



STEP BY STEP MANUAL WATER SUPPLY, IRRIGATION AND MULTIPLE-USE WATER SYSTEMS

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Table of Contents

LIST OF TABLES.....	iii
LIST OF FIGURES.....	iv
LIST OF SUPPORTING/REFERENCE DOCUMENTS.....	iv
LIST OF ABBREVIATIONS	v
FOREWORD	vi
1 PRE-FEASIBILITY STUDY-WATER DISCHARGE	1
2 FEASIBILITY STUDY GUIDELINES AND FORMAT	1
3 GUIDELINES FOR USERS ORIENTATION, COMMUNITY MAPPING, USERS COMMITTEE FORMATION AND REGISTRATION PROCESS	5
3.1 USERS ORIENTATION.....	5
3.2 COMMUNITY MAPPING	5
3.3 USERS COMMITTEE FORMATION.....	10
3.4 USERS' COMMITTEE REGISTRATION	13
4 PREPARATORY PHASE ORIENTATION TRAINING PACKAGE.....	13
4.1 ORIENTATION TO UC ON PROJECT, GEDSI AND TOTAL SANITATION.....	13
4.2 ORIENTATION TO UC ON FINANCIAL MANAGEMENT AND ACCOUNTING KEEPING	17
4.3 CLIMATE SMART AGRICULTURE AND AGROFORESTRY, ENVIRONMENTAL & BIODIVERSITY CONSERVATION.....	19
4.4 CLIMATE RESILIENT WATER SAFETY PLAN, OPERATION & MAINTENANCE, SCHEME INSURANCE, AND WATER QUALITY TESTING ORIENTATION*	21
5 DETAIL LAYOUT & INTEGRATED ACTIVITIES AND USERS' APPROVAL	29
6 DETAIL TECHNICAL SURVEY, CLIMATE CHANGE & VULNERABILITY CAPACITY ASSESSMENT	31
6.1 DETAIL TECHNICAL SURVEY.....	31
6.2 CLIMATE CHANGE AND VULNERABILITY CAPACITY ASSESSMENT SURVEY.....	37
6.3 SURVEY OF SOLAR AND ELECTRIC LIFT DRINKING WATER/IRRIGATION SCHEME	39
7 SCHEME DESIGN AND ESTIMATE.....	40
7.1 WATER SUPPLY SCHEME DESIGN.....	42
7.2 SOLAR/ELECTRICAL LIFT WATER SUPPLY	45
7.3 RAINWATER HARVESTING.....	46
7.4 MUS SCHEME DESIGN	46
7.5 IRRIGATION SCHEME DESIGN.....	48
7.6 IMPROVED WATER MILL SCHEME DESIGN	51
7.7 SCHEME COST ESTIMATE	53
8 ENVIRONMENTAL MITIGATION AND MONITORING PLAN.....	53

9	BANK ACCOUNT AND FUND COLLECTION FOR CONSTRUCTION & O&M FUND.....	54
10	COMMUNITY ACTION PLAN PREPARATION, PRESENTATION AND USERS' APPROVAL.....	55
10.1	DESIGN ESTIMATE AND COMMUNITY ACTION PLAN ORIENTATION AND PREPARATION.....	55
10.2	APPROVAL OF CAP, DESIGN AND COST ESTIMATE	56
10.3	FIRST PUBLIC AUDIT	58
11	FIELD MONITORING	60
12	PROJECT MANAGEMENT COMMITTEE APPROVAL FOR IMPLEMENTATION.....	65
13	IMPLEMENTATION PHASE AGREEMENT BETWEEN UC AND LG.....	66
14	USERS' COMMITTEE MANAGEMENT AND PROCUREMENT TRAINING	66
15	GUIDELINES FOR PRE-CONSTRUCTION SEMINAR.....	69
16	PROCUREMENT OF NON-LOCAL MATERIALS AND LOCAL MATERIALS COLLECTION ..	72
17	EXTERNAL AND LOCAL MATERIAL TRANSPORTATION AND STORAGE.....	79
18	SECOND PUBLIC AUDIT	80
19	UC FINANCIAL MANAGEMENT REFRESHER TRAINING	85
20	VILLAGE MAINTENANCE WORKERS/OPERATORS SELECTION AND TRAINING	87
21	DURING CONSTRUCTION SEMINAR.....	93
22	SCHEME IMPLEMENTATION AND COMPLETION	95
23	WATER SUPPLY SCHEME SYSTEM DISINFECTION	96
24	THIRD PUBLIC AUDIT	98
25	SCHEME COMPLETION REPORT, MB AND FINAL INSTALLMENT	101
25.1	MEASUREMENT BOOK AND SCHEME COMPLETION REPORT.....	101
25.2	FINAL PAYMENT TO USER COMMITTEE	101
25.3	UPDATE OF SCHEME INFORMATION BOARD.....	102
26	SCHEME INSURANCE.....	103
27	SCHEME O&M REGULATION PREPARATION.....	103
28	CR-WSP TRAINING AND PREPARATION	104
29	INVENTORY UPDATE IN NWASH MIS SYSTEM	109
30	SCHEME COMPLETION SEMINAR & COMPLETION CERTIFICATE.....	109
31	USERS COMMITTEE'S COMMITTEMENT.....	110
	ANNEX 1: FEASIBILITY STUDY FORMAT	112
	ANNEX 2: SCHEME LAYOUT & DESIGN MAP TEMPLATE.....	124
	ANNEX 3: SAMPLE USER COMMITTEE STATUTE AND APPLICATION.....	125
	ANNEX 4: CLIMATE CHANGE AND VULNERABILITY CAPACITY ASSESSMENT SURVEY FORM.....	137
	ANNEX 5: COMMUNITY ACTION PLAN FOR IMPLEMENTATION PHASE ACTIVITIES	144

ANNEX 6: SAMPLE AGREEMENT BETWEEN LOCAL GOVERNMENT AND USER COMMITTEE	145
ANNEX 7: UC COMMITMENT TOWARDS GEDSI	157
ANNEX 8: ENVIRONMENTAL IMPACT MITIGATION AND MONITORING PLAN-EMMP	159
ANNEX 9: WATER TARIFF FIXATION GUIDELINE	165
ANNEX 10: SCHEME COMPLETION CERTIFICATE	170

LIST OF TABLES

Table 1 List of people who attended the community mapping	9
Table 2 List of people who attended the mass meeting	12
Table 3 Crop Water Requirement	35
Table 4 Design of Sprinkler Stand/Offtake	50
Table 5 Design of Drip Irrigation System	51
Table 6 Functional Characteristics of Traditional and Improved Water Mills	52
Table 7 Format for Environmental Mitigation and Monitoring Plan.....	53
Table 8 Monitoring by Different Level.....	60
Table 9 Minimum Monitoring Requirements at scheme Level	62
Table 10 Appropriate time of various monitoring visits.....	62
Table 11 Composition of scheme level monitoring team	63
Table 12 Excavation of pipeline.....	73
Table 13 Grade of concrete	73
Table 14 HDPE Pipe Sizing and Series As per SDR	74
Table 15 GI Pipe Details as per NS.....	75
Table 16 CAP Vs Achievement.....	82
Table 17 Assurance of other activities in mass meeting	82
Table 18 Income and Expenditure Format	83
Table 19 Expenditure Format	83
Table 20 Stock Book Format.....	84
Table 21 Discussions held in the mass meeting and comments of the users	84
Table 22 Bleaching powder quantity for drinking water disinfection	97
Table 23 Scheme Details for Scheme Completion Certificate	171

LIST OF FIGURES

Figure 1 Sample of community map.....	9
Figure 2 Sample Layout of Irrigation Scheme.....	30
Figure 3 Sample Layout of DWS and MUS Scheme	31
Figure 4 Scheme Information Board	71

LIST OF SUPPORTING/REFERENCE DOCUMENTS

1. Final Project Document of LACC Project (Approved by 2nd Supervisory Board Meeting)
2. Project Implementation Manual (PIM) (Approved by 2nd Supervisory Board Meeting)
3. Community Procurement Manual (Approved by 2nd Supervisory Board Meeting)
4. Local Government Operation Act, 2074, Government of Nepal
5. Procurement Act, 2063 and related regulations
6. Relevant acts/policies approved by Project working local governments.
7. 12 volume WSS design guideline, 2002
8. Climate_Resilient_Water_Safety_Plan_Guideline_2017

LIST OF ABBREVIATIONS

CAP	Community Action Plan
CCA	Climate Change Adaptation
CR-WSP	Climate Resilient Water Safety Plan
DAG	Disadvantaged Group
DGPS	Differential Global Positioning System
DRM	Disaster Risk Management
DWS	Drinking Water Supply
GEDSI	Gender, Equity, Disability and Social Inclusion
GI	Galvanized Iron
GNNS	Global Navigation Satellite System
HDPE	High Density Polyethylene Pipe
HH	Households
IEC	Information, Education and Communication
IWRM	Integrated Water Resources Management
LACC	Local Adaptation to Climate Change
LG	Local Government
LGU	Local Government Project Implementation Unit
MB	Measurement Book
MIS	Management Information System
MOFAGA	Ministry of Federal Affairs and General Administration
MUS	Multiple Use System
PIM	Project Implementation Manual
PMC	Project Management Committee
PSU	Project Support Unit
RT/RVT	Reservoir Tank
RWH	Rainwater Harvesting
SBS	Step By Step
SWOT	Strength, Weakness, Opportunity and Threats
TO	Technical Officer
UC	Users Committee
VAT	Value Added Tax
VMW	Village Maintenance Worker
WASH	Water Sanitation and Hygiene

FOREWORD

Step-By-Step approach was developed to guide all stakeholders through a participatory and truly interactive planning and implementation process. It aims to build the capacity and sense of ownership in the communities to ensure future sustainability of these highly de-centralized community-managed rural infrastructure schemes. Attention is also paid into the most efficient use of water for multiple uses for enhanced livelihoods. This Step-By-Step Manual builds on the lessons learned in Rural Village Water Resources Management Project Phase I in Karnali and Sudurpashchim Provinces and earlier experiences in Rural Water Supply and Sanitation Support Program in Western zone (1990-2005) as well as experiences of Rural Water Supply and Sanitation Project in Western Nepal (RWSSP-WN) Phase I and II (2008-2019).

Step-By-Step Approach guides multiple stakeholders through the planning, implementation and post-construction phases. It translates the multi-layered complex principles of good local water governance and Integrated Water Resourced Management into do-able real steps backed up by systematic capacity building at the community level.

Step-By-Step approach has four main phases:

- The first phase in Step-By-Step approach is generally linked with preparation of Planning documents like WASH Plan, Water Use Master Plan, Local Adaptation Plans for Action. Seven steps Local level Planning process should be followed for identification of the projects.
- The second phase in Step-By-Step approach is Preparatory Phase followed by Implementation Phase. This Step-By-Step Manual focuses on these two phases.
- The final phase is Post-Construction Phase is further supported by the Post-Construction Manual. This phase is very specific for each unique situation: in a large complex and improved drinking water supply, Multiple Use System schemes post-construction phase can be fully focused on sustainable Operation and Maintenance and related Users Committee management practices. In water supply schemes it could focus on sanitation and hygiene, in irrigation schemes on livelihoods, production and market linkage options.

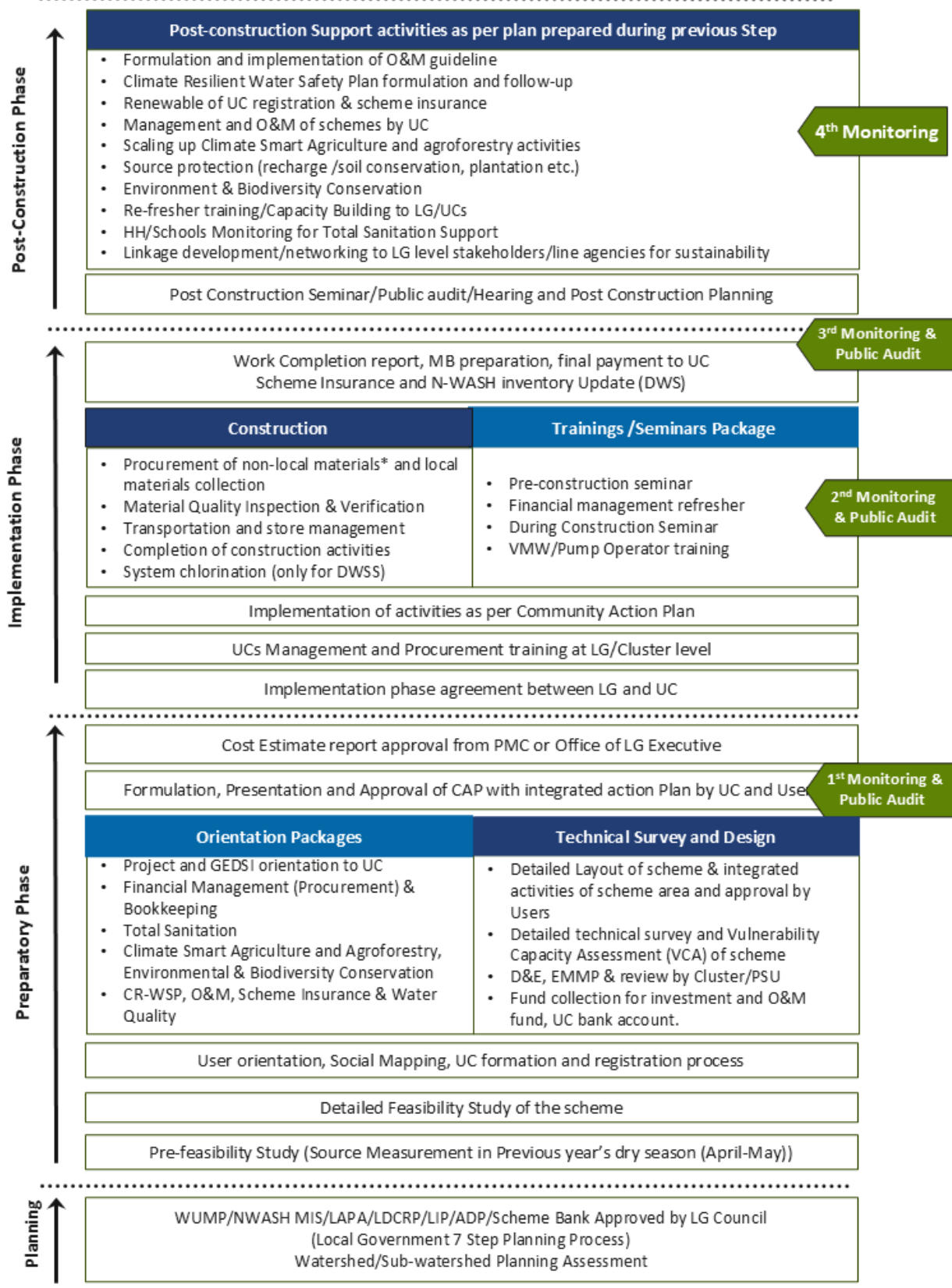
All phases must pay attention to the Project Implementation Manual (2025), Gender Equality Disability Social Inclusion & Human Right Base Approach Strategy and action plan (2025), as well as to the relevant chapters of the Local Government Operation Act, 2074 and respective regulations formulated by local government. This Step-By-Step Manual focuses fully on the capacity building of the Water Users Committees and therefore, the technical training events as Village Maintenance Workers, pump operators, irrigation operator and Masons, or those aimed as such other stakeholders as livelihoods groups and Community Organizations are not included in this manual.

Step-By-Step approach and related capacity building elements are constant work in progress. Any feedback on the contents of this manual is continuously welcome.

LACC Project, Birendranagar, Surkhet, Karnali Province, Nepal

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Step-By-Step for Water Supply/Irrigation/Multiple Use System (MUS)



* UC must follow the community procurement guideline

1 PRE-FEASIBILITY STUDY-WATER DISCHARGE

Introduction

Assessment of water source discharge is a crucial step in the prefeasibility survey of proposed Drinking Water Supply (DWS), Multiple Use System (MUS), and irrigation schemes. Before finalizing the annual work plan of the Local Government, it is essential to measure the discharge of the identified water sources, particularly during the dry season (March/April to May/June), which represents the period of minimum flow. Measuring during this season ensures that the true capacity of the source is understood and provides a reliable basis for determining the feasibility of supplying water to beneficiaries throughout the year. The minimum discharge values obtained serve as the foundation for designing schemes and guiding decisions on service population, pipe sizing, storage tank capacity, and distribution systems. Moreover, discharge measurement supports optimal and sustainable utilization of water resources, informs recharge and conservation measures, and strengthens long-term water security for communities.

Objectives of the water source measurement

- To assess the capacity of the source in order to identify its safe yield during the dry season
- To collect baseline information on seasonal fluctuations in water flow.
- To generate accurate data for use in future planning, design, and cost estimation of schemes.
- To determine whether the available source alone can meet the demand of the proposed population.

Water Source Measurement method

- **Timing and Location:** Discharge measurements are carried out during Chaitra–Jestha (March/April to May/June), the driest months of the year, at the major proposed water sources for selected schemes. Additional measurements may also be taken at local wells, Naulas, and springs to identify alternative or supplementary sources and to enhance community water resilience.
- **Equipment and Procedure:** Flow is measured using appropriate methods such as a V-notch weir or bucket-and-stopwatch technique, with readings taken three to five times and averaged for accuracy.
- **Data Recording:** Results are systematically documented in standard forms, including time and site details. For rehabilitation schemes, discharge records may also be incorporated into the minutes of the existing User Committee (UC).

2 FEASIBILITY STUDY GUIDELINES AND FORMAT

Purpose and Objectives of the Feasibility Study

The purpose of the feasibility study is to ensure that proposed schemes can be designed, constructed, and operated in a sustainable manner, incorporating disaster risk reduction, climate resilience, and environmentally friendly approaches. The objectives of the feasibility assessment are to evaluate the technical, environmental, and economic viability of the proposed scheme, as well as to assess its socio-economic and financial feasibility for long-term operation and maintenance.

Key issues to be verified during Feasibility study

The feasibility study should be carried out jointly by the Sub-Engineer and the Social Mobilizer. During the study, the following aspects need to be verified and ensured:

- Is there genuine demand for the scheme? Has the need been discussed and agreed upon in community meetings, or is it only the view of a few individuals?

- Are the beneficiaries currently unserved, or is the scheme intended to improve their existing service level for water supply or irrigation?
- Are there households excluded (left out) from the scheme that could technically be included?
- Are the users familiar/ aware of the priorities of WASH Plan and WUMP / Priorities from Local level Planning process?
- Are the users aware of their required contributions in cash, kind, and participation? Can they realistically meet these obligations? Has flexibility been considered for ultra-poor or disadvantaged households by adjusting the balance between cash and in-kind contributions?
- Has the Local Government made provisions to support the poorest households, so they are not left out?
- Are there any existing disputes over water sources or community conflicts that could affect the proposed scheme?
- Can the scheme be implemented with minimal impact on the environment, biodiversity, and local disaster risks?
- Is the scheme sustainable in the long term? For example, in the case of electrical or solar lift systems, are users fully aware of the expected electricity bills, operation and maintenance requirements, and monthly tariffs they will need to pay?

Selection of water sources: Adequacy, quality, and cost efficiency.

For improvement of water supply schemes at rural community level, the following strategies should be adopted:

- Select safe and least-contaminated spring or stream sources, ensuring thorough catchment assessment, environmental assessment, and source protection.
- Introduce innovative designs for spring and stream intakes, with strong emphasis on source protection, to minimize operational problems.
- Strengthen both institutional and community capacities for effective operation and maintenance of the water supply scheme.
- Apply and monitor Climate-Resilient Water Safety Plans to safeguard long-term water security.
- Ensure minimal environmental impact and integrate disaster risk reduction and climate resilience measures.
- Promote health, hygiene, and total sanitation activities, with training especially targeted to women and mothers' groups.
- Provide simple, cost-effective, and user-friendly water treatment facilities that are easy to operate and maintain.
- Prefer closed system designs wherever possible to reduce contamination risks and improve reliability.

Steps to Carry out the Feasibility study

1. Organize a meeting with ward representatives to review and align with existing plans such as the WASH Plan, Water Use Master Plan (WUMP), Local Adaptation Plans for Action, Local Disaster and Climate Resilience Plans, Watershed Plans, and Agriculture Development Plans. Identify local priorities and explore the potential for Multiple-Use Systems (MUS).
2. Visit and observe the proposed area and assess the existing water source(s). Identify currently used sources and determine the nearest appropriate source(s) for measurement and verification in terms of availability, reliability, and vulnerability.

3. While verifying water sources, ensure climate change adaptation, disaster risk reduction, and biodiversity considerations are integrated at both the spring-shed and watershed levels. Select water sources that are technically, environmentally, and socially appropriate, and as close as possible to the target cluster.
4. After site visits, explore alternative technological options beyond those proposed in the WASH Plan or other Local Level Plans. Options such as point source improvement, rainwater harvesting, or other innovative solutions may be particularly important for remotely located households.
5. If the initially proposed technological option is found unfeasible, facilitate community discussions to select alternate appropriate solutions. Document these decisions filling in the feasibility study format.
6. In the case of rehabilitation, maintenance, or service extension schemes, assess and document the usefulness, condition, and operational status of existing structures during the site visit.
7. Verify the number of benefiting households, population, and land area, and measure the water source(s) to confirm that the water discharge meets the demand.
8. Record the altitude of key points using GPS, such as sources, tentative reservoir tank (RVT) locations, service areas, ridges, valleys, landslide/flood-prone areas, and current or planned land uses including roads.
9. In case of lift scheme (solar or electrical), verify the altitude difference of water source and potential service reservoir location using altimeter.
10. Organize a scheme-level mass meeting with broad participation ensuring at least 75% of scheme households, with at least 50% female participants. Ensure representation from all settlements, castes, and ethnic groups in proportion to their presence. Any variation must be justified. Attendance of at least one ward committee representative is mandatory in the mass meeting.
11. During the mass meeting, record all necessary details in the feasibility study format. Discussion should cover:

During the meeting, following topics should be discussed and documented:

- Scheme implementation process and steps
 - Project working modality
 - Community contribution pattern
 - Structure, roles, and responsibilities of the UC and stakeholders (Local Government/Ward, LACC Project, other partner agencies, etc.)
12. Present the completed feasibility study format in the mass meeting for review. Ensure it is signed by key persons of UC, with a separate attendance sheet duly filled.

The Sub-Engineer will present the feasibility study findings, along with recommendations, to the Project Management Committee (PMC) of the respective Local Government.

Outcome of the study

The outcome of the feasibility study may result in either a recommendation to proceed or the rejection of the proposed scheme. Based on the study, the technical personnel may recommend the scheme for a detailed feasibility study either unconditionally or conditionally, or they may determine the scheme to be unfeasible. Unconditionally recommended schemes can move forward to the detailed study directly, without any modifications or additional requirements. For conditionally recommended schemes, the technical personnel specify the conditions that must be met before the scheme can proceed. Schemes deemed unfeasible are not considered for further planning or implementation.

Annex 1 provides the Feasibility Study Format to be used in the field during feasibility study.

Format 1: Assessment of social and financial feasibility for the proposed scheme construction, operation and maintenance

Format 1 of the template focuses on the social and financial feasibility aspects of the proposed scheme. The technician first validates the basic information of the proposed scheme and collects any missing data. Additionally, the technical personnel observe and assess further social and financial feasibility aspects as required by the format.

The collected information is then evaluated to determine how well it supports the acceptance of the scheme. Based on this assessment, the technical personnel may unconditionally accept, conditionally accept, or consider certain aspects as making the proposed scheme unfeasible. Unconditionally accepted aspects require no further action. For conditionally accepted aspects, the technical personnel specify the necessary actions that must be completed before the scheme can proceed. Finally, aspects deemed unfeasible are documented, along with a determination of whether the scheme can still be considered for further planning despite these limitations.

Format 2: Assessment of technical, environmental and economic feasibility of the proposed scheme

Format 2 of the template focuses on the technical, environmental, and economic feasibility aspects of the proposed scheme. The technical personnel first validate the basic scheme information and collect any missing data needed for further assessment. They then observe and evaluate additional technical, environmental, and economic feasibility aspects as required by the format.

The information collected is assessed to determine how well it supports acceptance of the proposed scheme. Based on this evaluation, the technical personnel may unconditionally accept, conditionally accept, or consider certain aspects as rendering the scheme unfeasible. Unconditionally accepted aspects require no further action. For conditionally accepted aspects, the technical personnel specify the actions that must be completed before the scheme can proceed. Finally, aspects deemed unfeasible are documented, along with a determination of whether the scheme can still be considered for further planning despite these limitations.

Format 3: Overall, Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and recommendations

Format 3 focuses on the overall SWOT analysis and the final recommendations for the proposed scheme. The technical personnel describe the strengths, weaknesses, opportunities, and threats of the scheme based on their observations and the validated basic information. This format provides an opportunity to openly and comprehensively assess the status of the scheme from a feasibility perspective. Based on this assessment, the technical personnel may recommend the scheme unconditionally, recommend it conditionally with specified requirements, or reject it as unfeasible. All recommendations must be supported by the information collected in the feasibility study and any specified conditions or requirements

3 GUIDELINES FOR USERS ORIENTATION, COMMUNITY MAPPING, USERS COMMITTEE FORMATION AND REGISTRATION PROCESS

3.1 USERS ORIENTATION

If the proposed scheme is found feasible through the feasibility study, it is included in the annual work plan of the Local Government and submitted for approval under the LACC Project.

A mass meeting is then organized to inform users about the scheme's approval, explain the project's working modality and implementation approach, and clarify the roles and responsibilities of UC and users, the Ward Committee, Local Government, and the LACC Project. The user orientation focuses on addressing community queries related to project norms and implementation procedures.

Participation in the public meeting is mandatory for at least 75% of beneficiary households, with a minimum of 50% female representation. Representation should also be proportionate across all settlements, castes, ethnic groups, and marginalized groups including people with disabilities.

For small schemes that can be completed within a single meeting, community mapping and User Committee (UC) formation can be conducted during the same mass meeting. For larger schemes, it is recommended to organize a separate meeting specifically for UC formation.

The meeting should not proceed without mandatory representation from the specified target groups and LG/Ward representatives.

Once the desired participation is confirmed, the following topics are discussed during the mass meeting.

- **Introduction of LACC Project, funding sources (Government of Nepal, Government of Finland & the European Union, Province and the LG)**
- LACC Project working modality, including the structure, roles, and responsibilities of UC, procurement process, climate-resilient construction, O&M fund, water tariff, and VMW selection process.
- **Fund flow mechanism and contribution from different stakeholders, including users.**
- **Role and responsibilities of Users, Users' Committee, Ward committee, LG, LGU, Cluster Level Technical Unit and Project Support Unit / Project Coordination Office.**
- **Importance and process of preparing community mapping**
- Basic skills, knowledge and capacity requirements of UC members, and representation of female, including representation of women and disadvantaged groups (DAG) in UC as per project norms.
- **In case of lift schemes, describes the technological options of electrical, solar or hybrid, spare pumps, water tariff, operation and maintenance costs etc. should be described.**

3.2 COMMUNITY MAPPING

Community mapping is the first step in community mobilization and scheme construction planning, followed by the formation of the Users Committee (UC).

Community mapping is an important participatory tool for collecting basic information about a community. This process gathers data on households, population statistics (women, men, people with disabilities, ethnic groups, landless households, etc.), community forests, natural resources, community groups, public infrastructure, and local institutions within the scheme area. At this stage, social, technical, and demographic

information is collected to support scheme planning. Community mapping is a visual method that shows the relative locations of households and the distribution of different social strata—such as male, female, adult, child, landowners, landless, literate, and illiterate—along with the social structures and institutions present in the area.

In the LACC Project, the term “community” refers to the scheme area to be served by proposed integrated water resources management initiatives, including multiple-use systems (MUS), agroforestry and agriculture, biodiversity and environmental conservation schemes, water supply and sanitation, improved water mills, source protection, and disaster risk management.

Community mapping actively involves local men and women from all ethnic groups to create a pictorial representation of their community in the form of a map. In areas where women are shy or hesitant to speak publicly, especially in front of men, it may be necessary to prepare separate maps for female and male groups. For large schemes, separate groups may also be organized. If needed, a confidence-building workshop for women can be conducted prior to preparing the community map.

Materials required for community mapping are usually locally available items, such as ash, sand, stones, small bricks, leaves, sticks, coal, and chalk. The choice of materials also depends on the community’s level and access to other resources. If available, items such as pencils, drawing paper, and colored pens may also be used. Additionally, if a satellite or Google map of the community area is available, it can be printed, displayed on a projector, or provided in hard copy for reference.

Applications of Community map:

- Serves as a basis for scheme planning and for developing the scheme layout.
- Illustrates the community layout, including existing infrastructure, watershed and spring-shed areas, vulnerable locations, demographics, ethno-linguistic groups, agricultural lands, forest areas, and other relevant features.
- Helps identify different social groups using locally defined criteria.
- Provides insight into social institutions and the perspectives local people may have regarding them.
- Shows boundaries of specific locations or settlements.
- Identifies hazards and risks that could negatively affect the community.
- Highlights available local and natural resources, such as water sources, aggregates, stones, and sand.
- Reveals existing or potential disputes related to the proposed scheme

Community Mapping Process:

1. **Preliminary Walk and Observation:** Walk through the village and discuss with local people, including representatives of women, men, children, persons with disabilities, adults, and all Dalit, indigenous, and other groups, to identify important features such as existing tanks, taps, wells, irrigation facilities, irrigation land command areas, sanitation conditions, agricultural practices, community forests, catchment, watershed, and springshed areas, vulnerable places, settlement patterns, and social strata. This exercise helps build rapport with the community. During the walk, discuss critical issues related to vulnerability, accessibility, and use of facilities by all—highlighting who may be excluded or unable to access facilities (e.g., menstruating females, persons with disabilities, disadvantaged groups). Avoid sensitive topics where possible.
2. **Community Meeting Organization:** Call a community meeting at a time and venue convenient for women and all ethnic groups. Encourage participation from all clusters and various castes/ethnic groups, ensuring equal representation of men, women, and all ethnic groups. Facilitators should

prepare a participant list including names, gender, occupation, ethnic/caste group, and age by clusters (using Table 1). A minimum of 75% of household representatives should participate.

3. **Introduction and Orientation:** Facilitators introduce themselves and clearly explain the objectives, agenda, and participants' roles. Confirm that the community understands and is comfortable with the discussion topics. Encourage active participation of women and disadvantaged groups (DAG).
4. **Defining the Mapping Area:** Decide the type and boundaries of the area to be mapped (e.g., village, indigenous domain, watershed, springshed, or irrigation command area). Begin with a physical map of the residential area.
5. **Selecting Place and Materials:** With local guidance, select a suitable location and medium, such as the ground using locally available items like stones, seeds, sticks, leaves, color powder, or coal.

Drawing the Map:

- Begin by preparing the outline or boundary of the area.
 - Identify and map important institutions and landmarks such as schools, health centers, religious buildings, community centers, and public or business facilities.
 - Mark household locations, differentiating vulnerable households using colors or symbols.
 - Indicate households with home gardens, commercial farming areas, barren land, irrigation command areas, latrines, and other agricultural land.
 - Highlight social categories (e.g., ethnicity, female-headed households, large households, persons with disabilities) and access issues (who cannot use taps, toilets, irrigation facilities, or other infrastructure).
 - Identify existing infrastructure such as water supply pipelines, irrigation canals, tanks, water mills, and bridges.
 - Identify catchment, watershed, and springshed areas and other natural resources such as forests, sand, stone, bamboo, and gravel sources.
 - Identify areas prone to hazards such as floods, landslides, droughts, and other disaster risks.
 - Use the map to discuss both physical and social vulnerabilities and potential protective measures.
6. **Transferring the Map to Paper:** Once the ground map is complete, copy it onto paper, marking north and making necessary amendments. Take photographs of both the ground map and paper copy.
 7. **Community Analysis and Validation:** Use the map to conduct semi-structured interviews and facilitate local analysis. Ensure community members understand how the information will be used. Ask for reflections on advantages, disadvantages, and analytical potential of the tool. Thank the participants for their time and contribution.
 8. **Household and Land Record Preparation:** Prepare a list of all households including owner names, population (men, women, children, adults, persons with disabilities), irrigation land command areas in case of irrigation scheme, and indicate key persons on the map.
 9. **Recording Information for UC Register:** Ensure all information collected through community mapping; including households, infrastructure, land, irrigation command areas, catchment/watershed/springshed areas, natural resources, and social categories; is properly recorded in the UC register for future reference.

Information to Include on the Community Map:

- Direction of North
- Date of map creation
- Community area boundaries, cluster names, and boundaries
- Geographical features: mountains, forests, paths, rivers, roads, road heads, cultivated land, grazing land, irrigation land, irrigation command areas, barren land, community land, vulnerable areas, catchment/watershed/springshed areas, and sources of sand, stone, bamboo, gravel, etc.
- Name and location of current and proposed water sources (verify from WASH Plan, WUMP, LAPA and other local level plans)
- Layout of existing and planned water supply/irrigation systems
- Other infrastructure: hydropower, irrigation schemes, water mills, bridges
- Institutions: schools, health posts, LG buildings, banks, cooperatives, and offices
- Community centers: temples, parks, meeting places, marketplaces, shops
- Public toilets, open defecation areas
- Waste disposal, cremation sites
- Historical disaster-prone and vulnerable areas (floods, landslides, drought, forest fires)
- Symbols explained in the bottom-right corner of the map
- LG, ward number, and cluster noted at the top of the map
- Total number of households, female-headed households, population (men, women, total), taps, toilets, etc., indicated on the map or additional sheet
- Social categories: Dalit, Janajati, and others

Participants in Community Mapping:

Prepare a record of participants paying attention to their gender, social/ethnic group, and cluster/ward representation. Include the date of the community mapping meeting: _____

Table 1 List of people who attended the community mapping

S.N	FULL NAME	ETHNICITY (✓)				SEX (✓)			AGE	(✓)	Contact no.
		B/C/T/S	DALIT	JANAJATI	OTHERS	FEMALE	MALE	OTHERS		DISABILITY	

Add rows as needed

EXAMPLE OF A COMMUNITY MAP

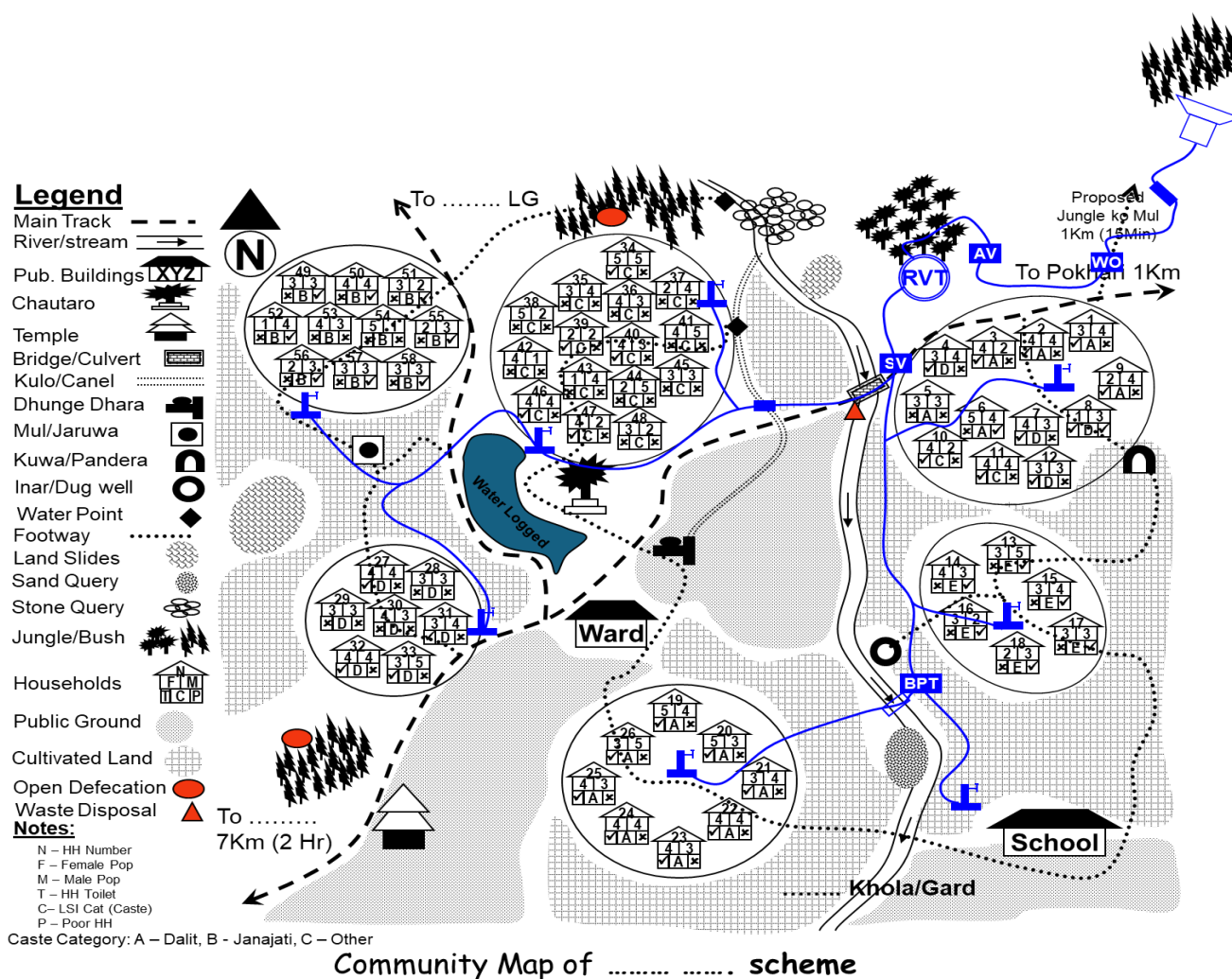


Figure 1 Sample of community map

3.3 USERS COMMITTEE FORMATION

Not all users can be mobilized every time, so a representative body must be elected to make decisions and take actions on behalf of the community. Users' representatives are elected through a mass meeting and form a Water Users Committee (UC). According to the Water Resources Act 2049 (Clause 5), a UC is established to manage water resources for the common benefit of users in an institutionalized manner. The UC is responsible to the users for various tasks related to the scheme and facilitates its implementation. Formation of the UC must follow the provisions set by the Local Government on Users Committee Formation, Operation, and Management.

