also a one-time income over the life of the system. Fill the 'tap connection charge' in the column of 'Rate'. The amount collected against the tap connection charge will be automatically calculated.

4. **O&M fund from the Local Government, including Subsidized Amount:** In the Purnima Project, Gaonpalika has committed to taking responsibility for the major maintenance and replacement of costly parts. In addition to this, Gaonpalika has also subsidized the amount of electricity used for pumping water. The estimated amount to be received by Gaonpalika should be filled in the heading of 'Yearly Cost' directly.

Water Tariff Fixation

Although there are different types of water tariffs in other countries, drinking water tariffs can be fixed in Nepal. This can be achieved in the following three ways; a water tariff fixation worksheet is presented in Annex 9.

1. Flat or Fixed Rate
2. Uniform Volumetric Rate
3. Increasing Block Rate

1. Flat or Fixed Rate

In the flat or fixed rate method of determining the water tariff, there is no accounting for the quantity of water used. In this system all households pay the same amount. However, different tariffs can be determined depending on the nature of the consumer. There might be separate tariffs for business purposes and institutional use. But the tariff rates for the same type of consumers are the same. Even if the water distribution line is of different sizes, the tariff can be determined differently depending on the size of the pipe. Thus, no matter how the tariff is determined, there is no accounting of how much water has been used.

Example of Method of Water Tariff Fixation (Flat Rate):
Water is distributed to 150 households through a WSS. The regular yearly operation, repair, and maintenance costs are Rs. 360,000. What would the monthly water tariff be if water is used as follows?

Step 1: Calculate the monthly system O&M and repair expenses:
Dividing the annual system operation and repair and maintenance expenses by 12 gives the monthly system operation and repair and maintenance expenses. Here the annual O&M and repair expenses are Rs. 360,000, so you know the month's cost by dividing this cost by 12 months.
Monthly expenses = Rs 360,000/12 = Rs 30,000

Step 2: Calculate the number of households benefiting from the WSS
Here, we are given a total of 150 households. The monthly operation, repair, and maintenance expenses are borne equally by all these households.

Step 3: Establish the monthly water tariff
In order to calculate the monthly tariff, the monthly operation and repair maintenance expenses have to be divided by the total number of households. This amount is the monthly water tariff.
Monthly water tariff per HH = Rs. 30,000/150 = Rs 200.00
In this way, we can calculate the monthly water tariff for the flat/fixed rate method.

2. Uniform Volumetric Rate

In this method, the water tariff is determined based on the amount of water used. The rate per unit is the same for all consumers based on water consumption. In some places, water tariff per unit varies depending on the nature of the users. As it is related to the amount of water used, every household must have a meter.

Method of Tariff Determination (Uniform Volumetric Rate)
Each household consumes water based on the number of family sizes. The amount of water consumption may not be the same in every household. This is because water consumption varies from personal behaviour, economic status and geographical location. In such cases, the amount of water distributed in the drinking water system is known based on the past water consumption rate.
The following table is an example of water use.

Range of Water Quantity (Unit)	Average Quantity	Households for Water Consumption
0 - 10	7	100
10 - 20	16	30
20 - 30	24	15
>30 (more than 30)	40	5

In this example, 100 households use 7 units (1 unit = 1,000 litres) per month, 30 HHs using 16 units, 15 HHs use 24 units, and 5 HHs use 40 units per month.

The annual O&M and repair costs of this WSS are Rs. 360,000. The water tariff is calculated as per the following method and step.

Step 1: Determine the monthly operation and repair and maintenance cost
Dividing the annual O&M expenses by 12 gives the monthly expenses. Here the annual expenses are Rs. 360,000, so the month's costs are calculated by dividing this cost by 12 months.
Monthly cost = Rs 360,000/12 = Rs 30,000

Step 2: Find out how many water units are distributed through the drinking water system
Based on the given water consumption schedule, we need to determine how many units of water are distributed from the WSS. The following table should be used:

Water Quantity Range (Unit) (1)	Average Consumption Unit (2)	Households (3)	Water Quantity (Unit) (4)
0 - 10 Unit	7	100	700
10 - 20 Unit	16	30	480
20 - 30 Unit	24	15	360
>30 (more than 30 Units)	40	5	200
Total water Consumed Unit			1,740

(1): Write the range of water consumption units in the WSS.
(2): Estimate the average water consumption in the WSS, within the range of each water quantity.
(3): Write the number of households consuming water in the range of each water quantity range.
(4): Now multiply columns 2 and 3 to calculate the amount of water consumed in each range.
(5): Now add up column 4 to determine the total water consumption. In the example above, the total water consumption is 1,740 units.

Step 3 – Determine the monthly water tariff
In the above steps, we have calculated the monthly amount of water distributed in the WSS. The monthly O&M expenses have to be borne from the sale of this amount of water. So, to calculate the water tariff per unit, divide the monthly O&M costs by the amount of water consumed throughout the month. For this example, we have calculated the monthly O&M is Rs 30,000. The amount of water consumed is 1,740 units. Now, to calculate the cost per unit of water, divide Rs. 30,000 by 1740.

Water tariff per unit = Monthly operation and repair and maintenance cost/total unit of water distributed in a month. Hence, Rs 30,0000/1,740 = Rs 17.24
In case of no data of water consumptions we can determine the water tariff based on the design quantity of water per capita per day, as per the following example:

Example of Method of Water Tariff Fixation (Uniform Volumetric Rate):
There are 150 HHs, total population = 150*5 = 750 (assuming average family size is 5), water consumption is 70 litres. Per capita/day and annual O&M cost is Rs 360,000, then the following steps and method can be used to fix the water tariff.

Step 1: Calculate monthly operation and repair and maintenance cost:
Dividing the annual system operation and repair and maintenance expenses by 12 gives the monthly system operation and repair and maintenance expenses. Here the annual operation and repair, and maintenance expenses are Rs. 360,000, and the monthly cost is calculated by dividing the total expenses by 12 months.

Step 2: Calculate total monthly water consumption
To find out the monthly amount of water, multiply the total population, daily water consumption rate and 30 (30 days of the month). Here 750 * 70 * 30 = 15,75,000 litters or 1,575 units of water is consumed.

Step 3: Calculate monthly water tariff
Divide the monthly operation, repair, and maintenance costs by the total monthly water consumption.

3. Increasing Block Rate

In this system, water tariffs will be based on water consumption. As the water use increases, so does the water tariff per unit. Therefore, an analysis is needed on the amount of water used (units), how many fragmented blocks should be made, how to make the size of each block, how much water tariff should be fixed for each block.

Method of water tariff determination in increase Block rate

Let's look again at the previous example of how tariffs are determined in this tariff method. Water is being distributed to 150 households through our drinking water system, and regular yearly operation, repair and maintenance costs are Rs. 360,000. If water is used as follows, what is the monthly water tariff?

Range of Water Quantity (Unit)	Average Quantity	Households for Water Consumption
0 - 10	7	100
10 - 20	16	30
20 - 30	24	15
>30 (more than 30)	40	5

Step 1: Determine the segmented block for water use

In this method to determine the tariff, first, the decision has to be made on the number of blocks to be created. 4 blocks of 10-unit intervals (0-10, 10-20, 20-30 and above 30) are considered in the above example.

Step 2: Assume Rs. X per unit for the base block (i.e. 0-10)

The first block should be considered as the base block, and the unit tariff rate should be fixed at the rate of one unit and based on this, the tariff of other blocks should be fixed many times or more percentage than the base block.

Let us assume the unit tariff rate X of the base block (0-10), which we have to determine. Then, if 10-20 units are consumed, the rate should be 20% more than the base rate; and if 20-30 units are consumed, the rate should be 40% more than the base rate; and if more than 30 units, a 60% higher tariff rate is assumed (the concerned committee should make this policy decision).

Step 3: Calculate monthly operation and repair and maintenance cost

Dividing the annual system O&M expenses by 12 gives the monthly system expenses. Here the annual O&M expenses are Rs. 360,000. The monthly cost will be calculated by dividing the total expenses by 12 months.

Monthly cost = Rs 360,000/12 = Rs 30,000

Step 4: Calculate the amount of water consumption

Use the following table for the calculation:

Range of Water Quantity (Unit)	Average Quantity	Households for Water Consumption	Calculation	Quantity
0 - 10	7	100	(7*X)*100	700 X
10 - 20	16	30	(10*X+6*1.2 X)*30	516 X
20 - 30	24	15	(10*X+10*1.2X+4*1.4X)*15	414 X
>30	40	5	(10*X+10*1.2X+10*1.4X+10*1.6X)*5	260 X
				1,890 X

Method of calculations

a) The average water consumption in the first base block (0-10 units) is 7 units per household, and the total number of households consuming water is 100 units, bringing the total water consumption to 700 units. Therefore, if the water tariff per unit is X, the total tariff raised would be Rs. 700 X from this block.

b) The average water consumption unit in the second block (10-20 units) is 16. The water rate is charged at X rate for the first 10 units and 20% more than the base for the remaining 6 units (16-10) so the tariff rate for the remaining 6 units is 1.2X per unit (1+20/100). So,

the cost per household from this block is (10*X + 6*1.2X). As there are 30 households consuming water according to this block, the total water tariff is (10*X + 6*1.2 X)*30 = 516 X.

c) The average water consumption is 24 units in the third block (20–30 units). Water charges at X rate for the first 10 units and 1.2X rates for the second 10 units; the remaining 4 units (=24-10-10) cost 40% more than the base, so the tariff rate for those remaining 4 units is 1.4X (1+40/100) per unit. So, the cost per household from this block is (10*X+10*1.2X+4*1.4X). As there are 15 households consuming water according to this block, the total water tariff is (10*X+10*1.2X+4*1.4X)*15 = 414X.

d) The average water consumption in the last block (>30 units) is 40 units. The first 10 units are charged at the rate of X, the second 10 units at the rate of 1.2X and the third 10 units at the rate of 1.4X. Similarly, as the remaining 10 units (=40-10-10-10) cost 60% more than the base, the tariff rate for the remaining 10 units is 1.6X per unit (1+60/100). For this block, since there are 5 households consuming water, the total water tariff is (10*X+10*1 .2X+10*1.4X+10*1.6X)*5 = 260X.

Step 5 – Calculate the monthly base tariff rate

The monthly maintenance and system operation costs should be divided by 1890 as calculated in the table above.

Rs. 30,000/1890 = Rs.15.87 (say Rs.16). Now find the unit rate for each block can be calculatedy:

Segregated Block (Unit)	Basis of water tariff	Tariff Rate Rs.
0 - 10	X	16
10 - 20	1.2*X	19.2
20 - 30	1.4*X	22.4
>30	1.6*X	25.6

This method of tariff is suitable for WSSs with many households. The Uniform Volumetric Rate is suitable for 500-600 households.

After calculating the water tariff by whichever method, at least a few percent amount should be added to the tariff rate so that the income us sufficient to be able to address risks other than the foreseen/estimated ones.

Refer to the Water tariff calculations worksheet in Annex 9.

8 Module 7: Conflict Resolution and Stakeholders Engagement

Conflict Resolution

A conflict is a struggle or clash between opposing forces, a state of opposition between ideas, interests or disagreement on a particular subject. There might be serious arguments if there are different opinions, ideas and views.

Being humans, the conflict comes when there is no balance between the opinions of both parties. Organisations' conflicts occur when there are human interactions. It can start when one member discusses their goal and the plans to execute it. The conflict is a state of disagreement over their values, motivations, ideas, or desires and interests. Sometimes these differences appear unimportant but when a conflict triggers strong feelings, a deep personal need is often at the core of the problem.

Conflicts can arise between the following parties:

- Internal conflict between 2 ideas of a single person
- Conflict between 2 people
- Conflict between an individual and organisation
- Conflict between 2 organisations/parties
- Conflict among more than 2 individuals or 2 organisations.

Identifying Potential Conflicts in Water and WSS

Water conflict is a term describing a conflict between countries, states or groups over the rights to access water resources. A wide range of water conflicts appear throughout history, though rarely are traditional conflicts waged over water alone.

The water conflict can occur on the source, its use, management and internal issues in the community and groups in the rural cases. Conflicts over water and water users cause sustainability issues in the rural water supply system. There is a growing number of water conflicts that go unresolved, largely at the state and community level and these will become more dangerous as water becomes scarcer.

Sometimes, the water conflicts at community level comes because of the personal interest of the people and lack of knowledge on the conflict and conflict management.

Sustainability of the WSS scheme affects two types of the conflicts: one is in the source and second among the WUSC, users and communities.

In a simple way, the conflict about water access, use of water, owned management of the water/source between two or more people, communities of a watershed is understood as a water conflict.

Conflict in WUSC/Users/Communities

The major area of conflict in the rural water supply system concerned with WUSC, users and communities are as follows:

- Water source ownership
- Water source limitation
- Multiple use of source
- Place of tap stand
- Conflict on the drainage
- Conflict on user of water
- Water tariff setting and collection
- Transparency issues
- Financial management by WUSC
- Conflict on WUSC formation
- Conflict on scheme management
- Conflict on meeting process
- Financial management conflict.

Causes of the Conflict

- Conflict due to lack of trust among the users
- Different interests
- Different objective and ideas
- Personal interests
- Lack of transparency
- Financial misuse
- Social or political interest
- Inequality / discrimination
- Lack of knowledge on the main subject
- Lack of awareness and knowledge about state law, act and regulations.

Effect of the Conflicts

There are so many types of conflicts in the WUSC, users and community as mentioned in the previous section. The conflict is not always negative; in case of timely resolution, it might result in a positive outcome for the quality of the WSS and its sustainability. The following table presents an analysis of the positive and negative effects of conflict:

Positive Effects of Conflicts	Negative Effects of Conflicts
- Increase communication and interaction among the person and group - Increase creativeness and work performance - Capacity building in problem solving and decision making - Improve group unity - Sharing of the experience and knowledge - Space to know new things	- Negative competition, mistrust - Tension, depression - Decrease of coordination - Unproductive use of effort and time - Groupism - Irresponsible activities - Divert from the main issue - Delay in results

Positive Effects of Conflicts	Negative Effects of Conflicts
- Relief from the expression of emotions - Possibility of transformation - Opportunity of new relationships - Change of perception on the issues - Clarity and problem solving	- Delay in decision making - Emotional decisions - Lose trust from the external stakeholders - Sometimes fighting and war - Generate fear environment

Identifying Potential Conflicts/Stakeholder Identification – Influence and Position Analysis

Conflict Analysis

- Types of conflict
- Identify issues and problems of the conflict
- Identification of conflicting parties
- Study and identify the background of the conflict on the particular issues
- Identify and analyse of the level and depth of conflict
- Study and identify the effect and impact of the conflict
- Identify the possible affecting people

Stakeholders' Analysis

Stakeholders' identification and analysis helps to identify the stakeholders involved or affected by the conflict. The analysis will indicate how powerful they are and what relations there are among them. Conflict may involve stakeholders external or internal to the WSS project, or a combination of those internal and external. Conflict between external stakeholders may be the most difficult to resolve because of their diversity and the lack of established procedures for tackling most of them.

The facilitator or moderators need to analyse the stakeholders relating to the WSS project and their effect. The moderator can help to identify the stakeholders, find the options, identify the effects and alternatives for solutions.

An example of the stakeholder's analysis frame is presented below:

Issue of the conflict	Involved stakeholder	Type of involvement / interest	Effect in the WSS scheme	Possible options for solution

Conflict Mitigation, Management & Resolution Strategies

Environment Setting

- Create an enabling environment as per the situation and location
- Collection direct and indirect information
- Create an environment to focus on the issue/problem
- Facilitate the creative and appreciative discussion on the issue/problem

- Find the points of common interest
- Hold separate discussions with the conflicting parties
- Re-organise the meeting to discuss on the common points
- Make common understanding on the part of the issue/problem

Conflict Mitigation

Conflict mitigation is a challenging part after analysing the conflict, issues and effect with stakeholder analysis. The major steps and facilitation to solve the conflict in a positive and transformative way are as follows:

- Conflict analysis and make common understanding to resolve it
- Selection of the potential mediator
- Study the related documents, analysing the legal aspects to enhance additional
- knowledge and skills
- Identify the options of the conflicting issues and parties in an agreeable manner
- Identification of the common understanding points
- More focus on the goal and objectives and make clarity for common understanding
- Transparent way of the overall process.

Facilitation for Conflict Resolution/Mitigation

- Create an environment of direct talks
- Facilitate the appreciative discussions
- Play an impartial mediators' role
- Appreciate the good ideas and positive discussions
- Emphasize the goal and objective focus points
- Appreciate and encourage on the common understanding points
- Link the points with legal provisions
- Facilitate to decide on further meetings to discuss the common points
- Introduce legal actions if needed.

Successful Management of the Conflict

- Develop common understanding and a progressive result
- Development of joint effort for better result
- Emerge new idea and solutions
- Enhance individual skill, knowledge and concept
- Creativeness and positive actions
- Improve quality of the work
- Development of sustainable way of development process
- Situation of faster progress in the work

Status of Unresolved Conflict

If the conflict has not been solved, there will be discouraging situations and low progress in the work and its sustainability. In case of unsuccessful conflict mitigation, the situation will be as follows:

- Discouraging situation for the assignment
- Disbursement of group work
- Loss of energy and misuse of capacity
- Divorced from the main task, goal, objective
- Developed negative thoughts
- Negative effect to the concerned people
- Loss the development and upcoming facilities
- Loss the trust among the stakeholders
- Delay of the development process
- Miss the opportunity of better facilities
- Hopeless situation
- Negative impact to the next generation

Tips for Facilitators in Conflict Management

The role of the facilitator is an important aspect during conflict mitigation/ transformation. The facilitator should be well-equipped with skill, knowledge and concept on the mediation and should be familiar with the subject matter. During conflict resolution/mitigation, the facilitator should follow the basic tips as follows.

- Listen carefully
- Understand the expression of the discussion points
- Speak less
- Analyse the situation
- Think about the alternatives /options
- Analyse the favourable time, venue and situation to influence
- Be impartial
- Be patient
- Use of appreciations and positive words in case
- Collect information related the issue/situation/conflicting parties
- Gain knowledge about legal provision
- Aware about the social norms, customs and issues.

9 Module 8: Water quality, Sanitation and Hygiene

Introduction to Water Quality, Field Testing, and Inline Chlorination

Ensuring safe drinking water is a core responsibility of the WUSC. Water that looks clear can still contain invisible risks—especially faecal pathogens. This section introduces the commonly applied water quality parameters in Nepal, the field methods used to test them, and the basic operation of inline chlorination devices used in rural gravity-fed schemes. The SOP for VMWs is being introduced to strengthen the capacity of WUSCs and to expedite quality service delivery through VMWs. This module will orient VMWs within their respective scheme areas on the SOP and their roles and responsibilities

1. Water Quality Standards and Parameters

Water quality standards originate from two main sources:

a) WHO Guidelines

The WHO Drinking Water Quality Guidelines provide international benchmark values for:

- Microbiological safety (E. coli = 0 CFU/100 mL)
- Key chemicals affecting health (arsenic, fluoride, nitrate, etc.)
- Aesthetic parameters (taste, colour, odour)

b) Nepal National Drinking Water Quality Standards

Nepal adopts similar limits but includes additional operational parameters.

Key parameters include:

Parameter Type	Parameter	Notes	Notes
Microbiological	E. coli	0 per 100 mL	Most important indicator of faecal contamination
Physical	Turbidity	≤ 5 NTU	High turbidity reduces chlorine effectiveness
	pH	6.5–8.5	Affects user acceptability and chlorine efficiency
	Colour	≤ 5 TCU	Aesthetic parameter
Chemical	Arsenic	≤ 0.05 mg/L	Chronic health risk
	Iron	≤ 0.3 mg/L	Causes staining; indicates reducing conditions
	Fluoride	0.5–1.5 mg/L	Low = dental caries; high = fluorosis
	Nitrate	≤ 50 mg/L	Important for child health
	Residual Chlorine	0.1–0.5 mg/L	Minimum protection at distribution point

Microbiological parameters change quickly and require frequent testing; chemical parameters change slowly and can be tested annually or bi-annually.

2. Microbiological vs. Chemical Contamination

Microbiological Contamination

Refers mainly to faecal bacteria, viruses and protozoa.

Key indicator: E. coli.

- Causes diarrhoea, cholera, dysentery
- Requires regular testing and continuous disinfection

Chemical Contamination

Includes arsenic, fluoride, heavy metals, and nitrates.

- Often originates from geology
- Requires laboratory or kit-based analysis
- Changes slowly; does not respond to chlorination

3. Basic Parameters for Safe Drinking Water

The most critical parameters for WUSCs to monitor—because they directly affect health or treatment efficiency—are:

1. Turbidity
   - Should be <5 NTU
   - High turbidity shields bacteria from chlorine
   - If high, allow sedimentation before chlorination
2. pH
   - Acceptable range 6.5–8.5
   - Chlorine is most effective at pH < 8
3. Arsenic
   - Limit ≤0.05 mg/L (Nepal standard)
   - Not removed by chlorination; specialist treatment required
4. Faecal Contamination (E. coli)
   - Zero tolerance
   - If results are positive: increase chlorination, check leakage points, protect sources

4. Handling of Water Samples & Use of Field Test Kits

Accurate field testing depends on proper handling:

a) Sample Collection

- Disinfect tap before sampling
- Flush for 1–2 minutes
- Rinse container three times with sample water
- Fill without touching inside of the bottle
- For open sources, collect 20 cm below surface

b) Microbiological Testing

Using P/A vials or WagTech/DelAgua kits:

- Fill to the indicated mark

- Keep upright at 22–44°C for 48 hours
- Colour change to black signals faecal contamination

c) Chemical/Physical Testing
Field kits commonly measure:
- pH
- Turbidity
- Iron
- Residual chlorine

5. Measuring Residual Chlorine
Residual chlorine is the only quick method to confirm effective disinfection throughout a rural system.
Procedure
1. Collect water in a clean transparent vial.
2. Add DPD reagent (tablet or powder).
3. Compare colour with chart.
4. Record value.

Target: 0.1–0.5 mg/L at tapstands
From the table below, values below 0.1 mg/L offer insufficient protection; values above 0.5 mg/L may cause strong taste or user rejection.

पानीको गुणस्तरमा क्लोरिनको मात्रा र कोलिफर्म जाँचमा ध्यान दिनुपर्ने कुराहरु :

क्र. सं.	परामितिहरु	एकाइ (Unit)	चेकगर्नुपर्ने समयावधि
भौतिक परामितिहरु			
१	धमिलोपन (Turbidity)	५ एन.टि.यु. (NTU)	दैनिक
२	हाइड्रोजन विभव (pH)	६.५-८.५	दैनिक
३	रङ्ग (Color)	५ टि.सि.यु. (NTU)	दैनिक
४	स्वाद र गन्ध (Taste and Odor)	आपत्तिजनक हुन नहुने	दैनिक
५	बिद्युतीय सम्वाहकता (Electrical Conductivity)	१५०० माइक्रो सिमेन्स(µS/cm)	मासिक
रासयनिक परामितिहरु			
६	फलाम (Iron)	०.३ (३) मि.ग्रा./लि. (mg/L)	बार्षिक
७	मेन्गानिज (Manganese)	०.२ मि.ग्रा./लि. (mg/L)	बार्षिक
८	आर्सेनिक (Arsenic)	०.०५ मि.ग्रा./लि. (mg/L)	बार्षिक
९	फ्लोराइड (Fluoride)	०.०५ – १.५ मि.ग्रा./लि. (mg/L)	बार्षिक
१०	अमोनिया (Ammonia)	१.५ मि.ग्रा./लि. (mg/L)	बार्षिक
११	क्लोराइड (Chloride)	२५० मि.ग्रा./लि. (mg/L)	बार्षिक
१२	सल्फेट (Sulphate)	२५० मि.ग्रा./लि. (mg/L)	बार्षिक
१३	नाईट्रेट (Nitrate)	५० मि.ग्रा./लि. (mg/L)	बार्षिक
१४	तामा (Copper)	१ मि.ग्रा./लि. (mg/L)	बार्षिक
१५	जस्ता (Zinc)	३ मि.ग्रा./लि. (mg/L)	बार्षिक
१६	आल्मुनियम (Aluminium)	०.२ मि.ग्रा./लि. (mg/L)	बार्षिक
१७	कुल कडापन (Total Hardness)	५०० मि.ग्रा./लि. (mg/L)	मासिक
१८	क्लोरिन अवशेष (Residual Chlorine)	०.१ – ०.५ मि.ग्रा./लि. (mg/L)	दैनिक
जैविक परामिति			
१९	ई-कोली (E.Coli)	सि.एफ.यु./१०० मि.लि.CFU/100 ml)	मासिक