The committee must include 50% female representation and proportional representation of disadvantaged groups (DAGs), with at least half of the female members occupying key positions.

Composition of the UC

UC is acting on behalf of the whole scheme users and area. Therefore, it is good to think beforehand what kind of UC composition represents the community in the best possible way. The project recommends following guidelines:

- a) In general, UC consists of seven to 11 representatives depending upon the size of a community to be served with water scheme. This includes chairperson, vice chairperson, secretary, treasurer and three to seven additional persons as members. UC with more than eleven members may not be efficient any more in making decisions. In case of large and complex schemes, different sub committees can also be formed as per requirements, but overall responsibilities lie on UC itself.
- b) Females are the primary users of water, so their expertise is necessary in UC. They have rich knowledge about the water resources management. Therefore, their role in UC is vital. At least half of UC members are required to be female. If there is an uneven number of the UC members, quota of female can be rounded either up or down. For example, if there are seven members, either three or four must be female. Female should hold the position of either a chairperson or a vice chairperson as well as other key positions in UC.
- c) UC should have a balanced representation from each ethnic group/caste and cluster/settlement. If UC members come only from one ethnic group or one cluster, they may not be supported by the whole community, nor represent all opinions. An imbalance between different ethnic groups and clusters in UC can create problems in various steps of the scheme cycle. Female and DAGs should be encouraged to come forward to be potential UC members.
- d) There should be only one UC per scheme. All UC members must be among the beneficiaries.
- e) UC should meet, or have a potential to meet, the following criteria: non-discrimination, participation and accountability.

General requirements for representatives of the UC

The users are free to select any woman, man or ethnic groups they assume to be able to carry out the duties as a UC representative. However, only active and trustworthy UC will be able to implement the scheme successfully. Generally, UC representatives should:

- Be cooperative and sociable and encourage participation of all.
- Be free from political squabbling.
- Have a reputation as a reliable person in the community.
- Be able to motivate the users.
- Be able to cooperate with the community in a democratic way.
- Be able to manage enough time to do the work.
- Be in good health, energetic, and capable of making quick, rational decisions.
- Possess high social morals and be committed to transparency and non-corruption.
- Have no outstanding issues (“beruju”) in previously implemented government schemes.

- Be permanent residents with no plans to migrate.
- Be mature, mentally stable, and interested in organizational activities.
- Be gender-sensitive and non-discriminatory.
- Preferably, key position holders should be literate

As specified in the Users Committee Formation and Operational Guidelines of Government of Nepal /LG, certain persons are not eligible to serve as representatives and members of the UC. These include schoolteachers, government officials, local government representatives, and individuals holding key positions in any other organizations or political parties. This restriction is intended to ensure that UC remains neutral, representative of the community, and fully focused on serving the interests of all users.

Procedure to form UC

- a) Call a mass meeting and present the agenda. Ensure adequate representation and participation of the users. Begin by engaging participants in dialogue about their daily activities to build rapport. After rapport building, proceed with the agenda and present information regarding UC formation.
- b) At least 75% of user households should be present at the mass meeting. Ensure adequate representation of all users, including men, women, clusters, and ethnic/caste groups. If the number of representatives is insufficient, or if women are in the minority, postpone the meeting until proper representation is achieved. Collect information about the participants using the attached format (Table No. 2).
- c) Based on the size of the proposed scheme and the number of settlements, ask the community to decide on the number of UC members (7 to 11). After determining the total number of members, decide on the number of female representatives and members from different ethnic/caste groups and geographic locations to ensure balanced representation.
- d) Allow the community to nominate representatives anonymously after discussion. Do not interfere with their discussion; only guide them to nominate enough women and representatives from all ethnicities, castes, and geographic areas.
- e) After nominating male and female candidates, hold a joint meeting where both groups discuss and decide on the final UC members, ensuring representation of all ethnic/caste groups and 50% female membership. If representation criteria are not met, reconvene the mass meeting to revise the UC membership. Ensure key positions are filled, with opportunities for women and DAGs, including at least one woman and one DAG in key positions depending on community size.
- f) During the mass meeting for UC formation, the participants should include one female and one male representative from each household, LG representatives, the LACC Project Officer or Field Coordinator, other relevant LGU staff, the Ward representative, and catalysts such as Female Community Health Volunteers, teachers, VMWs, Triggers, Traditional Birth Attendants, and others.
- g) Ensure the meeting time and venue are convenient for all participants. Provide house-to-house information (written or verbal) to all men and women. Inform all ethnic/caste groups and clusters about the meeting. At least two-thirds of households should attend. If participation is insufficient, postpone the meeting until adequate and balanced representation is achieved. Collect participant information using the attached format.
- h) The mass meeting should elect UC representatives in a socially inclusive and democratic manner. Both men and women should select representatives according to the criteria mentioned above.
- i) To obtain legal status, UC should be registered with the LG under the act formulated by the LG.
- j) The UC should seek approval for their actions from the users' mass meeting, which must be held at least once a year.
- k) The UC should develop a statute according to rules and regulations with support from the LACC Project Officer or LGU staff. An example of a statute is provided in Annex 4-A, and a sample application format is in Annex 4-B.

Roles and responsibilities

Users are managers and owners of their scheme. They should be involved in every phase of scheme cycle. UC is representative of the body of users. In other words, UC is main executive body to plan, manage, implement the scheme and maintain it after completion, thus also responsible for future sustainability and reliability. Success of a scheme depends largely on capacity of UC.

UC has many responsibilities before and during the implementation of the schemes, as well as after the implementation phase. The main responsibilities of UC are to:

- Co-ordinate with LG, LGU, PMC and the users.
- Play an active role in the different steps of the scheme planning and implementation.
- Hold meetings regularly and frequently.
- Collect local cash contribution for scheme implementation.
- Keep and update the records of scheme related transactions.
- Keep the users informed and develop ownership feeling among them.
- Be transparent and accountable to the users and the funding agencies.
- Operate, repair and maintain the scheme in the post implementation phase.
- Generate O&M fund and mobilize it for income generating activities when appropriate.
- Prepare scheme progress reports and financial statements; submit reports to the Rural/Municipalities and present them to the users.
- Manage the resources, such as materials, tools and workforce.
- Procure the non-local materials needed for the scheme, manage the store for them, use them properly in construction work, keep remaining material for future O&M and keep the records of all these transactions.
- Solve all disputes that arise in the scheme, including source disputes.
- Promote hygiene and sanitation activities in the community.
- Promote agroforestry and livelihood plans while prioritizing the multiple use of water with protecting biodiversity, forests, and water bodies.
- Promote environmental protection of water sources.
- Prepare and implement O&M Plan of water schemes. And CR Water Safety Plan also in case of DWS and MUS.
- Formulate new rules and regulations for the scheme as per need and ask the community approval for them in mass meetings.
- Sensitive towards female, poor, and DAG households, ensure inclusiveness.

Table 2 List of people who attended the mass meeting

Participants Detail in Mass Meetings

Dates of meetings:

(1) Female's meeting _____ (if held separately) (2) Mass meeting _____

Name of household representative attending the meeting	Gender (M/F/O)	Number of other HH members present			Person with Disability member in the HH	Ethnicity* (BCTS/D/J/O)	Cluster & ward no
		M	F	Other			

Number of participants in female's meeting: _____ (if held separately)

Number of households represented in the mass meeting: _____, which is _____% of the total scheme beneficiary households.

Number of females in the mass meeting: _____, which was _____ % of the participants.

Number of DAGs in the meeting _____, which was _____% of the participants.

3.4 USERS' COMMITTEE REGISTRATION

Registration of the Users' Committee (UC) is required to ensure its legal recognition, enabling it to operate as a formal, self-governed, and institutionalized body capable of receiving and managing funds and property.

- The need for UC registration is stipulated in the respective act and the procedures of the Local Government (LG).
- The entire UC must be registered at least during the implementation phase of the scheme and regularly renewed to maintain legal status.
- Only a legally registered UC can receive grants and funds from official sources.
- For Rainwater Harvesting and Point Source Improvement schemes, the UC may be registered at the ward office, as per LG regulations.
- The UC shall function as a continuous, self-governed, and institutionalized organization.
- The UC must have a separate stamp for official work.
- The UC shall have legal entity status, with rights similar to a legal person, including the ability to receive, use, and manage property.

The registration, renewal, and operation of Users' Committees (UCs) shall follow the provisions established in the act formulated by the respective Local Government (LG). All UCs must be registered with the Local Government in accordance with its regulations. The UC is required to submit all necessary documents along with the registration fee to the Rural Municipality or Municipality office. Upon completion of the process, the Local Government will issue the UC a registration certificate in the prescribed format. Note: A sample of the UC STATUTE and a sample of the application for the registration are given in ANNEX 4 of this manual.

4 PREPARATORY PHASE ORIENTATION TRAINING PACKAGE

4.1 ORIENTATION TO UC ON PROJECT, GEDSI AND TOTAL SANITATION

User Committee is the representative body of the scheme user households formed as per the Local Government Operation Act, 2074 (2017) and the Drinking Water, Sanitation, and Hygiene Act, 2081 (2024). They are fully responsible for community involvement at all stages of preparation and implementation, and related budget and materials. This is essential in building the capacity of the Users Committee, preparing them for the continued operation and maintenance of the scheme after its completion. Orientation about project and the scheme activities is extremely important to UC. While implementing the scheme activities, UC must follow norms, conditions, guidelines and approaches of the project and Local Self-Governance Act.

LACC Project's aim of reducing gender and social discrimination in the planning and implementation activities, this session will enable gender equality disability and social inclusion in all activities; the structures constructed through the project will be disability-friendly and user-friendly. This session will contribute to the implementation of the scheme and behavior change, provide important information to make the scheme

towards total sanitation, and play an important role in raising public awareness about gender, disability, social inclusion, climate change adaptation, environment and biodiversity conservation, and disaster risk management among the users' committee. Additionally, session regarding total sanitation will be provided to UCs related to drinking water supply which will contribute towards the towards total sanitized communities.

Objectives:

- Orient the Users Committee (UC) on the project concept, implementation guidelines, and standards.
- Provide guidance on procedures to be followed when working with the Local Government (LG).
- Enable understanding of the step-by-step approach, guidelines, norms, and the roles and responsibilities of the UC and other stakeholders in the process.
- Explain the concept of the Right to Water Resources and Sanitation.
- Introduce the GEDSI (Gender Equality, Disability, and Social Inclusion) concept, its importance in water resources and natural resources management activities, and its application in the step-by-step process and overall scheme planning and management.
- Sensitize UC members and other key persons in the scheme area on gender equality and social inclusion, emphasizing its importance for Integrated Water Resources Management (IWRM) activities and scheme sustainability.
- Explain the concept of gender, child, and disability-friendly structures.
- Clarify the role and responsibility of the UC in ensuring meaningful participation of women and ethnic/caste groups in the UC and other scheme activities, including practical ways to achieve this.
- Introduce total sanitation components and clarify the roles of the UC and LG (specific to drinking water schemes).

Bottom of Form

Materials required:

- Project briefing chart/power point presentation about the LACC Project details and the fund flow
- Step by Step chart- Water, LG Planning Step, supporting IEC materials
- Fund flow chart
- Cost sharing/contribution chart
- Chart of roles and responsibility of various stakeholders
- GEDSI integration flashcards, GDESI related flexes
- Charts/ IEC materials/ PowerPoint Presentation on Climate Change, Biodiversity, Environment and Disaster
- Total sanitation indicators flexes and flashcards,
- Others as required, eg. UC constitution, Operation & management sample regulations etc

Methodology: Explanation, Presentations, discussions, group work and brainstorming

Expected outcomes: After the orientation, UC members will:

- Be aware of the LACC Project and Rural Municipality/ Municipality approaches and working modalities.

- Understand the rationale behind the Step-by-Step approach.
- Understand their roles and responsibilities, with a focus on GEDSI (Gender Equality, Disability, and Social Inclusion) sensitization.
- Be familiar with LACC Project GEDSI and HRBA (Human Rights-Based Approach) policies and principles, as well as other cross-cutting issues such as climate change, disaster risk management, environmental protection, and biodiversity, and how these apply to each activity in the Step-by-Step process.
- Reflect on their attitudes and behaviors toward women, children, disadvantaged groups, and people with disabilities, and identify areas for improvement.
- Understand the roles and responsibilities of other stakeholders involved in scheme planning and implementation.
- Be aware of total sanitation components and the UC's role in promoting behavioral change in the drinking water scheme related community.

In the orientation program similar as other meetings and trainings, the participation of women, persons with disabilities, and all ethnic groups will be actively encouraged, ensuring that female participation reaches at least 50%. The Users Committee will review and ensure that women hold more than 50% of the membership, including key positions, and that all disadvantaged and marginalized groups are proportionally represented.

Duration: 1 day

Timing of the orientation: Immediately after formation of UC

Participants: All members of UC & Ward Chairperson/representative/LG executive members of scheme area, community leader/triggering actors.

Resources person: LACC Project Officer/Field Coordinator, Sub Engineer, & Community mobilizer of LGU

Organizer: Local Government Project Implementation Unit (LGU)

Training contents and schedule – 1 day:

Content	Time	Resources materials	Activities
Session I: Introductory session	60 min	Project Introduction	Self-introduction, ice breaking, games etc.
Opening, Introduction of participants and facilitators		PPT/Flexes	
Brief project introduction		Fund flow Chart	Presentation by the LGU staff on Project Introduction
Fund flow mechanism		Contribution Pattern Chart	Fund flow Chart
Contribution pattern of stakeholders		UC constitution	Contribution pattern
UC constitution and registration process			UC constitution and registration

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

Session II Scheme Step By Step Procedure Roles and responsibilities of the chairperson, vice-chairperson, secretary, treasurer and members of the UC Roles and responsibilities of other stakeholders	90 min	SBS Chart Roles and responsibilities Related Chart of UC & stakeholders	SBS Chart describe and discussion
Break	15 min		
Session III Introduction to HRBA and GEDSI, duty bearers and rights holders, non-discrimination, participation, transparency, accountability, impact, situation reflection & requirements. GEDSI Barriers in community Gender perspectives in water-use related planning, implementation, and maintenance	45 min	Flex and flashcards, videos related to gender equality, disability and social inclusion	Definition of Gender Equality, Disability, and Social Inclusion Gender and Social Inclusion and Sustainability Project Gender and Social Inclusion Principles ice breaking, games Discussion on popular proverbs related to female, disability, and caste Other appropriate tools, including discussions on the division of household work between female and male in a day
Session IV: Social Inclusion Gender Equality, Disability and Social Inclusion in a SBS approach Role and responsibilities of UC GEDSI. Solutions: such as literacy classes, disability-friendly structures, confidence building, etc. UC action plan for personal commitment on GEDSI	45 min	Flex and flashcards, videos related to gender equality, disability and social inclusion	Game & ice break discussion on accessibility and control of resource Discussing discrimination and inclusion Discuss how female and disadvantaged groups can be directly benefited in the schemes by including them numerically and qualitatively,

Session V: Total Sanitation	90 min	Policies, Regulations, directive, Procedures	
Policies, regulations and operational procedures related to Drinking water, Sanitation, Hygiene (Total Sanitation)		Total Sanitation Indicators chart	
Self-monitoring process		Steps of Total sanitation declaration flexes	
Fundamental rights to sanitation		Total Sanitation Guideline	
Analysis of the status of Total Sanitation in the scheme area			
Indicators for declaring the Total Sanitation area			
Total Sanitation declaration process			

Note: the facilitator should encourage all participants to actively participate in the discussion.

4.2 ORIENTATION TO UC ON FINANCIAL MANAGEMENT AND ACCOUNTING KEEPING

Since the investment fund from the Natural Resources Development Fund (NRDF) is directly transferred to the UC account for scheme implementation, the UC is responsible for purchasing required materials, managing the store, and maintaining systematic records of income and expenditure in accordance with the implementation guidelines. Therefore, UC members need to be familiar with procurement, store management, and bookkeeping procedures. Additionally, a detailed three-day training for UC members and the procurement committee will be organized after signing the implementation phase agreement, while this orientation provides a general introduction for all UC members.

This orientation is conducted after the completion of the detailed technical survey.

Duration: 1 day

Participants: All UC members and Ward Technician/representatives

Resource persons: Field Staffs (LACC Project Officer/Field Coordinator, Sub Engineer, WRT)

Organizer: LG Project Implementation Unit (LGU)

The objectives of the training are to:

- Aware UC members about community procurement process
- Inform UC members on record keeping of construction materials, pipe, fittings, skilled and unskilled laborers etc.
- Introduce different accounts keeping Books that need to be kept by the UC
- Aware UC members about quality of external and local materials required for the scheme.

Required materials:

Step by Step follow up chart, Fund flow chart, UC O&M regulation, Procurement Manual, Handbook for Quality and Specification of Construction Materials, sample of bookkeeping/store ledger, formats, black/white board/brown paper etc.

Major contents and session plan – Day 2

Content	Time	Activities and IEC materials
Session I	30 min	Game
Introduction		
Objectives Fund Flow system	45 min	
Contribution Pattern		
Fund release process to UC account	90 min	Fund flow and contribution chart
UC-LG agreement and conditions		Sample of agreement paper
Instalment and release procedure		
Required bills and vouchers		
Users' contribution for investment		
Kind contribution	90 min	
O&M Fund		
External material procurement process		UC manual/O&M book Procurement manual O&M regulation , Handbook for Quality and Specification of Construction Materials etc
Direct Purchase		
Sealed Quotation		
Comparative Chart	45 min	
Auditing		
Quality of Materials		
NS and ISI marks and information on pipe, fittings, tools and other construction materials	60 min	
Quality of local materials Scheme Cost and Accounting		
Estimated cost materials, transportation and labours		
District/LG rate		
Maximum budget and source of income		
Bank account		
Income Expenditure account		
Store record Closing		

4.3 CLIMATE SMART AGRICULTURE AND AGROFORESTRY, ENVIRONMENTAL & BIODIVERSITY CONSERVATION

In all the schemes under the project, construction work must be implemented to support a climate change friendly scheme, considering the protection of the environment and biodiversity by the user committees for the construction of climate resilient structures. Therefore, user committees highlight local technologies and practices on climate-smart agriculture and agroforestry, conservation of environment and biodiversity. The training in this regard is conducted during preparatory phase of schemes before the agreement.

This orientation is organized after the completion of the detailed technical survey.

Duration:	1 day
Participants:	All UC members and Ward Technical Representative
Resource persons:	Field Coordinator/NRM Facilitators
Organizer:	Project Implementation LG Unit

Objectives:

Objectives of this orientation are:

- Introduce natural resource management, challenges and solutions.
- To inform about the type, importance, and impact of biodiversity in the course of infrastructure construction.
- Explain the causes, impacts, and measures to be adopted in infrastructure and agriculture.
- The concept of disaster risk reduction and stating precautionary measures in infrastructure construction.
- Educate and teach practical measures about climate-smart agricultural and agroforestry practices.

Required Materials:

Step-by-step manual chart, Agriculture and Home garden Management Handbook, other charts, flipchart sample forms, brown paper, and marker pens etc.

Expected Results:

- Participants will understand the relationship between natural resource management, biodiversity conservation, and climate change.
- Be clear about four components of climate-smart agriculture and agroforestry and minimum practices promoted in households.
- They will be motivated to adopt environment-friendly thinking in infrastructure construction and agricultural practices.
- At the local level, they will be able to construct schemes to prioritize sustainable development in the concept of disaster risk reduction and climate change.
- Will inspire disaster risk reduction measures to be follow into practice.

Session Facilitation Process

Participants' curiosity, suggestions, discussions and practical interactions

Major Content and Session Plan – Day 1

Content	Time	Activities
First Session: Introduction What is catchment area and why integrated conservation practices? Spring shed Management Natural disasters	30 min	Group Discussion: Experiences sharing in local context
Second Session: Climate Change and Infrastructure Introduction of climate change: Causes, Green Houses Gases, Effects, Impact Effect on Infrastructure: Extreme Weather, delays and damage Solutions: Sustainable way of using local materials, Energy consumption, Climate Adaptive Construction	60 min	Presentation: Flip Chart, PowerPoint Group Discussion: Experience Sharing in local context Visual Materials: Video Clip, Infographics learning
Third Session: Climate Smart Agriculture Introduction: Climate-friendly agriculture system Major Practices: Adaptation and Mitigations Practical Solution: Climate Smart Technologies, Seasonal Farming, Reduction of Green Houses Gases, use of native/local crops, drought resilient crops species etc. and crop diversification.	60 min	
Fourth Session: Climate Smart Agroforestry Major Practices: Adaptation, Mitigation Climate Smart Agro-forestry: Introduction, Actions of Agroforestry, Division of agroforestry actions, female participation in agroforestry.	60 min	
Lunch Time	30 min	
Fifth Session: Disaster Risk Reduction and Management Introduction of disaster, effect, impact and risk assessment/vulnerability Remedial measures during construction phase Bio-techniques, Awareness, structure repair and preparedness	60 min	
Sixth Session: Environment and Biodiversity Conservation Conservation and Infrastructure construction Three layers of biological diversity: ecological, species, genetic Direct/indirect effects of infrastructure construction Mitigation Measures: Practices to be adopted at the planning, construction, and monitoring stages	60 min	

Note: Facilitators should encourage all participants to actively participate in the discussion

4.4 CLIMATE RESILIENT WATER SAFETY PLAN, OPERATION & MAINTENANCE, SCHEME INSURANCE, AND WATER QUALITY TESTING ORIENTATION*

* Climate Resilient Water Safety Plan and Water Quality Testing applicable for drinking water related scheme only

Introduction

For the sustainability of any scheme, it is necessary for the community to properly operate and maintain the schemes. Users of each drinking water scheme should prepare a community action plan for operation and maintenance from the beginning of the implementation of the scheme. Therefore, users need O&M, sustainability related capacity development training and appropriate guidance. For the sustainability of the scheme, the LGU staff should support UC in account-keeping of the O&M funds, spare parts store, O&M Plan formulation, preparation of regulation and capacity building of the UC. Similarly, user committees should also be able to look for external resources for financial and technical support if major maintenance is required. This procedure guides user committees for scheme sustainability, O&M fund collection, water safety plan management, direction to reinvestment, as well as the guide to LGU of project to facilitate the process.

Even though communities prepare these plans only after the implementation phase, experience indicates that basic orientation to the themes of sustainability, functionality, climate change, natural hazards, disaster risks, water safety and spring shed management is very fruitful if provided to UC during the preparatory phase. The orientation makes users think about the sustainability of their scheme, potential risks that may affect the functionality and how to best maintain the functionality in the short and long-term for smooth operation of the scheme. This guideline is for LGU staff on how to conduct a one-day orientation program to UC.

Additionally, Climate Resilient Water Safety Plans (CR-WSP) and water quality testing are essential for water schemes intended for drinking and domestic use. The orientation aims to familiarize UC members with the importance of CR-WSP, procedures for regular water quality monitoring, and methods to identify and mitigate potential risks, including contamination and climate-related hazards. This knowledge enhances the UC's capacity to plan, implement, and maintain safe and sustainable water schemes, promotes community awareness on hygiene and safe water practices, ensures compliance with national standards, and strengthens climate resilience, ultimately safeguarding public health and fostering community ownership.

Objectives:

The major objectives of the orientation are as follows:

- To guide the UC in developing and implementing the Operations & Maintenance (O&M) Plan from the beginning of scheme implementation.
- To ensure UC attention to O&M management during the construction of structures.
- To inform the UC about the importance and procedures of labor insurance during the construction phase and scheme insurance after completion.
- To develop the capacity of UC members to manage and implement the planned O&M Plan effectively.
- To ensure the sustainability of each scheme by maintaining basic service levels and managing continuous operation and maintenance.
- To orient UCs of drinking water related schemes only on Climate Resilient Water Safety Plan (CR-WSP) and water quality issues.

For sustainable operation and maintenance of the schemes, following key aspects are to be maintained in each and every scheme.

Preparation of O&M Policy, regulation and implementation:

UC prepares O&M policy and regulation with the facilitation of LGU staff. The O&M policy/regulation is approved in the mass meeting and implemented by the user. The document shall be accepted and signed by all the users. That document can be revised by the annual general assembly of the users as needed. LGU staff will support and monitor the endorsement of the O&M regulation. Periodic monitoring is done at the Ward level, and the related learning is documented for further improvement. UC follows the O&M policy and regulation presented in the *Post Construction Guideline*. UC will prepare and implement the O&M regulation with the facilitation of LGU staff based on the post construction phase guideline or LG level O&M directives/policy.

O&M Fund and Cash contribution collection:

Users collect cash funds for re-investment according to the project implementation Manual (PIM). The users collect and deposit the cash to the bank before signing the agreement. UC can use 50% of the funds during the construction phase and remaining 50% will be used for O&M. Additional funds are collected from regular water tariff as per the O&M policy/regulation. The mandatory amount of O&M funds is just indicative and it's not enough for the O&M of the scheme. The other sources for the O&M fund collection will be identified during the O&M training (primarily from the local government: fund from other line agencies and stakeholders). The UC can decide and collect small amounts of money from wage, transportation, pipeline excavation, trench digging etc. Transparency and public auditing of UC funds is the backbone of the scheme sustainability. The UC will maintain transparency of all funds, tools and other materials by conducting public audit once a year.

Regular water tariff collection:

O&M Policy and regulation sets the amounts and rules for the water tariff collection and use. UC manages the water tariff collection for the O&M fund. The fund is for non-local spare parts and for payment to the VMW/pump operator. LGU supports the UC and monitors the water tariff collection and mobilization in the schemes. Based on the tradition and practice of the community it can be in form of cash or kind or both.

Appointment of Village Maintenance Worker (VMW)/Pump Operator/Irrigation Scheme Operator or Care- Taker, Training and Mobilization

UC will assign a VMW/Pump Operator/Irrigation Scheme Operator for O&M of the scheme. The selection criteria for the VMW/pump operator/ Irrigation Scheme Operator and job description are in the O&M policy and regulation. UC will prepare clear criteria and job description of the VMW/pump operator and select candidates for the training. UC will select the VMW/pump operator/ Irrigation Scheme Operator at the beginning of the implementation scheme. UC will mobilize the VMW/pump operator/ Irrigation Scheme Operator for scheme O&M and provide remuneration as defined by the O&M policy and regulations.

Preparation of operation and maintenance action plan:

UC prepares Action Plan for O&M of the scheme. Once the construction of the project is completed, the action plan is prepared for sustainability. The post construction workshop prepares draft O&M Plan and get endorsement from mass meetings. LGU staff facilitates the training and supports the UC in preparing the plan. The LGU staff regularly support and monitor the proper implementation of the action plan.

Manage the tools for repair and maintenance:

The tools procured for scheme implementation are an asset of the community. It should be kept safely, and they should be used for repair and maintenance of the scheme. UC manages and stores the remaining tools properly after the construction. The record of the tools should be kept and should be publicly audited annually. If there are no sufficient tools for repair and maintenance, UC will buy from their O&M fund.

Climate Resilient Water Safety Plan (CR-WSP) and Implementation (drinking water scheme only):

The user committee of each water supply and MUS scheme should prepare and implement a CR-WSP for the quality use and sustainable operation of the scheme. The Users Committee should be facilitated by the staff of the LGU in training and preparation of the plan, as well as to facilitate and assist in the monitoring and implementation of the implementation of the water safety plan from time to time. Three days of detail training will be provided after the implementation phase.

CR-WSP is strategy for risk identification, analysis and corrective action, implemented in in scheme in recognition that water supply systems can provide safe potable and consistently reliable water in the face of climate change from the catchment area to the mouth of the people. It combines climate change impact mitigation and adaptation methods into different stages of water safety planning to address climate-related challenges.

Why climate-resilient water safety plans?

To ensure sustainability of safe water supply in a sustainable manner

- Climate Risk Reduction
- Protection of Public Health
- To conserve drinking water infrastructure and assets that adapt to changing climate patterns
- To comply with the rules and standards (environmental, water quality & biodiversity)
- To maintain economic stability by protecting investment and reducing additional expenditure
- Enhancing climate risk resistance to community drinking water services
- To conserve and promote the environment for sustainable resource management

Provision for maintenance of the structure of the scheme:

The UC needs external support for the sustainability and large-scale maintenance of the scheme. For this, it is necessary for the UC to explore the possibility of resources by expanding and coordinating relations with local government, supporting bodies and various other stakeholders. The LGU staffs will facilitate and assist to prepare the plan and follow up.

Co-operative involvement, fund mobilization and income generation:

In order to increase the O&M fund, it is necessary for the UC to be associated with self-reliant and reliable cooperatives. For this, the UC should open an account by subscribing to the share in the cooperative. If this happens, the UC will be able to avail loan facilities from cooperatives for large-scale maintenance and facility expansion of the scheme and will also get additional assistance in the O&M management of the scheme. Users should carry out income generating activities through the use of water after the construction of the scheme. In addition, the amount of maintenance fund collected in the scheme should also be invested in income-generating works. While mobilizing the amount of maintenance fund, it is appropriate to reserve the minimum amount for emergency maintenance expenses and mobilize the remaining amount through cooperatives. Only when reliable cooperatives are not available, the UC can mobilize the fund for income generation within the user household by making certain rules. Otherwise, it can be kept in the bank account of the UC.

Regular Meeting and Annual General Meeting:

UC should hold regular meetings at least on a monthly basis. The meeting will review and discuss the operational status of the scheme and the O&M plan. In addition, other issues related to the operation and maintenance management of the scheme can also be the agenda of discussion and decision of this meeting. The meeting should update the operation and maintenance plan of the scheme as per the need. Similarly, the UC will organize the Annual General Meeting every year and the operation and maintenance plan should be prepared by reviewing the operational status of the scheme, the status of collection of operation and

maintenance funds, the performance of the UC, the mobilization of VMW/pump operators/ irrigation Operators, the activism of the female's group, etc. Activities such as amendment of operation and maintenance regulations/procedures, restructuring of user committees and public audit of scheme should also be carried out through the Annual General Meeting.

Planning and support process to formulate plan for managing operation and maintenance

- After the completion of the construction of scheme, the plan should be formulated according to the post-construction phase of the scheme to carry out the operation and maintenance activities. A proposal should be made to include in the annual work plan of the rural municipality/municipality to carry out the activities mentioned in the post-construction phase activities in the completed schemes.
- According to the annual work plan, the staff of LGU under the project will prepare a plan for maintenance management activities in the monthly meeting.
- Capacity development activities for sustainability and maintenance management of the scheme will be included in the annual work plan of the rural municipality/municipality as per the procedure of the post-construction phase and implemented accordingly.
- In the post-construction phase, maintenance management related activities will assist the UC in capacity building through the staff of LGU. Training and capacity building activities will also be conducted at the scheme and users' level. The staff of the LGU will facilitate and assist in the preparation and implementation of the community action plan for O&M management.
- The staff of the LGU will continuously discuss the progress of post-construction phase activities and the status of O&M management in the monthly meeting. The project and the rural municipality/municipality will continuously monitor the O&M management activities.

Monitoring and Evaluation

The staff of LGU should continuously monitor the progress of scheme operation and maintenance activities at the scheme and community level.

The progress and status of O&M plan activities and management are monitored in the post construction phase by LG level monitoring.

In each monitoring and progress report, the current status and progress of the completed scheme is mentioned and suggestions needed for improvement are provided/exchanged.

During the on-site monitoring by the project and other agencies, monitoring and support should be done by giving top priority to the status of operation, maintenance management and water safety plan of the completed scheme. Further monitoring and evaluation will be carried out in accordance with the policy related to operation and maintenance management of rural municipalities/municipalities.

Financial management for O&M management activities

In order to carry out O&M management activities, after the completion of the construction work of the scheme, it is necessary to mention the aspect of financial management in the sustainable operation and maintenance action plan.

The cost of the major activities of scheme, the local government and ward level will be borne by LG funds or NRDF.

In addition, for some inter-district/LG activities can also be organized by the PSU TA fund. The budget for O&M and capacity development activities will be prepared and conducted by LG annual work plan.

Scheme Insurance

Insurance for rural drinking water, irrigation and multi-use system (MUS) schemes has not yet become widely practiced in Nepal. However, its use is increasing in large-investment scheme, climate-risk areas, or donor-supported schemes. In a disaster-prone country like ours, scheme insurance is an important part of sustainability. There is a plan to provide infrastructure insurance for drinking water, irrigation and multi-utility schemes to be completed through Local Adaptation to Climate Change Project. Insurance will help to repair the damage caused by various disasters in the future.

Conditions requiring insurance

- Natural disasters (floods, landslides, storms, fires)
- Theft, vandalism, accident
- To ensure sustainable service

What does insurance cover?

Intake, tank, main pipeline, solar panel, motor, pump, and other important structures

Labor/Workers' Insurance

Labor/Workers' insurance refers to a system in which a person of age (doing physical or technical labor) is financially protected by any law from the risks of accidents, injuries, diseases, disabilities, or death while doing scheme construction work. It is mostly operated by an insurance company, where the worker gets the benefit of insurance by paying the insurance premium. Worker insurance is considered mandatory, especially in construction, industry, transportation, mining, agriculture, and high-risk sectors, as these areas are more prone to accidents. In water supply, irrigations schemes, many difficult and vulnerable places involve with typical structure or pipeline alignment so Insurance can help to cover medical expenses, income losses, or family expenses after an accident. The insured workers will have their motivation to work in difficult areas, and security for their families. In Nepal, insurance of workers in construction sectors has been made mandatory under the Labor Act, 2074 and the Social Security Fund. Worker morale and productivity increase in jobs with insurance facilities. Similarly, it is a risk mitigation measure for both UCs and workers.

The main objectives of worker insurance are as follows:

- Providing financial compensation after an accident
- Supporting families in case of death or disability at work
- Bearing worker's health care expenses
- Providing workers with a sense of security in vulnerable areas
- Assisting consumer committees in fulfilling legal obligations

Process:

- Insurance Company and Plan Selection
- Determining the type of insurance: Group insurance in the plan, individual insurance collectively
 - Life insurance (in case of death while working)
 - Health Insurance (for medical expenses)
 - Accident Insurance (for Disability or Injury)
 - Determining Insurance Coverage (Coverage Amount)
- Filling worker details in the official form of the insurance company
- Documents required:
 - Copy of citizenship
 - Passport Size Photo

- Working period
- Premium payment: The user committee pays the premium from their management cost (sometimes partly contributed by the worker).
- The insurance company will provide an insurance certificate or card
- It should clearly state the sum ensured, term, and benefits

Water Quality Testing (for drinking water supply only)

Drinking water distributed to users should be pollution-free. Drinking water has become more adulterated with excreta. It shouldn't be. Since the sources of rural drinking water schemes are often original, even if the waste pollution is not at the source, it can enter the drinking water system due to various other reasons. Among these various reasons, our behavior towards water and lack of maintenance of the scheme are found to be more polluted. Efforts have been made to reduce as much pollution as possible in the drinking water supplied to the scheme users. Attention has been paid to ensure that the waste products do not enter all drinking water systems. For this purpose, the "Climate Resilient Water Safety Plan" is prepared and implemented in the post-construction phase. It is also important to test the water at source during the detailed survey. If the source is found to be polluted, water treatment system should be included in the design of the scheme.