- धाराबाट नमुना सङ्कलन गर्दा धारा बन्द गरी निर्मलीकरण गरेपश्चात् मध्यम गतिमा धारा खोल्नुपर्छ अनि केही मिनेटपछि सफा निर्मलीकृत भाँडोलाई धाराको पानीले राम्ररी पखालेर (Rinse) नमुना सङ्कलन गर्नुपर्छ ।
- नमुना लिँदा भाँडोलाई पानीमा डुबाउनुपर्ने अवस्थामा पानीको सतह भन्दा २० से.मि. तलबाट नमुना लिनुपर्छ ।
- फिल्ड लेबलमा कोलिफर्म/सूक्ष्म जैविक भए नभएको निर्क्योल गर्न पी.य. भाइल परीक्षण गर्नुपर्छ । यसका लागि पी.य. भाइलको सिसीमा पानीको नमुना तिरले देखाएको लेबलसम्म भरेर २२-४४ डिग्री सेन्टिग्रेड तापक्रमभित्र रहने कोठामा ४८ घण्टासम्म ठाडो गरी राख्नुपर्छ । यदि ४८ घण्टापछि कालो रङमा परिणत भएमा सूक्ष्म जैविक प्रदूषित रहेको थाहा हुन्छ |
- सूक्ष्म जैविक प्रदूषित देखिएमा कोलिफर्म हो वा होइन, यदि हो भने त्यो कति मात्रामा छ भनेर जान्नको लागि पुनः वाग-टेक वा डेल-अक्आ किट वा पानी परीक्षण ल्याबमा गई परीक्षण गर्नुपर्छ ।
- सूक्ष्म जैविक परीक्षणको लागि पानी सङ्कलन बोतल निर्मलीकृत गरी माथि उल्लेख भए जस्तै विधिबाट १ लिटर पानी लिई ६ घण्टाभित्र परीक्षण गरिसक्नुपर्छ ।
- ६ घण्टाभित्र परीक्षण गर्न नसकिने अवस्थामा पानीको नमुनालाई ४ डिग्री सेन्टिग्रेड तापक्रममा सुरक्षित साथ ढुवानी गरी २४ घण्टाभित्र परीक्षण गर्नुपर्छ ।
- पानी परीक्षणसम्बधी जानकारी वा सिकेका कुरामा अलमल भए वास इकाई वा सम्बन्धित प्राविधिकहरुबाट सहयोग लिनुपर्छ ।

6. Inline Chlorination – Basic Operation & Cartridge Replacement

It is a simple, low-cost technology that disinfects water automatically as it flows into the reservoir tank (RVT).

How Inline Chlorination Works

Water passes through the chlorine cartridge installed before the RVT.

Chlorine dissolves gradually, disinfecting the inflow.

A gate valve is installed before the device to control flow and prevent overflow (see picture below, top left side).

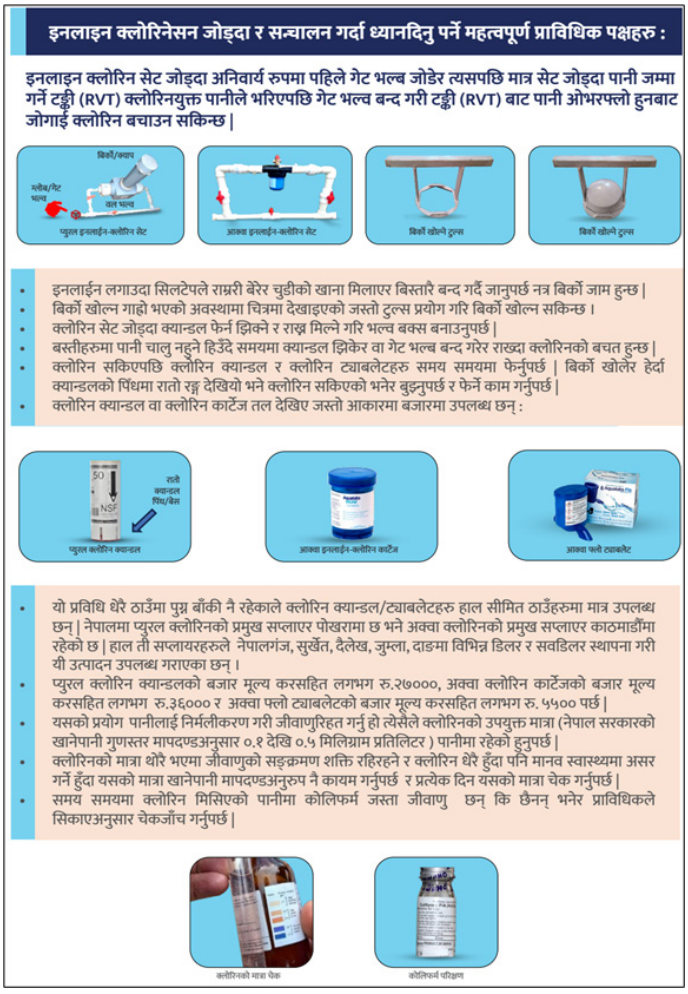
Steps for Cartridge Replacement

(See image below)

1. Close the gate valve to stop inflow.
2. Unscrew the cartridge chamber using the provided tool if needed.
3. Remove the old chlorine stick/tablet.
4. Insert the new cartridge (rural chlorine ball, inline chlorine cartridge, or tablet depending on model).
5. Ensure proper sealing using Teflon tape to prevent leakage.

6. Reattach chamber tightly.
7. Reopen gate valve slowly.
8. Measure residual chlorine at the tank outlet after 10–15 minutes.

The leaflet warns that chlorine must be replaced in time and that red coloration on the cartridge base indicates depletion (p.2) .



7. Overview of Water Purification Options

The WASH Catalogue (pp.15–16) presents the main household- and system-level treatment options with illustrations:

1. Inline Chlorination Cartridge
   - Continuous disinfection
   - Suitable for gravity-fed rural schemes
   - Effective against bacteria and viruses
   - Shown in WASH Catalogue p.15 and p.16 diagrams
2. Aquatabs Flo Unit
   - Automatic dosing device for small systems
   - Good for small RVTs or dispersed taps

3. Piyush or liquid chlorine
   - Household-level chemical disinfectant
   - Only effective if dosage is correct
4. Filters (Candle or Media Filters)
   - Improve clarity, reduce sediment
   - Do not remove bacteria unless combined with disinfection

Images of these four purification technologies are depicted clearly in the WASH Catalogue (pp.15–16), which can be copied directly into this module to support learning.

Conclusion

Protecting public health requires the WUSC to understand what safe water means, how to test it, and how to maintain disinfection systems. Inline chlorination, if properly installed and monitored, provides a reliable and affordable method to ensure microbiologically safe water in rural Nepal. Regular measurement of residual chlorine, correct sample handling, and periodic cartridge replacement are essential tasks that should be incorporated into the routine O&M schedule of every scheme.

Introduction to Sanitation and hygiene

1. Sanitation:

Sanitation and hygiene are two major factors that affect health; health is a state of wellbeing and is essential for a purposeful existence. Good health is not only freedom from sickness and diseases but a complete absence of anxiety, social and psychological tensions. If there is any deviation in the harmonic functioning of a person's body, their health gets affected and they may get sick.

The total sanitation guideline of the government of Nepal defines sanitation as the

management of the facilities and services for the safe management of human excreta from human contact. Sanitation in broad sense refers to creation of the enabling environment to be safe from the diseases and living life with dignity.

Sanitation means all measures that promote:

- Proper disposal of human and animal waste (solid as well as liquid wastes). It also includes disposal of hazardous wastes from hospitals/industries/other sources.
- Use and proper maintenance of toilets.
- Avoiding open defecation.

Maintaining proper standards of sanitation are necessary for improving and protecting the health and wellbeing of the people.

Sanitation includes steps to ensure access and use of improved and basic toilets by everyone. It also includes ways to prevent human excreta from coming into contact with other individuals. One of the important factors to maintain proper sanitation is to end the practice of 'open defecation'. This may be done by involving individuals and community members to build, maintain and use toilets. Therefore, sanitation is often associated with our surroundings or environment.

2. Hygiene:

The national guideline 2073 defines hygiene as all sets of behaviour which is essential to stop the spreading of diseases and to be healthy. According to the World Health Organization (WHO), "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases."

Personal Hygiene

Personal hygiene: involves caring for oneself and keeping clean the hands, eyes, mouth, skin, armpits, nose, clothes and bedding as well as private parts to avoid bad odour and reduce the risk of disease. Handwashing with soap or ash is among the most effective and cheapest ways to prevent diarrheal diseases which together are responsible for the majority of child deaths.

One of the most effective ways to protect ourselves and others from diseases is to adopt good practices of personal hygiene.

These may include:

- Taking a bath at least once a day
- Washing hands properly:
  - After using the toilet
  - After handling pets and domestic animals
  - After cleaning the a baby or child's bottom
  - Before preparing food or serving food

- Before and after eating food
- If someone around you is infected with cold or any other infectious disease
- After handling pets and domestic animals
- Before feeding the baby

- Brushing teeth in the morning and before going to bed
- Rinsing mouth after every meal
- Wearing clean clothes

Food Hygiene

Food Hygiene involves keeping food clean and free from contamination and spoilage. It is important to protect food against contamination and spoilage at all stages: collection, storage, preparation, cooking and serving. In particular, it is important to wash or cook food before eating to kill or wash away any harmful germs. Foodborne illness also known as foodborne disease or food poisoning is any illness resulting from the consumption of contaminated food, pathogenic bacteria, viruses, or parasites that contaminate food, as well as chemical or natural toxins such as poisonous mushrooms.

Environmental hygiene

Environmental hygiene Involves keeping the home environment clean and free from vectors. Environmental hygiene encompasses solid waste management, liquid waste management and vector control. Vectors of public health importance include housefly, mosquito, tsetse fly, blackfly and lice. Many of these vectors are associated with, or breed nearby, solid waste. Solid waste is defined as any unwanted residue, remains, leftovers, discarded materials or by-products that are no longer required/needed by the initial user or producer.

Importance of sanitation and hygiene

Safe drinking-water, sanitation and hygiene (WASH) are crucial to human health and well-being. Safe WASH is not only a prerequisite to health, but contributes to livelihoods, school attendance and dignity and helps to create resilient communities living in healthy environments.

Maintaining personal hygiene and sanitation is important for several reasons such as personal, social, psychological, health, etc. Proper hygiene and sanitation prevent the spread of diseases and infections. If every individual on the planet maintains good hygiene for himself and the things around him, diseases will eradicate to a great level.

Importance of Sanitation

Sanitation is another very important aspect. Many common diseases such as roundworms spread through the faeces of infected people. By ensuring that people do not defecate in the open, we can completely eliminate such diseases and even more severe ones such as the one caused by E. Coli.

Poor sanitation is linked to transmission of diarrheal diseases such as cholera and dysentery,

as well as typhoid, intestinal worm infections and polio. It exacerbates stunting and contributes to the spread of antimicrobial resistance.

Proper environmental sanitation can prevent the outbreak and spread of infectious diseases. The function of disinfectants is to kill and prevent the growth of microorganisms. Disinfectants are potentially noxious substances which are used in intensive animal production and disease control programmes.

Good workplace sanitation can lead to a drastic reduction of illness, increasing staff attendance and productivity. On the other hand, poor hygiene practice can pose a health and safety risk to a team, an office, or even an entire company.
Sanitation is vital for good health. Health problems associated with poor sanitation include diarrhoea, dysentery, typhoid, cholera, malaria, bilharzia, worm infestations, eye infections and skin diseases.

Importance of Hygiene
Hygiene, as defined by the WHO refers to ***"the conditions and practices that help maintain health and prevent the spread of diseases."***

This means more than just keeping ourselves clean. This means shunning all practices that lead to bad health. Throwing garbage on the road, defecating in the open, and many more. By adopting such a practice, we not only make ourselves healthier but also improve the quality of our lives.

Personal hygiene means keeping the body clean, consumption of clean drinking water, washing fruits and vegetables before eating, washing one's hands, etc. Public hygiene refers to discarding waste and excreta properly, that means, waste segregation and recycling, regular disinfection and maintenance of the city's water reservoir. Quality of hygiene in the kitchens is extremely important to prevent diseases.

Diseases spread through vectors. The vector is contaminated water as in the case of typhoid, cholera, and amoebiasis (food poisoning). By drinking clean water, we can completely eliminate the chances of getting diseases.

Some diseases are caused by pathogens carried by insects and animals. For example, plague is carried by rats, malaria, filarial, roundworms by flies and mosquitoes, etc.