The presence of coliform bacteria found in feces in drinking water means that feces are mixed with water and the use of this water can increase the possibility of spreading various types of diseases. Vials present or absent by coliform bacteria give sensitive information about whether feces are mixed with drinking water. The importance of such a test has increased in the absence of a laboratory to test whether feces are mixed with water. In this technique, bacteria eat food inside the bottle.

Essential ingredients: Presence Absence (P/A) Vial bottle, clean hand-wipe cloth, pen

How to test

- Wash hands with soap and water.
- Write the date, time, and sample number on the outer shell of the bottle.
- Fill the bottle with water directly from the source to the sample water filling area (up to the mark in the bottle).
- Close the bottle properly.
- Keep the bottle straight for 24 to 48 hours in a sunny place with a temperature of 22 to 44 centigrade.
- After the above time is over, look at the color of the water in the bottle.
- If the watercolor of the bottle is white or light yellow, then it is known that the sample water is not mixed with feces.
- If the color of the bottled water is black, then it is understood that the water is mixed with feces /coliform, such water is not suitable for drinking.

Note:

- Bottles should not be kept in the fire or sun for the purpose of increasing the temperature. In cold weather, the temperature may not reach the right result. In such a situation, a belt heated by the temperature of the human body can be used. This belt helps to heat the bottle, or warm cloth should heat the sample bottle and keep it inside the warm cloth.
- Never touch the inside or inside of the bottle or the sample of water to be tested.
- Water tests can also be done by the staff of health or agriculture or other section under the rural municipality/municipality.

Guideline of UC Orientation on CR-WSP, O&M, Insurance, and Water Quality Testing:

Repair maintenance and water quality testing are the main aspects of maintaining the sustainability and service level of schemes. The basic principle of the project is to support users manage their own scheme and maintain water quality and maintain proper operation and maintenance. According to the step-by-step procedure, a water safety/maintenance plan with climate change adaptation and disaster risk reduction should be formulated at the post-construction phase of the scheme. Past experience has shown that the maintenance of the project will be effective only if the community is made aware of the sustainability of the scheme from the time of the preparation phase. The orientation prompts users to think about the scheme's sustainability provisions, climate resilient water safety plans, scheme insurance and relationship to water quality and maintenance. These matters will be discussed in the one-day CR-WSP, operation and maintenance, scheme insurance and water quality orientation in the preparation phase.

Duration: 1 day

Participants: All members of the user Committee and some members (female and backward classes) and ward representatives

Resource Person: Field Coordinator, Sub-Engineer, WRT, and other Staff

Organizer: LG Project Implementation Unit

Objectives:

- To be aware of the importance of repair and maintenance of the scheme.
- To be aware of the provisions and activities required for the repair and maintenance of the scheme.
- To be aware of the importance of water quality in the scheme.
- To orient maintenance and climate resilient water safety plans for sustainability of the scheme.
- To Discuss mitigation measures to address climate change adaptation and disaster risk reduction.
- To fix provisions for regular operation of the scheme and maintaining service level.
- To orient scheme and labor insurance

Expected Outcome:

- Participants will be clear about the importance of maintenance and climate resilient water safety plans for the sustainability of the scheme.
- The user committee will have clear policies and provisions for the maintenance of the scheme.
- Along with testing the water, necessary provisions will be made to maintain the quality of water from the beginning of the scheme implementation phase.
- Participants will be familiar with climate change adaptation and disaster risk reduction and mitigation measures.
- In the future, the user committee will select village maintenance workers/pump operator and send them to training in order to suit the sustainability of the scheme.
- Will be knowledgeable about the insurance of the scheme and will proceed with the process for insurance of the scheme and labor.

Training materials required:

- Step-by-step chart, Sample O&M Regulation, Power Point Presentations, posters, charts, stationery, etc.

Major Content:

Day	Content	Time	Resource Materials	Activities
Fourth Day	First Session: Introduction Expectations Collection Objective and expected outcome	30 min		Game, Expectation collection in meta cards, if illiterate participants verbal expectations collection and summarized, and presentation
	Second Session: O&M for Sustainability and What is Sustainability? Scheme Operation and maintenance: Introduction, Its necessity, and importances How to formulate O&M Plan O&M Fund VMW/Pump operator/Irrigation Scheme Operator, Water Tariff, Meter Reading, Annex 6, Spare parts management	90 min	Annex-6: Water Tariff Card	Elaborate by showing in posters Sharing past experiences Elaborate importances of O&M Discussion
	Third Session: CR-WSP What is Water the Quality? What is CR-WSP? Its necessity, importance, and how to prepare plan How to implement CR-WSP in the scheme? Water Quality Testing procedure (by using Presence Absence Vail) Point Use of Water Treatment Methods	60 Min	Government of Nepal CR-WSP Guideline	Elaborate by showing in posters Sharing past experiences Elaborate importances of CR-WSP Discussion
	Fourth Session: Discussion on role of UC in CR-WSP and O&M Discussion of action related to CR-WSP and O&M Introducing forms and formats related to CR-WSP and O&M	60 Min	CR-WSP Format	Poster Learning sharing CR-WSP and O&M forms and formats presentation Action plan
	Fifth Session: Scheme Insurance	30 min		Poster

Introduction	Past Experience if any,
Condition of Insurance	Related reference materials
Major structure cover by Insurance	
Provision, policy and rules related to Insurance	
Labor Insurance	
Remaining time will be utilized for CAP session	

Note: Facilitators should encourage all participants to actively participate in the discussion

5 DETAIL LAYOUT & INTEGRATED ACTIVITIES AND USERS' APPROVAL

A layout is a diagrammatic form of scheme, in which the major components of the scheme and other infrastructure such as intakes, pipeline routes, roads, streams, wells, canals, tanks and its locations, existing infrastructure structures, different types of risks or vulnerabilities are reflected on the map by making signs. A layout should be drawn based on the social map (already prepared). When preparing the layout, the community should discuss it in the mass meeting and approve the best layout. Since the role of female in collecting water is important, it is necessary to discuss with female in every community and household and decide the location of the tap. For this, the staff of LGU should attend every meeting of the community and facilitate the users to be clear about the different options.

All the proposed options may not be possible (for example, due to geographical obstacles), but while preparing drawing of the scheme layout, it should be done in such a way as to ensure, as far as possible, the prevailing community values and everyone's right to access drinking water and irrigation. The final outline of the layout should be prepared only after the technical survey and design phase is completed. The first layout is an important basis for a detailed technical survey. If the layout determined by the users becomes technically unfeasible during the detailed technical survey and needs to be changed, then the matter should be discussed again with the community and a decision should be made. Such discussion is necessary to reduce disputes that may arise during the construction phase and to establish a common understanding among the users. By doing so, disputes during the detailed technical survey and implementation phase of the scheme will be reduced. The tools for this are the first layout of the scheme and the community map of the scheme area.

Process:

- Organizing a UC Meeting: First of all, a meeting of the UC should be organized, and by considering the capacity of the resource, the geography of the settlement, the needs of the community, and the density of the settlement, a decision should be made regarding the total required and feasible number of households and taps. To ensure the technical feasibility of structure, the sub-engineer must compulsorily visit the proposed location of proposed structures.
- Visit each settlement where the structure and taps are proposed. The sub-Engineer must visit the proposed tap location to ensure its technical feasibility. If the structure is proposed in private land, prepare a no objection note from the landowner permitting structure construction, its overflow and free movement of VMW to operate the system. If a private tap is proposed in the scheme, then the location of the private tap should be selected after discussing it with the female members of the family and should be within reach of all family members so that it can be used in any situation. The following points should be kept in mind while selecting the location of the tap, such as: it can be

used by children, it can be used during menstruation, the water that flows from the tap can be reused, or if it cannot be reused, it should be located in a place where it is easy to properly drain it.

- Call for a mass meeting of all users. One female and one male representative from each household should be invited to the meeting as well as LG/Ward members. Make sure that the time and venue of the meeting are suitable for all. Ensure that information (oral/written) about the meeting is given to all households. All ethnic groups/castes living in the community as well as all clusters should be well represented in the meeting. At least 75% of the households of the proposed scheme area should be present in the mass meeting. At least 50 % of the participants of the meeting should be female. If it is less or if females are in a minority in the meeting, postpone the meeting until the representation is adequate and equal.
- Present the proposed tap locations by female and discuss about the pipeline/canal route, required number of structures, and their location and minute it. If the pipeline route/canal route or other structures are proposed on private land, prepare no objection notes for the landowner for structure construction and drainage of overflow water.
- Draw the layout over the second copy of community map and present it to get preliminary approval from the community.

Survey team will refer and follow the first layout. If the detailed technical survey finds that locations are technically unfeasible, those should be presented and re-discussed in a mass meeting. After the detailed technical survey and preliminary approval of the community survey team a final layout map is prepared as presented in attached page (Sample of Gravity flow scheme is attached). The team will prepare similar layout maps of the irrigation schemes.

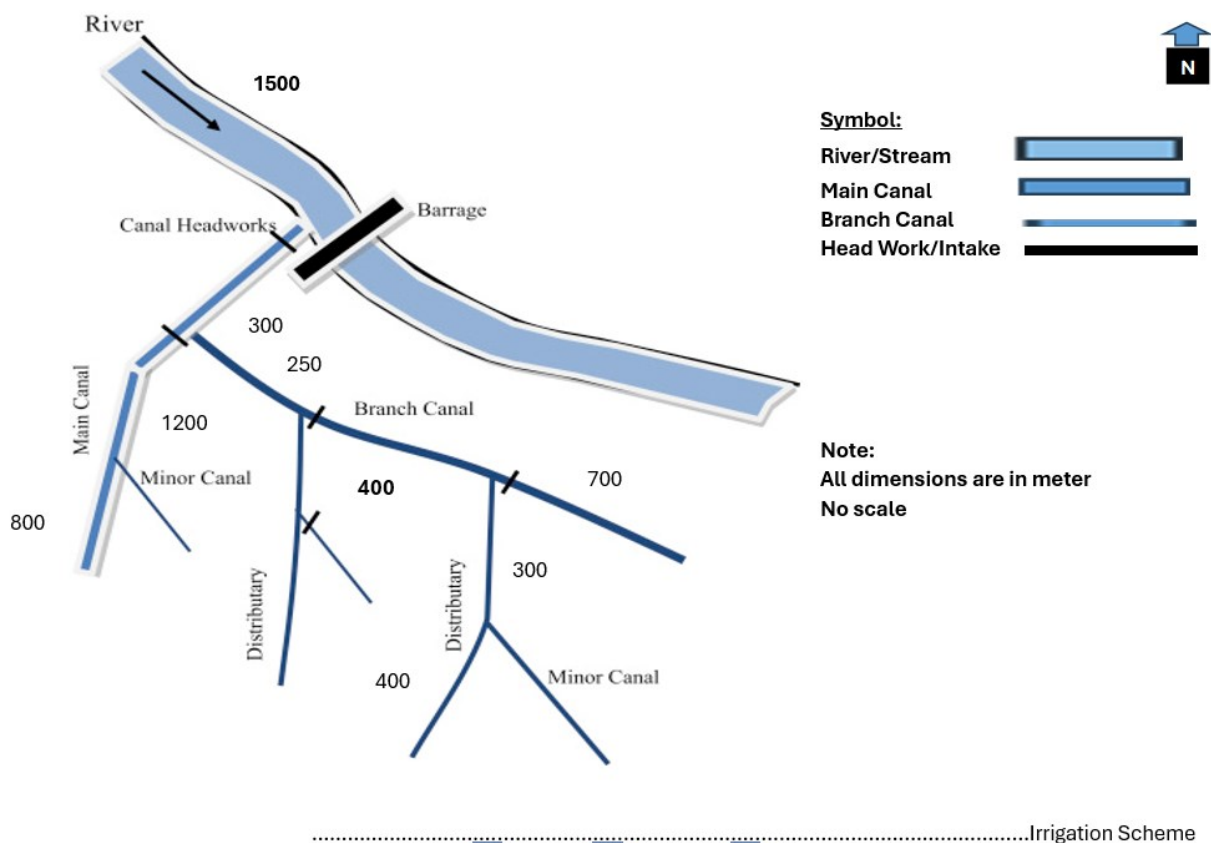


Figure 2 Sample Layout of Irrigation Scheme

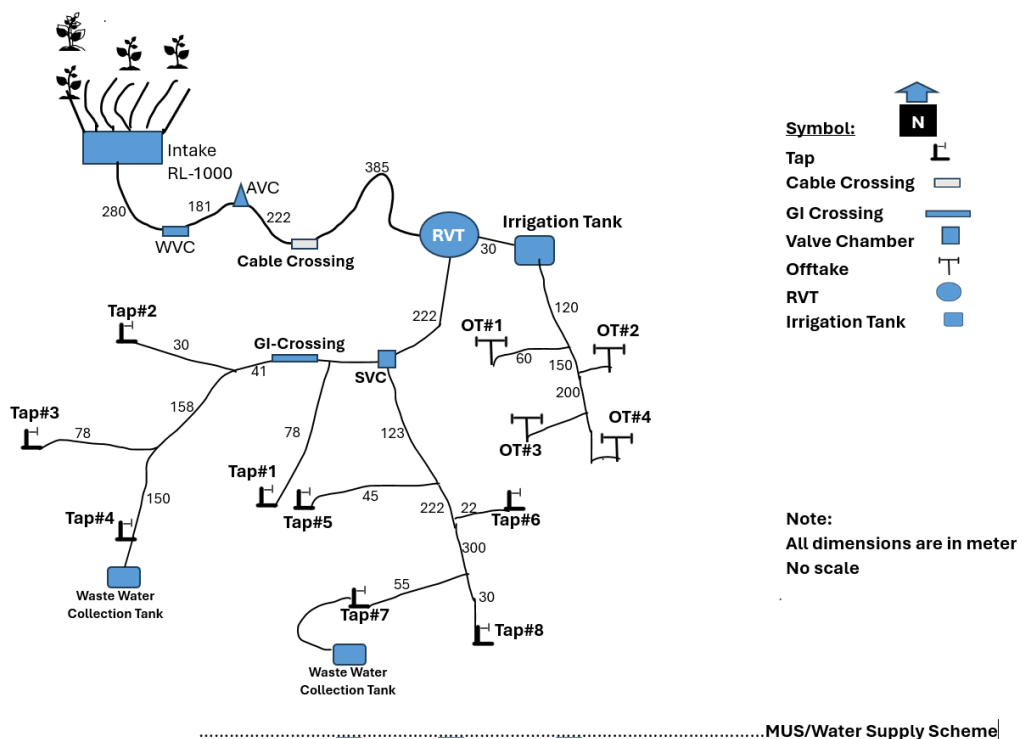


Figure 3 Sample Layout of DWS and MUS Scheme

6 DETAIL TECHNICAL SURVEY, CLIMATE CHANGE & VULNERABILITY CAPACITY ASSESSMENT

6.1 DETAIL TECHNICAL SURVEY

This manual has been prepared with the aim of supporting detailed technical surveys carried out for water supply (gravity, lift, and hybrid systems), multiple-use systems (MUS combining water supply and irrigation), and irrigation schemes (conventional and non-conventional). It also includes consideration of improved water mills, water harvesting ponds, solar-lift pipe irrigation, micro-irrigation technologies, and canal or pipe-based irrigation systems, while integrating disaster risk management interventions, environmental safeguards, and water source conservation.

A detailed technical survey is a critical step in project development. Various structures, their suitability, locations, sizes, and types can only be properly designed after a comprehensive survey. Even a minor error in the survey process may lead to social disputes, obstructions in water distribution, increased construction costs, reduced service efficiency, and long-term sustainability issues.

The exact status, dimensions, and design parameters of different structures are confirmed only after a thorough technical survey and subsequent detailed design. Basic data for the design is derived from both desk studies and fieldwork. This step aims to provide clear and practical guidelines outlining procedures, methods, and modalities for conducting detailed technical surveys for drinking water supply schemes, MUS, and irrigation projects.

Key Considerations Before Starting the Survey

- **Understanding the First Layout:** A detailed survey is a technical process where the preliminary layout of the scheme is validated. It involves measuring elevations, gradients, and distances of various points

from the source to the service area. Distances and elevations should be systematically tabulated with accurate field data.

- **Review of Planning Documents:** Before beginning, the surveyor should review the coverage area of the proposed scheme and the socio-economic profile of its users. Reference documents include WASH Plans, WUMP, LAPA, NAPA, LDCRP, other local level relevant sectoral plans and any prior feasibility studies. The community-prepared preliminary layout forms the main basis for the detailed survey.
- **Community Participation:** Community engagement is vital for ownership and sustainability. Participation should ensure inclusion of women, men, and people from all castes and disadvantaged groups in the survey and decision-making. In particular, women's perspectives are crucial in deciding the location of water taps, irrigation outlets, and household water facilities.
- **Integration and MUS systems:** The survey should carefully evaluate technical options for:
 - Gravity-fed and lift-based water supply systems (including hybrid gravity + solar-lift solutions).
 - Multiple-use systems (MUS) where domestic water supply and irrigation are integrated.
 - Irrigation schemes, both conventional (canals, surface irrigation, diversion) and non-conventional (pipe irrigation, water harvesting ponds, drip/sprinkler/micro-irrigation technologies).
 - Water mills and productive use structures that can be upgraded alongside irrigation canals.
- **Disaster, Environmental and Climate Sensitivity:** The survey should integrate risk assessments for landslides, floods, drought, and seismic conditions, along with climate change impacts. Priority should be given to water source protection, catchment conservation, and environmentally sensitive alignments to enhance long-term resilience.
- **Technical and Social Validation:** The location, alignment, and types of structures should be verified against the layout map prepared with user participation. Survey findings will form the foundation for technical design, costing, and implementation planning.

Composition of the Survey Team

The survey should be conducted by a multi-disciplinary team with clear roles:

- **Lead:** An experienced Sub-Engineer from the Local Government Unit (LGU).
- **Support:** LACC Project Technical Officer and Water Resources Technician (WRT).
- **Specialized Inputs:** In complex or critical cases, NRM Experts, Engineers, or Technical Assistance Advisors may facilitate in coordination with LG infrastructure section teams.
- **Community Involvement:** Community members, including women and marginalized groups, should actively participate in survey activities such as layout validation, site identification, and decision-making.
- **Coordination:** The survey team should liaise with available technical human resources from the ward or LG, ensuring inclusion and transparency.

Desk study

The desk study is the initial and detailed review of all available information to develop a general understanding of the proposed scheme area. It serves as a foundation for fieldwork and helps ensure that the survey team enters the field with sufficient background knowledge. Relevant data and maps should be compiled and carried into the field for instant reference and validation.

The survey team should study the following:

- Planning and baseline documents: All information available from Local Government (LG) plans such as WUMP, WASH, LAPA, NAPA, LDCRP, and other sectoral plans, as well as baseline data sheets and any previous feasibility study reports of the scheme.
- Maps and imagery: Topographical maps of the area, Google Maps, satellite imagery, ortho-photos, and Digital Terrain Models (DTM), if available, to understand terrain, watershed characteristics, and accessibility.
- Technical references: The recommended design parameters, standards, and guidelines relevant to water supply (gravity, lift, hybrid), multiple-use systems, irrigation technologies (conventional and non-conventional), and source conservation.

Field work

Field work is a participatory process in which both women and men from all ethnic groups and castes are encouraged to take part in decision-making within the available technical options and in line with the Project Implementation Manual (PIM). At the very beginning of field activities, the survey team should meet with the User Committee (UC) to build a common understanding and coordinate tasks. The UC and users are expected to support the survey team in measuring and estimating source discharge, fixing the locations of structures, and selecting alignments for pipelines or canals. Field work should also facilitate the resolution of disputes related to water sources or community access, ensuring equitable and sustainable use of the scheme's benefits.

The survey team should complete the following steps:

1) Reconnaissance (rec.)

During reconnaissance, the team should:

- Meet with the User Committee (UC) to review disaggregated population data and household layout plan, discuss revisions or additions of clusters or community tap stands, and ensure that any major changes in the layout are approved in a mass community meeting.
- Verify the most suitable source locations, considering upstream users, environmental issues, land use changes, and external factors such as planned roads or infrastructure that may influence water quantity and quality in the present and future.
- Calculate the required safe discharge at the source before detailed measurement; if discharge is insufficient, identify alternative sources that can reliably supply water.
- Assess source discharge for irrigation and Multiple Use Water Systems (MUS), ensuring sufficiency for crop water requirements, productive uses (e.g., livestock, kitchen gardens), and seasonal variations in availability and demand.
- Ensure that for water supply schemes the source meets minimum standards: 65 liters per capita per day (LPCD), fetching time less than 15 minutes, and water quality safe from coliform contamination; if these cannot be met due to capacity or geographical reasons, alternative sources should be considered.
- Evaluate practical risks related to long pipelines, difficult terrain, landslides, high construction costs, and potential disputes with other communities, and make decisions that balance technical feasibility, cost-effectiveness, environmental safety, and social acceptability.
- Use standard methods for calculating water demand and safe discharge at the source to guide decision-making for water supply schemes (see reference box below).

- Before measuring the discharge at the source, source capacity must be verified with the amount of water required by proposed population. If the source does not have the required water discharge, select & process for another source
- The irrigation water requirement will be determined based on the crop type, growth stage, climatic conditions, and effective rainfall. For crop water requirement for irrigation purposes, table 3 provides the basis for calculating crop water demand for irrigation:

$$P_f = P_o * (1 + r/100)^n$$

Where P_f = Projected population P_o = Present population

r = Population growth rate

n = Design period (20 years + 1 or 2 base year)

$$\text{Design Demand} = P_f * 45 \text{ l/d}$$

Design year water demand (liters per day). Design population x 45 liters or 65 to 100 liters (private tap).

The quantity of water required per person per day has been taken at 45 liters in basic drinking water service and 65 to 100 liters in the private tap system. There is no demand for water for livestock in this demand. If the demand for animals is to be included, then it should not be more than 20% of the above demand. Due to lack of resources and location specific reasons, the demand for water per person per day can be reduced from 45 liters per day to 25 liters, but for this, the community has to be prepared and acceptable from the general gathering.

$$\text{Water flow in the source (liters per second)} = (P_f * 45) / 86400 \text{ l/s}$$

$$\text{Required Safe discharged at source} = (P_f * 45) / 86400 \text{ l/s}$$

Table 3 Crop Water Requirement

S. N	Months/Sub	SF	Jan		Feb		Mar		Apr		May		June		July		Sep		Oct		Nov		Dec	
			1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
	Net CWR l/s/ha per half month																							
1	M Paddy	MP	-	-	-	-	-	-	-	-	-	-	-	0.543	0.089	-	-	0.102	0.401	0.078	0.183	-	-	-
2	S Paddy	SP	-	-	1.427	1.389	0.965	1.237	0.778	0.639	0.406	0.294	-	-	-	-	-	-	-	-	-	-	-	-
3	Wheat	Wh	0.285	0.285	0.285	0.223	0.099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.569	0.161	0.260
5	S Maize	SM	-	-	-	-	0.111	0.149	0.125	0.048	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	W Maize	WM	0.198	0.260	0.260	0.260	0.198	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.111	0.149
7	W Potato	WP o	0.196	0.250	0.280	0.280	0.268	0.233	0.118	-	-	-	-	-	-	-	-	-	-	-	-	-	0.104	0.136
8	M Pulses	MP u	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	W Pulses	WP u	0.124	0.186	0.235	0.260	0.260	0.238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.099
10	W Vegetables	Wve	0.213	0.235	0.235	0.220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.069	0.084	0.134
11	S Vegetables	Sve	-	-	-	-	0.084	0.134	0.157	0.048	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	W Minor Vegetables	WM Ve	0.213	0.235	0.235	0.220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.069	0.084	0.134

1 3	W Oilseed	Woi	0.114	0.203	0.248	0.248	0.178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.099
1 4	S Oilseed	Soi	-	-	-	-	0.099	0.114	0.130	0.036	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 5	M Ginger	Mgi	0.186	0.173	0.173	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.090	0.183	0.223	0.211	0.198
1 6	M Spices and Minor Tubers	MS M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.033	-	-	-	-
1 7	S Spices and Minor Tubers	WS M	-	-	-	-	0.104	0.136	0.123	0.038	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 8	W Garlic/Onion	Wga	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.066	0.173	-	-
1 9	W Minor Cereals	WM C	0.124	0.186	0.235	0.260	0.260	0.238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.099
2 0	M Sweet Potato	MSP o	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.036	0.109	-	-	-
2 1	Sugarcane	Sur	0.248	0.248	0.248	0.248	0.260	0.260	0.187	0.048	-	-	-	-	-	-	-	-	-	0.041	0.146	0.223	0.223	0.223

Sources: SuSWA Multiple Uses Water Services (Mus) System Design Options & Parameters, 2023

Safe discharge = 0.9 * measured discharged

- Reconfirm that there are no source disputes in the community. (The new source should be reliable to register in LG by user committee)
- If there is another option than the proposed technology option in the scheme, assure it before going for further process.
- Explore the technological options other than lift, point source development, rainwater harvesting and other options.
- Identify the critical locations along with the alignment and fix the approximate locations for components and measure level differences, using altimeter or Abney level or Global Navigation Satellite System, to see if the proposed locations is technically feasible.
- Refer community map and first layout plan to fix the approximate alignment for pipeline or canal with the community cooperation and support.

6.2 CLIMATE CHANGE AND VULNERABILITY CAPACITY ASSESSMENT SURVEY

Climate change risk (or climate vulnerability or climate risk vulnerability) refers to the "tendency to be adversely affected" by climate change. It can apply not only to human life but also to natural systems (ecosystems). Similarly, vulnerability can be defined as physical distress, economic vulnerability, social vulnerability, and environmental vulnerability. Three components of vulnerability – exposure, sensitivity and adaptive capacity – to identify climate adaptation strategies and actions.

Water resources, agriculture, forestry and biodiversity are major resources of livelihood for most of the people, especially those living in rural areas. These regions are at great risk for climate change, and their impact has already been observed and experienced. People are already facing stress due to acute scarcity of water for both drinking and irrigation purposes. In some places, this situation has forced people to migrate from their villages.

This challenge requires innovative solutions, one of which experts refer to as 3R. 3R means "recharge, retention and reuse of groundwater and rainwater". 3R is a more effective tool to combat climate change and its adverse effects at the watershed level. Therefore, 3R can be said to be a mitigation measure taken to increase the adaptive capacity of individuals affected by the adverse effects of climate change and resilience to recover.

This mainly includes the following:

- If available, analyze the data related to the disaster caused by climate change in the water supply, Irrigation and water resources sectors from the ward/local government/district administration office.
- In the meeting, brief the users on this issue and related experiences. Pay attention to the causes, problems and solutions/treatments that are sought to be tackled.
- Discuss with the consumers about deforestation, encroachment of riverbanks (for human use), areas with the possibility of landslides, etc.
- Discuss (especially with the elderly people of the area) whether in recent years the water level in the major snow-fed rivers or local spring of the area has significantly changed or not. Also discuss droughts, the trend of high/low/partial rainfall in recent years (if observed), or changes in the rainfall pattern (to be cross-checked with the hydrological/meteorological data of the area).

- Discuss whether in recent years any water sources have dried up, whether crop planting patterns have changed due to decreased water availability, or whether there have been other climate change-related reasons such as changes in paddy, wheat, or other crops, and note such events if any.
- Discuss with the consumers about the potential risks of natural disasters in the project area in the near future, such as floods, landslides, fires, and droughts caused by climate change. Record all information, data, and ideas that emerge from the discussion.
- Map deforested areas, landslide-affected areas, flood and inundation-affected areas on Google Earth/Google Maps or take GPS readings of those areas and clearly record case notes in a notebook or diary.
- Identify and suggest appropriate solutions for design and cost estimation: agroforestry improvement, recharge ponds, retaining walls, catch drains (to control water seepage and ultimately control landslides), spurs for riverbank protection works, and provide information on micro-irrigation and multi-use systems (MUS)

In drinking water, multiple-use, and irrigation schemes, the climate change and vulnerability assessment analysis of the proposed sources and structures/components, as well as the detailed study of water source protection, will be carried out using the form provided in Annex-5.

Details Technical Study

The detailed survey is done to find out the differences in level between the various places in the scheme area, and the distances between the different structures. All formats related to survey should be filled up and considered. Factors to be considered and included:

- Detailed household survey: This includes population details, water service levels, information on total sanitation, and household surveys in vulnerable conditions.
- Difficulties in access to water and water consumption patterns (recalling that household drinking water should be given priority)
- Topography and settlement pattern
- Community expectations
- Other alternative sources around
- Social Disputes
- Source conservation
- Climate vulnerability assessment
- Environmental & biodiversity information
- Livelihood opportunities and multiple use of water (MUS)
- Assess land area for irrigation

The pipeline/canal alignment and structure locations should be so fixed as to minimize construction cost and future maintenance. This leads to:

- Constructing of all structures on stable ground and slope.
- Avoiding “U”- or “Hump”-profiles and land slide prone area
- Better to follow foot trail for pipe alignment.

- Locating stream intake “in non-drying” area but avoiding direct flood.
- Think of proper water treatment option if required (stream intake).
- Long service lines should be avoided.
- Discuss alternatives to wastewater management in congested settlements

Many types of survey tools will be used to measure the height of structures. The selection of survey equipment should be done according to the following recommendations:

- Altimeter: Commonly used in preliminary study and pre-feasibility survey tasks
- Abney Level/Ranger Machine: If the terrain is steep. Especially in hilly areas, rural drinking water is used in water supply schemes.
- Automatic level: If there is a little steepness in the terrain. If the level difference is slightly critical, it will be significant from the altimeter/Abney level and as measured.
- DGPS/Global Navigation Satellite System Device: Currently, DGPS are frequently in use for surveying the rural drinking water projects in hilly areas. The project is also considering using this device as it will be easier to design of water supply, MUS and Irrigations scheme. Additionally, this tool will make it easy to update the NWAHS MIS after the construction is completed. SW GNSS Survey Devices is free software for post-processing GNSS data. It supports static, kinematic and Precise Point Positioning (PPP) processing. Corrected positions can be exported as Excel files. The correction can be applied to an SW Maps project, and the corrected project can be exported as Shapefiles, GPKG or KMZ. RINEX, u-blox UBX, Septentrional SBF and RTCM3 files are supported as input for rover and base station.
- Theodolite: In cases other than the above specifications.

6.3 SURVEY OF SOLAR AND ELECTRIC LIFT DRINKING WATER/IRRIGATION SCHEME

When the water source lies below the service area, then it will use external energy to lift the water above the cluster and supply through gravity flow system, are called lift drinking water schemes. There are two technologies in this system: first lifting (pumping) and then gravity distribution. From the source up to the distribution tank, the lifting technology is applied, and afterwards, the gravity system is adopted. Within lifting, there will be two types of options: solar and electric.

While surveying solar and electric lift drinking water or irrigation schemes, preliminary information on local needs and the condition of the source is collected first. After that, a site observation is done, and a profile survey of the water source, pipeline route, tank, and distribution area are carried out. The location of the pump house and a suitable place for solar panels, with minimal shading during daytime, is identified. Based on the source discharge, elevation difference, distance, and beneficiary population, the required technical data for the design of pipe size, pump capacity, and tank is collected. Finally, social inclusiveness and environmental impacts are also studied.

Some of the important things to keep in mind while surveying are:

- Observation of the distance and elevation difference between the source and the service area.
- Identification of the intake structure and tank location.
- Selection of appropriate technology (solar or electric).

- Determination of the location, size, and type of storage tank (including Sump-Well) for collecting water from the intake.
- In solar pumping schemes, identification of a safe and sunny location for placing solar panels.
- Since solar pumps operate only during 4.5–8 hours of sunshine, the size of the storage tank and Sump-Well is designed accordingly.
- In electric schemes, a survey is carried out for electricity line, poles, and transformer access from the nearest grid.
- Taking the elevation profile of the pipeline from the storage tank and Sump-Well to the distribution tank using Auto-Level or Abney Level.
- As a small error can make a big difference in pump sizing, measurements must be taken with extreme care.
- The remaining parts are surveyed in the same way as in gravity systems.

Processing Field Data: Field data should be processed using the equations mentioned in the survey record sheets.

Plotting and Presenting Processed Data: Once the survey data have been processed, the plan and the longitudinal profile can be made. Recommended scales are:

- Plan: any scale
- Longitudinal profile: Vertical: 1 cm = 20 m Horizontal: 1 cm = 50 m

Preparing Data for Feeding the Design Software:

Field book data and calculated level will be introduced in the design software. References: The rural drinking water supply design of the project should be done by placing it in the computer software (Project RWS Design Software) or Softwell Digital Based GPS system, and Community-based Rural Drinking Water Project Design Guidelines Part 1 to 12 (Department of Drinking Water and UNICEF, 2002).

Similarly, SW WSP V3 for Rural Water Supply Design tool is designed for design for water supply, MUS, and Irrigation schemes. The SW WSP was developed during 1996 by WELINK Consultants. Later it was adopted by SOFTWEL (A sister concern of WELINK) and has been upgrading and supporting it since 2000. A comprehensive update was made during 2005 for the ADB Funded CBWSSP and RVWRMP also customized as per requirement to use in the projects. It was extensively applied in design and drawings of many rural water supply projects in Nepal. Present SW WSP V3 is a significant upgrade to the previous version of SW WSP/SW CBWSSP. It includes facilities for integration with GIS, mobile application-based survey with Professional GPS integration, Digital Terrian Modeling (DTM) and cost estimation. The version is self-updating such that user gets automated update notice. In order to support the community water supply in Nepal, the SW WSP V3 is released as a free software without any license fees.

7 SCHEME DESIGN AND ESTIMATE

This document provides guidelines for designing community-based small to medium-scale gravity water supply schemes, multiple-use systems (MUS), and irrigation schemes. It is intended for Sub-Engineers/Technical Officers and may also be useful for local government (LG) Engineers, Sub-Engineers, Natural Resource Management (NRM) Experts, or Technical Assistance Engineers. The LGU Sub-Engineer, with support from the Technical Officer, will prepare draft designs and cost estimates

of surveyed schemes. These will be finalized, with drawings and profiles, under the technical guidance of the Technical Officer, Technical Assistance Adviser, and NRM Expert (Engineer).

The objective of this manual is to:

- Establish a uniform design approach for implementing community-based water resources schemes (Water Supply, Irrigation, and MUS).
- Reduce diseases and improve productivity by increasing access to drinking water, sanitation, and irrigation schemes through quality construction and water-saving practices.
- Minimize the hardship of supplying water for domestic and agricultural purposes through the use of appropriate rural technologies and design standards.
- Ensure schemes are climate-resilient, socially inclusive, environmentally sensitive, and disaster risk-informed.

General Design Strategies for All Schemes

Every community-based water resource scheme, regardless of type, should be designed with the following guiding principles:

- Optimal resource use: Make efficient use of available water and natural resources with minimal losses.
- Climate resilience: Incorporate measures to cope with rainfall variability, drought, and future demand.
- Disaster sensitivity: Protect intakes, reservoirs, and pipelines from floods, landslides, erosion, and other hazards.
- Inclusiveness: Ensure equal access for all social groups, with household-level taps designed to be disability- and child-friendly.
- Environmental safeguards: Protect catchments, watersheds, and spring sheds, and ensure minimal disturbance to ecosystems.
- Equity in supply: Use distribution systems (e.g., multiple reservoirs) to ensure fair access across settlements and clusters.
- Low O&M burden: Design simple, reliable, and low-cost systems that communities can easily operate and maintain.
- Affordability and sustainability: Keep construction economical and replicable without compromising quality.

Specific Strategies by Scheme Type:

- Drinking Water Supply Schemes
 - Prioritize household-level taps, including disability-friendly features.
 - Integrate Climate Resilient Water Safety Plans (CR-WSP) and water quality testing.
 - Provide redundancy in storage and distribution to ensure reliable service.
- Multiple-Use Systems (MUS)
 - Combine water for domestic use, sanitation, kitchen gardens, livestock, and small-scale irrigation.
 - Use multiple reservoirs or storage tanks to ensure equity and sustainability.
 - Promote water-saving practices and micro-irrigation technologies.
- Irrigation Schemes
 - Design efficient conveyance and distribution networks to minimize losses.

- Match command area with available water supply for equitable distribution.
- Integrate soil and water conservation measures.
- Build resilience to droughts and floods with flexible operation schedules and protective works.

7.1 WATER SUPPLY SCHEME DESIGN

The fundamental concept is to provide water supply schemes catering to targeted populations. Even in small schemes, it is suggested that more than one storage tank is provided to supply smaller groups of community tap stand users. When a gravity flow scheme is not feasible, alternate provisions such as rainwater harvesting, lifting water supply, and improvement of point source (spring protection) are investigated. Spring protection guards against possible contamination. Spring protection is principal option in mountain and hill communities where water is available nearby. It costs a fraction of gravity flow schemes and requires only simple and virtually cash free maintenance. This will be separately treated.