Mosquitoes thrive in stagnant water and rats in garbage dumps and the food that is dumped out in the open. By spraying stagnant water bodies with kerosene or other chemicals, we can completely eliminate mosquitoes from our neighbourhood. If that is unfeasible, we can all use mosquito nets to protect us from mosquitoes while we're asleep. This poses a physical barrier for the mosquito.

Rats thrive on unsystematic waste disposal. By segregating the waste, we can ensure that we don't leave food lying around for rats to eat. Close contact with sick people is also another way of contracting disease.

The sanitation and hygiene program and facilitation is very important to reduce diseases and improve peoples' health.
(Note: for additional and relevant resources, please refer to Total Sanitation Training Manual developed by SUSWA)

Sanitation Ladder as per JMP

The Joint Monitoring Programme (JMP) of UNICEF and the World Health Organization which is widely accepted worldwide is the most relevant monitoring mechanism for water, sanitation and hygiene. JMP has slightly changed the definition of toilets in recent times and has separated the improved toilets into improved and basic with some distinct features. As JMP definition correlates with the Sustainable Development Goals, the government of Nepal has also been complying with the SDG and JMP definition of the toilets; SUSWA also follows the JMP definition of toilets. The following table presents the toilet definition as defined by JMP and the features for each of the categories has been included for common understanding as well:

Category	JMP Definition	Detail Features
Improved	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite	- The toilets with impermeable slab/ base - Not shared with other households - The use of water seal pan, commode - Excreta safely disposed in situ or removed and treated offsite
Basic	Use of improved facilities that are not shared with other households	- The toilets with impermeable slab - Not shared with other households - The use of water seal pan, commode - Excreta management not properly planned
Limited	Use of improved facilities that are shared with other households	- The toilets with impermeable slab - Shared with other households
Unimproved	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines	
Open Defecation	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open places, or with solid waste	

Different Options of Household Toilets

Nepal became an open defecation free country by 2019. Though the country became ODF free, construction of toilets is ongoing. Households who have separated from a combined family, migrated from other villages, or who are building new houses are constructing new toilets. People are now aware of the importance of the toilet. The toilet gives privacy, dignity and convenience for the users. The initial assessment revealed that the quality of existing

toilets and newly built toilets remains challenging in the Karnali region. The existing masons or self-learnt masons follow the similar construction process and the standard. The poorly constructed toilets are often challenging to the users and even more challenging to the children, people with disabilities and elderly people. The key factor of poor-quality toilets in this region is the lack of technical knowledge of the masons and limited knowledge of self-learnt masons.

An improved toilet is one that hygienically separates human excreta from human contact, according to the Sanitation and Hygiene Master Plan (NSHMP 2011), which also recommends all toilets to have a permanent structure up to the plinth level. In Nepal the following options are considered as an improved toilet:

1. Ventilated improved pit (VIP) latrine
2. Flush or pour flush:
   - Pit system
   - Septic tank system
   - Pipe sewer system

Various factors play an important role in selection of a desired toilet option. Some key factors are as follows:

- Space availability
- Cost/affordability
- Availability of construction materials, sanitation products and technologies
- Water availability
- Geological condition: soil type, water table
- Social norms and cultural practice
- Faecal sludge emptying services

Site Selection:

Following aspects to be considered during site selection:

- The toilet should be easily accessible to all members of the household, including people with disabilities, elderly individuals, and children.
- Toilet should be located in a central or convenient location, ensuring that it is within a reasonable walking distance from households.
- Assessing the water table level and picking a place where the groundwater is not susceptible to contamination is essential.
- The location should be generally flat and distant from places prone to flooding or erosion.
- Toilet door should not face directly towards the house, courtyard, or public path so that female members can be more comfortable using the toilet.
- Cultural and societal elements should be examined to ensure toilet facility acceptance and usage. Local sanitation ideas, traditions, and preferences should be followed, and the design and location of the toilet should reflect community cultural norms and values.

Pit Construction:

The pit size varies based on the family size, available space, soil condition and level of groundwater. However, taking in consideration of average family size of 5 members following size could be appropriate in the hills of Nepal.

For circular pit:

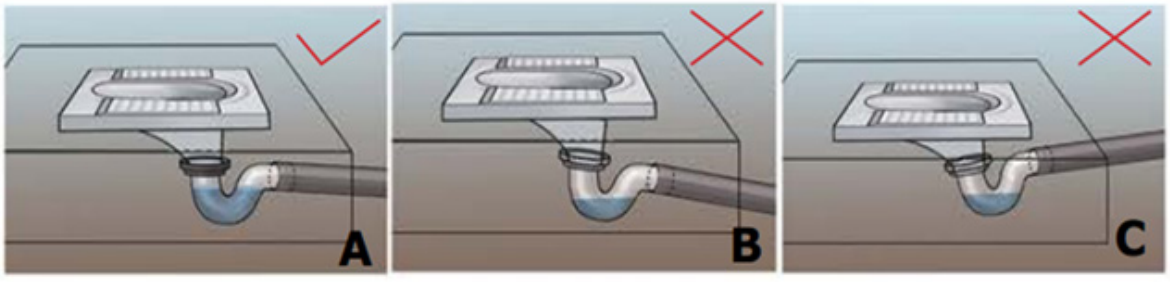
Type of lining		Typical diameter	Standard Depth
Stone line		4 ft	6 ft

For rectangular pit:

Type of lining		Length	Breath	Depth
Stone line		4 ft	4 ft	6 ft

Pipe options:

- Place the pan over it and test the height, distance from rear wall end and orientation of the pan. The gap between the rear wall and pan must be at least 6 inches. Or, the siphon must be fixed at least 10 inches far from the rear wall.
  - Once confirming all, remove the pan and start syphon/i-trap fixing work.
  - The correct position of the siphon is necessary.
- Place a stable materials like flat stone or gravel below the siphon/i-trap
- Fix the siphon by 1:3:6 or 1:4 cement mortar all round covering the pipe connection. Test the connection again by pouring water.
- Fill the floor with soil and compact it. Stone soling must be done up to 2 inches below the pan level.
- Put flat and stable stone support in all four corners of the pan's downface so the load on the pan holds by the support and protect siphon or i-trap from being damaged from the upper load.
- Check the level of the pan by spirit level. Once it is done, cover the opening with clothes to protect it.



Floor finishing, punning, colouring

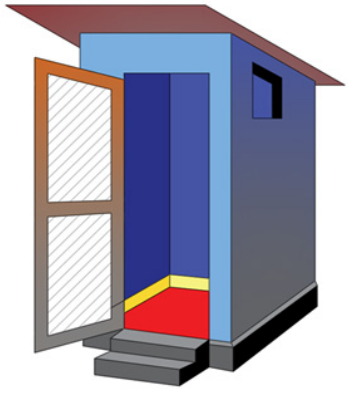
- One layer of stone soling must be placed after the compaction of soil. The soling must be done up to 2 inches below the pan level.
- Once completing the soling work, 1.5-inch-thick PCC with the cement mortar ratio of 1:3:6 must be done in the floor.
- Once completing the floor concreting, it would be better to do side wall plastering at least 1 foot height on the inner side of the wall. A thin layer of punning should be applied to the plaster wall on the same day.

- Then, over the pan floor, 0.5-inch cement plaster with the 1:4 cement and sand ratio should be done above the PCC. Check the level of plaster work with the help of spirit level. Make sure that the slope of the floor is well maintained from all directions towards the pan.
- On the same day, after finishing plaster work, a thin layer of punning must be done. Prepare a punning mixture by mixing the oxide colour (red, yellow, blue and so on) and cement. Ratio of red oxide and cement should be in a 1:2 ratio. Apply over the plaster surface.
- If punning is not done in wall section, wall should be painted (a boarder in the wall) with enamel/distemper paint after the plaster has completely dried. Colour will not stick to wet plaster; it must be applied after the plaster has dried.

Superstructure

The superstructure can be built using various local available and non-local materials such stone, wood and CGI sheet. Irrespective of the type, a super structure must have following minimum characteristics:

- The superstructure should be properly closed from all sides to ensure safety and privacy to every user and should not have chinks and holes in it.



- The superstructure must have at least one ventilation of appropriate size for light and aeration.
- It must have a proper roof; otherwise, the latrine will be out of use in the rainy season. The fixtures of door like latches should operate properly.

Standard Size

Description	For stone superstructure	For wooden/CGI
Floor size (inside toilet)	Length 3 ft 4 in, width 3 fit 4 in	Length 3 ft 4 in, width 3 fit 4 in
Toilet size (outside)	Length 6ft 3 in, width 6 fit 3 in	Length 3 ft 6 in, width 3 fit 6 in
Wall height	Front 7 ft, rear 6 ft	Front 7 ft, rear 6 ft
Door size	Height 6 ft, width 2 ft 6 in	Height 6 ft, width 2 ft 6 in
Ventilation window	at 5 ft height from the floor,	at 5 ft height from the floor
Size of ventilation	width 2 ft, height 1 ft	width 1 ft, width 8 in
Water tap	1.5 ft above the floor	1.5 ft above the floor
Door lock and handle	2 ft 6 in (should be easily reachable for children and people with disabilities)	2 ft 6 in (should be easily reachable for children and people with disabilities)

(Note: for additional and relevant resources, please refer Household toilet construction manual developed by SUSWA and iDE)

Changing Sanitation and Hygiene Behaviour for Total Sanitation

Sanitation and hygiene behaviour change is a systematic approach to encourage the widespread adoption of safe hygiene practices in order to keep people and their environment clean. Good hygiene habits help us to keep our body strong and healthy. Cleanliness helps to prevent diseases. It also helps us to give a good appearance and have better self-esteem.

The post ODF leads the total sanitation activities. This phase includes all arrangements leading to sustainable sanitation and hygiene facilities and behaviours. The respective communities/LGs themselves will identify and implement various parameters during the post ODF phase, the following indicators may be suggested to ensure that a total sanitation situation is achieved in the given area.

Key sanitation and hygiene behaviour:

- Use of toilet
- Practice of hand washing with soap or cleaning agent at critical times
- Safe handling and treatment of drinking water at household level
- Maintenance of personal hygiene (regular nail cutting, bathing, cloth washing, daily combing, tooth brushing etc.)
- Safe handling of food
- Proper solid and liquid management in and out of the home.

(Note: for additional and relevant resources, please refer to Total Sanitation Training Manual developed by SUSWA)

Total Sanitation and Indicators

The Sanitation and Hygiene Master Plan of Nepal has defined the term Total Sanitation as "Unless otherwise stated, Total Sanitation for the purpose in this Master Plan is a range of facilities and hygiene behaviours that lead to achieve sanitized condition of the designated areas (Palika and municipality including settlements, Toles, school's catchments, etc). Total Sanitation concentrates on ending Open Defecation as a first significant step to an entry point of changing behaviour. The second step includes all arrangements leading to sustainable hygiene and sanitation behaviours. Therefore, Total Sanitation is expected to achieve a sanitized condition in two phases in a sustainable manner…"

Total sanitation is the concept of developing the specific area with the provision of improved toilets, safe drinking water, hand washing with soap at the critical times, proper provisions for the waste management, household sanitation and food hygiene, and ending of the open defecation. Development of the specific area with the provision of all these aspects takes longer time and the Guideline on Total Sanitation (2073) by the government of Nepal has envisioned to separate the total sanitation phases into two parts which are:

Clean and Hygienic Area

After meeting the minimum targets of sanitation and hygiene related indicators, any specific area will be developed as the clean and hygienic area. There are 7 key indicators under this:

- Planning
- Access to safe toilet
- Personal hygiene
- Access to safe water supply
- Food hygiene
- Household and institutional sanitation
- Environmental sanitation

Total Sanitation Targeted Area

Any specific area will be developed and declared as the total sanitized area with the fulfilment of the following key indicators:

- Cleanliness of the latrine

- Existence and condition of handwashing facilities
- Garbage site management
- Safe disposal of waste water from bathrooms and kitchens
- Management of shrubs and bushes around the community
- Compliance with Community Action Plans
- Updated Community Defecation Map/ tracking other hygiene practices
- Availability of community-enforced by-laws and sanctions e.g. against open defecation
- Food hygiene and safety practices appropriate to local lifestyle
- Household water safety
- Proper disposal of animal waste/ confinement of animals
- Water source protection
- Availability of sanitation and hygiene products and services desired by consumers
- Availability of financing for consumers and suppliers

(Note: for additional and relevant resources, please refer to Total Sanitation Training Manual developed by SUSWA)

Menstrual Hygiene Management

Menstrual hygiene is an issue associated with women and adolescent girls. Lack of correct information makes people across society uncomfortable to talk about this subject. Good menstrual hygiene is crucial for the health and dignity of girls and women. Everyone in society, including male members, must understand that this is a natural process and not a matter of shame. It is therefore necessary that the subject is discussed.