The designer should mainly pay attention to the following points:

- All components of the schemes are equally important, but the selection of a suitable site and the design for intake construction are of greater importance.
- The intake construction site must be selected at the time of the site survey itself.
- At the selected site, construction must be carried out using appropriate technology, with special consideration given to preventing the loss and pollution of the source.
- As far as possible, separate intake designs should be prepared according to the condition of each source, and the layout and construction of the intake should only be done under the supervision of experienced technicians.
- There may be a need for a water treatment plant in a drinking water system, but in community-based rural drinking water systems, its possibility is quite low.
- Since the construction of a water treatment plant requires large investment and the operation demands experienced and skilled manpower, the possibility of such treatment plants in the rural municipalities/municipalities where the projects are implemented is quite low. However, in sources such as springs and rivers with high risk of water pollution, it is appropriate to install treatment structure intake and roughing filters. Therefore, while identifying sources, less polluted sources should be selected by considering the following points so that there is no need to construct a water treatment plant.

Selection of source: Adequacy, quality and cost economy

To improve the drinking water condition of rural communities, the following strategies should be adopted:

- New designs for spring and river intakes separately, to minimize operation and maintenance requirements.
- In cases where water treatment plants need to be constructed, the design should include water treatment structures with simple, low-cost technologies that can be operated and maintained by the community itself, and priority should be given to closed systems as far as possible.
- Project structures should be proposed in such a way that maximum use of local resources & technology is ensured.

As necessary, while designing the scheme, the designer should use their judgement and creativity based on experience to introduce innovations into the design so that the project can be operated throughout its design life.

Distribution of water based on adequacy of water at source:

Location of the storage at a higher altitude allows adequate head (pressure) to be maintained in the distribution network. When appropriately designed, constructed and maintained a gravity scheme is a reliable water supply system.

Gravity scheme is the most appropriate in LACC Project working area due to its very low cost of operation. When the source discharge is higher than the peak water demand for the population, LACC Project will promote a Multiple Use System (MUS) which provides water for domestic use and irrigation.

Open System:

In an open system, the safe source yield must meet the peak water demand of the service area. A storage tank is not required in an open system and all its pipelines are distribution lines. In an open system, no flow closing devices are installed in the distribution system hence no faucet is installed on the community tap stand. Static pressure, therefore, never builds up in the system. These systems are very cheap to build, operate and maintain.

Nevertheless, they do not make optimum use of the water extracted and can lead to environmental hazards like soil erosion and public health hazards by continued wastewater flow.

Break Pressure Chambers (BPCs) are generally not required in an open system. However, in some cases the dynamic pressure may exceed the pressure limit of the pipe class and chambers may need to be provided to break the excess head. These chambers are called Interruption Chambers (IC). Distribution Chambers may also need to be provided to ensure proper distribution of flow in different branches.

Closed System:

A closed system is used when the safe yield of the source cannot directly supply the peak water demand. To balance the deficit and meet the peak demand, a storage tank is provided. As the water thus stored cannot be allowed to go to waste, faucets and valves have to be installed to control flow. A closed system, therefore, is subjected to the maximum static water pressure and should be designed accordingly.

Break Pressure Chambers (BPCs), therefore, need to be provided in a closed system whenever the working pressure limits of pipes, pipe joints and fittings are exceeded. In the distribution system, overflow and wastage from the Break Pressure Chamber should be controlled, which is achieved by installing a float valve. Provision of faucets at stand post also allows it to be closed and minimizes the problem of wastewater disposal in a closed system.

The closed system is the preferred option of LACC Project to optimize the use of water in all possible uses. Nevertheless, open system option may be considered for situations requiring very low cost (small sized scheme) and where safe disposal of excess water is possible.

Continuous Close System:

- The water is available in the distribution lines all the time (24 hours) and controlled by tap.
- The distribution line is always under pressure, the possibility of contamination by negative suction in the pipeline in a continuous system does not exist.

Intermittent Closed System:

- In an intermittent supply system, the water is supplied to the consumers only during some fixed hours of the day (2 or 3 times a day at the designated time).
- Many schemes in Nepal are presently being operated intermittently even though they were originally designed to function continuously. The possible reasons include the source has dried, or the faucets in the tap stands are not properly maintained leading to wastage. In many cases the non- performance of the float valves in Break Pressure Chambers also leads to excessive wastage. When schemes are operated on intermittent basis water is supplied for a short period within which time the design demand must be met.

Private Tap System:

A private tap system should be proposed for the households depending on the amount of water in the source. But co-investment from these households will be a key point of discussion. It is advisable to increase individual demand for water (at least 65 liters per day) and keep the water control valve in a pipe separated place rather than along the main distribution pipeline. In the absence of proper management of water consumption and distribution, it is appropriate to take into account the intermittent system while designing the tank. Private tap will be designed to be connected through junction point by using saddles.

Innovativeness in design:

During scheme design, maximum emphasis should be given to the use of local materials, and lightweight and cost-effective structures should be prioritized in such a way that the quality of the project is not compromised. Environmental & biodiversity risk observed in the surveying must be designed & estimated to minimize its effect during implementation period.

Point source improvement and water quality improvement:

Point Source Improvement (PSI) schemes are built primarily to develop and protect spring fed water supply that communities have already been using. A catchment, sometimes a reservoir tank (RVT) and one tap stand are provided for each spring with adequate safe yield. These schemes are simple, inexpensive, and can be implemented quickly due to the small scale of the project. These systems are not necessarily designed to bring water to the users, but to minimize the risk of contamination. The pipeline length can be increased if additional head is available and thus water can be reached nearer to community. An increased length may also be practical if all the users are clustered in one area. The stream sources are generally more turbid and contaminated so intake filters should be in place to reduce contamination level.

It is suggested not to expose or impound water in such conservation and source improvement of traditional springs as this will lead to contamination and back pressure.

Points to consider for point Source improvement:

- No open defecation! Attention especially to upstream clusters.
- Design appropriate conservation activities in source catchment area like bio engineering for landslide prevention.
- Plantation and structures to support recharge of the source.
- Recharge trench, pit, rainwater harvesting jar/tank for the collection, recharge, and storage in the watershed area above the source if potential.
- Control grazing in and around the source area.

- Design the reservoir tank to store water for at least four dry months as the resource conservation plan for optimum use of water.

Stream/River Water: with Roughing Filter

If there are no springs above the service area, river or stream water may also need to be brought for drinking water purposes. As stream water is generally polluted both physically and biologically, it is not suitable for drinking purposes. To address this, intake or roughing filters are designed for safe drinking water use after the source intake. As special attention is required for the regular maintenance of the filters, sufficient discussion on this matter is necessary beforehand.

Inline Chlorination System:

This is the water purification device/system to be installed in the drinking water scheme. Generally, if stream water sources are to be used in a drinking water system, then the design and cost estimate must include this system. In drinking water and multiple-use schemes implemented by the LACC Project with stream or potentially contaminated sources, an inline chlorination machine will be designed.

Similarly, Pureall and Aqua Tab chlorination systems, which are recognized in the Nepali market and by the Government of Nepal, are also available. These systems, certified by WHO and NSF, and prepared according to ISO 9001:2015 standards, are safe, reliable, and sustainable solutions for water purification. Pureall Chlorination (Pureall 50, Pureall 50+, and Pureall 100) is suitable for inline chlorination. Pureall 50 is an effective product that can be used in purification systems at the school level, capable of purifying about 125,000 liters of water. Pureall 50+, which is used in comparatively larger systems, has the capacity to purify about 300,000 liters of water. For water supplied from large storage tanks, Pureall 100 is appropriate, which can purify about 2,500,000 liters of water. All of these products can be effectively used at a 1 ppm dosage.

In addition, Aqua Tab-Flow has special properties, even at 0.5 ppm, it can inactivate about 3,40,000 harmful microorganisms. If stored properly, it can be used safely for up to 3 years. Such chlorination systems are suitable for schools, health institutions, and even in community water supply schemes.

7.2 SOLAR/ELECTRICAL LIFT WATER SUPPLY

While designing solar or electric lift drinking water schemes, the ideas are primarily prepared based on the type of water source, discharge, and the elevation difference of the service area. Water is collected in the base reservoir tank from the source through an intake structure, which must be designed to provide protection against floods, soil erosion, and animals. Sump-Well is constructed as base tank, tank sized according to the available discharge and the specified pumping duration. Water is then pumped from this reservoir tank to the distribution reservoir tank.

In solar schemes, submersible pumps are operated by solar panels, and since solar pumps can only run 4.5–6.5 hours daily depending on sunshine hour availability, the panel size and Sump-Well size are determined accordingly. In electric schemes, electricity grid/lines, poles, and transformers are arranged from the nearest grid for continuous operation of the pump. When designing the pipeline from the Sump-Well to the service reservoir tank, the pipe size and type (HDPE or GI) are determined based on length, head, flow rate, friction, and water hammer pressure. The distribution reservoir tank is placed at an appropriate location to supply water by gravity to all beneficiary areas.

All components of the scheme, including the intake, Sump-Well, pump, solar panels or electric line, pipeline, and reservoir tanks, are included in a layout map, which serves as the basis for completing the design work. The pipe size is determined using Lea's formula, and the pump and panel size is calculated using the formulas mentioned below

Horsepower of Pump
$$HP = \frac{Q \rho g H}{746 \eta}$$

Where,

Q = discharge, m³/s

ρ = density of water, kg/m³

g = acceleration due to gravity, m/s²

H = total dynamic head, m

η = efficiency of pump

Assuming efficiency of pump as = 50 to 60 %

7.3 RAINWATER HARVESTING

For places where water is scarce and sources are below the village, rainwater is the only option for safe water supply. The capacity of the rainwater harvesting jar for drinking water is 2cum to 6cum. It can be used also for irrigation purposes. Rainwater tanks can provide relatively safe, soft, clear and odorless water for different uses of water including drinking. Rainwater as it falls is relatively free from contamination but during collection and storage there is a potential for physical, chemical and microbiological contamination. In most cases, physical and chemical contamination are easy to control but microbiological contamination is more difficult. Inadequate maintenance is the major reason in past surveys for microbiological contamination of stored rainwater.

Rainwater harvesting still needs promotion. Rainwater harvesting can support gravity systems with inadequate source yield. There are many technical options for using rainwater. Reservoir tanks can also be proposed to collect and store water from nearby temporary water sources that last for about 6 to 8 months. Since water from two or more sources is stored in a tank, its quality may vary, so it should be used as soon as possible, or the tank should be disinfected by using chlorine before storing rainwater. Since the rainwater harvesting system is a system that stores water for about 4 dry months, much attention should be given to the proper use of water.

7.4 MUS SCHEME DESIGN

Water is required for various needs which can be broadly categorized.

Domestic Demand: Water is needed for our various personal or social activities, whether indoors or outdoors, such as drinking, cooking and sanitation are the main requirements of water.

Productive Demand for Irrigation: Water is needed for our productive uses such as irrigation for home gardens and field crops, livestock raising, food processing and other enterprises, etc. These productive activities make a major contribution to rural communities in terms of income generation and food security.

MUS are water systems designed whereby a single water system fulfils both domestic and productive water needs. As such, it takes into account the water demands for each of those components. Because MUS includes productive use, the community is more likely to maintain their water system. For example, irrigation and improved water mill support the income generating activities and reduces the hardship of women & girl by reducing the travelling time to local water mills at streams usually below the villages. This saved time can be utilized for other livelihood activities.

Objectives:

The goal of MUS is to explore ways to provide required water for domestic and productive use of small-scale water supplies by designing for the improvement of rural livelihoods through more productive use. There can be a number of MUS designs depending on the type of water source, its location in relation to the community, water quality & quantity and desired/available technologies. By definition, MUS might be the scheme which may cover different types of needs of the rural community by providing safe drinking water, irrigation, Improve Water Mill, rural electricity from Pico-hydro and micro-hydro powder, fisheries, poultry farming and other domestic enterprises. It will integrate considering multiple sources to multiple use of water in the community. Multiple sources, local available springs; conservation and protection activities, need to ensure before consumption in the end field.

Design Guidelines

This guideline is prepared for gravity water supply and micro irrigation MUS schemes. 65 l/person/day, for domestic uses in rural areas and 800 l/day/HH or 200 liters to 1000 liter per ropani, for productive uses in rural areas.

In MUS schemes, institutional water demand is considered same as that of drinking water supply systems and livestock demand is also included on top of population demand (65 l/cap/day) if the source yield is exceeded enough to supply the recommended per capita water demand. Livestock demand, however, should not exceed 20 % of the design domestic water demand. In the lift schemes, demand should consider the economic operation and sustainability of the schemes.

Types of MUS

Depending on the amount of water available in the source (scarce, moderate, and abundant), three types of MUS can be constructed:

- TYPE A: Continuous Flow System
- TYPE B: Seasonally Controlled System
- TYPE C: Year-round Controlled System

TYPE A: Continuous Flow System: This type of MUS is built if the safe discharge at the water source is more than 1.5 times the projected water demand. Water is supplied throughout the day from the tap-stands without regulating the flow in the main tank. However, this type of system is not recommended if the household number exceeds 40 and/or the pipe network is more than 4 km long.

TYPE B: Seasonally Controlled System: If the flow of the water source is not adequate to meet the design demand throughout the year, this seasonal design must be adopted to ensure domestic water supply in the dry season. There are two separate water tanks –one for domestic and one for productive uses. Water from the source is first supplied to the domestic water tank. Once it is filled, the surplus water will be directed to the productive water tank beside it. Such a design allows first priority for domestic water use. There will be two separate distribution pipelines – one leading to tap stands and the other to irrigation off-takes. As far as practicable, both the domestic and productive pipelines will be laid along common trench. Tap stands are located between houses to serve domestic demand. On the other hand, off-takes are constructed approximately at the center of the irrigation field of few landowners (on average 3-6 households). This is the ideal system for rural system considering operation & maintenance.

TYPE C: Year- round Controlled System: If the water source is just enough to meet the design demand, Type C is recommended. This system is similar to the continuous flow system in terms of the single main tank and pipe network, however in addition, each household has a storage tank at the house.

Based on a community-developed schedule, house tanks are filled on a turn-by-turn basis and the household members choose how much water to use for each purpose.

MUS Schemes Components

The major structures of the MUS are the intake, storage tanks, and water outlets (Multiple use Tap stand and off take). Depending on the alignment, some minor structures such as a break pressure tank, washout, air valve, or gully crossing might also be required. Every structure is constructed according to strict quality control mechanisms supervised by the LGU's technicians and the LG representatives. Source conservation & protection activities should be emphasized similar to other systems, utilization of traditional sources like well, naulo and spout also support for multiple use priority. Recharge, Retention, Reuse practice will enhance sustainable water management of the community.

Intake:

The structure is made to capture water from the source and similar to other systems. Source conservation, protection, recharge, retention, re-use principle are integral parts for the catchment.

Storage Tanks:

Storage tanks are necessary to balance the supply and demand of water. While the supply from the source is uniform throughout the day, consumption has peaked during the morning and the evening hours. Thus, if the yield of the source does not meet the demand as per the consumption pattern, storage tanks are required. Soil cement Tank is additional option for storage of water for irrigation purposes.

Water Outlets:

Two types of water outlets, tap-stands and offtakes, are constructed for domestic and irrigation use respectively. Every outlet is provided with two taps for better service. In each outlet a flow regulator balances and adjusts the flow rate. One domestic tap-stand is designed to serve 4 – 6 households. Likewise, one offtake provides irrigation to a 500-1000 square meter area depending on the crop season and type of micro irrigation used. Off takes are located approximately in the center of several households' crop fields. Usually each tap-stand and off take will have a service coverage between 3-6 houses and 4-7 crop fields respectively.

Pipeline: Same as that of drinking water supply systems except two-line systems on distribution networks.

Transmission Line: Same as that of drinking water supply systems.

Distribution Pipeline: The main difference with the drinking water supply and MUS is due to the distribution network of pipelines. In MUS, two pipelines can be provided to supply the water for domestic uses and productive uses separately.

7.5 IRRIGATION SCHEME DESIGN

Introduction

Irrigation system is artificially supplying water to cultivable land in the required quantity, which ensures that crop production is regular, balanced, and reliable. This system is especially used to provide the necessary moisture to crops during periods of water scarcity. Since rain-fed farming systems involve high uncertainty, irrigation helps to provide continuity and reliability in agricultural production. Modern irrigation systems play a significant role in increasing land-use efficiency, reducing production costs, and improving the livelihood of farmers.

Objectives:

- Providing required water at every stage of crop growth and production.
- To ensure crop production through irrigation even in conditions of irregular or low rainfall.
- To enable the cultivation of various cash and high-value crops when irrigation is available.
- To help maintain reliability and regularity of production.
- To manage necessary soil moisture, improving soil structure, fertility, and productivity.
- To create climate smart agriculture-based employment and income through higher production and crop diversification.

CANAL IRRIGATION SYSTEM

A canal irrigation system is an effective method used to supply water systematically to agricultural fields, delivering water from the source to the farm by gravity. This system mainly consists of an intake structure, main canal, branch canals, field channels, control structures (such as regulators and outlets), and a drainage system. The length, width, slope, or pipeline and structures of the irrigation canal are designed according to the field's level and distance.

In the current context of reduced discharge from water sources due to climate change, delivering water in open canals can lead to losses from evaporation and other leakages, reducing water use efficiency. Therefore, the project will give priority to pipe irrigation systems, and careful attention will be given during survey & design. The size of canals or pipelines is determined based on water flow rate, field requirements (liters/second or hectare/day), and land characteristics. Additionally, to prevent erosion, grasses are planted along the canal or pipeline edges, and techniques such as gabions, concrete lining, or bioengineering methods are applied. Pipe and canal irrigation systems are cost-effective, gravity-based, energy-efficient, and can be managed at the community level, making them effective in both hilly and Terai regions. While designing such schemes, water availability, seasonal flows, land use, and farmer participation are prioritized.

PIPED IRRIGATION SYSTEM

A pipe irrigation system is a climate-friendly irrigation method in which water is delivered directly from the source to the fields through high-pressure pipes. Compared to open canals, this system reduces water loss (evaporation, seepage), makes irrigation control easier, and significantly increases land-use efficiency. The system consists of a water source (such as a stream, spring, or borehole), pumps (if gravity flow is not available), main pipelines, branch pipelines, valves, and distribution outlets (sprinkler, drip, or open outlet). The size, pressure, flow rate, and distribution structures of the pipes are designed according to irrigation requirements.

Pipeline systems are generally of two types:

- Gravity-fed pipe system — where water flows by gravity (requires elevation difference).
- Pressure-fed pipe system — where high pressure is provided using a pumping system.

Pipe irrigation systems improve irrigation efficiency, ensure uniform water distribution in the fields, and reduce irrigation costs, especially when drip or sprinkler systems are included.

NON-CONVENTIONAL IRRIGATION (Micro-irrigation Technologies (MIT))

The irrigation technologies which differ from conventional canal systems and are relatively modern methods can be regarded as non-conventional technology. They may include range of water acquisition and application technologies such as Sprinkler, Drip, Soil Cement Tank, Pond, Pipe, treadle pump etc.

Sprinkler system, also named overhead irrigation, is the method of watering the plants in the form of spray which breaks into drops and stimulates the natural rainfall with controlled frequency, intensity and duration.

Drip Irrigation system: Drip or trickling irrigation is a method to apply precise amounts of water in the form of drop in root of the plants. The application in general is 1-8 Ltr per hour

SPRINKLER IRRIGATION SYSTEM:

The sprinkler irrigation system, also known as overhead irrigation, distributes water to crops through special nozzles that spray water under pressure in the form of a fountain or rain. This technology supplies water in a controlled manner, similar to rainfall, where the amount, timing, and intensity of application can be managed. Since the system distributes water evenly across the land, it conserves water and reduces problems of surface runoff and waterlogging. Sprinkler systems can also irrigate areas where water would otherwise be difficult to reach. In addition, soluble fertilizers and pesticides can be applied along with the water, thereby improving crop quality and efficiency. When designing a sprinkler system, the rate of water application is determined according to the soil's infiltration capacity, which helps prevent erosion and soil damage. The minimum operating head required 30 m (For sprinklers 2.5 kg/cm² to 3 kg/cm²).

Table 4 Design of Sprinkler Stand/Offtake

Sprinkle set	Main pipe	Pressure Height	Heads per set	Stand	Avg. irg. coverage in sq.m./day (3shifts/day)
Small	16m (length)	8-15m	4	4	250
Large	34m (length)	10-15m	8	8	500

Source: Sprinkler Irrigation System Manual-USAID, Feb-2009

Drip Irrigation System:

Drip irrigation, also known as trickle irrigation, is a technology in which water is delivered directly to the root zone of crops in the form of drops. This highly climate-friendly system supplies the precise amount of water needed at the exact location, maintaining the required soil moisture and preventing water stress in crops. Generally, the water delivery rate in drip irrigation ranges from 1 to 8 liters per hour, distributed under pressure through a pipe network using devices called drippers or emitters. These drippers are installed according to crop spacing. The drip system is particularly suitable for row-planted, high-value crops (such as fruits, vegetables, vines, and flowers). It ensures extremely efficient use of water and allows simultaneous application of fertilizers and soluble chemicals. In Nepal's hilly and mountainous regions with small, scattered fields, limited water sources, and higher elevations, this system is especially beneficial. Similarly, in the Terai's Bhabar region, where groundwater is deep and soils are porous, drip irrigation is even more relevant. Drip irrigation contributes positively to irrigation efficiency, crop productivity, and water conservation, particularly in areas with limited water resources and difficult geography. Drip Irrigation Capacity

Table 5 Design of Drip Irrigation System

Land Area	48sqm (1.5aana)	72 (2.5 aana)	96sqm (3 aana)	144 sqm (4.5 aana)	288sqm. (9 aana)	576 sqm (18 aana)
Drip pipes	4	6	8	12	24	48
Number of Drippers	80	120	160	240	480	960
Tank Capacity (lit)	50	50	100	100	200	500
Tank Height (m)	1	1	1	1.5	1.5	1.5

Source: <https://sitaldripnepal.com/index.php/our-products/sital-drip-irrigation-technology/>

POND IRRIGATION SYSTEM

In the pond irrigation system, water from different sources—such as rainwater, runoff from streams, or water collected from waterfalls—is stored in an open and low-cost pond and is used for irrigation as needed. Such ponds can harvest stormwater or collect water from intermittent sources to ensure irrigation throughout the year. The stored water can then be delivered to fields through sprinklers, drip systems, or short open canals. The size and storage capacity of the pond are determined based on the water requirements of the crops. The total water needed for a field during a specific period and the deficit between that requirement and the water available from sources determine the volume of water that must be stored in the pond. The pond size can therefore be designed according to the reliability of the water source and crop demand.

Such ponds are highly useful in rural and hilly areas, where only small sources exist and continuous irrigation is not available. Low-cost designs (such as DWG code: SCT Soil Cement Tank) are also available, which provide long-term irrigation solutions using local resources and materials.

SOLAR/ELECTRICAL LIFT IRRIGATION SCHEME DESIGN

When the irrigation command area is located above the proposed water source, a solar or electric lift irrigation system should be considered. In designing such a system, the type and location of the water source, required discharge, and elevation difference between the source and command area are the primary factors. The overall design approach is similar to that of a lift water supply system, as outlined previously. However, for lift irrigation systems, additional considerations must be made for potential water losses due to evaporation, seepage, and conveyance inefficiencies, to ensure adequate water delivery that meets crop water requirements.

References for design:

- Design Guidelines for Planning, Designing, and Implementing Gravity-Fed Piped Multiple Use Water Systems, IDE/Nepal, Kathmandu, 2006.
- Manual of Sprinkler/Drip Irrigation Technology, NITP, DOI 2063.
- Section 7.1.1, Solar/ Electrical Lift Water Supply of this manual

7.6 IMPROVED WATER MILL SCHEME DESIGN

Based on the data obtained from the feasibility study, improved water mill schemes can be designed as per detailed requirements. While designing such improved mills, key factors such as water discharge, head, turbine, penstock pipe, grinding stone, etc. need to be considered. Generally, for an improved grinding water mill, a power requirement of 800 to 5000 watts is needed. Fundamental Functional Characteristics of Traditional and Improved Water Mills:

Table 6 Functional Characteristics of Traditional and Improved Water Mills

Comparison Parameters	Traditional Water Mill	Improved Water Mill
Length of canal, meter	20-200	20-200
Working head (H), meter	3-7 (max.)	2 to 7
Water discharge (Q), lps	40-100	30-100
Speed, rpm	60-90	110-210
Inclination to chute (degree)	40-50	30-40
Output power capacity (kW)	0.2-0.5	0.5-3.0
Grinding stone	Local	Local
Thickness of grinding stone (inch)	10-Mar	15-May
Diameter of grinding stone (inch)	24-34	24-34
Operational efficiency (%)	Below 25	30-50
Functions and capacity	Grinding cereals grains, only (maize, millet, wheat, rice, etc.), 10-20 kg/hr	Grinding of cereals (maize, millet, wheat, rice etc), 20-50 kg/hr
		Dehusking/partial polishing of paddy (5070 kg/hr)
		Expelling oil from oilseeds (10-15 kg/hr)
		Generation of electricity (12V-DC, 220V-AC, 1-3 kW)
Repair/maintenance	High	2 years
Life span	Low	10 years

Sources: Improved Water Mill Development in Nepal-A Status Review, SNV/Centre for Rural Technology, Nepal, January 2024.

Based on this source, generally, a small-capacity grinder used for milling a small amount of grain (40 kg/hour) requires about 0.7 to 1kw of electricity, whereas a higher-capacity grinder (80 kg/hour) requires about 1.75 to 3.50. Similarly, among rice hulling machines (rice hullers), “Number 4” requires 3.7 kW, “Number 5” requires 2.2 kW, and “Number 6” requires 5.1 kW of power, depending on their processing capacity. For allo (nettle fiber) processing, a relatively low consumption of 0.3 kW is

sufficient, while for operating a beaten-rice (chiura) mill, about 4.1 kW is required. Thus, it is evident that in rural areas, the electricity demand for small-scale industries and agricultural processing machines varies depending on the type of equipment. Therefore, when planning solar or alternative energy systems, it is very important to consider the electricity consumption of such equipment.

7.7 SCHEME COST ESTIMATE

The amount of work of all the structures required in the schemes (Quantities) is calculated according to the dimension given in the respective design drawings. The cost of each item is calculated by multiplying the calculated quantities with their per unit rate. These rates are usually taken from the local government or district rate list and are also included in the rate to calculate its lead distance if materials or manpower need to be transported. After receiving the cost of each item, additional expenses needed to ensure satisfactory implementation of the scheme, such as contingency, monitoring expenses, environmental management, UC management cost, etc.—are added to the cost. In this way, the total estimated cost of the scheme (Total Estimated Cost) is prepared by combining all the expenses, which forms the basis for the budget formulation, approval, and implementation of the scheme.

8 ENVIRONMENTAL MITIGATION AND MONITORING PLAN

For all schemes implemented under LACC Project, an Environmental Mitigation and Monitoring Plan (EMMP) will be prepared and applied to ensure environmentally sustainable and climate resilient. The EMMP should be implemented to minimize any potential negative impacts arising from preparatory phase from. Regular monitoring of the scheme is required to ensure that proposed mitigation measures are implemented effectively. Such monitoring should be done at preparatory, implementation, and post-construction phases of scheme. While preparing the mitigation and monitoring plan, the main problems are identified after on-site observation (During detail technical survey-Climate Change and Vulnerability Capacity Assessment) and analysis of the data received. Based on that, Environmental Mitigation and Monitoring Plan-EMMP are prepared, which incorporates the following elements:

Table 7 Format for Environmental Mitigation and Monitoring Plan

Phase	Potential environmental and social impacts	Possible mitigation measures	Means of verification	Monitoring responsibility
Preparatory Phase				
Implementation Phase				
post-construction Phase				

This type of planning will help minimize the potential impacts of the schemes on the social, biological, physical and economic environment. The detailed sample EMMP table for DWS, MUS and irrigation schemes has been attached to Annex 7, which will be used for implementation.

9 BANK ACCOUNT AND FUND COLLECTION FOR CONSTRUCTION & O&M FUND

In all LACC Project supported scheme, the UC operates a bank account independently. The Project Document of the bilateral agreement between the Governments of Nepal and Finland/EU clearly states that UCs are accountable for the procurement and management of construction activities, and that project funds shall be transferred directly into UC bank accounts. Likewise, UCs will be responsible for leading the entire procurement process.

The roles of LG, LGU and the Project will be facilitating the process. Specifically, they support UCs in preparing comparative charts and in carrying out quality and quantity inspections of procured materials. Each UC is therefore required to open and operate a bank account for financial transactions.

Additionally, users will contribute funds for construction works as well as for Operation and Maintenance (O&M) during the preparatory phase of the scheme. Out of the total collected funds, 1% shall be allocated and deposited into viable cooperatives as O&M funds to ensure long-term financial sustainability.

Bank Account Operation

The user committee itself decides who will operate the bank account of the committee. Generally, the bank account is operated with the joint signatures of the Chairperson and the Secretary or the Treasurer. As per the project's GEDSI strategy, one of the signatories must be a female member. Similarly, the account can be operated either by the Chairperson and Treasurer, or the Chairperson and Secretary, or the Secretary and Treasurer, or by any three of the mentioned officials (with at least one-female signatory being mandatory).

Users' Contribution

Contribution from users is mandatory for both Scheme construction and Operation & Maintenance. Project Implementation Manual has clearly specified in detail the requirements of cash and kind contributions to be made by the community in all types of Schemes. The amount of such contribution is presented in the design and cost estimate report of each scheme. The community must contribute a total cash contribution of 2% of the total cost estimate, at least 1% for cash contribution in construction and 1% for the O&M funds. The community's contribution must be deposited into the UC's Bank Account before the Scheme implementation agreement is signed, and the voucher must be submitted to the LG Office. Community contribution of all types of schemes supported by LACC Project must be as per indicated in the Project Implementation Manual (PIM).

The contribution indicated in the Project Implementation Manual (PIM) is minimum. If the community's contribution in the mentioned sectors exceeds this minimum percentage, the community's kind contribution will be increased and calculated accordingly. However, if the calculation shows an amount lower than the minimum percentage, amounts mentioned under other headings such as main line excavation, semi-skilled labor, transportation, etc., should be adjusted to maintain the minimum investment percentage.

Local Government's Contribution

Local Government must make cash invest in all type of schemes implemented by project. The amount to be invested by LG must be deposited in installments into the Users Committee's Account, as mentioned in the implementation phase agreement. The contribution of the LG for all types of schemes will be as per the Project Implementation Manual (PIM).

If the LG determines that the targeted community is unable to contribute due to extreme poverty or marginalization, the LG may provide a subsidy in some portion required cash contribution. However, the contribution to the O&M fund and the prescribed kind contribution must be compulsorily undertaken by such community.

10 COMMUNITY ACTION PLAN PREPARATION, PRESENTATION AND USERS' APPROVAL

10.1 DESIGN ESTIMATE AND COMMUNITY ACTION PLAN ORIENTATION AND PREPARATION

At the end of the preparatory phase, the LGU Staffs will conduct an orientation training for Users Committee on design, cost estimation, and Community Action Plan. This training is important for the users' committees to clearly understand the schemes design and cost estimates (including scheme layout), as well as the cash and kind contributions of different stakeholders, so that the community action plan can be prepared in a participatory and transparent manner. After this training, the users' committee will conduct the users mass meeting and share the draft Community Action Plan of implementation phase and approve it from users' mass meetings. Approved CAP must be attached in the annex of implementation phase agreement between LG and UC.

Training Duration: Final day of preparatory phase

Participants: All users committee Members and representatives from respective ward

Resource person: Technical Officer, LACC Project Officer and others respective field staffs

Organizer: Local Government Project Implementation Unit

Objectives of the Training:

- To make the Users' Committee clear about the design, cost estimation, and layout of the scheme
- To make the Users' Committee clearly understand the importance of the Community Action Plan (CAP)
- To prepare the Community Action Plan for scheme level activities completion

Expected outcomes:

- The members of the User Committee will be clear about the design cost, quantity of materials (local & external) and scheme layout; will prepare a draft of the community action plan (based on the available CAP format in Annex 4).

Required Materials

- Design & cost estimate of the Scheme, standard sample of Community Action Plan, SBS chart, SBS manual, Bookkeeping records files, contribution patterns, brown paper, posters, etc.

Major contents and session plan:

Days	Major Content	Time	Activities and Training Materials
In 4th days final 90 minute	Introduction & Design & Cost estimate	30 Minutes	Game
	Introduction Detail design & cost estimate report and scheme layout Estimated structures Estimated cost (Structure cost, Rate of Skilled and un-skilled labor, sand, cement and other construction materials) etc.		Prepare and presentation participants expect Summary in brown Papers Training objective presentation from brown paper
	Community Action Plan (CAP)	60 Minutes	Present the final design and cost estimate of the scheme
	Introduction, importance, preparation process of CAP		Present the detail scheme lay out plan
	List out the major scheme level activities and identify relevant responsible person		
	CAP implementation process		
	CAP revision process		
	Formulation of the draft of Community Action plan		
	Fix the appropriate transportation rate construction materials (Sand, Cement and other materials) and management cost.		
	Discussion and preparation of procurement plan		
	Preparation of seasonal Callender and Identification of local Resource person; Skilled & un-killed labor and VMW/pump operator/caretaker		
	Identification of local materials, items for cash and kind contribution.		

10.2 APPROVAL OF CAP, DESIGN AND COST ESTIMATE

After completing the detailed survey, design, cost estimate, and all training under the preparatory phase, the Users' Committee must present the Community Action Plan, design, and cost estimate for approval in a mass meeting of the users. This event takes place together with the first monitoring of the scheme and first public audit organized by the Users' Committee. The mass meeting must ensure that scheme is technically and socially appropriate, that all households from all areas and community included and also ensure the underserved households are covered by scheme. This meeting is crucial for laying the foundation for the regular operation and sustainability of the scheme in the future. The monitoring team will include representatives from the Local Government and the Project as well.

Community Action Plan and Design & Cost Estimate Approval Process

- The Users' Committee shall call the mass meeting for the approval of Community Action Plan and the design cost estimate, as well as to conduct the first public audit and monitoring. The venue and time of mass meeting will be suitable for all users.
- The maximum number of users must participate in this meeting; at least 75% of households, 50% of Female, and proportional representation from caste/ethnic group, people with disabilities, and disadvantaged groups must be ensured. If female's participation is less than 50% or representation from all ethnic group and areas is not achieved, the meeting shall be postponed, and a new date and time shall be set.
- The meeting shall be chaired by the Chairperson of the UC. One of the committee members (preferably the Secretary or Treasurer) shall present the agenda of the meeting. The agenda of this meeting shall be as follows:
 - Opening and introduction of the program
 - Objectives of the mass meeting
 - Presentation and approval of preparatory phase activities carried out by the Users' committee
 - presentation of detailed design & estimate including contribution from users and approval from the users
 - Presentation and approval of the scheme layout plan
 - Presentation, discussion, finalization and approval of the Community Action Plan.
 - First monitoring of the Scheme as per the monitoring book.
 - Procurement process of external construction materials, formation of procurement committee and approval from mass meeting
 - Selection of Village Maintenance Workers (VMWs)/pump operator/caretaker
 - Validation of suggestions and recommendations made by the monitoring team and recording them in the UC minute and monitoring book.
 - Presentation of the minutes among the users and stakeholders.
 - Closing of the mass meeting
- The Users' committee shall prepare and present the project information board. The details of the beneficiaries, households, User committee members details, social map and the project layout plan, the estimated cost, and the investment contributions of various stakeholders should be clearly mentioned in the scheme information board. (A sample of the scheme information board is presented in this guideline).
- Users committee members will present the Community Action Plan with the help of the field coordinator/social mobilizer and the design cost estimate with the help of the sub-engineer.
- All female and male should ensure they have knowledge about the design, cost estimates, and how much money will be spent for which purpose.
- Everyone should be encouraged to discuss the Community Action Plan, and formal approval should be taken from the mass meeting.
- Users should be clearly informed about the amount of work that has to be done and the users' cash and kind contribution.