Adolescent girls particularly need support and guidance at the initiation of menstruation. It is essential that at this time, schools and families provide them a safe environment that offers protection and guidance to ensure their basic health and well- being. Knowledge about handling of sanitary napkins/homemade pads and their proper disposal is essential for maintenance of hygiene.

(Note: for additional and relevant resources, please refer to Total Sanitation Training Manual developed by SUSWA)

Role of the Sanitation and Hygiene Promoters

Sanitation and hygiene promoters are the key agents at community level to promote sanitation and hygiene in the community. They facilitate the behaviour change for the hygiene promotion. The major role of the sanitation promoter is as follows:

- Conduct community meeting and facilitate sanitation and hygiene topic
- Form a sanitation group
- Distribute hygiene kits
- Conduct training on WASH
- Facilitate for WASH sustainability
- Maximize beneficiary contribution
- Provide hygiene education

- Supervise community hygiene behaviour
- Conduct health and hygiene promotion
- Evaluate hygiene risks
- Mobilize communities to increase ownership
- Community engagement and participation
- Experience in developing and monitoring budgets
- Keep close coordination with project and line agencies
- Perform other relevant tasks as assign

Role and Responsibility of Stakeholders

Sustainability of WASH facilities is important for the water and sanitation service to the people. The stakeholders have a vital role in the community to promote sanitation and hygiene. The stakeholder includes the Local Government, WASH unit, WASH sector agencies, WASH projects, WUSC etc.

- Plan and implementation of WASH facilities to the community
- Provide training to the WASH unit staff and sanitation promoters
- Manage budget for the sanitation activities
- Capacity building of the WASH sector agents
- Support and facilitate the good governance in the WUSC
- Collaboration and coordination with sector agencies
- Ensure the proper functions of the WUSC and staff
- Support and monitor the implementation of the sustainability measures
- Manage data base of the WASH progress in the community
- Monitoring of the WASH activities

Monitoring and evaluation of the sanitation and hygiene activities

Monitoring and evaluation part is important to make the proper intervention, make corrections and documentation of the learnings. Monitoring in the sanitation and hygiene sector aims mainly to measure and ensure that inputs and activities lead to their intended results and outcomes to adjust course where necessary and to establish whether progress is being made towards a given goal. The major areas of monitoring are:

- Sanitation
- Hygiene
- Total Sanitation and the progress against the indicators
- School WASH

(Note: for additional and relevant resources, please refer to Total Sanitation Training Manual developed by SUSWA)

10 Service Support Centre (SSC)

Throughout this training manual, we explored various aspects of WSS management for water supply and sanitation. But there's another crucial player in this journey: the Service Support Centre (SSC). Think of the SSC as your reliable teammate, providing valuable resources, guidance and expertise to make managing your water and sanitation WSSs a breeze. SSC is a valuable partner in strengthening WSS management capabilities for WASH units and WUSCs.

Technical supports expected from SSC:

Unleash the Power of Data: Dive into regional WSS information, risk assessments, and best practices readily available through the SSC, fuelling strategic direction and informed choices.

Access regional data, streamline inventories, build robust maintenance systems, learn from success stories, craft your MAP with expert guidance. Unleash sustainable water and sanitation, together!

Sharpen Inventory Skills: Embrace user-friendly tools and templates provided by the SSC, transforming WSS record-keeping into a streamlined process with accurate and accessible inventories.

Build a Robust Maintenance System: Gain insights from the SSC's resources and technical assistance, crafting effective maintenance schedules, robust record-keeping systems, and clear roles within the organization.

Mitigate Risks, Maximize Impact: Equip yourself with the SSC's simplified risk assessment methodology and regional risk data, prioritizing actions and safeguarding WSSs from potential threats.

Learn from Success Stories: Immerse yourself in case studies showcasing successful WSS management strategies implemented by WUSCs across the region, sparking inspiration and adaptable ideas.

Chart a Course to Success: Develop a comprehensive WSS Management Action Plan (MAP) with the SSC's guidance and resources, including templates, best practices, and individual consultations.

Empower Your MAP: Don't go it alone! The SSC offers targeted support to address any challenges encountered while implementing the MAP, paving the way for smooth execution and enduring impact.

Let's link SSC support in our training sessions. Here's how the SSC can empower you in each session:

1. Introduction to WSS Management for Water Supply and Sanitation: Unlocking Insights: Imagine having access to a treasure trove of data on water and sanitation WSSs across your region. The SSC helps you tap into this wealth of information, providing insights into WSS performance, potential risks, and best practices.

2. Understanding WSS Inventories/WSS Register: Sharpen Your Inventory Game: Recording and maintaining accurate WSS information can be a challenge. The SSC offers user-friendly tools and templates to streamline this process. Their skilled staff can also guide you through data collection and ensure your register is always up-to-date. [Image: A WUSC member using a tablet with the SSC app to record information about a water pump with the SSC logo visible on the app screen.]

3. Practice creating a WSS Inventory Register: Learn from the Masters: The SSC has extensive experience in creating and managing WSS inventories. During this session, you'll get hands-on practice using their tools and methodologies, ensuring your own register is built on a solid foundation.

4. Assessing Risks and Prioritizing Actions: Mitigate Risks, Maximize Impact: Identifying and prioritizing risks are crucial for effective WSS management. The SSC provides access to regional risk assessments and a simplified risk assessment methodology tailored for your context. With their support, you can make informed decisions about which WSSs require immediate attention. [Image: A risk assessment matrix with different types of risks plotted on a graph, with the SSC logo positioned as a shield protecting against them.]

5. Setting up Operations and Maintenance Systems: Building a Robust Maintenance System: The SSC understands the importance of proper maintenance schedules and record-keeping. They offer valuable resources and technical assistance to help you develop a robust maintenance system that keeps your water and sanitation WSSs functioning optimally. [Image: A calendar with preventive maintenance tasks scheduled for different WSSs, with the SSC logo acting as a reminder and support system.]

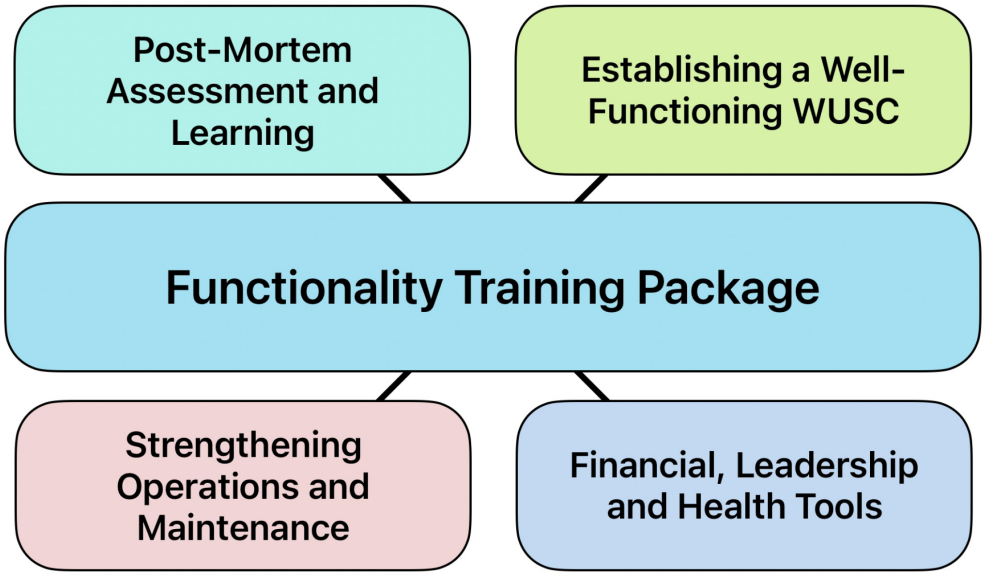
6. Case Studies and Best Practices: Learn from Success Stories: The SSC actively collects and shares successful WSS management examples from WUSCs across the region. These case studies offer valuable inspiration and practical tips that you can adapt to your own context. [Image: A WUSC member presenting their successful WSS management strategy to a group of peers, with the SSC logo displayed on the screen behind them.]

7. WSS Management Action Plan (MAP): Chart Your Course to Success: Developing a comprehensive MAP can feel overwhelming. The SSC is here to guide you every step of the way. They provide templates, best practices, and technical support to help you create a MAP

that aligns with your specific needs and resources. [Image: A WUSC member working on a MAP document with the SSC logo visible as a helpful resource guide on the side.]

8. Preparation of WSS Management Action Plan: Your Action Plan, powered by the SSC: The SSC offers individual consultations and targeted support to address any specific challenges you may face while developing your MAP. With their expertise, you can confidently implement your plan and ensure long-term WSS management success.

SUSWA
SUSTAINABLE WASH FOR ALL



Volume 3: Annexes

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Introduction to the Functionality Package

This functionality training package guides facilitators and trainers in providing Capacity Building (CB) to Water Users and Sanitation Committees (WUSC) to operate and maintain water supply schemes at the community level.

This functionality training package is organised into three volumes:

Functionality Training Manual Volume 1: Training Plan (this Volume)
Functionality Training Manual Volume 2: Training Knowledge
Functionality Training Manual Volume 3: Annexes

The training plan shown in Volume 1 includes practical information on the initial assessment and the training modules. Trainers and facilitators should use it to schedule and prepare their sessions in the field with the WUSCs. All the modules are interrelated and must be implemented in sequence, including a few days of interval between each module. Following the initial diagnostic phase, the training modules are clustered into three outcome areas, each of which focuses on a different aspect of WUSC empowerment:

Initial Assessment:	Understanding the context
Outcome Area 1:	Preparation of a well-functioning WUSC: the governance and rules
Outcome Area 2:	Empower the WUSC with operation and maintenance tools
Outcome Area 3:	Additional tools required by the WUSC: finance, leadership and health.

The training and reference materials in **Volume 2** help facilitators find the necessary information and refresh their knowledge. It is designed to go beyond the "how-to's" presented in Volume 1 and into the fascinating "why's". This Volume unpacks the theoretical foundations of key concepts, giving a deeper understanding of why the tools and techniques presented in Volume 1 truly work; it is intended as a theoretical bootcamp, strengthening knowledge so that these concepts can be applied in real-world scenarios with confidence and nuance. However, the training package is designed for skilled facilitators with pre-existing knowledge of community-based water supply management. These contents are designed to support their own training preparations; the trainer/facilitator is not limited to the given material and may find and include other relevant reference materials to make the training effective for their particular group of trainees. Volume 2 also introduces the Support Service Centre (SSC).

Volume 3 comprises the annexes, templates, and tools referred to in the training manual, along with a few practical facilitation tips and the main reference documents on the policy framework of the WASH sector in Nepal.

Annex 1:
Tips for the Trainer/Facilitator

The quality of facilitation is important to make the training effective. So, the trainer/facilitators should be well prepared to conduct the training. The major areas to be considered by the trainer/ facilitator before conducting training are presented below. These are the guidelines or tips only and the trainer/ facilitator generates their innovative ideas to make the training more effective with a learning environment.