- Encourage all male, female and people from different ethnic groups to participate in the discussion and clarify any questions they may have.
- The mass meeting will formulate a plan for external material procurement and will also form a procurement committee. (For detailed information, please refer to the Users Committee's External Material Procurement Procedure).
- The public audit and its approval process should be carried out during this mass meeting.
- After the completion of the public audit, the monitoring team will conduct the first monitoring of the scheme based on checklist of monitoring book. All findings and discussion points of the monitoring must be filled out on-site during the monitoring.
- All issues discussed and raised during the meeting should be documented. The points and issues highlighted by the monitoring team should be verified by the users Committee/Users, and this should be recorded in the UC meeting minutes and monitoring book.
- Signatures of all participants should be obtained in the minute book of the Users' Committee, and an attendance sheet should be prepared separately indicating gender, disability, and ethnic groups.
- After this mass meeting or the first public audit, the Users' Committee meeting shall prepare for the approval of scheme documents and the agreement for the implementation phase and submit the documents to the local government office.
- If, for any specific reason, the first public audit/mass meeting or the first monitoring team does not approve the prepared design estimate and Community Action Plan for scheme implementation, the project will not proceed to the implementation phase and scheme will be dropped and removed from the annual program.
- The monitoring team will submit the monitoring book to the LG office for necessary action.

10.3 FIRST PUBLIC AUDIT

Public audit is also a means to inform the users about activities conducted at the scheme level. This is carried out through a mass meeting organized with the participation of all households in the scheme area. In the Local Adaptation to Climate Change Project, it is considered an important tool for transparency. Public audit aims to maintain the quality of activities carried out to achieve sustainable benefits. In the project cycle, such public audit should be conducted at least three times. After the finalization of design, cost estimate and layout plan of the of the scheme are prepared, a one-day first public audit is organized with the participation of all scheme area households. This should be done at the end of the Community Action Plan preparation process. Its main objective is to receive the final approval of the scheme from the users.

During this meeting, the Schemes' layout, design, and cost estimates are reviewed and discussed. If the users agree, the scheme design & estimate report is submitted to the Rural Municipality/Municipality Project Management Committee for final approval. If the users do not agree, the project is re-analyzed and, where possible, redesigned, dropped/postponed, or even removed from the annual program as well.

The first public audit must also be conducted on the same day of scheme level first monitoring.

General objective of public audit

Inform the community and stakeholders about the scheme activities and their implementation progress.

Demonstrate the Users' Committee's commitment to ensuring that project activities are carried out transparently for the beneficiaries.

Inspire a sense of ownership of the Scheme activities within the community.

Specific objectives of the first public audit

- To conduct the final review of the scheme design, cost and layout plan
- To discuss the procurement process and form the procurement committee,
- To present the Community Action Plan by the Users' Committee,
- To approve the Community Action Plan Scheme design and cost estimate from the mass meeting.
- To ensure that there are no disputes related to the scheme within the community.

Participants and stakeholders of first public audit

- Users' Committee Members,
- Representatives from 75% of the beneficiary households (including at least 50% female),
- Representatives of the Rural Municipality/Municipality and respective Ward,
- Representatives from Rural Municipality/Municipality and Ward level political parties and social leaders,
- Representatives from other civil society and organizations/institutions (if any),
- Monitoring team of the Rural Municipality/Municipality and Project.
- This meeting will be organized and facilitated by the Local Government Project Implementation Unit.

Required Documents for first public audit

During the first public audit, the Users' Committee should manage the following documents:

- Users' Committee minute book
- Draft copy of Community Action Plan of the Scheme
- Scheme design and cost estimate report
- Final layout plan and community map of the Scheme

Process

Since the above-mentioned activities "approval of the Community Action Plan and design estimate" and the "first public audit" are to be completed in the same mass meeting, the UC should arrange the meeting and ensure that the participation process is conducted as specified above

Reporting

After the public audit has been completed, LGU Staff will prepare a monitoring report. The monitoring team will prepare a monitoring report on site using the prescribed format and read it out to all participants for their signatures. The Community Action Plan must be prepared by covering detailed activities of implementation and post-construction phases. All activities related to construction and capacity development should be identified and included in the Community Action Plan. During the implementation phase, this action plan should be regularly reviewed and updated. The final action plan should be attached to the implementation phase agreement.

11 FIELD MONITORING

Monitoring and evaluation are extremely important to ensure that project results are achieved in terms of both quality and quantity as well as by process. Monitoring activities must be relevant, timely and accurate so that project stakeholders can assess project progress and impact, while also providing necessary data and information. In addition, field monitoring data must fulfill the interests and requirements of national and sectoral stakeholders by:

- Inform decision making
- Track progress and process
- Measure output, impacts and results
- Increase accountability; in both ways: downward (to the community level) and upwards to sectors and competitive authorities
- Encourage investment and willingness to contribute
- Build capacity

Monitoring at different levels

Monitoring and evaluation will be conducted at various levels, from the community to the project level, as mentioned below. In addition to the minimum recommended monitoring, local governments and project support units will carry out ad-hoc supervision and follow-up visits. Reports from every monitoring visit must be submitted to the municipal/rural municipal executive through the LG level PMC. The PMC will also include issues observed during monitoring in the monthly reports submitted to the project support unit. Monitoring visit reports must be provided to the Ministry of Federal Affairs and General Administration (MoFAGA) and to the project when requested.

Table 8 Monitoring by Different Level

Level of monitoring	Frequency of monitoring	Description
Project level	As per necessary	As per Project Implementation Manual
Province Level	As per necessary	As per Project Implementation Manual
Local government level	At least once a year	As per Project Implementation Manual
Project Level	At least two-time monitoring and reporting as per necessary	The Project Support Unit (PSU) will independently monitor project activities in the Local Government at least twice a year to ensure that all activities are implemented in accordance with the Project Implementation Manual (PIM) and the SBS procedures. Additionally, the PSU will ensure that financial expenditures comply with relevant rules and guidelines and will provide necessary facilitation to support effective project implementation. The PSU team will consult with the Rural Municipality/Municipal Project Management Committee and provide recommendations for further project improvements.

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

		The monitoring report will be submitted to the Ministry of Federal Affairs and General Administration/Supervision Committee, as well as to the LG Executive and the LG Project Management Committee.
Scheme level	At least 3 times in (for water, irrigation, multipurpose) / 2 times (for other activities)	On a regular basis, schemes will be closely monitored by the users and the ward office as they are very close to schemes area. In addition, a Monitoring Team of cluster office of project and LG office will monitor the schemes at the various critical stages. The critical stage of monitoring is identified and mentioned in step-by-step manual of LACC Project. The findings of each monitoring visit should be validated by UC/users and recorded in UC register and monitoring book.

Local Government Level Monitoring

Different schemes and programs implemented with project support will be monitored at the local government level. Teams will monitor project activities, staff performance, sustainability issues, Natural Resources Management related schemes, livelihoods, agriculture, agroforestry, and cooperative programs annually.

Scheme Level Monitoring

Step-by-Step Manual and the individual scheme-monitoring formats (as Scheme Monitoring Books) will serve as the main basis for scheme level monitoring. The aspects to be monitored and the methods/techniques applied during each monitoring visit are provided in the Monitoring and Evaluation Format. Scheme level monitoring costs are to be covered by LG-NRDF.

Monitoring of Natural Resource Development Fund (NRDF)

All payments from the Natural Resource Development Fund (NRDF) shall be made on the basis of written recommendations from the Technical Assistance Advisor or designated project representatives. The progress of activities implemented by the Local Government shall be approved through meetings of the respective LG Project Management Committee. The Technical Assistance Advisor, in close coordination with the accounting section of the Local Government, must verify the payments made during scheme implementation activities certified by the Chief Administrative Officer and report to PSU.

For monitoring of the NRDF, the Project Support Unit will conduct visits to each local level at least twice a year, at an interval of six months. The monitoring team will review all payments and related processes carried out through the NRDF, prepare a report, and submit it to the Chief Administrative Officer of the concerned Local Government, the Provincial Project Coordination office and PSU.

Minimum Monitoring Requirements at scheme Level

Table 9 Minimum Monitoring Requirements at scheme Level

S.N	Type of scheme/Activity	Project Cycle			
		During CAP revision	During Implementation	Completion stage	Total visit
1	Irrigation schemes	1	1	1	3
2	Improved water mills	1	–	1	2
3	Drinking water & sanitation schemes	1	1	1	3
4	Multipurpose schemes	1	1	1	3
5	Community/institutional sanitation (schools, menstrual hygiene related)	1	–	1	2

Appropriate time of various monitoring visits

Table 10 Appropriate time of various monitoring visits

SN	Description	Desired time for Monitoring
1	Preparatory Phase of individual scheme (First Visit)	During CAP Approval: At the same day of mass meeting when layout of the scheme, Training, design and BoQ and community action plan.
2	Implementation Phase of individual scheme (Second Visit)	After collection of local materials and procurement of non-Local Materials: Visit should be made after the procurement/collection of construction materials by the UC, which takes place after the first instalment for construction of scheme from the LG.
3	Implementation Phase of individual scheme (Third Visit)	During post construction seminar (After completion of scheme): This visit is to make to ensure the completion of all proposed activities of implementation phase (including quality of construction works, Book keeping, store management, local government project implementation unit staff performance, quality of training, transparency/public audit and Step-by-Step follow up).

Composition of scheme level monitoring team:

At least one PMC member will be included in every scheme-level monitoring team. Teams should be as participatory as possible. The following team composition is proposed:

Table 11 Composition of scheme level monitoring team

Stakeholders	Proposed team members
LG Office	Team led by LG vice-chairperson
PMC committee members	Member from PMC Member from LG Infrastructure development section/Agriculture Section/ Environmental Section Other member as assigned by LG office
Respective ward office	Ward Chairperson Ward Members
Local government project implementation unit	Local government project implementation unit staffs
Project	Technical Assistance Adviser/NRM Expert/ Technical Officer PSU representative, If needed

The PMC must prepare a monitoring schedule in advance and inform team members accordingly.

Field Monitoring Reports

All the field monitoring reports will be prepared at the spot of monitoring and signed by all the visiting members. The findings of the monitoring will be presented to the beneficiaries, and the key recommendations will be written in respective minute book of beneficiaries (e.g. UC Register) and monitoring book. The monitoring teams are requested to check these recommendations by the previous team before proceeding further in their task. All the reports will be submitted to PMC of respective LG. After LG level monitoring brief discussion on findings will be held at PMC meeting for further action. Summarized report of field monitoring will be forwarded to PSU through MIS system.

Scheme Monitoring Process

A monitoring team will collect information and fill up monitoring book. Information can be collected and verified through following method in different monitoring visit as appropriate.

1. Discussion with Users Committee (with and without presence of Local government project implementation unit staffs)
2. Discussion with Users through mass meeting
3. Observation and inspection of constructed structures.
4. Observation and inspection of store and procured and collected external/local materials.
5. Inspection of book keeping, minutes, bill and receipts and financial statements and ask UC and Local government project implementation unit staffs for clarification.
6. Testing effectiveness of delivered training through cross checking with training participants.
7. Provide written suggestion to UC or Local government project implementation unit staffs (if any) in their register.

Key aspects to monitor in different scheme level monitoring visits

Monitoring	Key Aspect to Monitor
First (At the End of Preparatory Phase)	Commitment of users to implement scheme by contributing cash and kind. Understanding of project approach and norms by all users including all class, caste and gender. Feasibility of scheme in terms of social disputes, cost and technical complexity. Users committee formation process and representation Transparency of information; budget, cost contribution, design estimate, minute keeping Awareness and consensus of users on scheme structures, layout, rate and cost of the scheme including component costs. Effectiveness of training/s provided by Local government project implementation unit staff including training days and facilitation. Performance of Local government project implementation unit staff in the scheme in preparatory phase
Second (In Implementation Phase)	Progress of the scheme implementation as per CAP Quality of procured materials and collected local materials Procurement process Store and transportation management UC meeting and minutes: practice of collective decision making and transparency Financial status: income, expenditure Status of bookkeeping and other records Effectiveness of training/s provided by Local government project implementation unit staff including training days and facilitation. Performance of Local government project implementation unit staff in the scheme in preparatory phase
Third (At the End of Implementation Phase)	Physical completion of scheme; structures, pipelines, protection, CCA/DRM components etc. Quality of procured materials and collected local materials Procurement process Status of leftover materials and tools UC meeting and minutes: practice of collective decision making and transparency

Financial status: income, expenditure, due payment, contribution by users

Status of bookkeeping and other records

Effectiveness of training/s provided by Local government project implementation unit staff including training days and facilitation.

Performance of Local government project implementation unit staff in the scheme in preparatory phase

Additional details are provided in the project monitoring book.

12 PROJECT MANAGEMENT COMMITTEE APPROVAL FOR IMPLEMENTATION

The Project Management Committee (PMC) is a mechanism established at the Local government for project activities implementation, under the leadership of the respective local government. As per PIM of the LACC Project, the PMC at the local level has the authority to approve annual programs, implement activities, monitor the progress, and make necessary decisions. The committee prepares the annual work plans of the project according to local needs and policies. Once endorsed by the council, the committee submits it to the project.

PMC has the authority to make decisions required for plan implementation and to provide necessary directives. The PMC monitors implementation progress of the scheme; it suggests organizing public audit & hearing meetings and receiving monitoring reports. Furthermore, it regularly monitors the income and expenditure records of the schemes. Proposals for capacity development activities should be prepared by the LGU staff of the local government implementation unit and pre-approved by the PMC.

The cost estimates of all water supply, irrigation, multipurpose schemes and other investment heading scheme must be approved by the PMC after the first round of monitoring before moving forward to the implementation agreement. Before approval, the PMC will review the project accounts based on established criteria. It must also ensure that all preparatory activities have been completed and that the users have approved the plan through their mass meeting.

Approval Process

On behalf of the Local government executive office, the PMC approves the schemes before signing the implementation phase agreement. The following basic requirements will be checked, and the approval will be recorded in PMC meeting minutes.

- Completion of all preparatory phase activities as per project step by step manual including UC capacity building activities, verified and quality checked by monitoring team.
- All the preparatory phase activities are reported by LGU staff.
- Monitoring report of preparatory phase submitted.
- Design estimate of the scheme shared and approved in mass meeting.
- UC bank account in operation and Cash contribution of users both for investment and O&M fund deposited on it.
- Local government contribution as per design report is ready to deposit in UC bank account or ensure the fund is secured for the schemes.

- Community Action plan prepared and approved by mass meeting.
- All above documents are submitted by local government project implementation unit staff to LG.

13 IMPLEMENTATION PHASE AGREEMENT BETWEEN UC AND LG

The implementation phase agreement between the users' committee and local government is presented in ANNEX-4 of this SBS manual.

14 USERS' COMMITTEE MANAGEMENT AND PROCUREMENT TRAINING

The user committee are responsible for keeping the record of the funds received from Natural Resource Development Fund (NRDF) and other sources, in accordance with PIM. The received fund should be utilized for material procurement and storage, mobilization of skill human resources and completion of other activities as per agreement. The UC should keep their record in transparent manner showing all income–expenditure account clearly.

This training is organized immediately after signing the implementation phase agreement. It should be provided to at least three people from one UC consisting of members of user committee, procurement committee members, and ward chairpersons in a convenient location.

Duration: 3 days

Participants: UC members (Chairperson, Secretary, Treasurer, procurement committee member and one PMC member from LG).

Time: Immediately after signing the implementation phase agreement

Facilitator: Full time facilitator (Local Government Project Implementation Unit Staff, Technical Assistance Advisor, Natural Resource Management Expert) Part time facilitator (LG Engineer, Accountant)

Venue: LG head Quater or Cluster level

Organizer: Local Government Project Implementation Unit

Objectives of the training:

- To enable user committees to procure external construction materials as per project procedures.
- To strengthen the capacity of user committees in maintaining systematic accounts of income and expenditure.
- To enable user committee members to keep records of construction materials, pipes and tools.
- To train user committee members to maintain records of skilled, semi-skilled labor and voluntary labor contributions.
- To enable user committees to assess the quality of construction materials (local and external).
- To enhance transparency and accountability of user committees throughout all stages of the project.

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

- To raise awareness among user committees on climate change adaptation, disaster risk management and resource conservation methods.
- To familiarize user committee members with the financial rules and policies of the Government of Nepal and local governments.

Training materials required:

Design and cost estimate book, implementation phase agreement, community action plan, book-keeping forms (requisition form, cash receipt, sample vouchers), procurement forms, sample accounts (bank, income-expenditure, inventory), calculator, brown paper and samples of water pipes, fittings, tools, and safety equipment for demonstration.

Contents of the Training

Day	Content	Time	Activities and materials
First Day	Session I Introduction Objectives of the training Pre-test LACC Project Introduction, fund flow and contribution pattern	90 min	Game Presentation Written test Fund flow chart Contribution chart
	Session II Process of fund release to UC account Condition of Agreement Records and documents to be maintained by UC	90 min	Presentaiton UC & LG Agreement documents
	Session III External materials procurement process Role and responsibility of UC, Procurement committee, Monitoring committee and other stakeholders	90 min	Procurement manual, step by step chart of procurement, UC manual
	Session IV Quality and specification of external materials Quality of local materials Standard of construction (pipeline, structures etc)	90 min	Scheme design report Handbook for Quality and Specification of Construction Materials and Schemes Photos

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	Session I Day I Review occupational health and safety, Natural Resource management and climate-smart practices.	90 min	Discussion, sharing
	Session II Scheme Cost and recording Estimate of each component and heading of expenditure	90 min	Design estimate report of scheme formats
	Session III Public Audit, Scheme information board, (Process, participation and content) Introduction of bookkeeping to be maintained by UC	90 min	Sample formats Picutre of scheme information board UC mannual
	Session IV Introduction of account keeping and formats (procurement and bookkeeping) Construction materials, transportation, skill and unskilled labor District rate, maximum ceiling per component and source of income Samples of receipts Bank Khata Income expenditure Khata Store book (consumable) Store book (Non-consumable) Scheme book (Yojana khata)	90 min	O&M regulatin, Procurement manual, UC manual Sample of account and vouchers/reciepts
Second Day			
Third Day	Session I & II Exercise on filling formats related to procurement Exercise on filling formats and book keepings discussed on Session IV of day II	180 min	Group exercise based on sample case
	Session III		

	Climate-Resilient Water Safety Plan, water quality testing, productive use of water. O&M Regulation and Water Tariff	90 min	Discussion
	Last Session Joint Procurement Committee minutes sharing and grouping Presentation and interaction on the issues Post test of the training Closing of the training	90 min	Discussion Written Test Closing of the training

15 GUIDELINES FOR PRE-CONSTRUCTION SEMINAR

After signing the implementation phase agreement between the users' committee and the local government, the users' committee begins construction activities according to the approved Community Action Plan (CAP). A pre-construction seminar is organized to encourage the committee members and clarify their roles and responsibilities. This seminar helps the user committee understand procurement procedures, review and update the community action plan, and mobilize the community systematically in construction activities.

Duration: 1 day

Timing: After the implementation phase agreement and UC management and procurement training.

Participants: All users' committee members, procurement committee members, and ward representative.

Facilitators: Field coordinator, Sub-engineer, Water Resource Technician and Social Mobilizer.

Organizer: Local Government Project Implementation Unit (LGU)

Objectives:

- To review the community action plan and manage activities accordingly.
- To discuss procurement plans, rules and procedures.
- To clarify agreement provisions and conditions for User committees.
- To prepare consumer committees to carry out activities as per the community action plan.
- To identify the high risk-prone construction sites and prepare mitigation plans.
- To prepare users' committees for implementing environmental and biodiversity impact mitigation measures.
- To facilitate the insurance procedure for construction labor groups.
- To remind users committee members of their roles and responsibilities.
- To provide information on roles and responsibilities of other stakeholders.
- To review project operation and maintenance requirements.
- To strengthen community mobilization, transparency, and public auditing practices.

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

- To remind users committees of proper record-keeping of meetings, decisions and documents.

Expected Outcomes:

- User committees will be able to advance work as per the community action plan.
- User committees will be capable of managing procurement and related activities.
- User committees will be able to review and revise community action plans when needed.
- User committees will be aware of project operation and maintenance.
- User committees will remember their roles and responsibilities, along with those of stakeholders.
- User committees will understand the importance of transparency in transactions.
- User committees will be aware of environmental and biodiversity impact mitigation measures.
- User committees will manage labor insurance processes.
- User committees will prepare for high risk-prone construction sites.

Materials required:

Agreement documents, design and cost estimate, community action plan, environmental and biodiversity impact mitigation plan, SBS related charts/posters, labor insurance forms, operation and maintenance manuals and other guidelines.

Major content of the workshop:

Content	Time	Methods/Materials
Session I Participant introduction Objectives Review of the training conducted during preparatory phase	60 min	Group discussion SBS Chart
Session II Agreement provisions Stakeholder roles and responsibilities Decision making/minuting and reporting Public auditing	90 min	Agreement Paper Discussion
Session III Review of community action plan Environmental and biodiversity mitigation plan Identification of risk-prone sites Supervision and revision needs	90 min	CAP, Discussion on Environmental and biodiversity mitigation plan
Session IV Construction material management Discussion on procurement plan and procedures	120 min	Procurement guideline, Insurance form, VMW manual.

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

Store management requirements		
Good & Bad practice of store management		
Discussion on local material collection, labor insurance, labor wages, transport rates and material quality.		

Note: The scheme information board should be installed in this period, the sample of the board is as below (the normal size of the is 5X4, however it can be adjusted as per requirement):



Co-funded by
the European Union



SUOMI
FINLAND

----- Rural/ Municipality

Local Adaptation to Climate Change (LACC) project
XX district, XX province

X X Scheme Name XX MUS/DWS/IRR.....

Ward Number: -----



Social and Technical Features:

Name of Users Committee:

UC's Reg. No.:

Beneficiary Settlement/Cluster: Irrigation Command Area (Ropani):

Construction Period: to

Beneficiary Household

BCTS	Dalit	Janajati	Other	Total
-	-	-	-	-

Beneficiary Population

BCTS	Dalit	Janajati	Other	Total
F M	F M	F M	F M	F M
110 -	-	23 -	-	110 23

Details of Users Committee

BCTS	Dalit	Janajati	Other	Total
F M	F M	F M	F M	F M
1 -	-	-	2	1 2

Major Components in the Schemes

SN	Components	No.	SN	Components	No.
1	Intake	7			
2		8			
3		9			
4		10			
5		11			
6		12 Tap			

Climate adaptation, risk management, and resource conservation activities in the Scheme:

Planned: Completed:

Trained Human Resources in the Scheme

SN	Details of Human Resources	BCTS		Dalit		Janajati		Other		Total		Mobile Number
		F	M	F	M	F	M	F	M	F	M	
1	ige Maintaine Worker	-	-	-	-	-	-	-	-	-	-	
2	Operator	-	-	-	-	-	-	-	-	-	-	
3		-	-	-	-	-	-	-	-	-	-	

Scheme Implemented By:
LG Project Implementation Unit,

Scheme Layout Map

Detail Cost Estimate

Description	Estimated Cost NPR.	Actual Cost NPR.
Non local materials	3,200,000	1,111,111
local material Collection & Unskilled labour	3,200	1,200
Skill labour	12	12
Transportation by Truck	12	12
Transportation by People	12	12
Store cost (Road head)	12	12
Ucs management cost	12	12
Total	3,203,260	1,112,371

Contribution Patteren

Description	Estimated Cost NPR.	Actual Cost NPR.
Community		
Kind	1,234	1,234
Cash	50,000	50,000
NRDF		
RM (Cash)	1,000,000	900,000
GoN	780,000	780,000
GoF/EU	600,000	600,000
Total	2,431,234	2,331,234

Description of Operation & Maintainece Fund

Collected fund before scheme implementation (NPR.): 1,200,000

Collected fund during scheme implementation (NPR.): 2,222,222

Per HH Contribution (NPR.) 2,000



Figure 4 Scheme Information Board

Note: The scheme information board should be installed in this period, the sample of the board is as below (the normal size of the is 5X4, however it can be adjusted as per requirement).

16 PROCUREMENT OF NON-LOCAL MATERIALS AND LOCAL MATERIALS COLLECTION

Refer Community Procurement Manual for External Materials Procurement and the illustrated handbook of external construction materials.

GUIDELINES FOR EXTERNAL AND LOCAL MATERIAL COLLECTION AND SPECIFICATION OF MAJOR WORK

Introduction

As per the PIM, communities are responsible for procuring, collecting, and transporting both local and non-local materials required for scheme construction. Local construction materials, such as stone, sand, gravel, and timber, are to be collected and transported by the community. In addition, with the support of technical personnel, users shall procure external materials such as cement, reinforcement bars, and other items in accordance with the project's procurement procedures. This process ensures that both local and external construction materials meet the required quality standards.

Stone: Stones should be hard, tough, clean and regular on faces. Stones obtained from quarries are suitable; however, those collected from rivers are usually smooth and rounded in shape. Such stones should be dressed so that their outer surfaces become rough. Stones to be used must not have soil or other impurities attached to them, and they should be washed with clean water before use in construction.

Aggregates: Aggregates should be clean, hard, non-porous, crushed from good quality stone, and free from dirt or other impurities. As far as possible, it must be washed with clean water before use. Contaminated aggregates cause reinforcement bars used in concrete to rust quickly. Aggregate with high percentage of flaky or elongated particles should be rejected. After twenty-four hours in water, a previously dried sample should not gain more than 10% in weight. Aggregates with angular and rough surfaces is considered suitable.

Cement: Cement shall be of Nepal Standard (NS) or Indian Standard (IS) standard (markings). It shall be packaged properly with extra bag to avoid loss during transportation and storage.

- In Nepal, a cement bag must weight 50 kg and the quality standard mark of NS 49 (Ordinary Portland Cement), NS 572 (Portland Cement), NS 384 (Portland Slag Cement), or NS 385 (Portland Pozzolana Cement).
- Cement must be fresh, with the manufacturing date or batch number clearly indicated on the bag.
- Since cement deteriorates when exposed to water, moisture, or vapor, leading to lump formation and loss of quality, proper protection is essential. During transportation, cement bags should preferably be repacked inside an additional bag. When transported by mules, the cement bags should be opened and repacked into 40 kg bags, and special care should be taken to avoid contamination with soil or other impurities.
- Cement must be stored in a location with minimal windows and doors, placed on a timber platform above the ground, and stacked at least 1 foot away from the wall.
- Lumpy or hardened cement shall never be used. Such deteriorated cement must not be reused, even if broken down or powdered.

Bricks: Bricks should be well burnt, uniform shape and free from cracks, lumps and foreign matters.

Timber: Whenever applicable, Sal Wood should be used. If not available, only hard wood locally available in the area shall be used. The timber must be well-seasoned, free from cracks, and straight. Where the timbers need to be embedded underground should be treated with preservative paint to prevent decay and insect attack. In projects, timber is generally used as posts for fencing.

Sand: As far as possible, river sand or quarry sand should be used. The sand must be free from soil, silt, and any other chemical impurities. It should neither be too fine nor too coarse. Before use, sand must always be washed thoroughly with clean water. Sand mixed with soil can be identified when rubbed between the fingers, as it leaves dirt stains.

Water: The water used for all construction works must be clean, free from chemicals, and free from turbidity.

Reinforcement bars: All reinforcement bars used must conform to Nepal Standards. The bars should not have any coating of paint, grease, oil, or other foreign materials. Only fresh and rust-free bars should be used. During storage, the bars must be protected from water to prevent rusting. Reinforcement bars are available in plain, Tor steel, deformed, and other types. While transporting, the bars should be carried as straight as possible without bending. Excessive twisting or bending reduces their strength

Excavation for Pipelines: The pipeline of scheme is like the veins of a human body. Before excavation begins, the technician must mark the alignment on the ground using pegs, and community people should dig strictly according to this alignment. The depth and width of the trench for the pipeline must be as specified in the pipe size design.

Table 12 Excavation of pipeline

Diameter of Pipe (mm)	Width of trench (cm)	Depth of trench (cm)
16 – 50 mm	30-45	90
63 mm and above	60	90

If tree roots are found within 50 cm of the pipeline, they must be removed. If a rocky area is found along the pipeline alignment, pipe should be laid underground with Plain Cement Concrete work. The ground surface of the pipeline trench should be levelled and prepared properly. After the pipes are placed in the trench, they should be backfilled with soft soil, pressed and compacted by foot. Otherwise, the pipes may rise in loose soil and not remain at the required depth. At points where the pipeline changes direction, nearby permanent structures should be marked with paint so that the pipeline can be easily located in the future for maintenance and repair.

Ordinary Concrete: In general, cement concrete is prepared in the following proportions. For each bag of cement (50 kg), the quantity of water used in making concrete should not exceed the specified limit given below.

Table 13 Grade of concrete

Grade of Concrete	Nominal Mix (Cement: Sand: Aggregate)	Quantity Water (Lts) per 50 KG cement
M 10	1:3:6	34
M 15	1:2:4	32

M 20	1:1.5:3	30
M 25	1:1:2	26

For water-retaining structures, a waterproofing compound should be used at a rate of 2% or as specified on the package. For all types of cement works, cement, sand, and aggregate must first be dry mixed in the prescribed proportion and turned over two to three times. Only after this should the specified quantity of water be gradually added while mixing. The mix should not be tamped in a way that allows water to flow out. Once the cement mix is prepared, it should not be kept for long periods and must be used immediately.

Curing: In all construction works involving cement, the freshly placed cement mix must be protected from the harmful effects of sunlight, running water, dry wind, and vibrations. Since the cement hardening process is exothermic, these protective measures are essential. During curing, the structure must be kept moist for at least seven days by continuously sprinkling water. This can be done by covering the structure with jute bags and spraying water or by placing sand over the concrete and sprinkling water.

Pipes: In schemes, two main types of pipes are used to convey water from the source to the distribution point:

a) HDPE (High-Density Polyethylene) Pipes:

These pipes are lightweight, highly durable, and easy to join, making them suitable for rural water schemes. They are available in various sizes and pressure ratings, suitable for use in remote and hilly areas. When procuring HDPE pipes, the following should be considered:

HDPE Pipe Sizing

Table 14 HDPE Pipe Sizing and Series As per SDR

Pipe Size (mm)	Pressure Rating (kg/cm ²)	Supply Length (m)	Coil Inner Diameter (m)
16	12.5, 16, 20	300	0.50
20	8, 10, 12.5, 16, 20	300	0.50
25	6, 8, 10, 12.5, 16, 20	200	0.70
32	5, 6, 8, 10, 12.5, 16, 20	200	0.80
32	5, 6, 8, 10, 12.5, 16, 20	100	0.80
40	4, 6, 8, 10, 12.5, 16, 20	5*	–
40	4, 6, 8, 10, 12.5, 16, 20	100	1.00
40	4, 6, 8, 10, 12.5, 16, 20	100	1.00
50	4, 6, 8, 10, 12.5, 16, 20	5*	–
50	4, 6, 8, 10, 12.5, 16, 20	100	1.25
50	4, 6, 8, 10, 12.5, 16, 20	50	1.25

63	3.2, 4, 6, 8, 10, 12.5, 16, 20	5*	–
63	3.2, 4, 6, 8, 10, 12.5, 16, 20	50	1.50
63	3.2, 4, 6, 10, 12.5, 16, 20	25	1.50
75	2, 3.2, 4, 6, 10, 12.5, 16, 20	50	–
75	2, 3.2, 4, 6, 10, 12.5, 16, 20	6	Pieces

According to NS 40-2042, Fifth Amendment 2079, HDPE pipes must have continuous blue markings 2–5 mm wide and be marked with the Nepal Standard logo. Each meter of pipe should indicate the outer diameter, pressure rating, series, length in meters, Nepal Quality Standard number, and the manufacturer's name.

b) G.I. (Galvanized Iron) Pipes:

GI pipes are used in rocky areas, places where excavation is not feasible, during river crossings, and for various structures. These pipes are coated with zinc to prevent corrosion. During handling and transportation, care must be taken so that the zinc coating is not damaged. When joining GI pipes, white Teflon tape must be used. GI pipes are available in 6-meter lengths, and the threads must be protected during transport.

GI Pipe Sizing

Table 15 GI Pipe Details as per NS

Class		Light Class	Medium Class	Heavy Class
Pipe Size (inch)	Pipe Size (mm)	Weight without socket (kg/m)	Weight without socket (kg/m)	Pipe Size (inch)
0.5	15	1.02	1.28	0.5
0.75	20	1.49	1.66	0.75
1	25	2.11	2.54	1
1.25	32	2.71	3.26	1.25
1.5	40	3.39	3.75	1.5
2	50	4.29	5.28	2
2.5	65	6.04	6.72	2.5
3	80	7.21	8.87	3
4	100	10.49	12.69	4
Color Mark		Yellow	Blue	Red

(NS 199:2046, the pipes must be galvanized mild steel. Each pipe and fitting should be tested at the manufacturing site under a hydraulic pressure of 50 bar (MPa). GI pipes have a circular colour band according to their class. When purchasing pipes, only those bearing the Nepal Standards mark and number, or an equivalent Indian Standards mark, should be procured.)

Precautions Before Starting Construction:

This manual is designed to serve as a practical guide for User Committees and LACC Project staff members at the LG level in implementing day-to-day project activities. Since scheme construction may be the first such experience for many User Committee members and LG staff, the manual aims to provide clear direction and support throughout the process.

1. Checklist: Precautions Before Starting Work:

Construction cannot proceed without:

- A registered, committed, and trained UC is familiar with the scheme.
- A community action plan (CAP) is prepared with the active participation of all users.
- Design, estimates (Easily understandable), layout and structural drawings in clear language.
- Specify the work for Cash and Kind contributions.
- Quality standards and specifications for construction work.
- Identification of high-risk sites/areas and management of safety tools and equipment.
- Environmental Mitigation and monitoring plans.
- Insurance for construction labor.

2. Procurement of External Construction Materials:

Before procurement of external materials for construction, the following documents must be verified:

- Approved and easily understandable item wise quantity and cost of external materials.
- Trained procurement committee.
- Clear list of tools, safety equipment, and external materials.
- Specifications and quality standards for materials.
- Quotation or contract forms.
- Minutes related to procurement.
- Delivery schedule of construction materials.
- Plastic sheets for cement storage.
- Unloading and storage at road head.
- Timely management of transportation of external material in case of further transportation by tractor, mule and labor.

3. Local Material Collection and Transport:

- Clear identification of materials to be collected and transported locally.
- Identification of location, quarry sites of quality construction materials (stone, sand, gravel, etc.).
- Storage locations.
- Selection and identification of collectors, transport personnel and local vehicles.

- Detailed allocation of materials to sites.

4. Storage Arrangements:

The following material should be arranged for proper storage.

- Cement must be stored in rooms with wooden floors.
- Thermochromic Chowk, tools and fittings must be stored in rooms with minimal windows and doors.

5. Work Schedule:

- Role and responsibilities to individuals for work.
- Schedule of main work.
- Curing responsibility division for each structure
- Responsible person for mobilizing human resources and construction materials for structure construction
- Construction starts and end times, warning signage, and safety boards.
- Brief orientation for construction activities and construction safety before starting work.

6. Human Resources:

- Appropriate deployment of Skill and Unskilled labor.
- Information on the importance and impact of construction quality.
- Record keeping of voluntary and paid labor participants i.e. cash and Kind contribution.
- Rotational participation for construction (to ensure the participation by all users).
- Efficient construction plans to minimize cement wastage.
- Reservation for female and marginalized groups in paid work.

7. Progress, Measurement, and Record-Keeping:

- Attendance records Labor (Skill & Unskilled).
- Work progress layout (Color).
- Measurement and record of completed works (Mandatory representation of Users Committee while taking measurements).
- Preparation of construction log sheets (Separate for each structure).

8. Safety:

- Encourage workers to wear protective footwear.
- Use safety equipment when working with sharp tools.
- Apply safety measures at high-risk sites.
- Group accident insurance for workers.

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

- Special attention to construction in steep areas, rock cutting, sand/gravel mining, deep trenches, or tree felling.

Construction work Log Sheet: After completing each structure, the water source technician must update and approve the log sheet. The log sheet is mandatory for final project evaluation.

Construction Work Log Sheet
(Mandatory to be filled for all structures)

Scheme Name:

Structure Name:

Construction Start Date: Construction Completion Date:

SN	Estimated Quantity (as per Estimate)	Actual Quantity Spent
A. External Material		
B. Labor		
1. Skill Labor		
2. Unskilled Labor (Cash Contribution)		
3. Unskilled Labor (Kind Contribution)		
C. Pipes and Fittings		
D. Local Materials		
E. Miscellaneous Items		

Additional rows can be added as required.

Prepared By:

.....

Checked By:

.....

Approved By:

.....

Water Resources Technician

Sub-Engineer

Committee Chairperson /
Nominated Committee
Member

Date:

Note: The quality of materials should be ensured as per “LACC Project Handbook for Quality and Specification of Construction Materials, 2025

17 EXTERNAL AND LOCAL MATERIAL TRANSPORTATION AND STORAGE

One of the key responsibilities of the Users Committee is to ensure quality and transparency, which requires the proper transportation and storage of construction materials from the market to the scheme site. Any misplacement or damage of materials during transport or storage can adversely affect construction. Therefore, all materials must be properly documented upon receipt and use.

This guideline is designed to support the Users Committee in both the transportation and storage of materials while enhancing its capacity in storage management, thereby contributing to long-term sustainability. To ensure durable management of materials, it is also essential for the Users Committee to establish a storage management system for future maintenance and repair needs.

Objectives:

- Assist Users committees in material transport and storage.
- Support record-keeping for material (Income/Expenditure).
- Storage Management Process
- Essential materials must be procured first based on need.
- Assign a procurement committee and responsible personnel during preparation of CAP.
- Decide storage locations during CAP.
- Follow the external material procurement guidelines, which describe the procurement lasers (Accounting), and transportation processes in detail.
- Selected personnel are responsible for transport quality, quantity, and condition.
- The technicians of the Local Government Project Implementing Unit, the project can assist in checking the quality during the transportation of materials and will submit the handover and quality verification report of the purchased materials to the municipal unit.
- The selected persons must ensure whether materials, especially cement, tools, and fittings, have been properly transported and whether the storage rooms are well arranged or not. Special attention must be given to materials such as cement, tools, and fittings.
- Before moving materials from the transport vehicle into the storage room, the quality of each item must be checked in detail one by one.
- While transporting materials from the roadside storage room to the scheme site, the designated person must keep records of each and every material.
- The person responsible for storage management must always record every arrival and dispatch of materials and locations.
- Materials kept in the storage must be entered into the income account. Likewise, after dispatching materials to the person carrying them, it must be entered into the expenditure account, and the recipient must provide their signature after receiving the materials.
- The Users Committee must arrange a main storage room for all materials near the scheme site.
- Similarly, records must be maintained on separate sheets for each type of material.
- In case of any breakage or loss of materials, the Users Committee shall be held responsible.

Note: Details regarding external materials transport and storage management will be discussed in the pre-construction seminar, with the content already mentioned in Section 15.

18 SECOND PUBLIC AUDIT

Public Audit is a key tool to inform all users and stakeholders about the schemes and activities implemented at the local level. It is conducted in a mass meeting with the participation of all households involved in the scheme. In activities supported by the Local Adaptation to Climate Change Project (LACC Project), public audit is the primary method to ensure transparency. Public audit not only helps maintain the quality of the scheme but also maximizes its sustainable benefits. A minimum of two public audits is conducted during the implementation phase of the scheme. The second audit is organized immediately after the procurement of external materials and the collection and transportation of local materials to the scheme site. This chapter provides guidance to the Users Committee and the LGU staff for implementing the LACC Project on ensuring transparency, fostering ownership, and effectively conducting public audits.

Objectives of Public Audit

GENERAL OBJECTIVES OF PUBLIC AUDIT:

- Notice community people and concerned stakeholders on their scheme activities and implementation process and progress.
- Demonstrate commitment of UC to community people that the scheme is getting done in a transparent way.
- Trigger users feeling of ownership in the scheme activities.

SPECIFIC OBJECTIVES OF SECOND PUBLIC HEARING:

- Presentation of income/expenditure status of scheme and its approval by users.
- Explain procurement process and procedures.
- Review of CAP and scheme progress compared to CAP.

Stakeholders of the Public Audit

- All Users Committee members
- More than 75% of the users representatives (50% of whom must be female).
- Representatives from the Local Government and LG Executive Office.
- Members of the Ward Committee of the concerned ward.
- Representatives of political parties from the concerned area.
- Representatives of civil society.

Local Government Project implementing Unit (LGU) staff shall provide facilitation and support from the beginning for organizing the public audit. The report of this public audit must be submitted when requesting the second installment of the scheme.

Records and Preparations Required for the Second Public Audit

- UC Minute Book
- Procurement Committee Minute Book
- Received quotation and comparative charts
- All other procurement related documents
- Income & Expenditure Book

- Design estimate and implementation phase agreement.
- Bill Voucher File
- Store Recording Book
- Labor Attendance and Payment Record Book (Dor Hajir Faram)

Topics of discussion for second public hearing:

- Quality and Quantity of materials
- Unit price against estimated rate
- Means and Cost of transportation
- Name of Supplier/s and quality of services
- Storage of materials in road head and site.
- Quantity and Quality of materials transported to the site.
- Following of procurement process.
- Status of local materials collection
- UC and procurement committee decisions
- Installation of project information board
- Book and account keeping
- Cash in hand with procurement committee and any of the UC members
- Support received from LG, Ward Office, institutions, and other agencies

Public Audit Reporting: After completion of the event, detail report on public audit will be prepared by UC. For this, Local Government Project implementing Unit (LGU) staff shall facilitate and provide support. The report should be formulated as per attached format.

Process of conducting Second Public Audit: This event is organized after procurement and transportation of first batch construction materials as per procurement plan. This audit is the most important event as all income and expenditures till the date are discussed. Following process shall be followed while conducting this event:

- **Preparation of** income expenditure statement of the scheme by UCs.
 - Mass meeting organization.
 - Presentation of income expenditure statement including NRDF and UCs Cash & Kind.
 - Show receipt vouchers of the expenditures incurred during material transportation including the receipt of the supplier.
 - Verify the bills, receipts and other documents (quotations, UC meeting minutes etc...) with respect to the presented income and expenditure.
 - Allow users to raise their comments (if any) and clarify the comments.
 - Discuss the problems faced, if any. Capture the public voices
 - Request all users, participants to take part in the discussion, clap their hands and accept the discussed matters.

- Keep records of the discussions in the minute register getting signatures of all participants.
- Update project information board if found any changes.

Finalize the public audit report (as per format) and have signatures with stamp of UC in every page of report. Closing the public audit meeting.

REPORT FORMAT FOR SECOND PUBLIC AUDIT

1. SCHEME PROGRESS (FOR SECOND PUBLIC AUDIT ONLY):

a) CAP vs Achievement:

Table 16 CAP Vs Achievement

S.N.	Scheme activities planned as per CAP	Date as per CAP	Progress achievement ref. CAP	Causes of under achievement (if any)	Remarks
	Add rows as needed				

b) Assurance of other activities in mass meeting: *(add space/rows as needed)*

Table 17 Assurance of other activities in mass meeting

S.N.	Activities	Progress	Remarks
1	What construction materials are procured?		
2	How much cement, pipe, tools and fittings etc. are procured?		
3	What is the unit and total price of the aforesaid materials?		
4	Who were suppliers/manufacturers of the materials?		
5	How much spent on transportation and storage?		
6	What were the means of transportation?		
7	What is the condition of transported materials?		
8	Are materials procured in planned time? If not, justify.		
9	Is the quantity, quality price is reliable? If not, justify.		
10	Is the procurement policy followed up? Is bills, receipts and quotations are genuine?		
11	Are the local materials being collected as per CAP ? if not why ?		
12	Is community contribution is (Cash+kind) going on?		
13	Are there decisions made by UC before procurement? If not, justify.		
14	Are the decisions made by the UC are participatory from GESI aspect?		
15	Is project board is installed. If not justify.		
16	Are community people informed income and expenditure of the scheme? If not, why?		

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

17	Are bookkeeping and other financial management documentations maintained? If not, what are the causes, justify.		
18	Are the safety tools & equipment's properly used by labour in the construction site?		
19	Are there any advances with UC? How Much and why it is not settled?		
20	Is there equal opportunity to all users of local employment generated by the scheme construction? If not, who control such opportunity and why?		
21	Are constructed structures of the scheme correct as per the design & estimate? If not, what are the factors of variation?		
22	Is there enough technical and other support by Local Government Project Implementation Unit (LGU) staffs? If not, justify.		
23	Is Step-By-Step followed up?		
24	Does LG support as per the Memorandum of Understanding and scheme agreement document/s? If not, why not?		
25	What were the problems faced and what were the way out made and who supported for it?		
26	Other (if any)		

2. INCOME AND EXPENDITURE (ENDORSED BY THE MASS MEETING):

Income and Expenditure accounts should be formulated in following format and endorsed in mass meeting in the minute book. Photocopy should also be attached herewith the report.

Income

Table 18 Income and Expenditure Format

Sources of income (mention cash or materials received from where)	Cash or materials	Remarks

Expenditure

Table 19 Expenditure Format

Expenditure detail	Rate	Quantity	Total
1. Materials (which materials are procured)			
Add rows as needed			
2. Wages (how much paid on which work)			

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

3. Kind (how much)			
4. Management cost (Transportation and others)			

Stock

Table 20 Stock Book Format

Description	Amount/quantity	Remarks
1. Cash		
Bank		
Cash receivable (detail)		
2. Materials		

Sundry Creditors (payable amount)

Description	Cash/Quantity

.....

Prepared by:

Name:

Designation:

Date:

.....

Verified by:

Name:

Designation:

Date:

.....

Approved by:

Name:

Designation:

Date:

3. Discussions held in the mass meeting and comments of the users

During the public audit, the questions and comments of the users must be recorded in their own language in order to explore and discuss the actual matters. In addition, such matters should also be presented by asking them to write based on their own experiences. Such matters must be recorded as follows.

Table 21 Discussions held in the mass meeting and comments of the users

SN	Designation and Address	Questions and Comments	Signature

.....		
Prepared by:	Verified by:	Approved by:
Name:	Name:	Name:
Designation:	Designation:	Designation:
Date:	Date:	Date:

4. Major points observed in the scheme (Local Government Project Implementation (LGU) Unit)

5. Suggestions and Recommendations (Local Government Project Implementation (LGU) Unit)

6. Summary (Local Government Project Implementation (LGU) Unit)

Name:

Designation:

Date

(Representative Local Government Project Implementation (LGU) Unit)

19 UC FINANCIAL MANAGEMENT REFRESHER TRAINING

Introduction:

UCs members get financial management and record keeping knowledge in preparatory phase. One day review training/workshop will be organized for UC members for practical knowledge on financial management, bookkeeping and storekeeping during Implementation Phase. UC must be able to maintain records of the income and expenditure systematically as per financial regulation of LG.

Duration:	1 day
Timing:	Before During Construction Workshop
Participants:	All UC members, Chairperson of monitoring committee, Ward representative.
Resource persons:	Field coordinator, Water Resource Technician and Social Mobilizer.
Organizer:	Local Government Project Implementation Unit

Objectives:

- Provide the practical knowledge on financial record keeping (income and expenditure of fund, cash/advance payments) to UC members
- Review the quality and quantity of materials and provide the practical knowledge on store management (Update of entry and issues materials, record keeping of construction materials and tools, and maintaining proper documentation).

Expected result:

After this training, UC members will be able to keep the proper store record, account record, labor record.

- They will be reminded of the process of properly maintaining records of financial transactions related to income and expenditure as well as the store ledger.
- Maintain record of skilled/unskilled labour payment and kind contribution as well.

Required materials:

Bills of materials, design estimate reports, bookkeeping, store ledger, vouchers, calculator, marker, black/white board/brown paper etc.

Training Topics 1day:

Sessions	Time	Activities and materials to be used
Session I Introduction & Objective of the training Review of bills; HDPE/GI pipe Fittings and Tools Construction materials (cement, steel etc.) Transportation (vehicle, porter, mule etc.) Others (labour etc.)	30 min	Approved quotation UC minutes Bills of materials Record keeping of UC
Session II Practical works on account Income posting in ledger book. (LG, User, NRDF fund etc.) Expenditure posting /Record keeping of payments (Cash, advance)	120 min	Approved quotation Bills of materials Record keeping of UC
Session III Practical work on Store management Review of Quantity and quality of materials. Materials entry in ledger book (consumable and non-consumable materials) Issue of materials and managing the stock book. Maintaining the quality of materials in store. Curing the structures and schedule	120 min	Approved rate (quotation) Payment of material bills Accounts of the UC
Session IV Preparation of income/expenditure statement	60 min	
Session V: Closing the training	30 min	

Note: The LG unit staff implementing the project may prepare the subject matter, table and sessions in a more detailed form as required, without omitting any content.

20 VILLAGE MAINTENANCE WORKERS/OPERATORS SELECTION AND TRAINING

Introduction:

Sustainability of any of the scheme depends very much upon how the UC/Users take the ownership of the scheme. It is the responsibility of UC to care, maintain & operate infrastructure, with a clear Community Action Plan (CAP) from the beginning of the construction work. Therefore, at the beginning of project implementation, the Users' Committee must select Village Maintenance Worker (VMW) or operator from the users. If the village maintenance workers or operator are selected during the mass meeting held at the end of the project preparatory phase, they can participate in the construction activities of the project and gain detailed knowledge about the scheme.

The same method should be used when selecting pump operators for lift schemes. After the construction work is completed, the role of Village Maintenance Workers or Operators is crucial for the effective implementation of the schemes. Past experiences shows that the regular operation of the scheme depends on the performance and mobilization of the Village Maintenance Workers or operators. Therefore, the Users' Committee must exercise great care when selecting Village Maintenance Workers or operators. The criteria for selecting Village maintenance workers and operators, along with their job descriptions, are also outlined in the Operation & Maintenance regulations.

VMW or Operator Selection Process:

Village Maintenance workers or operators must be engaged in the work from the very beginning of the construction scheme. This enables them to gain knowledge about the project's various structures, pipelines, and construction processes. The village maintenance workers or operators should be provided with training during the project implementation phase itself.

- The Users' Committee shall determine the criteria for selecting Village Maintenance Workers and inform the community about these criteria. If necessary, the criteria may also be revised.
- Selection Process of VMW in water supply & MUS schemes, Pump Operator in lift scheme and care takers/ operators in irrigation schemes. In lift schemes, VMW & Operator prefer with same person rather than different one to economize the remuneration cost:
 - Local and person from the users' household only
 - Age between..... to.....
 - Priority to female, Dalits, indigenous peoples, persons with disabilities, and marginalized communities.
 - Positive in engaging of social volunteer
 - No plan for going outside or India for work other than scheme area
- The Users' Committee shall present the criteria to the community and prepare a list of interested individuals for approval through the mass meeting.
- A written commitment to work must be obtained from the selected individuals.
- The selected individuals must be provided with training, appointed with a clear job description, and paid their remuneration on a regular basis as per scheme O&M regulation.
- The Users' Committee must select two Village Maintenance Workers, of whom at least one must be a woman, and both must receive the necessary training.

- Clear job descriptions must be prepared, assigning responsibilities to the male and female Village Maintenance Workers, and they must also be nominated for training.
- An appointment letter must be issued, clearly mentioning the terms of service and remuneration.

Roles and Responsibilities of VMW are as follows.

- Participate in all UC meetings and know/inform the working status of scheme
- Proper use and maintenance of scheme's tools
- Inspect the scheme from catchment to tap areas regularly
- Maintain and operate the small doable work and for other maintenance work beyond VMW
- capacity inform UC and receive external technical support for O&M
- Regularly clean all scheme structures
- Support females' group for optimum water use in HH tap as per required.
- Motivate household for maintenance of the scheme structure & taps
- Protect catchment areas; surroundings of water source area and motivate community people for afforestation activities
- Motivate Community for toilet use, total sanitation activities and efficient, multiple and productive use of water for agricultural productions.
- Perform all other duties as required for sustainability and functionality of the scheme as advised by UC
- Take the lead in implementing climate-resilient water safety plans with the support of the Users' Committee.
- Advise community to use wastewater from water taps to their home garden
- Provide extra care and attention to the watershed area during the rainy season.

Roles and Responsibilities of Pump Operator

- Participate in all UC meetings and know/inform the working status of lifting components.
- Proper use and maintenance of pumping components like solar panels, pumps, electrical meters, boards
- Maintain and operate the maintenance work of lift components and inform UC and receive external technical support for large scale work.
- Regularly clean all solar panels and casing pipe for pump propeller erosion.
- Motivate household for care take of solar panel, intake chamber and base tank silt washing.
- Perform all other duties as required for sustainability and functionality of the lift components as advised by UC
- Take the lead in implementing climate-resilient water safety plans for water supply schemes with the support of the Users' Committee.

Roles and Responsibilities of Irrigation Caretakers

- Participate in all UC meetings and know/inform the working/operation status of scheme
- Proper use and maintenance of scheme's tools

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

- Inspect the scheme from intake catchment to branch canal or off tap areas regularly
- Maintain and operate the small doable work and for other maintenance of canal & pipe system. Inform UC and receive external technical support for large scale maintenance and O&M.
- Regularly clean all scheme structures
- Support farmer's group for optimum water use in the land and prepare the rotational schedule for irrigation and make followed by the farmer.
- Protect intake catchment areas; surroundings of water source area and motivate community people for afforestation activities
- Motivate Community for total sanitation activities and efficient, multiple productive use of water for agricultural productions.
- Perform all other duties as required for sustainability and functionality of the scheme as advised by UC
- Advise community to use wastewater from water taps to their home garden.
- Provide extra care and attention to the watershed area during the rainy season.

Termination of the work of Village Maintenance Worker or Operator

In case VMW or Operator do not perform the job, her/his appointment as VMW or Operator will be terminated through the decision of users' mass meeting. UC can appoint the second trained person as VMW/Operator/Caretaker. If this isn't feasible, then new VMW/Operator/Caretaker should be selected and trained as soon as possible to avoid a gap in operation and maintenance.

TRAINING TOPICS FOR VILLAGE MAINTENANCE WORKER

Day/ Class	Session I	Session II	Session III	Session IV
	1.5 Hour	2.5 Hour	2.5 Hour	1.5 Hour
1st Day	Opening, Introduction, Rules, Pre-test, Objectives, Preparation and management of Basic Facilities, Role and Responsibility of VMW, Safety Consideration During Construction			
2nd Day	Introduction to Basic and Comprehensive Hygiene Sanitation Health Hygiene Types of Sanitation	Relationship between water & sanitation What is water? Importance of water for our health Water quality Fecal- contamination route (4Fs) water-borne diseases Importance of hand washing, hand washing at critical times with soap Last two-year status LG's water born disease	Source Conservation Water Cycle Types of Sources and Their Conservation Recharge, Collection, and Reuse Methods of Recharge Risk Reduction and Impacts of Climate Change with Adaptation Climate-Resilient Water Safety	Understanding concept of Engineering drawing Plan, Section and Elevation Measurement units (mm, cm, m, inch, feet) Relation between Metric unit and British Unit Area and Volume calculation

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	(Diarrheal epidemic) by Health Post	Read drawings and transfer them onto the ground.	
3rd Day	Review of the Previous Day, Construction Materials and Quality Local Materials (sand, stone, aggregate, water, wood, bamboo, mud etc.) Non-local materials (Cement, Rebar, GI wires, Pipes, Other construction materials etc.) Tools and fittings Construction of Climate-Resilient Structures Introduction Earth works in excavation and filling Stone Soling, Stone masonry (dry, cement mortar) Water cement ratio Plain Cement Concrete, Reinforced Cement Concrete, Curing Ferro cement works Plaster, punning, pointing Form work, Fencing, gabion work etc. Painting		
4th Day	2 Hour	6 Hour (Practical Session)	
	Components: HDPE pipes (Size, series, markings, pressure etc.)	Method of Making Polythene Pipe Fittings: T-pipes, Y-pipes, and reducer pipes. Preparation of pipe segments and using a mechanical jack, including methods for connecting.	
5th Day	Continuation of the previous day’s practice of making fittings from polythene pipes		
6th Day	1 Hour	2 Hour	5 Hour (Practical Exercise)
	Review of the previous day. Introduction to basic and personal water supply systems, MUS schemes GI Pipes: Size, Class, Color	Importance of Quality Construction in Maintaining Drinking Water Quality; Introduction to Structures of Drinking Water and Small Irrigation Systems: Soil Cement Tank, Plastic Tank, Sprinkler and Drip Irrigation Systems	Measuring water source (using bucket and clock methods) Joining GI and polythene fittings Installing GI pipes and fittings in structures, threading GI pipes

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

		Studying pipes and fittings in a nearby scheme
7th Day	Review of the previous day Climate-Resilient Water Safety Plan Monitoring Activities	Practical work Intakes & Catchment protection work Laying and jointing of pipes in trench Layout and construction of tap stand
8th Day	Review of previous day Practical continuation: Layout and construction process of ferro cement RVT	
9th Day	Review of previous day Practical continuation: Layout and construction process of ferro cement RVT	
10th Day	Review of previous day Practical continuation: Layout and construction process of ferro cement RVT	
11th Day	Review of previous day Operation and Maintenance of Schemes Operation and Maintenance fund Water tariff VMW/Caretaker/Operator Quality control	Practical Continuation: Ferro cement tank, Tap, Interruption Chamber & other structures
12th Day	Review of previous day Sample collection for Presence/Absence vial test, CR-WSP check list	Practical Continuation: Ferro cement tank, Tap, Interruption Chamber & other structures
13th Day	Review of the previous day Communication, Leadership, Participation, Problems in the Water Supply System, and Their Control and Improvement Measures	Household water treatment methods: Sedimentation, Boiling, Filtration, Chlorination and sodis Disinfection of structures (chlorination) Practice replacing washer at the tap
14th Day	Commitments, final tests and evaluation Interaction with users in training area and closing	

Based on the above topics, 7-days refresher training schedule for village maintenance workers can be prepared.

TRAINING CONTENT FOR PUMP OPERATOR

Day/Class	First	Second	Meal	Third	Fourth
	1.5 Hour	1.5 Hour	1 Hour	2.5 Hour	1.5 Hour
1st Day	Opening session, expectation from participation, Field problems and solutions made during operation of solar lifting water scheme Pretest	Introduction of Project, Role of pump operator, concept of lift system, and technology option in LACC Project		Electrical and solar lift water supply schemes components Orientation on safety measures and tools used in the lift system	Orientation on solar modular and control panel/panel board etc.
2nd Day	Review of the 1st day Orientation on the solar voltage connection, how to AMP/Voltage measurements.	AMP/Voltage calculation	1 Hour	Brief orientation on pump and lighting/ earthing and lighting arrester system (Types, capacity, power need to pump etc.)	
3rd Day	Review of day 2nd Field visit for practical on solar water lifting system and its operation system and familiar with all components	Practice on panel replacement and control panel replacement			
4th Day	Earthing system connection/replacement and checking its working status	Practice on pump installation/replacement and its operation system			
5th Day	Importance of O&M and water tariff collection	Total Sanitation, CR-WSP, CCA/DRM, GEDSI Integration, Functionality and sustainability of lift water supply system, Any further clarification on technical issue if any?			Overall review of the training, Closing Post test

21 DURING CONSTRUCTION SEMINAR

Introduction

During construction seminar shall be organized simultaneously with the second public audit. The objective is to strengthen the capacity of the UC in scheme-related responsibilities, enabling them to efficiently carry out daily tasks during the implementation phase. The Local Government Project Implementation Unit will organize the seminar when the implementation activities are halfway. The UC shall be informed to bring all necessary documents (e.g., store records, accounts, bills, design estimates, CAP, UC meeting minutes, etc.) to the seminar.

Objectives

- Provide support in the implementation of the community action plan and update it as necessary.
- Identify and resolve the scheme related problems (technical, management, social etc.) to ensure the stipulated construction quality and time frame.
- Facilitate the preparation of bills of payment and other necessary documents required for the release of the second instalment from LG.

Details of the Seminar

Duration:	1 day
Timing:	After the Financial Management Refresher Training
Participants:	All UC members (the members of the construction sub-committee if applicable), Representatives from ward
Resource persons:	Field coordinator, Water Resource Technician and Social Mobilizer.
Organizer:	Local Government Project Implementation (LGU) Unit

Methods

Local Government Project Implementation (LGU) Unit staffs should encourage both female and male members to actively participate in an engaging, express their views and participatory manner.

- Group discussions.
 - Presentation of the scheme progress report by the UC.
 - Review the CAP and take necessary action.
 - Necessary discussions for the implementation of the Environmental Mitigation & Monitoring Plan.
 - Presentation of financial statement on scheme by the UC.

Expected outcomes

- Disputes related to the project (including source, labour and social issues among others) will be addressed and resolved, with the stakeholders concerned taking necessary initiatives for their resolution.
- Improvement measures planned (if needed) to ensure quality in construction.
- Users aware of the progress of the scheme.

- Users aware of the financial situation.
- The community action plan will be reviewed and revised as necessary.

Materials needed:

- Design and estimate of the scheme
- Implementation agreement document
- CAP of the scheme
- Environmental Mitigation and Monitoring Plan
- Final layout, Community Map
- Flex, markers, brown papers etc.
- Presentation of bills, payments and accounts

Topics of the Workshop – Day 1

Topic	Time	Activities and Materials to Be Used
Session I Introduction Objective of workshop	15 min	Let the UC members discuss first. A resource person will review all the bills and payment accounts and provide necessary suggestions.
Session II Identification of problems and solutions. Present the progress of the scheme according to the action plan, along with discussing scheme-related disputes and issues such as social, management labour, investment, store, procurement, and safety issues, etc. (Collect separate opinions from female and male on existing and potential problems and possible solutions). Income/expenditure presentation and approval from the users.	60 min	
Session III Discussion of UC's recommendations. Discuss and revise the CAP if necessary. Focus on sanitation and maintenance aspects in relation to the continuity of the sustainable scheme. Check all the records i.e., store book, account book, bills, meeting-minute book etc. Give feedback on bookkeeping and records of the UC.	150 min	

Feedback form & its implementation.	
Check the store, remaining materials and quality of construction work. Ensure they are properly stored.	
Session IV	15 Min
Conclusion of the day's discussion summary and closing.	

Note: Important topics, decisions and detailed participant information (gender and ethnicity) raised during the workshop must be clearly documented in the progress report submitted to the LG office. Questions raised separately by female and male should also be distinctly recorded.

22 SCHEME IMPLEMENTATION AND COMPLETION

Before the construction of any schemes, detailed design and cost estimates are prepared. The cost estimate includes all the components to be implemented in the schemes. By incorporating these components and activities, the community must prepare a community action plan before the implementation phase begins and follow the planned activities as per schedule. Plan also includes the capacity building activities for the users, UCs, VMWs, operators in water supply and operators/caretakers in irrigation schemes and development of CR-WSP in drinking water schemes, operation & maintenance plan and implementation according to that plan. In addition to scheme implementation, CAP developed under the scheme also includes various capacity development activities related to climate change adaptation and disaster risk reduction. Generally, the scheme is considered as completed only after the user committee accomplishes the following activities with the facilitation of the LGU staff and Local government.

Construction of scheme structure and components

- Designed & estimated components like Intakes, Collection Chambers, Distribution Chambers, Reservoir tanks, Taps, GI support blocks etc. each structure with standard quality and its services.
- Completion of Fencing work of all structure as per the estimation.
- Completion of painting work in all the structures.
- Completion of excavation and back filling of transmission, distribution and HH pipelines.
- Completion of climate resilient activities related to source protection, improvement and plantation as per estimates.

Capacity Building Related Activities

- Following activities must be completed with improvement in capacity of user committee and users.
- Preconstruction and during construction Seminar
- Planned Refresher training like financial management & account keeping
- VMW/Operator training
- Public auditing at least two times during implementation phase

- Timely monitoring of schemes progress including the mass meetings

Climate change adaptation and disaster risk reduction related activities

- Completion of source protection, improvement and plantation/turfing activities as per estimation
- Proper Intake packing with following the standard process (covering plastics, boulder stone and turfing layer as far available)
- Completion of the recharge pit or ponds or trench in upstream area of intake as per plan
- Completion of Retaining walls, gabion work in the places where landslides are highly vulnerable
- Proper use of wastewater from taps and overflow of RVTs in home garden or manage in drainage system
- Completion of proper surface drain (earthen trench) around the structure for flood control.

23 WATER SUPPLY SCHEME SYSTEM DISINFECTION

* Applicable for drinking water supply schemes only

A) Chlorine use and storage:

In rural water supply systems, disinfection of water is seldom done. It is essential to disinfect structures and pipes prior to the distribution of water to the consumers. There are always chances of fecal matters getting entry, remaining into the structures and pipes through different mediums, especially construction materials like sand & stone, tools and humans involved in construction work. For this purpose, Chlorine is widely used as a disinfectant.

Chlorine: Chlorine kills bacteria in water and makes it drinkable. Chlorine is available in both gas and solid form. Chlorine is available in solid form as “bleaching powder”. The amount of chlorine to be added to water depends on the quality of the water and the level of pollution. Chlorine is available in the market as bleaching powder, which contains 25% to 35% chlorine. As this gas evaporates and leaves only limestone, the bleaching powder should be kept in a closed container so that no air can enter. Since chlorine can chemically corrode iron or other metals, it is advisable to store them in a plastic container with a lid. This is important to consider as the amount of chlorine and the amount of bleaching powder vary. When storing bleaching powder, it should not be kept in a damp place and should not be allowed to come into contact with moisture.

DOSE: The chlorine dose depends upon many factors but here it is taken as guided by bleaching powder requirement, volume 6: water quality and simple treatment of “*design guidelines for community-based gravity flow rural water supply schemes*”.

B) Amount of chlorine in drinking water and method of use in emergency situations:

The chlorine we put in kills bacteria in drinking water and reduce chemical reactions to ammonia and other compounds. The maximum amount of chlorine in water is kept in the tap at a rate of 0.5 mg per liter. Even if it is initially kept at 0.5 mg per liter, if 0.2 mg per liter of chlorine is found in the tap, the water is safe to drink. There are various methods available in the market to check how much chlorine is in the water.

Amount of bleaching powder (Thumb Rule) to use for drinking water in emergencies

Table 22 Bleaching powder quantity for drinking water disinfection

S.N	Source condition	Bleaching powder quantity for drinking water disinfection
1	Safe source, unlikely of contamination	4 mg/L (4 gm/cum)
2	Safe source but likelihood of contamination	6 mg/L (6 gm/cum)
3	Stream or open source	8 mg/L (8 gm/cum)

C) How to make and use chlorine solutions (in an emergency)

Precautions: Chlorine is very corrosive so enough precautions must be taken while handling.

- It attacks mucus membrane so direct breathing while preparing solution must be avoided.
- Hand gloves and masks over mouth must be used.
- Bleaching powder must not be touched by bare hand. Gloves or plastic must be used.
- Bleaching powder must be kept in airtight container, in dry place and away from direct sunlight. It must be kept away from children.
- Immediately clean hands and cloths if chlorine solution is spilled.

Required materials:

- Required amount (weighed) of bleaching powder
- Rubber gloves
- Thin wooden stick
- Cloth or mask to cover nose and mouth
- Clean water & plastic bucket or jug

Process:

- Take the bleaching powder quantity as above condition. If the source falls under s.n 1, and the reservoir is 5000 liters capacity, calculate bleaching powder as $4 \text{ gm/cum} \times 5 = 20 \text{ gms}$. Measure bleaching powder weight.
- Take this weighted bleaching powder in a clean plastic jug and pour water with continued stirring.
- Let the solution stand still for at least 5 minutes. The settled sludge should be disposed of safely.
- Pour the clear solution into the reservoir when it is empty (ie after supply at evening time) near the inlet pipe. Fill the reservoir full and close the inlet valve.
- Chlorine solution needs thorough mixing and contact period of at least 30 minutes.
- This water must be kept in the reservoir for at least 30 minutes before using it for drinking.
- If there is smell of chlorine, water should be aerated but never mixed with untreated water. Aeration could be performed by pouring into 2 glasses.
- Above process is performed every time when the tank is filled.
- If above process could not be followed, Point of Use treatment should be done prior to use of water.

D) Structure Chlorination:

As per “Health Aspects of Plumbing, World Health Organization / World Plumbing Council 2006” recommends dosing chlorine concentration of 20 mg/L for system chlorination prior to commencing the system or after maintenance of the system.

Precaution: before performing structural chlorination:

- All users must be notified about the disinfection activities and ensure that the chlorinated water must not be used for any purpose.

Dose: Assuming 25 % chlorine in bleaching powder, the required dose of bleaching powder is $4 \times 20 = 80$ mg/L (80 gm/cum).

Process:

- Calculate the size of the reservoir in cum.
- Calculate the dose by multiplying by capacity of the reservoir (If the capacity of a reservoir is 5 cum, then the dose is $5 \text{ cum} \times 80 \text{ gm} = 400 \text{ gm}$)
- Weigh this quantity of bleaching powder.
- Prepare the solution as above, taking precautions mentioned above.
- Pour the solution into the tank when empty.
- Fill the tank with water thoroughly mixing of chlorine solution. When filled, close the inlet valve so that there is no overflow.
- Wait for 2 hours before flushing out.
- Keep on flushing reservoir till the smell of chlorine dies off.
- Check coliform by P/A vial.
- For chambers where water cannot be retained, surface should be wet by chlorine solution continuously for 2 hours.

This method of chlorination is not for continued supply system. Chlorine dose must not be used more than specified here.

24 THIRD PUBLIC AUDIT

Introduction

Public auditing is an appraisal of the output against investment and activities related to the development work. It ensures actual investment, income, quality and quantity of the work, procedures of the activities carried out and thereby corrective measures among concerned stakeholders. In LACC Project, public auditing is treated as one of the most important events of the scheme cycle and is conducted after completion of all scheme level activities by UC.

Public auditing is conducted through mass meeting of the users and other concerned stakeholders as well. The Public Audit of the scheme is done in the same day of final monitoring of the scheme.

Duration: 1 day for the workshop

Timing: After completion of all implementation phase works

Organizer: Local Government Project Implementation (LGU) Unit

Objective of Public Auditing - Main objective of public auditing is to:

- Audit the expenditure and activities publicly and approve it through mass meeting.
- Analyze problems faced and their solution for future reference.
- Analyze and identify the proper mechanism for sustainable operation of the schemes to be addressed in post construction phase.
- Ensure the project benefit reach to the target group.
- Promote ownership of the scheme through transparency.
- Assure proper use of allocated fund for the scheme aims to maintain quality in the schemes for sustainability

Stakeholders for Public Auditing - Major stakeholders are listed below:

1. UC members
2. All skilled labor (workers)
3. Representatives from beneficiaries HHs (50% female is compulsory)
4. Ward representatives
5. Ward level political party representative or other community leader
6. LG officials and elected representatives
7. Civil society representative (if any)

Following documents should be maintained by UC in the scheme.

1. UC Minute Book
2. Income & Expenditure Book and statement
3. Bill Voucher File
4. Design report and agreement paper of the scheme
5. Store Recording Book
6. Labor Attendance and Payment Record Book (Dor Hajir Faram)
7. Incoming and Outgoing Letters Record Files.
8. Visiting Register/Issue Logs

Public Auditing Tools

1. Social Map
2. List of Beneficiaries
3. SWOT Analysis
4. Questionnaires
5. Income and Expenditure of the Scheme
6. Financial Management related relevant Documents
7. Participatory Observation
8. Interview with few participants
9. Participatory Discussion on Subject Matter
10. Feedback

Public Auditing Process

Public Auditing is conducted at the end of the implementation of the scheme before releasing final instalment to UC. UC and Local Government Project Implementation (LGU) Unit in consultation with

ward and LG are jointly responsible for organizing this meeting following the processes mentioned below:

- The monitoring team from the LG/Project will visit all the structures from source to tap and confirm the completion of all the activities before the mass meeting. The team also discusses with female/Dalit, PWD, and other marginalized beneficiaries, VMW, mother group members etc. about their feeling on the scheme, its completion process and role and responsibility performed by UC, LGU, LG and other stakeholders. The voice of such beneficiaries will also be captured and documented.
- Call mass meeting at the scheme area and ensure full participation of the users and the stakeholders concerned. Information should be delivered to all participants seven days before the event. It should comprise date, time and venue of the public auditing. It's also advised to display the notice in public places, Ward Office, school and other institutions.
- Present the benefits of the scheme that includes total beneficiaries, employment opportunity, O&M fund, VMW etc.
- Present scheme of completion activities and financial reports in standard format. Such statements shall be completed and minute in UC register before conducting public audit.
- In the statement it should be very clearly mentioned about bank balance, cash in hand (mentioning the name of cash holder), due payment (disaggregating supplier, skilled labor, unskilled labor, transportation, store rent etc. it should follow component cost heading of design estimate). All the expenditure should be compared to estimated costs according to the heading wise breakdown made in estimate report of the scheme.
- Please refer to the second public audit paper for suggested discussion topics.
- Present the status of left over materials with present value. The meeting should also decide on utilization of those materials. The masses may decide to keep required leftover materials for O&M purposes and sell extra or perishable (e.g. cement) to another nearby scheme. If there is not another ongoing scheme in the area, it can be sold to individuals or other institutions. The cost of the sold materials should not be less than original cost including transportation cost.
- Present status of tools in the scheme. Quantity and present status of the tools should also be presented. If some of the tools are lost or broken, it should be verified by the then UC meeting. All the tools are users' property so they should be kept safely for future O&M purposes.
- It is suggested to decide on mobilization and mode of payment of VMW/Pump Operator, fixation of water tariff and discussion should be made for O&M and CR-WSP along with O&M regulation.
- Open the floor to general users and monitoring team for discussion.
- Carefully listen to the comments/queries from the audience and respond to them. Also submit evidence if needed. UC should be well prepared with necessary documents and evidence before appearing in public auditing meeting. The trust of the users to User Committee directly affects the sustainability of the scheme.
- Discuss with the users about LGU staff performances.
- Monitoring team will discuss with the community and UC as per the required information as mentioned in monitoring guidelines.