Some points/tips are the following:

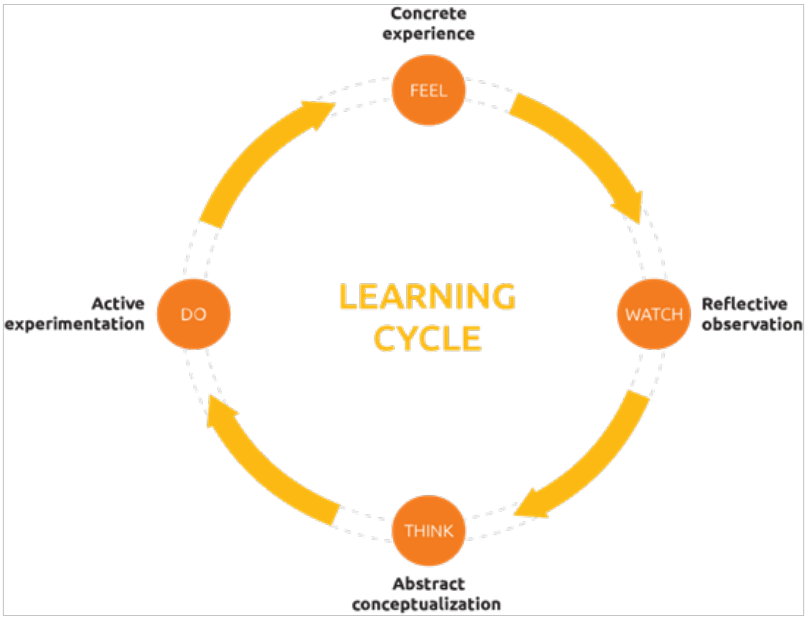
- Read the trainers' guide before training so that you are well prepared and know how to handle your sessions.
- Know how to conduct the sessions in the local language. You will have to get used to translating phrases. Make everyone feel comfortable and part of the group.
- Ensure all training sessions are inclusive and accessible for all participants, especially women, PWDs and marginalized groups. Key tips include:
  - Use gender-balanced examples and role models.
  - Encourage equal speaking opportunities for all participants.
  - Use accessible language and visuals.
  - Adapt physical spaces for persons with disabilities.
  - Address social norms sensitively when discussing leadership and decision-making.
- Listening closely, learn information about the situation from non-verbal cues.
- These are questions that encourage people to give their own opinions, rather than a "yes/no" or single response. Example: "What problems do you have with your water sources?" or "How can you raise money for the new facility?" These questions facilitate open discussion. They allow people to express their own ideas and find their own solutions without fear of giving a wrong answer.
- Give people time to think and come up with an answer.
- Find the place that people feel comfortable with.
- Remember, your job is to ask questions and get participants talking.
- Make eye contact, use hand gestures, walk close to shy people and use people's names. Try to draw out the silent and control the talkative.
- "Yes … I see … And then? … Tell me more". They help to keep the person talking.
- Use eye contact and body language. Praise and encourage but do not over-praise.
- Briefly restate what people say in your own words, to make sure you have heard and understood correctly. When you rephrase make sure to do two things – 1) verify with the speaker if you have understood correctly, and 2) see if others want to add something.
- Do not be satisfied with one answer. Ask follow-up questions to explore issues and make it clearer – "Why? What else? … Tell me more. Can you explain further?"
- Look around and see who is participating and who is not involved. Are people still interested?

- Restate what people have said in a simple, brief form. This will make it easier for people to contribute.
- Look for signs of tiredness or boredom. When people get tired, change the activity, introduce a song, or take a break to refresh
- Estimate how much time each activity takes, watch the time and set an appropriate pace for the group.
- Create an atmosphere of flexibility, creativity and experimentation and develop insight into the learning process of the participants while using time efficiently to organize learning situations in a good sequence.
- Be open to get feedback from the participants about the way you work and take time to examine your own attitudes, values and ideas.
- Encourage participation through warm ups and energizers, using particular interest-based questions, using practical instruction, using discussions in buzz groups, encouraging brainstorming, using creative debate/discussions, conducting practical exercise/ drama, using relevant pictures, conducting sample visits and other creative exercises and methodology.

Understanding on Learning Cycle

A trainer/facilitator should have basic understanding about the learning cycle. The trainer/ facilitator should present and discuss on the basis of the learning cycle and understand the participant's learning method and capacity.

A learning cycle is a concept of how people learn from experience and external additions. There are stages and methodology of learning and facilitate the learning event/ process as per the below learning cycle figure.



Annex 2:
Documents Library

WASH POLICY & GUIDELINES

- Draft National WASH Policy – March 2078 - English
- National WASH Policy – March 2078 – Nepali
- Operation & Maintenance procedures – DWSSM
- Rural WSS Policy – 2004
- WASH M&E Framework for Water Supply System Functionality and Sustainability -
- Ministry of Water Supply

WATER MANAGEMENT SYSTEMS

- Tapping the unreached in Nepal – ADB
- Digging deep behind the complexities of sustainable water supply in Nepal – Adhikari – IRC
- Direct support post-construction to rural water service providers – IRC
- Professionalising community-based management for rural water services – IRC
- Scaling up the Community – Schouten – IRC
- Water supply systems in Nepal – how to build better, more sustainable services – Oxfam
- Post-Construction Support and Sustainability in Community-Managed Rural Water
- Supply – World
- Bank Policy brief

LIFE CYCLE COSTING

- Financial sustainability of gravity fed rural piped water supply scheme - IWA
- O&M Costs for Water Supply Systems – The WASH Project
- LCCA for sustainable water service delivery – WASHDEV
- Key Factors for Sustainable Cost Recovery – IRC
- Life Cycle Costing – IRC

NWASH SSC

- Board Concept – Nepali
- Insurance approach - Nepali
- Water Supply – Service Support Centre Proposal – English

RELEVANT PAPERS

- Functionality of Rural Community Water Supply Systems and Collective Action: a
- Case of Guras
- Rural Municipality, Karnali Province – Rajouria et al
- Thinking beyond domestic water supply: approaches to advance multiple-use water systems

- (MUS) in the rural hills of Nepal – Raj et al
- Innovative monitoring mechanism: Evidence from rural drinking water sector in Nepal – Yadav
- (NEWAH)

OTHER

- Ministry of Water Supply, DWSSM, National Water Supply and Sanitation Training Center: (https://nwsstc.gov.np/)

Annex 3:
WSS Inventory Template

SN	Detail*	Description	WSS 1	WSS 2
1	WSS ID	Unique identification number for each WSS (can be numerical or alphanumeric)		
2	WSS Name	Descriptive name of the WSS		
3	Quantity	Unit and quantity detail		
4	WSS Type	Category of the WSS (e.g., water source, treatment system, distribution network, sanitation facility)		
5	Location	Physical location of the WSS (community, ward, GPS coordinates if available)		
6	Installation Date	Date when the WSS was first installed		
7	Manufacturer	Name of the company that made the WSS (if known)		
8	Model Number	Specific model or type of WSS (if applicable)		
9	Condition	Current condition of the WSS (good, fair, poor, critical)		
10	Maintenance History	Record of past maintenance activities and dates		
11	Warranty Information	Warranty details (if applicable)		
12	Next Scheduled Maintenance	Date of the next planned maintenance activity		
13	Cost	Original purchase cost or estimated value of the WSS		
14	Funding Source	How the WSS was financed (e.g., government, donor, community contribution)		
15	Additional Information	Any other relevant details (e.g., capacity, technical specifications, special requirements)		

Annex 4:
Repair and Maintenance Template

WSS Information

- WSS Name:
- Unique ID:
- Location:
- Type of WSS:
- Installation Date:
- Warranty Information:

Maintenance Schedule

Frequency	Task	Tools & Materials	Person Responsible	Estimated Cost
Daily	Visual inspection for leaks, cracks, or blockages	Flashlight, wrench	WUSC member	N/A
Weekly	Check water pressure and flow rate	Pressure gauge	WUSC member	N/A
Monthly	Clean filters and screens	Cleaning brush, sponge	WUSC member	N/A
Quarterly	Lubricate moving parts	Multi-purpose lubricant	Skilled WUSC member or local technician	N/A
Annual	Thorough inspection and preventive maintenance	Tools appropriate for specific WSS	Skilled WUSC member or local technician	Budget depending on potential repairs

Repair Log

Date	Problem Detected	Repair Action Taken (Risk Mitigation Action)	Tools & Materials Used/ Maintenance Modality	Parts Replaced (if any)	Cost of Repair

Tips for Practical Session:

- **Provide blank templates:** Have participants fill out the template for a specific WSS in their community.
- **Group discussion:** Discuss challenges and solutions for implementing the plan in Karnali, considering resource limitations and technical skills.
- **Role-playing:** Simulate scenarios where repair needs arise and practice using the plan to determine appropriate actions.

Local resource exploration: Identify available local technicians, spare parts suppliers, and potential funding sources for repairs.

Annex 5:
Model WSS Management Action Plan (MAP)

WSS Management Action Plan (MAP)
For
Insert name of WUSC

Prepared by:
Date:

Approval date:

Contents of the MAP

1. Introduction
2. Our Priority WSS
3. Stakeholders and Performance Goals
4. Current WSS Management Methods
5. Gap Analysis and Risk Assessment

WSS Management Action Plan (MAP)
for
Drinking Water Supply and Sanitation WSSs

Introduction:
As the custodian of water supply WSSs in [insert WUSC title], ……. Palika, Karnali, it is essential to ensure their efficient and effective management. This simplified WSS Management Action Plan (MAP) outlines a systematic approach to improving the performance and longevity of our priority WSS(s) while considering the unique context of Karnali.

1. Our Priority WSS: Drinking Water Supply and Sanitation WSSs
1.1 Importance and Criticality:

- Drinking water supply and sanitation WSSs are undeniably our community's most critical WSSs. Their proper management is essential for the following reasons:
- Public health: Access to safe and clean drinking water is fundamental for preventing waterborne diseases and ensuring overall health and well-being.
- Safety: Safe sanitation facilities are crucial for hygiene and disease prevention, particularly for women and children.
- Social well-being: Reliable access to water and sanitation improves quality of life, reduces burdens on women and girls for water collection, and creates a more dignified environment for everyone.
- Economic development: Adequate water and sanitation infrastructure supports businesses, attracts investment, and contributes to overall economic growth.

1.2 Description of Priority WSS:
Our "Drinking Water Supply and Sanitation WSSs" encompass the entire system that provides clean water for consumption and manages wastewater disposal. This includes:

- Water sources: Wells, springs, rivers, or other water intake points.
- Treatment facilities: Plants that purify water for safe consumption.
- Distribution networks: Pipelines and infrastructure that deliver water to households and communities.
- Storage facilities: Reservoirs and tanks that hold treated water for continuous supply.
- Sanitation systems: Toilets, septic tanks, and wastewater treatment facilities.

By focusing on this multifaceted WSS, we aim to optimize our water and sanitation systems for improved public health, safety, social well-being, and economic prosperity in our community.

Note: This section can be further customized by briefly mentioning any specific challenges or opportunities related to your local water and sanitation context. For example, you could mention challenges like water scarcity, aging infrastructure, or limited resources. You can also highlight local initiatives or traditional practices that contribute to water management for a more comprehensive picture.

2. Stakeholders and Performance Goals:

2a. Stakeholders:

Internal:

Technical staff (engineers, maintenance personnel)

Water user committees

External:

Palika officials, WASH unit, Engineers

Elected representatives – Ward Chair and members, Deputy Mayor, Mayor

Community representatives

Traditional water management groups

Development partners (e.g. SUSWA)

Regulatory bodies

2b. Performance Goals:

This provides a clear framework for measuring and monitoring your progress towards improved water and sanitation service delivery.

Performance Goals	Level of Service	Performance Attribute	Performance Measure
What you wish to achieve (examples below)	Explain what your desired level of service is for your target customer(s) (e.g., residential users, public institutions). This could be specific metrics like: Access: % of population with reliable access to safe drinking water and sanitation facilities. Quantity: Minimum per capita water supply per day. Quality: Compliance with drinking water quality standards.	Reliability: Continuity of service with minimal disruptions or outages. Responsiveness: Timely response to complaints and maintenance needs. Affordability: Water and sanitation fees within reasonable affordability levels for various income groups. Sustainability: Environmental impact of water extraction, treatment, and disposal.	Identify specific indicators or metrics that will track your progress towards achieving the desired level of service for each performance attribute Choose quantifiable and measurable indicators. These should be objective and verifiable data points that accurately reflect the performance of your water and sanitation system. Consider using a combination of quantitative and qualitative measures. Quantitative data (e.g., customer satisfaction surveys) can complement quantitative metrics (e.g., leakage rates) for a more holistic understanding of performance.

Examples of performance goals:

Goal 1: Secure reliable and safe water supply for [target population] by [target date].

Goal 2: Increase operational efficiency and reduce maintenance costs by [percentage] within [timeline].

Goal 3: Foster community ownership and participation in water resource management.

3. Current WSS Management Methods:

Identify and assess the existing tools and methods used by stakeholders to manage the priority WSS (i.e. Drinking Water Supply and Sanitation WSSs), including:

- Inventory records (WSS ledgers, stock book)
- Maintenance schedules
- Data collection and monitoring systems
- Stakeholder communication mechanisms
- Budget allocation and resource management

4. Gap Analysis and Risk Assessment:

Compare the current practices with the desired performance goals to identify gaps in knowledge, tools, resources, and procedures. Analyze how these gaps impact the performance and sustainability of the priority WSS.

Risk level: Use a simple rating system (e.g. high/medium/low) to denote the potential severity and likelihood of negative consequences if the identified gap is not addressed.

Consider factors like:

- Impact on public health and safety.
- Cost of potential failure or damage.
- Disruption to water supply and sanitation services.
- Environmental impact.