- Minute all the discussion and decision regarding the final approval of the scheme in UC minute book.
- Monitoring team will brief all the findings and recommendations to the masses. After the discussion, if required, the masses will approve the audit and decide to request final installation to LG.
- Get signatures of all participants in attendance and closing page also.
- LGU staff will prepare final report for PMC and submit it.
- There is no need to prepare separate reports of public audits as will be written in monitoring book itself.

25 SCHEME COMPLETION REPORT, MB AND FINAL INSTALLMENT

25.1 MEASUREMENT BOOK AND SCHEME COMPLETION REPORT

After completing the final public auditing of the schemes implementation, the LGU sub-engineer prepares measurement book (MB) with the help of the Technical Officer. This measurement book is prepared on a computer (Excel base) and covers the actual work completed with dimensions (LBH) in all the structures and pipelines on the field as per design estimate. According to which, the actual work completed is compared with the estimated quantity and cost. After submitting the details of all the work, a summary table of the estimated and actual costs is prepared, which is the scheme completion report. UC bill for final payment will be integral part of the measurement book.

The structure wise completion and summary report are prepared as per field measurement by the sub-engineer of the LG implementing unit (LGU) with the assistance of the technical officer. Measurement book (MB) will be checked by the LG infrastructure development section or the designated technician and submitted to chief administrative officer (CAO) for approval process. In completion report, the details of the under or over expenditure on each structure and headings are calculated along with the amount and % of +/- . There will not be any excess payments under the headings that found more than estimated. If the cost estimate has been revised in advance, then all the documentation will be ensured before that payment for the headings.

After the completion report is prepared, UC payment bill is prepared by User Committee, in which the total amount that can be paid for the final installment is calculated by deducting the advance amount taken by the UC. In this bill, the final installment payment amount is calculated by calculating the estimated cost and the actual expenses of the scheme heading including the cost of materials procured as per the agreement, labor costs, transportation costs, and all expenses including the UC management costs.

25.2 FINAL PAYMENT TO USER COMMITTEE

After the necessary documents are prepared and approved, the Local government project implementation unit (LGU) submits them to the LG executive office for the final installment payment of the User committee. The following documents are required for the final installment payment of the User committee.

- User Committee application to receive the final installment
- Measurement Book and completion reports as per MB
- Scheme Public Audit report and mass meeting minutes

- Written Recommendation letter of ward Office and LGU unit
- Photocopy of scheme level third monitoring Report
- Written recommendation of TA Adviser or his/her designated project representative

As the final installment payment to the user committee is made based on actual expenses, the entire amount mentioned in the agreement may not be paid to the user committee. The amount saved in this way is spent on other project activities within the same local government. Therefore, it is necessary to clearly explain this matter to the user and user committee in advance by the local government project implementation Unit (LGU) staff and TA team under the scheme so that there is less chance of confusion and disputes in the community regarding the final installment payment. The final installment payment will not be made by Local government office until the amount that the user must contribute to the construction and maintenance of the schemes and the amount that the local government must invest in the entire user committee account. Generally, the payment amount may be deducted in the following cases.

- If any work is not completed as specified in the design estimate report or if any changes are made in structure or if the design is changed without prior approval, if the quantity and cost of any item of work increase or if the quality compromised or if the materials are not procured according to the prescribed quality, the amount to be paid to the User Committee will be reduced.
- Though the final installment amount is mentioned in the UC agreement, it will be paid based on the actual measurement & evaluation. The final installments will be paid only as per the evaluation of the actual expenditure incurred in the scheme. However, user Committee will not be paid more than the amount mentioned in the final installment. If the cost of the scheme is to increase, the additional amount can be paid only if the User Committee applies to Local government for a valid reason and obtains prior approval of revision or additional estimates.
- During the final evaluation of the scheme, it will not evaluate more than the estimated amount for the mentioned headings in the cost estimate without prior approval.

Detailed about the evaluation & payment terms regarding this are mentioned in the agreement signed between the Users Committee and Local government office.

25.3 UPDATE OF SCHEME INFORMATION BOARD

It has already been mentioned that Scheme information Board should fix it in a suitable public place after implementation phase agreement completion. As soon as the evaluation of the scheme is completed and the final installment payment is received by the User committee, the permanent scheme information board should be updated based on the actual expenditure and placed in a visible suitable place for all to see.

Once the cost estimate of the scheme is approved, a scheme information board of the scheme should be prepared on flex and placed in a suitable visible place in the scheme area. Only the estimated cost of the scheme is shown on that board. After the scheme is completed, the actual expenditure should also be shown based on the scheme completion report, and a permanent scheme information board should be made and placed in a suitable visible place so that any stakeholder or user can easily get the information about the benefiting community, income and expenditure of the schemes. Detail content of the scheme information board shared with sample in Preconstruction seminar chapter.

26 SCHEME INSURANCE

To ensure sustainable service of drinking water supply, irrigation and multi-use system schemes that are completed through LACC Project, major structures - intakes, reservoir tanks, transmission pipelines, solar panels, pumps, motors, and other important structures - will be insured from user committee. Detail orientation regarding schemes will be provided by the Local government Project implementation Unit (LGU) to all schemes UC key representatives and Village maintenance workers VMW or operators with the facilitation of local insurance agents.

27 SCHEME O&M REGULATION PREPARATION

In drinking water, irrigation, and MUS schemes implemented through LACC project, the Users' Committee must prepare an Operation and Maintenance Regulation to ensure the scheme's sustainable and smooth operation in the future. For the schemes implemented with project support, the community must prepare two interrelated plans: operation and maintenance and climate-resilient water safety plans. Members of the Users' Committee will receive orientation training on operation and maintenance and on climate-resilient water safety plans during the preparatory phase orientation. Therefore, the Users' Committee may prepare the Operation and Maintenance Regulation at any time during the implementation phase, but it must be completed before the third public audit and monitoring of the scheme.

The main aspects of the Operation and Maintenance Procedure are mentioned in the orientation training for the Users' Committee during the preparatory phase, under the topics of "4.D. climate-resilient water safety plan, operation and maintenance, scheme insurance, and water quality orientation". Detailed sample formats of the Operation and Maintenance Regulation are also mentioned in the scheme level SBS reference materials. The staff of the LGU must facilitate the Users' Committee in preparing the Operation and Maintenance Regulation.

The Operation and Maintenance Regulation is a procedure formulated by the users regarding various important decisions related to the operation and maintenance of the scheme. The Operation and Maintenance Procedure includes the following topics:

- Introduction
- Institutional arrangements: WUSC composition, number and frequency of WUSC meetings and general assemblies, communication between WUSC and water users, reporting and coordination of WUSC
- O&M management: tools and spare parts management, tap groups
- CCA/DRM: Protection of source and scheme structures
- Village Maintenance Worker (VMW) and Pump Operator: salary, roles and responsibilities
- O&M fund: water tariff, water tariff collection and mobilization, water tariff increase, punishment for neglecting tariff payment, support from cooperatives and financial institutions
- Source and catchment area protection, scheme infrastructure protection, proper utilization of water and punishment for damaging scheme or mishandling water.
- Service level improvement and extension
- Continuation of total sanitation activities
- Supporting agencies and their roles in the Post-Construction Phase

The O&M regulation is prepared by UC and approved in a mass meeting during the 3rd monitoring and public audit. Presence of at least 50% female should be ensured in the mass meeting (and representative proportions of ethnic minorities, people with disability, and disadvantaged castes). The document must be accepted and signed by all the users. That document might be revised by the annual general assembly as needed.

28 CR-WSP TRAINING AND PREPARATION

* Applicable for drinking water schemes only

The Government of Nepal started a Climate Resilient Water Safety Plan (CR-WSP) in all drinking water supply schemes. This plan makes sure the supplied water from the system; we drink is always safe. Government of Nepal has held that all drinking water schemes must follow the Climate Resilient Water Safety Plan. This plan will prepare in each drinking water schemes including multi-use system (MUS) schemes made by the LACC Project.

Water Safety Plan (WSP) is a systematic approach for improving and maintaining drinking water quality from catchment to consumers. Water safety plans are preventive and protective style of risk management in the supply system. WSP has played a very important role in improving service levels and sustaining the water supply system in Nepal. Despite this, implementation of WSP has been affected by some external factors in recent years. Climate Change is one of the major factors which have been affecting the water supply systems causing depletion of sources, increasing water-induced disasters, deteriorating water quality and many others. This manual only guides us to develop the CR-WSPs in system way. It requires consideration of these new emerging challenges in implementing CR-WSP in water supply systems. It works to identify and prevent (control) risk that could lead to water pollution at all stages of water distribution, from the water source area to mouth of the consumers. For this, it is necessary to continue the monitoring and preventive work in the risk areas identified by the water safety plan and to test the water quality from time to time to ensure that water is safe.

By implementing the water safety plan as part of the scheme's operation and management process, consistency in the quality of drinking water distributed by the project is ensured. Thus, the preparation and implementation of the water safety plan requires genuine commitment from influential members (Health Office, Teachers & community leaders) of the community. Therefore, the water safety plan should not be considered as one-time maintenance work to be done on the schemes, but as a part of the daily operation, maintenance, and management activities of the schemes.

The World Health Organization has developed the concept of drinking water safety plan for the continuity of safe drinking water supply and included it in the National guidelines of drinking water quality. Climate change has an impact on the quality management of drinking water supply schemes. This guideline provides guidance on how to develop drinking water safety plans by considering both general and climate change-related risks. The main objective of that guideline is to support UCs of rural drinking water supply schemes to implement climate-resilient water safety plans. In the context of Nepal, this guideline will be suitable for small and simple rural-level drinking water supply schemes.

There are six stages to implementing a Climate resilient water safety plan:

- (1) Formation of a Water Safety plan (WSP) team
- (2) Assessment of the water supply system/components
- (3) Risk identification and control
- (4) Corrective measures/Action

(5) Monitoring and Verification

(6) Review and Documentation

Objectives

As a result of Water safety Plan training, the WSP team prepares short-term plans for routine maintenance tasks and long-term plans for major repairs and upgrades. The Climate Resilient Water Safety Plan supports the maintenance work procedures and the necessary regular maintenance plans that are approved by the user. If additional budget is required to ensure the safe water with quality and regular operational issues in specific scheme component with technical assistance, and to sustain regularity of the climate resilient water safety plan, the user committee could ask for support in the post-construction phase.

Specific Objective of the training

- The concept of a climate resilient water safety plan.
- Discussion on the operation, maintenance and the major factors affecting water quality including climate change and natural hazards.
- To convince the WSP team to be proactive in the importance of safe water supply, water quality, operation, and maintenance of the system.
- Assessment of the water supply scheme and its components (preparing a community layout plan from watershed to household level to identify potential risk factors & locations in the schemes layout).
- To conduct tests related to rural drinking water supply quality parameters.
- Prepare a water safety plan based on risk assessment using the CR-WSP form.
- Discussion on the importance of water tariff collection and mobilization of repair and maintenance funds.
- To ensure that WSP Team agrees to regularize the implementation, review and update the Climate Resilient Water Safety Plan.

Expected results:

- The WSP Team will be able to identify the issues related to climate change and its adaptation, disaster risk, risk management and mitigation, water quality, scheme operations and sustainability.
- The WSP Team will be able to identify factors that will impact the scheme operations and supply of safe water in the short and long term.
- The WSP Team will prepare short and long-term plans, including maintenance and repair plans.
- The WSP Team will be confident in source protection; repair and maintenance of the scheme is important and will be able to take action to improve the scheme operations and safe water supply.
- The community will be able to maintain the scheme structures smoothly, while reducing its dependence on external support.

Climate Resilient Water Safety Training and Plan Preparation

Duration: 2 to 3 days (Small schemes and lesser transmission pipelines will be possible in 2 days, large schemes in 3 days)

Participants: Selected members of UC and Water Safety Plan Team

Resources Person: Field Coordinator, Local Government Project Implementation Unit (LGU) staff and ward technicians

Resources materials: Climate Resilient Water Safety Plans Guideline, Flip chart, O&M regulations, Water Quality testing Kits & book, Posters & stationery

Days	Contents	Time	Activities
Day 1	Session I	1 Hour	Sharing Expectation
	Introduction		Collection of participants expectations and discussion in pairs
	Introduction of Participants		Each participants present their opinion/thinking in pairs
	Objective and Expectation of training		
	Short information about Project and SBS procedure		
	Session II	1.5 hours	Present the concept of climate resilient water safety plan to participants using a flip chart or computer presentation.
	Sustainability, Functionality, Climate Change & Adaptation, Natural Risk/vulnerability, Disaster Risk and its control measures and mitigations, and Introduce Climate Resilient Water Safety plan		Conduct discussion on the topic and exchange experiences.
	Experience sharing in above topic from participants		
	What are their thoughts on how climate change affects their lives at present and in the future?		
	What types of natural hazards exist in their scheme area, what kinds of disasters do they recall/remember, what types of risks are seen in their scheme, what kinds of disasters could cause such risks, how can they be prevented or mitigated, what can contaminate water, what factors can cause water contamination, and how can water quality be improved or preserved?		
	Session III	1.5 hours	Presentation/Discussion
	Introduce the project's approach on water safety plan.		Show the Water Safety Plan guideline and allow

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	Explain the importance of the water safety plan for protecting water from the catchment/watershed to the household. Explain the parameters of water quality, how to test those parameters, and provide examples of activities that can improve water safety. Explain watershed and spring shed management, how it can support water safety, and how to enhance water availability.		participants to get familiar with it. Share the results of water quality testing from the preparatory phase and discuss what actions can be taken to improve or maintain the water quality results. Discuss the need for watershed management (spring shed management). What kinds of activities have been carried out to protect the watershed area up to the tap? Is there a need for tree plantation, check dams, etc.?
	Session IV: Analyze the scheme: prepare a list of all the structures of the scheme and analyze them. Draw a community map/scheme layout map including the scheme structures, watershed area, source characteristics, and land use. This exercise will be carried out based on the Climate Resilient Water Safety Plan Guideline and field visits.	3 Hours	During the field visit, test the required drinking water quality parameters according to the checklist. If there is not enough time, conduct the water quality testing on the previous day and analyze the results the following day.
Day-2	Session I: Identification and analysis of risks based on the Climate-Resilient Water Safety Plan forms and social/community mapping/scheme layout. Under this, identification and analysis of direct and indirect risks that affect the safe supply of water. Consideration of current and potential risks such as changes in monsoon patterns, changes in water availability/capacity, land-use changes, and population growth. This type of exercise requires a field visit.	2 Hours	While analyzing, the results of the water quality tests should also be taken into consideration.
	Session II:	1 Hours	See the CR-WSP Guideline formats and details description forms

Prepare a climate-resilient water safety and monitoring plan. Discuss the changes occurring in the project area and the necessary control and adaptation measures. Develop short-term and long-term plans according to the water safety guideline form		
Session III:	1 Hour	
Monitoring, Review, Update and reporting of CR-WSP Financial Support in Post construction, its introduction and process		
Session IV	1 Hour	
Water Tariff collection, its importance and discussion on O&M Fund collection and funds mobilization for sustainability and functionality Presentation of User Satisfaction form and its uses		
Session V:	30 min	Repeat the practice from the first day but allocate 10 minutes to discuss the facilitation/feedback of the workshop.
Closing Session		
Feedback collection		Each participant will present their ideas within their group.
Clarify that the final training and community needs to implement the plan. Discuss the fourth monitoring.		

CR-WSP Plan Preparation: The Scheme level climate resilient WSP will be prepared as per climate resilient water safety plan guidelines for Rural water supply in each Water Supply and sanitation schemes and multi-use system schemes as per Government of Nepal “Climate Resilient Water Safety Plan for Rural Water Supply System, 2027”.

29 INVENTORY UPDATE IN NWASH MIS SYSTEM

* Applicable for drinking water schemes only

NWASH MIS is a national information management system of water supply, sanitation and hygiene, it is the mobile app-based digital data collection system developed under the Department of Water Supply and Sewerage Management (DWSSM), Government of Nepal. It supports data collection along with monitoring, planning and reporting on water supply, sanitation and hygiene (WASH) across each local government, compiling for provincial and federal levels.

It shows the location of each water supply structure on a map (with GPS), which helps in planning and decision-making. It helps the Local government to prepare inclusive, gender-sensitive and sustainable WASH plans. In this system, data is sent into online portal through app mobile stored in the field, and necessary editing is done by supporting sections, concern LGs could edit and verify the data. Water supply and sanitation projects to be completed at the local government with the support of LACC Project will be updated in the NWASH MIS after completion.

30 SCHEME COMPLETION SEMINAR & COMPLETION CERTIFICATE

Introduction

After final instalment release to UC, UC will organize the Scheme Completion Seminar. The participants should include all scheme-related sub-committees (example: Procurement committee, monitoring committee etc.) members involved in scheme implementation phase. It will also be participated by the users and labors involved in implementation of scheme. The Scheme Completion Seminar will be organized immediately after the UC has made all the final payments to all suppliers and workers, and when the UC has received all contributions as agreed (from the LG, from the users, from any others). LGU staff will support UC to organize all its bills and vouchers for the seminar. A copy of MB, scheme completion report and UC payment bill prepared by the LG are also important documents for the seminar.

Scheme Completion seminar can take one full day, or less if everything is well prepared and there are no pending issues or conflicts. Scheme Completion seminar shall focus on the final financial clearance of the scheme in between the users and labor. UC will present final financial statement and clear the due payment to supplier, labor, users, transporter and any other creditors. After this seminar all the financial issues of the UC shall be wrapped up.

The next step is the regular operation and maintenance introducing CR-WSP as the scheme enters in post construction phase.

The purpose of the Scheme Completion seminar is to ensure that all works in the scheme is physically completed and financially cleared.

Objectives:

- To ensure that scheme is financially cleared,
- To update financial status after receiving the final instalments and after paying from WUSC all liabilities to suppliers and labors involved in implementation phase.
- Review the users' cash and kind contribution made during implementation phase.
- Update the inventory of surplus materials after the completion of construction works
- Learning sharing among the participants on scheme implementations

Major contents of the seminar

UC will present:	Important questions to participants
Introduction of the objectives of the seminar & scheme status.	Do all participants agree that the scheme is physically completed?
Compiled and properly filed bills, vouchers, receipts and updated bookkeeping	Do all participants agree that
Status of the store (remaining construction materials and tools), stock entry and management of surplus materials, tools.	UC has received the due contributions from users, LG, and NRDF?
Status of the final payments to the UC from the LG and NRDF (Governments of Nepal, EU and Finland)	UC has paid its due payments to suppliers UC has paid its due payments to laborers?
Status of the final payments by the UC to the suppliers and labors	Are there any remaining payments to be made, any items that scheme is physically completed? Can this scheme be defined as financially clear? and as Implementation Phase Completed?
Review of Users Contribution in scheme during implementation phase and closing of seminar	

Scheme Completion Certificate

Although users are the owners and they decide and manage their scheme in planning, implementation and operation and maintenance, the ownership certificate further encourages users to realize their sole role for operation and maintenance management of the scheme independently. After financial clearance of the scheme LG provides ownership certificate to the users in following template. The certificate to UC is handed over on the same day of scheme completion seminar.

Sample of completion certificate is attached in **Annex 9** of this manual.

31 USERS COMMITTEE'S COMMITMENT

1. We are committed to orientation towards Total Sanitation
 - We will safely store, treat and manage drinking water
 - We always use toilet and will regularly clear, operate and maintain toilet and dispose child seat in toilet or safe pit.
 - We will care on personal hygiene and establish behavior to wash our hands with soap after using toilet, handling dirt and before cooking and eating food.
 - We will manage solid and liquid waste properly.
 - We will manage cleanliness of house and proper management of animal waste.
 - We will properly wash and cook food and avoid stall food.
 - We commit to allow use of toilet and public tap to menstruating female and will give nutritious food during menstruation and encourage them to stay in safe place inside house.
 - We allow all class, gender, disability, and ethnic groups for access of toilet equally without any discrimination.

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

2. We are committed to collecting water tariffs regularly from the beneficiaries as decided by the UC.
3. We will formulate O&M plan and implement it for sustainable operation and maintenance of the schemes.
4. We will formulate and implement Water Safety Plan and will inspect all components for maintenance and improve regularly.
5. We will appoint VMWs/Pump Operators, pay them and take their service regularly.
6. We will assess status of the scheme regularly through UC meetings and formulate and implement operation and maintenance regulations.
7. We will not allow misuse of drinking water for other purposes than drinking.
8. We will use access water for home garden management
9. We will consult and coordinate with LG in case of major repair requirements that can't be done by UC.
10. We will organize annual general assembly and public audit to maintain transparency of the scheme.

ANNEX 1: FEASIBILITY STUDY FORMAT

Feasibility Study Format

Name of Scheme

Date of Study: From to

General Information

Province Name

District Name.....

Local Government Name.....

Ward No/s.....

1) Was the Planning document (from which the scheme selected) followed the rural municipality/municipality planning process? ☐ Yes ☐ No

If not, the study should be taken forward only after a decision regarding the selection process is made at the ward level meeting. *A copy of the decision should be included in the annex of feasibility study report.*

Format 1: Social and financial feasibility		
Assessment from mass meeting	Is the community committed to paying water tariff? ☐ Yes ☐ No ☐ Yes with condition	
	Mention the Condition	
	Is community ready for cash and kind contributions as per project's policy for implementation? ☐ Yes ☐ No ☐ Yes with Condition	
	Mention the Condition	
	Was the community involved in LG level seven step planning process (WUMP/WASH Plan/LAPA/LDCRP or other regular planning process)? ☐ Yes ☐ No	
	Is there any kind of social disputes/disagreements that effect scheme sustainability? ☐ Yes ☐ No	
	If yes, describe the type of dispute and its effect on the scheme sustainability:	
Conclusion from the Mass meeting		Overall Conclusion

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	Is the Local Government ready to contribute the matching according to the project's guideline? ☐ Yes ☐ No		
Data Collection & Observation Total numbers..... HH	Major Occupation of the community		Remarks
	Occupation	HH Numbers	
	☐ Agriculture		
	☐ Service		
	☐ Remittance		
	☐ Business		
	☐ Local Shop		
	☐ Other		
	☐		
	Number of respondents during Data collection		Remarks
	Ethnicity		
	Ethnicity Detail	HH Numbers	
	☐ BCTS		
	☐ Dalit		
	☐ Janajati		
	☐ Other		
	Number of respondents during Data collection		
	Food self-sufficiency status		
Food sufficiency	HH Numbers		
☐ Less than 3 months			
☐ 4-6 months			
☐ 7-9 months			
☐ More than 9 months			
Number of respondents during Data collection			
# Feasibility Condition of acceptance	Is the community ready for commitment, contribution with their ownership & participation for operation maintenance and sustainable scheme. ☐ Yes ☐ No ☐ Conditional		Mention the Condition
	Any Other social disputes that may affect scheme water sources or land in the community. ☐ Yes ☐ No ☐ Conditional		Mention the Condition

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	Social inclusion aspects in feasibility evaluation: Has the assessment of the extremely poor and backward communities identified ☐ Yes ☐ No	
	For Rehab/maintenance Scheme	Remarks
	Time span of Scheme from its completion & commissioning ☐ Within 5 Years ☐ 6-10 Years ☐ 11-15 Years ☐ 15-20 Years ☐ More than 20 Years	
	Status of existing physical structures in the schemes ☐ Good ☐ Satisfactory ☐ Poor	
	Status of existing operational situation in the schemes ☐ Full Operation ☐ Partial Operation ☐ Closed	
	Status of existing operation & maintenance fund in the schemes ☐ Good ☐ Satisfactory ☐ No O&M fund	
	Status of existing User Committee in the schemes ☐ Good ☐ Satisfactory ☐ No UC existence	
	Status of the existing water safety plan (WSP) ☐ Good ☐ Satisfactory ☐ No WSP plan	
	Is there VMW/Operator working in the scheme? ☐ Yes ☐ No Is the User committee (UC) registered as per LG regulation? ☐ Yes ☐ No	
Conditional Acceptance	List the problems and conditions for acceptance: 1 2 3 4 5 Does the community agree to fulfil the conditions above? ☐ Yes ☐ No	
Reasons for Rejections	List the problems and cause: 1 2	

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

Format 2: Technical, Environmental and Economic Feasibility

**Assessment
from mass
meeting**

A. Proposed schemes type

☐ New ☐ Rehabilitation

☐ Water Supply ☐ Irrigation ☐ Multiple Use System (MUS)

Trick Mark (☐) the proposed type of technology. In case of MUS scheme, select the relevant technologies.

☐ Gravity New

☐ Canal New

☐

☐ Gravity Rehab

☐ Canal Rehab

☐ Improve Water Mill

☐ Solar Lift New

☐ Pipe Irrigation New

☐

☐ Solar Lift Rehab

☐ Pipe Irrigation rehab

☐

☐ Electrical Lift New

☐ New Lift Irrigation

☐

☐ Electrical lift Rehab

☐ Lift Irrigation Rehab

☐

☐ Rainwater Harvesting

☐ Pond Irrigation

☐

☐ Source Improvement

☐ Drip Irrigation

☐

☐ Source Conservation

☐ Sprinkler Irrigation

In case of Rehabilitation scheme,

Scheme Completed Date:

Supporting Agency Name:

Implementing Agency/Organization:

Are Detail Design & Estimates available at present?

☐ Yes ☐ No

Existing service type

☐ Public Tap ☐ Private Tap ☐ Open

Has the Quantity, Accessibility, Reliability, Quality condition full filled? ☐ Yes ☐ No

If not, mention which conditions are not meet.

Facing of Water Source location:

☐ North ☐ South ☐ East ☐ West

Facing of the community location: ☐ North ☐ South ☐ East ☐ West

Name of nearby Road Head:

Distance between Road head & community Km Type of Road : ☐ Black top ☐ Gravel ☐ Seasonal ☐

Name of nearby Market

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

Rehabilitation Scheme: Condition of Physical structures					
SN	Name of structure	Unit	Quantity	Existing operation status	Remarks
1	Intake	No		☐ Operational ☐ Partially operation ☐ Closed.....	
2	Collection chamber	No		☐ Operational ☐ Partially operation ☐ Closed.....	
3	Distribution Chamber	No		☐ Operational ☐ Partially operation ☐ Closed.....	
4	Interruption Chamber	No		☐ Operational ☐ Partially operation ☐ Closed.....	
5	Break Pressure Tank	No		☐ Operational ☐ Partially operation ☐ Closed.....	
6	Private Tap				
7	Public Tap				
8	Institutions Tap				
9	Schools Tap				
	Main Canal/Pipe	m		☐ Operational ☐ Partially operation ☐ Closed.....	
	Branch Canal/Pipe	m		☐ Operational ☐ Partially operation ☐ Closed.....	
	Irrigation Pond	No		☐ Operational ☐ Partially operation ☐ Closed.....	

Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS

Field data and observations on source and environment	Proposed Source Description:	1 st	2 nd	3 rd
* See detailed measurement sheets and related statistical formats in Annex1.	Existing use of water source	☐ Water Supply ☐ Irrigation ☐ Water Mill, ☐ Not in use, ☐ other.....	☐ Water Supply ☐ Irrigation ☐ Water Mill, ☐ Not in use, ☐ other.....	☐ Water Supply ☐ Irrigation ☐ Water Mill, ☐ Not in use, ☐ other.....
	Measured Discharge during WUMP/SSA/or if any (lps)			
	Measured Date			
	GPS of Source			
	Type of the Source	☐ Spring ☐ Stream ☐ Naula Other	☐ Spring ☐ Stream ☐ Naula Other	☐ Spring ☐ Stream ☐ Naula Other
	Present Measured discharge (lps)			
	Measurement Process			
	Date			
	Observed Water Quality at the source (clear and good; good; muddy):			
	Water Quality perception at the source (clear and good; fairly good; muddy)	☐ Good ☐ Satisfactory ☐ Bad	☐ Good ☐ Satisfactory ☐ Bad	☐ Good ☐ Satisfactory ☐ Bad
	Estimated reliability of the source (months running) as per community experience:			
	General trend of source discharge	☐ Reducing ☐ Increasing ☐ Constant	☐ Reducing ☐ Increasing ☐ Constant	☐ Reducing ☐ Increasing ☐ Constant

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	Is the source prone to any other risks such as flooding or landslides?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	What measures should be considered in the catchment area to recharge and protect the source?			
	Is there any kind of source or land dispute?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	What is the per capita available per day in litres (L/D) as per source discharge?			
	RL (GPS) of proposed Reservoir Tank			
	RL (GPS) of highest proposed service tap			
	Is the source discharge sufficient for proposed use?			☐ Yes ☐ No
	Is the source and RVT/pond/service area heads sufficient for the proposed system*?			☐ Yes ☐ No
	In case of lift scheme, how many lifting stages are required?			
	Distance of electric transmission line from the proposed intake of the scheme:.....			
	Is the scheme the best option for the community, in terms of cost of the scheme?			☐ Yes ☐ No
	If not, what are other cost-efficient options?			
	Key environmental/technical aspects to be considered for scheme implementation (e.g. landslide, crossing, risk of flood, ridge and valley, soil type etc. geographical feature, parallel/overlapping schemes, upstream settlements and other risks to water quality).			
	Study team's recommendation:			
	1			
2				
3				
4				
5				
Field data and observations	Tentative layout of the scheme showing settlements, geographical features and required structures and length of pipeline/canal: Also take a bird's eye view photo of the beneficiary community (Template in Annex 2).			

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

on scheme design and economic feasibility	Total tentative cost of the scheme design, NRs**		
	Per Capita Cost of the scheme design, NRs**		
	In case of electric lift scheme, expected monthly electricity cost, NRs		
	In case of any lift scheme, expected monthly operation cost (Pump Operators salary + electricity cost + VMW/other human resources), NRs		
	Does the proposed scheme meet the Quantity, Accessibility, Reliability, Quality criteria:		Availability ☐ Yes ☐ No Accessibility ☐ Yes ☐ No Quality/safety ☐ Yes ☐ No Affordability ☐ Yes ☐ No Acceptability ☐ Yes ☐ No
	Is the proposed design cost economically feasible? ☐ Yes ☐ No ☐ Yes with Condition		If no, mention the reason
#Conditional acceptance	Is the water source sufficient for the proposed population for the scheme design?		☐ Yes ☐ No
	Is the water source head enough for technical design?		☐ Yes ☐ No
	Is the scheme economically feasible?		☐ Yes ☐ No
	If no Mention the reason?		
	List the observed conditional issues and the conditions for acceptance:		
	Does the community agree to meet the conditions above? ☐ Yes ☐ No		
Cases with no support to acceptance	List and describe the problems:		

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

Format 3: Overall SWOT analysis and recommendation	
Overall SWOT analysis by the study team:	Strengths & opportunities of the proposed scheme. Aspects that support acceptance:
	Weaknesses & threats of the proposed scheme. Possible further drawbacks, conditions for acceptance, and requirements to meet them:
Recommendation	Is the scheme Socially and financially feasible? (unconditional/conditional#/infeasible): ☐ Yes ☐ Conditional ☐ Not Feasible If not, mention the reason.
	Is the scheme Technically, Environmentally and financially feasible? (unconditional/conditional#/infeasible): ☐ Yes ☐ Conditional ☐ Not Feasible If not, mention the reason.
	Is the schemes suitable for further implementation? ☐ Yes ☐ No If no, why? mention the reason.

ANNEX TO FEASIBILITY STUDY: Measurement format for source discharge and head feasibility

Spring measurement: Bucket and watch method for each source/s at least 3 measurements

S.N	Volume of the container (Lts)	Time to fill container (S)	Q, Discharge of the source (L/S)	Average discharge (L/S)	Source location (jungle, cliff, rocky, cropping land, landslide zone, river side)
1					
2					
3					

$Q = \text{Volume/Time}$

Stream measurement: Velocity Area method at least 3 measurements

S.N	Length of stretch (m)	Time taken (S)	Velocity (m/s)	Cross section area (m ²)	Q, discharge (L/S)	Average discharge (L/S)
1						
2						
3						

$Q = 850 * \text{Area (m}^2\text{)} * \text{Velocity (m/s)}$ in l/s for stream.

For Naulo (source improvement): Completely empty the Naulo. Measure the average storage volume. Record time to fill the Naulo. Calculate as per spring.

Source water quality: a) Good b) Fair c) Bad

Sufficiency of the source (For population; multiply with concern LG density (pop/HH): annexed):

Future population = Present population * Growth factor (growth factor based on 22 year of district, annexed)

Future total demand: Future population * 45 or 65 L/D (minimum)

Minimum source discharge required = Future total demand/86400 L/S < Safe source discharge (80 % - 90 % of measured source discharge)

Source safe discharge is sufficient for the design population (Yes / No)

Irrigation: Water requirement

Water demand for Micro Irrigation (pond): 250-500 Lts per Ropani

Canal Irrigation: take average 3 lps per hectare [use 2-5 lps per hectare (1 Hectare = 20 Ropani)].

Improve Water Mill: minimum water requirement: $P = 5QH$ (power must be minimum 800-Watt, Q in lps, H in mt)

**ANNEX TO FEASIBILITY STUDY: MEASUREMENT FORMAT FOR SCHEME COST ESTIMATION
(PIPED SCHEME)**

Estimated cost: Probable structures: (Use Quick Reference Tool for the cost calculation of the district in '000

S.N	Structures	Quantity	Unit	For new structures		For rehabilitating existing structures	
				Unit cost, NRs, new	Total Amount, NRs	Unit cost**	Total amount, NRs.
1	Intake (spring / Stream)		Nos				
2	Collection Chamber/ Distribution Chamber /Break Pressure Tank		Nos				
3	Intake Filter / Roughing Filter		Nos				
4	Ferro Cement Tank Sedimentation tank		Nos				
5	Interruption Chamber		Nos				
6	Transmission pipeline (tentative)		Mts				
7	Ferro Cement Tank Reservoir (10 Hrs capacity)		Nos				
8	Distribution pipeline (tentative)		Mts				
9	Stand post (Public Stand Post)		Nos				
10	School stand post		Nos				
11	Junction box		Nos				
12	Soil cement tank (MUS)		Nos				
13	Irrigation off-take (MUS)		Nos				
14	Animal drinking trough		Nos				
15	Cable crossing		Nos				
16	Tools		Set				

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

17	Solar lifting accessories	Single lift	Lump sum				
18	Barbed wire fencing		Nos				
19	Public Tap Stand		Nos				
20	Soil Cement Tank		Nos				
21	Offtake Tap		Nos				
22	Animal Trough		Nos				
23	Cable crossing		Nos				
24	Tools Sets		Nos				
25	Source Protection		Nos				
26	Plantation		Nos				
27	Disaster Related activity		Nos				
	Sub-total, NRs.						
	Other system appurtenances, spring-shed protection etc @ 10 % of sub-total, NRs.						
	Total tentative cost of the scheme, NRs.						
	Per Capita Cost of the scheme, NRs.						

*** Rehabilitating existing structures may cost 25-50 % of the cost of new construction.

ANNEX 2: SCHEME LAYOUT & DESIGN MAP TEMPLATE

Draw tentative layout of the scheme showing settlements, geographical features and required structures and length of pipeline/canal: Also take a bird's eye view photo of the beneficiary community

ANNEX 3: SAMPLE USER COMMITTEE STATUTE AND APPLICATION

USER COMMITTEE (UC) STATUTE

Preamble: In order to fulfill the needs of the community/settlement, to create employment opportunities through the maximum mobilization of locally available labor, skills, resources and opportunities, and to contribute significantly to the development of the rural/municipality through inclusive and participatory planning, a water supply and sanitation/irrigation/multipurpose scheme has been selected. The purpose is to autonomously implement, monitor, review, evaluate, operate, and maintain such schemes.

Therefore, in accordance with the provisions of the *Users Committee Registration Procedure, 20...., WASH Act 20...., of.....* Local government this statute has been formulated, and the users committee has been established.

CHAPTER 1 PRELIMINARY

- Short Title and Commencement:
- (1) The name of the users committee will be, “..... users committee”.

(2) This statute shall commence after the endorsement by community mass meeting and from the date of approval by Rural/municipality office.