5. Action Plan and Prioritizing actions

We create a comprehensive and well-defined action plan that effectively guides the implementation of the MAP and improves the management of water supply and sanitation WSSs.

Action	Responsible Person/Team	Target Date	Resources Required	Estimated budget	Potential funding sources
Briefly describe the specific action to be taken.	Assign clear ownership for each action, indicating individuals, committees, or departments responsible for implementation.	Specify the estimated date of completion for each action. Deadlines can be specific dates or timeframes (e.g., within 6 months).	List the resources needed for each action, including: Human resources, Materials and equipment.	With quantity and amount	(Internal budget allocations, Grants and external funding, Community contributions)

While developing MAP, focus on

- Prioritizing actions based on their impact on achieving the specified goals, considering feasibility, budget constraints, and local context.
- Developing SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) action steps with clear responsibilities, timelines, and resource requirements.
- Clear and concise communication: Use clear and concise language that is easily understood by all stakeholders involved.
- Flexibility and adaptation: Be prepared to adapt your action plan as necessary to respond to unforeseen circumstances and opportunities.

Examples of possible actions:

- Develop a comprehensive WSS inventory and condition assessment.
- Implement preventive maintenance schedules.
- Enhance data collection and monitoring systems for water quality and resource levels.
- Conduct training and capacity building workshops for water user committees.
- Secure funding and resources from development partners.
- Integrate traditional water management practices into WSS management strategies.

Prioritization of action based on Risk and Gap Analysis

While prioritizing actions, consider prioritizing actions based on their combined score from Gap Analysis and Risk Assessment. You can assign numerical values to the Gap Analysis and Risk Level columns and calculate a total score for each action. Prioritize actions with the highest scores first, as they address the most critical gaps and pose the highest potential risk. Target Date for completion should reflect the urgency of each action based on its risk score. High-risk actions might require immediate attention, while medium-risk actions might have more flexible deadlines.

Maintenance Plan Integration:

Throughout the Action Plan, specifically connect actions to ongoing maintenance activities where relevant. For example, an action to “implement monthly treatment of borehole with disinfecting chemicals” is directly linked to the maintenance plan for the borehole. Alternatively, we can consider dedicating a separate section to a comprehensive maintenance plan. This plan could outline specific maintenance tasks, schedules, responsibilities, and resource requirements for different components of the drinking water supply and sanitation system.

Follow-up and Review:

- Review the MAP regularly, at least every six months, to assess progress, adjust actions as needed, and address any unforeseen challenges.
- Emphasize the importance of regularly reviewing and updating the MAP, Gap Analysis, and Risk Assessment based on changing conditions and progress. This ensures the plan remains relevant and prioritizes emerging risks and gaps.

- Ensure transparent communication with stakeholders regarding the implementation and outcomes of the MAP.
- Monitoring and Evaluation: Define how you will track progress and measure the effectiveness of each action. This could involve:
  - Indicators: Specific metrics to monitor progress towards achieving the action's objectives.
  - Data collection methods: How you will gather information and track progress (e.g., surveys, inspections, performance data).
  - Reporting system: Establishing a mechanism for reporting progress and evaluating outcomes.

Annex 9:
Water Tariff Calculator

General Information of the Scheme

1)	Name of Scheme :	ABC.....
2)	Rural Municipality/Municipality :	ABC.....
3)	Ward Number :	1
4)	Total Scheme Cost :	3303412.00
5)	Present Population :	4833
6)	Number of Households :	886
7)	Annual Household Growth Rate (%) :	2.00
8)	Annual Population Growth Rate (%) :	2.04
9)	Design period :	15
10)	Inflation Rate :	7
11)	Annual salary and allowance expenses :	140000
12)	Annual operation and management cost of WUSC :	14400
13)	Water Demand (litres per capita per day) :	65

HH & Population Forecast		
Year	Household	Population
1	886	4833
2	904	4932
3	922	5032
4	940	5135
5	959	5240
6	978	5346
7	998	5456
8	1018	5567
9	1038	5680
10	1059	5796
11	1080	5915
12	1102	6035
13	1124	6158
14	1146	6284
15	1169	6412

1. Annual Operation Expenditure Cost							2. Scheme Recovery Cost			Total Annual Expenditure Cost (1F+2C)	Water Tarriff Calculation			
Year	A. Annual Maintenance cost (2 to 3% of total estimated cost) Here 2.5% is taken for calculation	B. Annual salary and allowance expenses	C. Annual operation and management cost of WUSC	D=(A+B+C)	E. Contingency =(5% to 10% of D). Here, 5% is taken for calculation	F. Total annual operation expenditure cost = (D+E)	A. Annual cost recovery =(Scheme total cost) / (Scheme design period in years)	B. Contingency = (5% to 10% of A) Here, 5% is taken for calculation	C. Total scheme recovery cost =(A+B)		Household	Population	Monthly Water Tariff Rate Per Household (NPR)	Water tariff per cubic meter (unit) of water (NPR)
1	82585	140000	14400	236985	11849	**248835**	220227	11011	**231239**	**480073**	886	4833	**45.15**	**4.19**
2	88366	149800	15408	253574	12679	**266253**	235643	11782	**247426**	**513679**	904	4932	**47.37**	**4.39**
3	94552	160286	16487	271324	13566	**284891**	252138	12607	**264745**	**549636**	922	5032	**49.69**	**4.60**
4	101171	171506	17641	290317	14516	**304833**	269788	13489	**283278**	**588111**	940	5135	**52.12**	**4.83**
5	108252	183511	18875	310639	15532	**326171**	288673	14434	**303107**	**629278**	959	5240	**54.68**	**5.06**
6	115830	196357	20197	332384	16619	**349003**	308880	15444	**324324**	**673328**	978	5346	**57.36**	**5.31**
7	123938	210102	21611	355651	17783	**373434**	330502	16525	**347027**	**720461**	998	5456	**60.17**	**5.57**
8	132614	224809	23123	380547	19027	**399574**	353637	17682	**371319**	**770893**	1018	5567	**63.12**	**5.84**
9	141897	240546	24742	407185	20359	**427544**	378392	18920	**397311**	**824855**	1038	5680	**66.22**	**6.12**
10	151830	257384	26474	435688	21784	**457472**	404879	20244	**425123**	**882595**	1059	5796	**69.46**	**6.42**
11	162458	275401	28327	466186	23309	**489495**	433221	21661	**454882**	**944377**	1080	5915	**72.87**	**6.73**
12	173830	294679	30310	498819	24941	**523760**	463546	23177	**486724**	**1010483**	1102	6035	**76.44**	**7.06**
13	185998	315307	32432	533736	26687	**560423**	495994	24800	**520794**	**1081217**	1124	6158	**80.19**	**7.40**
14	199018	337378	34702	571098	28555	**599653**	530714	26536	**557250**	**1156902**	1146	6284	**84.12**	**7.76**
15	212949	360995	37131	611075	30554	**641628**	567864	28393	**596257**	**1237886**	1169	6412	**88.24**	**8.14**

Water Tarriff Calculation Considering Annual Operation Expenditure Cost Only

Annual Operation Expenditure Cost						Total Annual Expenditure Cost (D+E)	Water Tarriff Calculation			
Year	A. Annual Maintenance cost (2 to 3% of total estimated cost) Here 2.5% is taken for calculation	B. Annual salary and allowance expenses	C. Annual operation and management cost of WUSC	D=(A+B+C)	E. Contingency =(5% to 10% of D). Here, 5% is taken for calculation		Household	Population	Monthly Per Household Water Tariff Rate	Water tariff per cubic meter (unit) of water
1	82585	140000	14400	236985	11849	**248835**	886	4833	**23.40**	**2.17**
2	88366	149800	15408	253574	12679	**266253**	904	4932	**24.55**	**2.28**
3	94552	160286	16487	271324	13566	**284891**	922	5032	**25.76**	**2.39**
4	101171	171506	17641	290317	14516	**304833**	940	5135	**27.02**	**2.50**
5	108252	183511	18875	310639	15532	**326171**	959	5240	**28.34**	**2.62**
6	115830	196357	20197	332384	16619	**349003**	978	5346	**29.73**	**2.75**
7	123938	210102	21611	355651	17783	**373434**	998	5456	**31.19**	**2.89**
8	132614	224809	23123	380547	19027	**399574**	1018	5567	**32.72**	**3.03**
9	141897	240546	24742	407185	20359	**427544**	1038	5680	**34.32**	**3.17**
10	151830	257384	26474	435688	21784	**457472**	1059	5796	**36.00**	**3.33**
11	162458	275401	28327	466186	23309	**489495**	1080	5915	**37.77**	**3.49**
12	173830	294679	30310	498819	24941	**523760**	1102	6035	**39.62**	**3.66**
13	185998	315307	32432	533736	26687	**560423**	1124	6158	**41.56**	**3.84**
14	199018	337378	34702	571098	28555	**599653**	1146	6284	**43.60**	**4.02**
15	212949	360995	37131	611075	30554	**641628**	1169	6412	**45.74**	**4.22**

Annex 10:
Water Safety Plan Template

Format 6a: Short-Term Plan (Regular O&M)

Structure and place	Risk	Cause of Risk (Present Condition)	Yes / No	Imme or Re wor
1. Catchment area	Catchment degradation; Depletion of water in the source	Deforestation or degraded vegetation (sparse trees, bare soils) in the catchment		
		Over-grazing or excessive collection of fodder; bare soils		
		Agricultural practices (e.g. bamboo plantation in dry areas)		
		Soil erosion, sedimentation in downslopes, dust storms		
		Soil erosion, sedimentation in downslopes, dust storms		
	Regular works for protection of Catchment area			
	Contamination of source water	Drying or depletion of the source		
		Frequent erosion around the source		
		Risk of landslides close to intake		
2. Source / intake	Washing away of intake structures	No fencing or damaged		
		Access of people or animal to the source		
		Unsafe use of toilet in the settlement above the source		
		Damage of intake cover		
		Danger of flooding of intake		
		Open source		
		Leakage of water from intake structure		
	Regular works for protection, repair & maintenance of water source (intake)			

ediate gular ks?	Implementation		Monitoring		
	When?	By Who?	When?	By Who?	Status (Done / Not done)

Structure and place	Risk	Cause of Risk (Present Condition)	Yes / No	Imme or Re wor
3. Transmission and Distribution line	Contamination of water through pipe lines Washing away of pipe line by flood, land slide, fire	Pipeline in landslide prone zone		
		Exposed pipeline in the ground		
		Pipeline damaged by nails/pegs		
		Leakage from pipeline		
		Pipeline joint connected by plastic or clothes		
		Damage of pipe support block		
		Rust in pipe fittings		
	Regular works for protection, repair & maintenance of main & branch pipeline			
4. Reservoir Tank and other structures	Contamination through Structures (Collection chamber, crossing, interruption chamber, washout, air valve, distribution chamber, reservoir tank, break pressure)	No fencing around structures		
		Settlement near structures		
		Completely damaged or cracks on covers of structures		
		Valve Chamber in damaged condition		
		Cracks and leakage from the structure		
		Pollution around structures		
		Pollution inside the structures		
		Water logging around the structures		
		Water logging in the chamber having fittings		
		Condition of flooding of structures during monsoon		
		Leakage from the fittings used in the structure		
	Regular works for protection of Reservoir tanks and chambers			

ediate egular rks?	Implementation		Monitoring		
	When?	By Who?	When?	By Who?	Status (Done / Not done)

Structure and place	Risk	Cause of Risk (Present Condition)	Yes / No	Imme or Re wor
5. Taps	Contamination from taps	Cracks or broken tap stands		
		Filthy taps platforms		
		Leakage from the tap structure		
		Pollution around tap structure		
		Unmanaged drainage of waste water from the taps		
		Multiple private pipes connected to the taps		
		Washing of dishes in the taps		
		Water drained in the roads		
	Regular works for protection of Taps			
6. Use of water at household level		No properly cleaned pots before filling water		
		Water pots are not covered in the houses		
		Water pots are easily accessed by children		
		No filtering or boiling of water		
		Dirty utensils are used to drink water		
		Pollution around houses		
		Unsafe toilets in the houses		
		No habit of hand washing with soap after using toilets		

ediate egular rks?	Implementation		Monitoring		
	When?	By Who?	When?	By Who?	Status (Done / Not done)

Format 6b: Long-Term Plan (Major repair, upgrading and risk reduction activities)

Location and Structure	Present Status	Long-term major repair, upgrading and risk reduction activities	Source of fund (internal or e
1. Catchment area			
2. Source/ Intake			
3. Transmission and Distribution Pipeline			
4. Reservoir Tank and other chambers			
5. Taps (public/ private)			

xternal)	Implementation		Monitoring		
		By Who?	When?	By Who?	Status (Done / Not done)

Annex 11:
Draft WUSC Constitution

……. Water Supply and Sanitation Users' Committee By-laws 20XX (20XX B.S.)

Preamble:

It is essential for local people today to organize themselves and carry out local development and construction programs through public participation to address the community's needs. In this context, the residents of …… Municipality, Ward No. ……, in ……. District felt the need and desire to implement water supply and sanitation programs locally. Therefore, it was deemed appropriate to establish a service-oriented, autonomous Users' Committee to select programs, plan, implement, monitor, review, evaluate, operate, and maintain them at the local level. With the active participation of the villagers, this by-law was drafted, and the …… Water Supply and Sanitation Users' Committee was formed.

Chapter 1: Preliminary

1. Brief Name and Commencement:
This by-law shall be called the …… Water Supply and Sanitation Users' Committee By-laws 20XX.

2. Definitions:
Unless the context otherwise requires, the following terms used in this by-law shall have the meanings as stated:

2.1. "Act" refers to the Water Resources Act 2049.
2.2. "Group" refers to all Users benefiting from water supply and sanitation facilities under this committee.
2.3. "Rules" refer to the rules made and implemented by the working committee under this by-law.
2.4. "Committee" refers to the Users' committee formed under this by-law.
2.5. "Members of the Users' committee" refers to the Chairperson, Secretary, Treasurer, and other members of the committee.
2.6. "Officials of the Users' committee" refers only to the Chairperson, Vice-Chairperson, Secretary, and Treasurer.
2.7. "Chairperson" refers to the chairperson elected as per this by-law.
2.8. "Sub-committee" refers to any sub-committee formed under the Users' committee as per this by-law.
2.9. "Supporting organization" refers to non-governmental organizations that assist the committee in social mobilization and technical work.

2.10. “Donor organization” refers to national, international, governmental, or non-governmental entities providing financial support.
2.11. “User” refers to an individual who utilizes the services provided by the committee’s programs.
2.12. “Area” refers to the geographical coverage of services provided or construction sites managed by the committee, including……, etc., in Ward No. .. of ……. Municipality, … . The main water sources (gravity pipe system) include …….., within the committee’s jurisdiction.
2.13. “Program” refers to the activities implemented by the committee under this by-law.
2.14. “Service fee” refers to the monthly or annual fee (cash, in-kind, or other) charged for services provided by the programs operated by the committee.

3. Logo and Stamp:
3.1. Logo: Depiction of water flowing in a stream.
3.2. Samp: …….. Water Supply and Sanitation User’s Committee …… Municipality, Ward No…….. (Name of the WUSC).

4. Office:
The committee office shall be located in ……, Ward No. ……, ……. Municipality.

Chapter 2: Objectives

5. Objectives of the User’s Committee:
The main objectives, while working within the prevailing laws, shall be:
5.1. Organize Users benefiting from water supply and sanitation programs in the area
5.2. Identify local needs and implement programs accordingly.
5.3. Involve all Users in planning and development activities in the area
5.4. Ensure fair maintenance, repair, and benefit distribution of programs implemented in the area.
5.5. Arrange capital, labor, and resources required for program selection, preparation, and implementation and manage their utilization. Operate all programs and policies as per this by-law.

Chapter 3: User’s Committee

6. Formation of the Committee:
6.1. The committee shall be formed through a general assembly. All Users must be informed at least seven days in advance. The meeting time and place should be suitable for both men and women.
6.2. Equal representation from all parts of the program area shall be ensured.
6.3. Representation of all ethnic communities shall be ensured

6.4. At least 75% of households benefiting from the program must be represented, with at least 50% female participation.
6.5. The above procedures shall also be followed during committee reformation or new elections.

7. Committee Meetings:
7.1. Meetings shall be held at the designated time and place.
7.2. Members shall be informed seven days prior about date, time, place, and agenda.
7.3. The quorum for meetings is 70%. If not met, a second meeting may proceed with 50% of total.

8. Functions, Duties, and Authorities of the Committee for the DWS Scheme:
8.1. Initial Stage:
- Organize User assemblies.
- Identify and prioritize needs, inform relevant authorities.
- Assist feasibility study teams.
- Discuss and decide on cash and labor contributions with Users.
- Consult with Ward and Municipality offices.

8.2. Preparation Stage:
- Conduct User assemblies.
- Inform Users about the program.
- Prepare community maps and collect baseline data.
- Plan program layout, collect cash from Users, open bank accounts.
- Conduct trainings and workshops.
- Prepare cost estimates, community workplans, and submit for approval.
- Form procurement committee of 3 members (1 coordinator + 2 members).
- Sign agreements for program implementation.

8.3. Implementation Stage:
- Hold pre-construction workshops on cost, agreements, and community workplans.
- Train committee and procurement committee on materials management.
- Procure materials, manage storage, deploy skilled labor.
- Monitor progress, conduct at least 3 general assemblies to review finances.
- Upon completion, hold a final assembly to approve financial statements.

8.4. Post-construction Stage:
- Hold regular meetings.
- Set water tariffs for maintenance, determine labor remuneration.
- Collect fees, conduct maintenance, procure essential spare parts.
- Maintain health and sanitation programs.
- Annual audit and report submission to Ward, Municipality, and Water Resources Committee.
- Inform authorities if repairs exceed the committee's capacity.

Chapter 4: Roles, Duties, and Powers of Officials (WUSC Officials and Members)

9. Chairperson:

9.1. Lead all activities, chair meetings, provide active leadership.
9.2. Make decisions in emergencies.
9.3. Liaise with government and non-government entities.
9.4. Assign responsibilities during absence.

10. Vice-Chairperson:

10.1. Assume chairperson's duties in absence.
10.2. Implement committee objectives.

11. Secretary:

11.1. Manage office operations,
11.2. Prepare for meetings,
11.3. Record decisions
11.4. Coordinate community participation.

12. Treasurer:

12.1. Manage finances, income, and expenditures.
12.2. Maintain records of labor, materials, and capital.
12.3. Facilitate audits.

13. Members:

13.1. Monitor project implementation.
13.2. Mobilize labor, capital, and materials.
13.3. Report project status to local Users.

Chapter 5: Financial Management

14. Sources of Funds:

14.1. Donations and grants from donors.
14.2. Service fees collected from Users.
14.3. Support from government, NGOs, and local donors.
14.4. Community labor, capital, and materials.
14.5. Other sources of aid.

15. Assets:

The committee is an autonomous, organized entity with rights to acquire, use, and dispose of assets legally.

16. Fund Management:

16.1. Separate fund account.

16.2. Bank accounts operated jointly by three designated officials. Treasurer supervises fund utilization.

17. Labor, Skill, Capital, and Materials Management: The WUSC will manage all the local labor, skill and other local materials and the capital and external materials for the scheme will be managed from the donor as per an agreement. During these contribution, there will be considered the level and condition of the users.

18. Labor, skill, Capital and Materials for O&M. The community should manage the necessary local labor and skill for operation and maintenance of the scheme. The WUSC will manage all the records of the contributions. There will be consideration of the GEDSI issues while community contribution.

19. Audit and Accountability:

19.1. All the financial audits will be done as per the rule of Government of Nepal

19.2. Social audit after program completion.

19.3. Annual financial audit by a User-appointed auditor.

19.4. Reports submitted to general assembly and relevant authorities.

Chapter 6: Miscellaneous

20. Election:

20.1. Users will elect the committee members from among themselves.

21. Disqualification:

21.1. Under 18 years of age

21.2. Mentally incapacitated

21.3. Convicted of moral corruption

21.4. Misappropriation of program funds

21.5. Holding conflicting governmental positions.

22. Motion of No Confidence:

22.1. Two-thirds majority of present members can remove a member.

23. By-law Amendment:

23.1. Requires two-thirds majority approval in the general assembly, with 75% household representation.

24. Rules

24.1. Committee may create operational rules to achieve objectives.

25. Progress Reports:

25.1. Submitted at least once a year to the Ward and Municipality offices.

26. Advisory Committee:

26.1. May be formed with Ward, Municipality, donors, and distinguished local personalities.

27. Conflicts with Law:

27.1. Provisions contrary to prevailing laws shall be inactive to that extent.

28. Penalties:

28.1. Absentee members or non-participating Users may face fines as decided by the committee.

29. Expense Settlement:

29.1. All income and expenditures reconciled after program completion.

30. Annual General Meeting:

30.1. Reports on finances, administration, and progress will be presented annually.

30.2. Terms of the Committee will be 3 years.

31. Additional Provisions:

31.1. Committee can be dissolved or restructured if found acting against User interests.

31.2. Agreements with government or NGOs permitted.

31.3. External beneficiaries may pay fees to access services.

31.4. Ward, Municipality, donor representatives to participate in meetings if resources are involved.

Committee Officials Elected on ……. 2082 (…… , 2025):

1. Chairperson: ……..
2. Vice-Chairperson: ……. …….
3. Treasurer: ……..
4. Secretary: ……
5. Assistant Secretary: ……..
6. Member ……..
7. Member……..
8. Member ……..
9. Member ……

Note: This constitution is an example and template briefly presented in concise form. There can be added or deleted the topics as per need and volume of the scheme under the related act and lows.

These are guidelines or tips only and the trainer/facilitator should generate their innovative ideas to make the training more effective with a learning environment.

Annex 12:
Sample Pre-Test Questionnaire for WUSC Capacity Building Training to WASH Unit Staff/SSC

Name: .....

Affiliated Office / Institution / Rural Municipality / Municipality:.....

Tick (√) the correct answer to the questions below

1. **In which year was the Department of Water Supply and Sewerage Management (DWSSM), the leading government agency working in the water supply and sanitation sector of Nepal, established?**
   a) 1971
   b) 1978
   c) 1983
   d) 1988

2. **According to the National Census 2021 (2078 BS), what is percentage of people in Nepal currently use basic drinking water services?**
   a) 93%
   b) 97%
   c) 86.73%
   d) 95.5%

3. **According to the "Water Supply and Sanitation Status Report 2075" published by DWSSM, what percentage of water supply schemes in Nepal are fully functional?**
   a) 25.50%
   b) 28.13%
   c) 32.55%
   d) 35.75%

4. **How many liters of water per person per day is considered the basic level of drinking water service?**
   a) 35 liters
   b) 40 liters
   c) 45 liters
   d) 50 liters

5. Which of the following are necessary for the smooth functioning of a water supply scheme?

a) Properly designed and properly constructed water supply system
b) Inclusive, active, and efficient user committee
c) Trained and voluntary maintenance workers
d) Availability of necessary spare parts and tools
e) All of the above

6. Which among the following is not a tool used in water supply schemes?

a) Tuti
b) Pipe wrench
c) Hacksaw blade
d) Heating plate

7. In the Sustainable Development Goals (SDGs), which goal number relates to water, sanitation, and hygiene (WASH)?

a) Goal no 4
b) Goal no 6
c) Goal no 8
d) Goal no 10

8. According to the "Water Supply and Sanitation Status Report 2075," what is percentage of water supply schemes have maintenance workers?

a) 31%
b) 33%
c) 37%
d) 39%

9. How can we confirm that water quality is good?

a) Tastes good (no smell), looks clear
b) The source, reservoir, and pipeline are safe with no chances of contamination
c) No waterborne diseases have been noticed
d) Laboratory tests show no harmful contaminants
e) All of the above

10. According to the "Water Supply and Sanitation Status Report 2075," what is percentage of operational water schemes have a operation & maintenance fund?

a) 5.7%
b) 7.5%
c) 15.5%
d) 19.5%

11. Which of the following are criteria for selecting village level l maintenance workers?

a) Mature and honest
b) Willing to work for the community
c) Planning to stay away from the village for a long time
d) Strong male
e) All of the above

12. Who must prepare the municipal-level Water, Sanitation, and Hygiene (WASH) Plan?

a) Federal government
b) Provincial government
c) Donor agencies
d) Municipality

13. Which of the following does not fall under the principles of good governance?

a) Conflict management
b) Transparency
c) Accountability
d) Participation

14. What is done in the third stage of the Water Safety Plan (WSP)?

a) Group formation
b) Identification, analysis, and control measures of hazards and risks
c) Monitoring and verification
d) Review, reporting, and record keeping

15. Write the full form of:
SSC = ...

16. …….
17. …….
18. …….

(Note: The pre/post-tests will be designed based on the type of the training and level of the participants. In the community level, there might be plenary sessions for pre-tests for modules depending on the level of the participants.)

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