Definition: Unless the subject or context otherwise requires, in this statute, -

- “Chairperson” means chairperson of water supply and sanitation/irrigation/MUS scheme.
- “Users” means a person, institution or body using water supply and sanitation /irrigation/MUS services.
- “Users Committee” means committee formed under section 5 of this legislation to operate and manage the water supply and sanitation/irrigation/MUS scheme.
- “Sub Committees” means committees formed by users committee under section 21,22 and 23 of this legislation.
- “Vice-chairperson” means vice- chairperson of water supply and sanitation/ irrigation/ MUS scheme.
- “Fund” means the fund generated by users committee under section 24
- “Prescribed” or “as prescribed” means prescribed or as prescribed in this legislation
- “Sustainable use” means the utilization of drinking water, irrigation, water resources, aquatic ecosystems, and their components in such a manner that ensures they do not diminish over the long term, remain in their natural condition, and are maintained within limits that guarantee their long-term conservation.
- “Rules” means rules developed by users committee under section 48 of this legislation.
- “Officials” means Chair, Vice Chair, Treasurer and Secretary of the user committee, selected by the general assembly of the water supply and sanitation/irrigation/MUS scheme.
- “Chief Administrative Officer” means the chief administrative officer of Rural/municipality.
- “Statute” means the statute of water supply and sanitation/irrigation/MUS scheme.
- “Secretary” means the secretary of water supply and sanitation/irrigation/MUS scheme.

- “Member” means the member of the user committee other than the Chair, Vice Chair, Treasurer and Secretary. This also indicates the general members and honorary members of the water supply and sanitation/irrigation/MUS scheme.
- “Service fee” means cash, assets or others collected from the users on monthly/yearly basis against consumption of services of the scheme as administered by the user committee under this legislation.
- “Scheme” means the program being operated by the user committee under this legislation.
- “Donor” means any national, international, governmental or non-governmental committee or organization that provides financial assistance to user committee.

CHAPTER 2 OBJECTIVES AND FUNCTIONS

Objectives of the users committee: The fundamental objectives of this Users’ Committee shall be as follows, to be carried out within the framework of the prevailing laws:

- To organize, operate, and manage water supply and sanitation/irrigation/MUS related projects within the working area of the committee, and to ensure non-discriminatory service delivery.
- To maintain the quality of water supply and sanitation/irrigation/MUS services.
- To conserve, promote, and manage water sources and watersheds.
- To raise awareness among users regarding water supply and sanitation/irrigation/MUS projects.
- To mobilize, manage, and operate the necessary fund, labor and resources required for project implementation.
- To prepare and implement climate-resilient water safety plans for drinking water and sanitation projects.
- To ensure equitable access, sustainable use, and fair distribution of benefits from project implementation for single women, persons with disabilities, Dalits, indigenous and economically marginalized households within the users committee.
- To provide and facilitate special facilities, concessions and benefits to single women, persons with disabilities, Dalits, indigenous and economically marginalized households.
- To involve and engage users in all development and construction activities, including the multi-purpose use of water systems, within the project area.
- To establish and implement an operation and maintenance fund for project execution, and to undertake all necessary measures to ensure smooth operation and sustainability.
- To provide certain benefits to communities that contribute to the conservation of ecosystems.

Functions of users committee: In order to achieve its objectives, the users committee shall carry out the following functions:

- Provide the community with water supply and sanitation/irrigation/MUS services in an accessible, sustainable, and non-discriminatory manner.
- Ensure that the structures of water supply and sanitation/irrigation/MUS are accessible, user-friendly and safeguarded.
- Determine and implement various fees and charges related to services in accordance with local or prevailing laws.

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

- Prepare and implement maintenance plans to guarantee the quality of all parts of the drinking water/irrigation/MUS supply systems, and, in the case of drinking water and sanitation projects, to maintain quality through climate-resilient water safety plans (from source to tap).
- Conserve, sustainably use, prevent pollution, and control risks associated with water sources, springs, lakes, ponds, and wetlands, thereby contributing to watershed protection.
- Organize various campaigns, training, studies, interactions, or workshops for institutional capacity building and community mobilization.
- Formation and mobilize sub-committees and working groups under the users committee.
- Promote and expand the use of efficient technologies for irrigation and multiple uses of water.
- Prioritize multiple water use and implement agroforestry, agriculture and livelihood projects while conserving biodiversity, forests, and ecosystems.
- Implement and manage economic or other benefit-sharing programs for communities contributing to ecosystem conservation.
- Play an active role in watershed conservation by continuing activities related to water source protection, recharge enhancement, and climate adaptation risk management.
- Coordinate and collaborate with local governments, provincial government, donor agencies, and other organizations in project implementation.
- Maintain transparency and good governance in the committee through activities such as public audits and public hearings.
- Manage an O&M fund and VMW personnel for regular maintenance of the projects.
- Provide concessions or discounts on fees and charges to ensure equitable access for single women, persons with disabilities, Dalits, indigenous and marginalized members of the community.
- Recruit employees or consultants as necessary for daily operations and program implementation, and to determine their service conditions and remuneration.
- Prepare and implement work plans of the users committee.
- Develop and enforce rules regarding the storage and use of tools and equipment owned by the users committee.
- Operate bank accounts and conduct an audit of the users committee's financial transactions within three months of the completion of each fiscal year.
- Construct, lease, or rent buildings as necessary, and purchase, rent, or sell office equipment such as computers, telephones, printers, and fax machines.
- Comply with this statute and the various rules made under it.
- Ensure sustainable operation of the project by making users and employees responsible, and by establishing and enforcing rules relating to rewards and penalties.
- Undertake any other functions necessary for the fulfilment of the objectives of the users committee.

CHAPTER 3 USERS COMMITTEE ESTABLISHMENT

Users committee formation: water supply and sanitation/irrigation/MUS user committee is formed as an organized and not-for-profit entity.

The users committee office shall be located at, ward no..... of Rural/municipality, district, province.

This users committee shall remain as a continuous and uninterrupted institution.

Users committee logo and stamp: i) Without contradicting the prevailing regulations, the users committee shall have its own distinct logo and stamp.

ii) The details of users committee logo and stamp is presented in Annex 1

Working area of users committee: The working area of users committee is In East, in West, in North and in South.

CHAPTER 4 MEMBERSHIP PROVISION

Membership: The following types of members are available in the users committee.

General member: According to Section 9 of this regulation, a household residing in the project area and holding Nepali citizenship, who applies following the prescribed procedure, shall be eligible to obtain membership and become a member of the committee.

If any household migrates to the project area in the future or purchases land within the project area, they may apply for membership and obtain it in the committee.

Membership Fee and Procedure for Granting Membership: 1) The membership fee and procedure for granting membership shall be as follows:

- Users who avail themselves of the services and facilities provided by this committee shall be members of the users group. This membership shall be considered automatically acquired as soon as they become users.
- The provisions regarding the membership fee shall be determined based on the recommendation of the users committee and the decision of the general assembly.
- All members must comply with the provisions of this regulation and the rules and regulations made under it.
- Persons with disabilities, economically disadvantaged single women, and senior citizens aged 70 years or above shall not be required to pay the membership fee to obtain general membership of the committee.

CHAPTER 5 GENERAL ASSEMBLY PROVISION

- **Formation of general assembly:** 1) The general assembly of the committee shall be formed from the members who have obtained membership under section 9 (a). The general assembly shall be the highest body of the committee.

The general assembly of this committee shall be as follows:

- Annual general assembly: Conduct the general assembly on annual basis.
- Special general assembly: If one-fourth of the total members of the committee request a special general assembly with a stated reason, the user committee shall be obliged to convene the special general assembly within at least 7 (seven) days; however, no special general assembly may be held again within six months of the previous special assembly.

The first annual general assembly of this committee shall be held within two months from the end date of the fiscal year in which the committee was registered, and subsequent annual general assemblies shall be held within three months from the end date of each fiscal year.

For conducting the annual general assembly of the committee, all general members shall be notified at least 15 days in advance, and for a special general assembly, at least 7 days in advance, specifying the venue, date, time, and agenda to be discussed.

In the general assembly convened as per Subsection (4), the quorum shall be seventy-five percent (75%) of the total general members. If the quorum is not met, the assembly cannot proceed, and a new general assembly shall be called after a minimum period of 7 days.

If the quorum is not met in the general assembly convened for the second time as per Subsection (5), a new general assembly shall be called with a 7-day notice for the third time, and the quorum for this assembly shall be fifty-one percent (51%) of the total number of members.

Functions, Duties, and Authority of the General Assembly: The functions, duties, and authority of the general assembly shall be as follows:

- Approve the plans, programs, and annual budget presented by the users committee.
- Discuss and approve the annual audit report received from the auditor, and provide guidance to the users committee to regularize or recover any irregular or unsettled amounts identified in the audit report.
- Appoint the auditor for the upcoming year and determine their remuneration.
- Review the annual progress report of the committee and evaluate the work carried out, providing necessary guidance to the users committee.
- Conduct elections for the positions of the users committee officials as per the regulations when their term of office expires.
- Approve amendments to the regulations, rules, and by-laws proposed by the users committee.
- Examine and approve actions and procedures carried out by the users committee that are in the best interest of the committee.
- Approve, as needed, the positions, salaries, allowances, and other benefits of employees proposed by the users committee, to be funded from the project's internal resources.
- Determine service fees, late fees, interest, penalties, and fines to be paid by beneficiaries for using the services provided by the project.
- Conduct elections for users committee officials or members whose term has expired, following the procedure outlined in the regulations.
- In cases where no specific authority is assigned to any particular body under this regulation, such authority shall rest with the general assembly.

CHAPTER 6 PROVISION ON USERS COMMITTEE

- **Users committee formation:** 1) The general assembly shall form a user committee consisting of at least 7 and at most 11 members as specified below:
 - Chairperson 1
 - Vice-Chairperson 1
 - Secretary 1
 - Treasurer 1
 - Members (Max.7)

In the users committee, among the positions of Chairperson, Vice-Chairperson, Secretary and Treasurer, at least two (2) positions, including the Treasurer, must be held by women, ensuring that at least fifty percent (50%) of the committee members are women. There must also be proportional representation from Dalit and marginalized communities of the project area.

The term of the users committee shall be two (2) years. The members of the users committee are not applicable to continue in the same position for more than two consecutive terms.

If the position of any member in the users committee becomes vacant before the annual general assembly, the vacant position may be filled through a mass meeting for the remaining term. If a member's position becomes vacant before the completion of their term, the member appointed to that position shall hold office only for the remaining period of the original term of the member whose position became vacant.

Meeting and Decision-making process: 1) Meetings of the users committee shall be convened by the Chairperson of the committee as required. However, if 25 percent of the total members request a meeting, the chairperson shall be obliged to call a meeting of the users committee.

Members of the users committee must be present in the meetings in person.

A meeting of the users committee shall not be held without the presence of at least 51 percent of the total members.

The meetings of the users committee shall be presided over by the Chairperson of the committee, and in the absence of the Chairperson, by the Vice-Chairperson.

Decisions in the meetings of the users committee shall be valid by majority vote, and in the case of a tie, the Chairperson shall have the casting vote.

The matters discussed and decisions made in the meetings of the users committee must be recorded in a separate minute book, and at least 51 percent of the members present in the meeting must sign the minutes.

All tasks to be carried out by the committee shall be done on the basis of decisions of the users committee. If deemed necessary, the users committee may form various committees or sub-committees to achieve its objectives and to facilitate smooth implementation of its functions. Such committees shall be subject to approval by the general assembly.

Functions, Duties, and Authority of the users committee: The functions, duties, and authority of the users committee shall be as follows:

- To organize the general assembly or mass meeting, present the estimated budget and work plan for project implementation, and have it endorsed by the mass meeting.
- To enter into agreements with the concerned bodies for the implementation of the project.
- To conduct programs in the interest of the users committee and the users, and to remain accountable to the general assembly or mass meeting.
- To assist donor agency staff and other deputed personnel in feasibility studies, data collection, work plan preparation, and related activities.
- To hold discussions with users regarding cash and labor contributions for achieving the committee's objectives, and to maximize the use of available resources and means.
- To consult with the rural/municipal government regarding resource mobilization, implementation, supervision, and monitoring.

- To open and operate the committee's bank account, ensure the safety of funds and assets, and have annual income and expenditure audited within three months after the close of each fiscal year.
- To form a procurement committee as per the rules, through the users mass meeting, for the purchase of construction materials, and to procure materials through the procurement committee following the prescribed rules.
- To draft and implement regulations concerning the selection, terms of service, and facilities of staff and maintenance workers, after approval from the general assembly. While selecting staff and maintenance workers, priority shall be given to women and disadvantaged caste/ethnic communities.
- To form advisory committees, other committees, or sub-committees as deemed appropriate during its term to fulfill the objectives of the committee.
- To establish a grievance hearing committee to address users complaints and take necessary decisions regarding such grievances.
- To participate in and ensure participation in training, workshops, and capacity-building activities organized by donor agencies or the rural/municipal government for the sustainability of the project.
- To make necessary arrangements for the maintenance of the project, and in cases where maintenance cannot be managed through committee resources, to coordinate and partner with the resource-providing agency.
- To form a monitoring sub-committee through the users mass meeting and to ensure regular monitoring of the project's quality through that sub-committee.
- To make available the required local resources and land for the construction of project structures, and to mobilize community labor, both skilled and unskilled, as necessary for project construction.
- To organize users mass meetings during both the construction and post-construction phases to review and endorse income, expenditure, and progress, and to submit the completion report, along with the final public audit report, to the concerned body.
- To maintain transparency in all committee activities, including financial and material records, and to renew the registration of the users committee within the prescribed timeframe.
- To hold regular meetings of the users committee after the completion of construction, formulate a maintenance regulation, and operate a maintenance fund.
- To conduct awareness campaigns within the project area against social malpractices and anomalies, and to promote sanitation, hygiene, and other social reforms.

Functions, Duties, and Authority of the user committee's key members: The functions, duties, and authority of the users committee's key position holders shall be as follows:

- Chairperson
 - Follow all rules, responsibilities and rights as assigned by the committee
 - Chair the committee meeting and cast a deciding vote only if needed. Ensure that all WUSC members are encouraged to speak in meetings and actively fulfil their roles.
 - Enhance coordination and support in collecting resources to meet the objectives of the WUSC.

- Manage daily operation of the scheme activities.
- Call WUSC meeting as deemed necessary.
- Collect and finalize agenda for WUSC meeting.
- Implement the decisions made by the WUSC.
- Manage resources coordinating government and non-government organizations.
- Enhance participation of the users for the scheme activities.
- Take care of assets of the scheme.
- Delegate authority and responsibility to vice-chair when required.
- Vice-Chairperson
 - Work as chairperson in his/her absence.
 - Support in other activities as stipulated in the WUSC manual.
 - Carry out the activities as assigned by the committee.
- Secretary
 - Office management activities to effectively implement the WUSC's decisions.
 - Provide required logistic support to the WUSC
 - Minute decisions made in the WUSC meeting.
 - Acknowledge the decisions of WUSC meetings to each committee member.
 - Keep records related to scheme implementation and notify it in the WUSC meeting.
 - Support in enhancing participation in execution of the scheme.
 - Follow other activities as assigned by the WUSC.
- Treasurer
 - Handle financial transactions of the scheme.
 - Submit income, expenditure and budget of the scheme to WUSC and get approval thereof.
 - Collect the receivable amount of the committee and reconcile the financial transaction.
 - Perform other activities as assigned by the committee.
 - Auditing of the transaction
 - Ensure proper book keeping of income and expenditure of cash and kind including materials related to the users, donors, Municipality etc.
 - Keep records on how cash, kind and materials are used and what is the balance.
 - Take responsibility for cash, kind and materials received for the scheme and reconcile as suggested by the WUSC.
 - Support in enhancing participation of the users.
- Members
 - Monitor implementation activities of the scheme.
 - Ensure cash, kind and materials required for implementation of the scheme.
 - Enhance community participation as needed
 - Keep the users informed on the situation of the scheme regularly.
 - Perform other activities as assigned by the WUSC.

Right to Resign: The Chairperson may resign from the position by submitting a resignation through the Vice-Chairperson to the users committee, and the vice-chairperson as well as other office bearers may resign by submitting their resignation to the chairperson.

Formation of sub-committees: 1) To ensure the quality of services provided by the users committee, sub-committees may be formed as necessary within the scope of this statute.

Each sub-committee shall consist of up to 5 members, with the representation of at least 2 women and inclusive participation from other ethnic groups.

The functions, duties, and powers of the sub-committees shall be as prescribed by the users committee.

CHAPTER 7 FINANCIAL MANAGEMENT

- **Users committee Fund:** 1) The users committee shall have its own separate fund, and the following amounts shall be deposited into this fund:
 - Amounts and grants received from various partner agencies and non-governmental organizations under agreements.
 - Entrance fees and membership fees received from members.
 - Revenues or service charges received from users for utilizing the services and facilities of the users committee, as well as contributions and donations.
 - Amounts received from fines imposed by the committee.
 - Income generated from operating water and environment-friendly enterprises, eco-tourism programs, or payment for ecosystem services programs.
 - Labor, capital, and materials contributed through community participation.
 - Income from rent, lease, or sale of movable and immovable property or other assets of the users committee.
 - Grants, assistance, or physical resources received from the Federal Government, Provincial Government, or Rural/Municipal Government.

Explanation: For the purpose of this section, “ecosystem service” means the ecological system of interrelationship between the community and the environment, and it refers to the contribution made by the community for the conservation of such a system.

Account Operation: 1) The bank account of the users committee shall be operated with the joint signatures of the Treasurer and two office bearers designated by the users committee (including at least one woman).

- The Treasurer’s signature shall be mandatory for operating the bank account of the users committee.

Fund expenditure procedure: 1) The funds deposited in the user committee’s account shall be expended only in accordance with the plans, programs and budget approved by the general assembly or mass meeting.

- The financial report of the amount spent from the fund must be compulsorily presented at the general assembly.

- The management of the fund, accounting system, auditing, and other expenditure-related procedures shall be carried out as prescribed by this statute and in accordance with the provisions of the prevailing laws. From time to time, the users committee may review whether the fund has been properly utilized and issue necessary instructions.

Current and Fixed Assets Management: The users committee is a self-governed, autonomous and organized institution. The Committee may earn, use and sell these current and fixed assets as provisioned in the existing law. All legal obligations will be activated by its name.

Service fees and tariff determination: The fees and revenue for the services provided by the committee shall be as determined by the annual general assembly.

Users Committee Bookkeeping and Auditing: 1) The accounts of income and expenditure of the users committee must be maintained clearly and properly in accordance with the prevailing law.

The accounts of the users committee shall be audited by a registered auditor appointed by the general assembly within three months of the end of the fiscal year, in accordance with the prevailing law.

Any amount found irregular through the audit must be recovered from the person who spent it within three months and deposited into the account of users committee.

The users committee shall submit one copy each of the audit report and the annual progress report to the rural municipality/municipality and the concerned authorities within six months of the end of the fiscal year.

Labor, Skill, Capital, and Material Management Process: For the works of the projects to be constructed by the users committee, the required labor, skills, capital, and materials shall be arranged from grants or assistance received from the federal, province, rural municipality/municipality, other government and non-governmental, or donor agencies. The required physical labor for the project shall be carried out by the local users of the village. A participatory method shall be adopted while collecting the labor contribution and cash contribution to be borne by the users. Any labor, skills, capital, and materials that cannot be arranged by the users shall be managed through federal/provincial government, rural municipality/municipality, other government and non-governmental, or donor agencies.

Formulation of O&M fund: 1) For the regular maintenance of the project, the users committee shall establish a separate operation and maintenance fund.

- The following amounts shall be deposited into the maintenance fund.
 - Amount collected from users as maintenance fees,
 - Cash provided by individuals or families who are unable to contribute the labor as determined by the committee,
 - Amount received from the committee's main fund as decided by the users committee

The management of the maintenance fund account and related expenditure shall be carried out as determined by the users committee.

CHAPTER 8 MISCELLANEOUS

Provision regarding Election: Members of the users committee shall be elected by the users' mass meeting.

Ineligibility of the candidates: Candidates having the following conditions will not be eligible for users committee members:

- Non-Nepali citizen
- Candidates below 18 years old.
- Candidates medically certified to be mentally abnormal.
- Candidates convicted of criminal cases.
- Candidates directly sitting in position of political parties
- Candidates are employees of governmental organizations
- Candidates having another work contract from governmental agencies within same implementation fiscal year
- Candidates working against the user committee activities.

Vote of No-Confidence: A vote of no-confidence can be submitted against any candidates of the committee. 2/3 votes of the committee members may cancel the membership of any users committee member. However, such members will be given opportunity for clarification.

Amendment of the Statutes: 2/3 of the committee members may edit or revise the legislation if felt necessary, but this should be approved by the concerned local government before implementation.

Staff Management: For the daily operations of the committee and the implementation of plans and programs, the creation of staff positions, salaries, allowances, and other service benefits, as well as the terms of service and procedures to be followed, shall be as determined by the users committee.

Delegation of Authority: The authority of any office-bearer of this committee may be delegated to another member or office-bearer.

Provision for Concessions or Exemptions in Fees and Revenue: 1) The committee shall provide special concessions on various fees charged for services to single women, persons with disabilities, Haliya, Dalits, and economically disadvantaged households.

If a disaster or any other extraordinary situation occurs in the service area of this committee, then single women, Dalits, persons with disabilities, poor and disadvantaged households might be unable to pay the service fees, in such case, committee may reduce or exempt the fees for the aforementioned users.

Develop Rules and Regulations: The users committee may develop new rules and regulations based on the scope of this legislation of the committee.

Right of Interpretation: The right to interpret this statute shall rest with the general assembly of the committee.

Dissolution of the Committee: If the committee cannot operate in accordance with the statute or needs to be dissolved for any other reason, all assets of the committee shall belong to the rural municipality/municipality.

Repeal and Saving Clause: 1) Notwithstanding anything written in this statute, if any provision is inconsistent with the prevailing law, it shall be deemed automatically void to the extent of such inconsistency.

The local authority may give necessary instructions to this committee, and it shall be the duty of the committee to comply with such instructions.

Penalties and fines: To maintain discipline among the members of the users committee, penalties and punishments shall be imposed as mentioned below.

If a member repeatedly remains absent from the meetings of the users committee or sub-committee without prior notice or valid reason, the committee may impose penalties as decided by it.

If users fail to provide the required public participation as decided by the committee meetings, penalties may also be imposed. Repeated failure to participate may result in higher fines. Such penalties shall be as decided by the committee.

If anyone causes damage to the project, compensation equivalent to the loss or as decided by the committee meeting shall be recovered.

SAMPLE APPLICATION

Chief Administrative Officer, ... office of the (LG name)

Sir,

As it is required to register a Water and Sanitation Users' Committee. This application is submitted pursuant to with NPR for the registration fee and one copy of the Users' Committee Constitution.

- Description :
- Name of Users' Committee :
- Working area :
- Objectives :

Names and addresses of Water Users and Sanitation Committee members: Description of water resource to be used:

- Name and location of source & Present use of that source
- Type of use of source & Quantity of source to be utilized
- Description of service to be provided by Users' Committee & Office address
- Type of service & Scope of work & No of beneficiaries:
- Possibility of future extension of service
- Description of financial source Applicant

On behalf of Water Users and Sanitation Committee (Signature)

Name:

Designation:

Address: Date: ...

ANNEX 4: CLIMATE CHANGE AND VULNERABILITY CAPACITY ASSESSMENT SURVEY FORM

— A. Study on Climate Change and Vulnerability Capacity Assessment of Water Sources and Proposed Structure			
I. Study of Water Sources			
Descriptions	Source #1	Source #2	Source #3
Forest and land cover in the water source area.	(Forests (broadleaf, needle leaf, mixed), croplands, shrublands, grasslands, bare lands, as well as permanent ice/snow.) situated on a National Forest, Community Forest, National Park, Buffer Zone, Riverbank Private Lan, etc.)		
	Please detail:	Please detail:	Please detail:
How close are the households from the source? (KM)			
Is there a risk of water contamination from poor fecal sludge management?	(unsealed latrines, open defecation, open grazing) and agricultural practices (chemical fertilizer use) above the water source? (If yes please brief)		
	☐ unsealed latrines ☐ open defecation ☐ open grazing ☐ Chemical fertilizer uses above the water source ☐ Other	☐ unsealed latrines ☐ open defecation ☐ open grazing ☐ Chemical fertilizer uses above the water source ☐ Other	☐ unsealed latrines ☐ open defecation ☐ open grazing ☐ Chemical fertilizer uses above the water source ☐ Other
Is the site itself of cultural, archaeological, historical, or social value? (If yes please brief)	☐ Yes ☐ No (If yes, write in short)		

Environmental features of spring shed (d/s and u/s)?	(Explain land cover type, forests type, abundant and endangered tree/vegetation and animal species, soil type, land type (grassland/ pastureland/ marshy land etc.)		
Geographical features of spring shed (d/s and u/s)	(Explain landforms such as valleys, vertical cliffs, rocky area, landslides, water body (springs, streams/rivers/falls, lakes, etc.), etc)		
What are man-made features around the catchment areas? Are any developmental activities taking place around its vicinity?	(road, airports, industry/warehouse, bazar, parks, playground, human settlement, dumping sites, etc. of Up Stream & Down Stream of water source and their effects over the proposed water source)		
Do water source lie on public, private or protected land?	If yes, Is there permit required from concerned body like Community Forest, LG, National Park? Ensure consent is taken for the proposed work.		
	☐ Public ☐ Private ☐ Conservation Area ☐ Community Forest ☐ Public Land ☐ National Park	☐ Public, ☐ Private ☐ Conservation Area ☐ Community Forest, ☐ Public Land, ☐ National Park	☐ Public, ☐ Private ☐ Conservation Area ☐ Community Forest ☐ Public Land ☐ National Park

	Has there been a permit taken from concerned body for work? ☐ Yes, ☐ No	Has there been a permit taken from concerned body for work? ☐ Yes, ☐ No	Has there been a permit taken from concerned body for work? ☐ Yes, ☐ No
Is there soil erosion due to open grazing and surface runoff? Condition of Soil erosion, gullies, rill, and mitigation measures.			
II. Study of Water Supply Structures			
Components	Structure #1	Structure #2	Structure #3
Layout Drawing (please draw will well-levelled dimensions)			
Fencing Details: Length of fencing and specific designs (Differences in fencing level, Partial fencing requirements, specific considerations, etc)			
What is the slope of the proposed structure location? Is the soil sufficiently stable? What are its type and thickness, texture, drainage, and topographical features? How is the spoiled soil managed? (Please provide details.)			
Key Considerations for Design, Estimation and Construction of Structure (Please suggest special considerations for designing and			

estimating intake structures, including			
Is the area and/or site prone to landslides, flooding, drought, fire, earthquakes, and other disasters? (Please provide details on potential disasters and their effects.)			
What are the reasons for potential disaster?			
Mitigation Plans for Potential Disasters (Please provide details on the proposed mitigation actions for potential disasters and their effects, including drawings.)			
Consideration for managing excess water from overflow and washout.			
Is there a loss of vegetation/trees/herbs during construction of structures? If Yes, then what type of vegetation and also mention mitigation measures to reduce the loss.			
Is there a loss of animal habitat during construction of structure? If Yes, then what type of animal habitat and mitigation measure to reduce loss.			

Others (please specify if any, eg: Manhole and Cover; Gate and locking system; ...)			
---	--	--	--

B. Climate Change and Vulnerability Risk Assessment of Scheme Area:

#	Vulnerabilities	Likelihood/occurrence of past disaster	Years of Event	Impact level of the event causing loss of lives, livestock and damage infrastructures				Problem of disaster	Any Action taken
				low (1)	Medium (2)	High (3)	Very High (4)		
1	Has heavy rainfall creating flood caused problems to the functionality of existing schemes around the scheme area in the last 20 years? Yes, ☐ more than 5 times (very High) {4} ☐ more than 3 times (High) {3} ☐ more than 1 time (medium) {2} ☐ No harm (low) {1}	Very High (4) High (3) Medium (2) Low (1)						In case yes, what kind of problems has flooding caused to the functionality of the scheme? (tick one or more) ☐ Physical damage/ Property loss ☐ Sedimentation ☐ Debris deposition ☐ Depletion of supply/flow ☐ Worsening water quality ☐ Outbreak of waterborne disease or ☐ Something else (specify):	
2	Has too little rain / drought/ caused problems with the functionality of the schemes	Very High (4)						In case yes, what kind of problems has too little rain/	

Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS

#	Vulnerabilities	Likelihood/occurrence of past disaster	Years of Event	Impact level of the event causing loss of lives, livestock and damage infrastructures				Problem of disaster	Any Action taken
				low (1)	Medium (2)	High (3)	Very High (4)		
	around the scheme area in the last 10 years? ☐ more than 5 times (very High) {4} ☐ more than 3 times (High) {3} ☐ more than 1 time (medium) {2} ☐ No harm (low) {1}	High (3) Medium (2) Low (1)						drought caused to the functionality? (tick one or more) ☐ Physical damage/Property loss ☐ Depletion of water sources ☐ Worsening water quality ☐ Outbreak of waterborne disease ☐ Something else (specify):	
3	Has landslide caused problems to the functionality of the scheme around the scheme areas in the last 10 years? Yes, ☐ more than 5 times (very High) {4} ☐ more than 3 times (High) {3} ☐ more than 1 time (medium) {2} ☐ No harm (low) {1}	Very High (4) High (3) Medium (2) Low (1)						In case yes, what kind of problems has the landslide caused to the functionality? ☐ Physical damage/Property loss ☐ Debris Deposition ☐ Depletion of supply/flow ☐ Worsening water quality ☐ Outbreak of waterborne disease Something else (specify):	

Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS

#	Vulnerabilities	Likelihood/occurrence of past disaster	Years of Event	Impact level of the event causing loss of lives, livestock and damage infrastructures				Problem of disaster	Any Action taken
				low (1)	Medium (2)	High (3)	Very High (4)		
4	Has water contamination by viruses/bacteria/chemicals caused problems to the functionality of the scheme around scheme areas in the last 10 years? ☐ more than 5 times (very High) {4} ☐ more than 3 times (High) {3} ☐ more than 1 time (medium) {2} ☐ No harm (low) {1}	Very High (4) High (3) Medium (2) Low (1)						In case yes, what kind of problems has water contamination caused to the functionality? ☐ Physical damage/Property loss ☐ Depletion of supply/flow ☐ Worsening water quality ☐ Outbreak of waterborne diseases Something else (specify):	
5	Has fire caused problems to the functionality of the scheme around scheme areas in the last 10 years? ☐ more than 5 times (very High) {4} ☐ more than 3 times (High) {3} ☐ more than 1 time (medium) {2} ☐ No harm (low) {1}	Very High (4) High (3) Medium (2) Low (1)						In case yes, what kind of problems has a fire caused to the functionality? ☐ Physical damage/Property loss ☐ Depletion of supply/flow ☐ Worsening water quality ☐ Outbreak of waterborne disease Something else (specify):	

ANNEX 5: COMMUNITY ACTION PLAN FOR IMPLEMENTATION PHASE ACTIVITIES

(Note: CAP must be attached in implementation phase agreement paper)

Community Action Plan (CAP)

Scheme: _____ Ward No./Cluster: _____ Rural Municipality/Municipality; _____ Date: _____

Implementation Phase Activities Scheme Name and Type: _____ Total Households: _____ Total Population: _____

S.N.	What? Description of Works	Total Days	When?		Where? Location	How? (Process)	Who? UC Member	Who? LGU	Who Support ?
			Start Date	Completion Date					
1	Completion of Preparatory Phase's Activities								
2	CAP Approval from mass meeting First Public Audit and Monitoring								
3	Implementation Phase Agreement								
4	Procurement of external materials: Quotation Open, Suppliers Selection and Agreement with Suppliers								
5	Demand of first installment								
.....									
Add number of rows as per need									
Signature of UC members:									

ANNEX 6: SAMPLE AGREEMENT BETWEEN LOCAL GOVERNMENT AND USER COMMITTEE

..... Municipality/Rural Municipality
Office of Municipality/Rural Municipality Executive
Office Location,District
 Province



Local Adaptation to Climate Change (LACC) Project

Implementation Phase Agreement Paper

BetweenMunicipality/Rural Municipality andUC

Fiscal Year

Name of the Scheme:

Scheme Location:Municipality/Rural Municipality & Ward No.....

Tole/Cluster:

Beneficiaries Household: Population:

Duration of the agreement:

FromTo

Agreement signed Date:

Salient Features of the Scheme

Name of Scheme:			
Scheme Code:		Scheme Type	√ New √ Rehab
Scheme Implementation Location:			

Beneficiaries:

Number of beneficiaries	Households	Female	Male	Total population
BCTS				
Dalit				
Janajati				
Others				
Total				

UC Composition:

Details	BCTS		Dalits		Janajati		Other		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Key Position										
Members										
Total										

Proposed Structures:

Type of connection	Total no. of taps	Remarks and other information regarding the connections:
Private connections		
Public tap stands		
Schools		
Health posts		
Other institutions		

Intake (No:)	Collection Chamber /Distribution Chamber/IC/Break Pressure Tank (No:)	RVT (No:)	Total Pipeline Length (m)		Other structures:
			Transmission	Distribution	

Contribution Pattern:

Source of Funding	Amount in NPR	Percentage (%)
A. Government of Nepal		
B. Government of Finland/EU		
C. Rural Municipality/Municipality		
Natural Resource Development Fund-NRDF (A+B+C)		
D. Users' Cash Contribution		
E. Users' Kind Contribution		
F. Others:		
Grand Total (A+B+C+D+E+F)		
Users' cash contribution (for O&M Fund)		

Proposed Instalment to UC from Rural Municipality/ Municipality

Instalment	Amount (NPR)	Condition for instalment release
First (50%)		After signing implementation agreement, Market Survey and Procurement Process (Quotation) approval by UC
Second (30%)		Submission of expenditure documents after second Public Audit, Measurement book and Running Bill from TSU and Second Monitoring visit team Recommendation
Third/Final (Maximum 20%)		After fully completion of scheme work, Final Evaluation and MB from TSU, 3 rd Public audit and recommendation of 3 rd Monitoring team
Total (100%)		

Signature of contracting Parties:

.....

On behalf of UC

UC Chairperson

Date:

Stamp

..... Rural Municipality/ Municipality

.....

On behalf of Rural Municipality/ Municipality

Chief Administrative Officer

Date:

Stamp

Office of Municipality/ Rural Municipality Executive

..... District. Province

IMPLEMENTATION PHASE AGREEMENT

Name of the scheme:

1. CONTRACTING PARTIES

This contract is made for the implementation of the above-mentioned scheme between:Rural Municipality/ Municipality, hereinafter called LG, Water Users and Sanitation Committee, hereinafter called UC. "Project" will represent the Local Adaptation to Climate Change (LACC) Project, Project support unit and Province Project Coordination Office, Surkhet/Dhangadhi and cluster Support Unit of the Project. The scheme was prioritized in Water Use Master Plan (WUMP)/WASH plan in priority (or was selected based on the proposal submitted by the LG, that was prioritize completing the steps through the local planning process, to the Project on)

Implementation of the scheme in transparent way is evident for ownership of the community and quality construction and capacity enhancement of UC/users is essential for sustainability of the scheme and independent operation and maintenance management of scheme after construction. Considering the fact, overall responsibility of scheme implementation and its management is handed over to the users. The LG, in support of the project provides necessary support to enhance capacity of the UC.

The UC commits to establish O&M fund and raise water tariff regularly for the sustainable operation and maintenance of the scheme. Village Maintenance Worker will be selected and appointed for regular operation, maintenance and repair of the scheme. LG will provide necessary technical training to the VMW. The UC will be as act as independent and self-governed entity as provisioned by respective legislation.

The LG, as investor and accountable to fulfil basic need of the community, shall closely monitor the scheme implementation work and provide necessary support to UC and project implementation unit staffs. The LG is committed to allocate operation and maintenance fund annually for repair and maintenance support to the scheme.

2. SCOPE OF CONTRACT

The contracting parties agree to undertake necessary action and work to complete thescheme.

The scope of the activities and work are specified in the attached community action plan (CAP) and design report of the scheme. All activities and work shall be carried out in accordance with the "Step-by-Step Manual" of the Project.

3. CONTRACT PERIOD

The implementation will start on (dd/mm/yy) and will be completed on

LG may allow UC to extend the duration of this contract upon a written request from them with valid justification that proves the extension. However, LG will not cover any additional cost thereof.

4. ROLE AND RESPONSIBILITIES

4a. Role and Responsibilities of the UC

The community has the ownership of and full responsibility for the scheme from the date of signing this contract. UC shall represent the community as their elected executing body.

UC shall be responsible for scheme implementation in accordance with the Community Action Plan (CAP), including the following tasks:

- Manage all the construction activities in a timely manner as specified in the Community Action Plan, which comprise procurement as per specification and transportation of none local material, collection and transportation of local material, arrangement of road head or site stores, store keeping for construction materials and tools, maintaining books and accounts of all income and expenditure.
- Procure construction materials, pipes, fittings and tools from VAT registered suppliers/manufacturers/firms not exceeding the estimated rate following the procurement process mentioned in Community Procurement Manual of the Project. UC is responsible to verify the quality of materials with the support of project implementation support unit staff before delivery from the suppliers/manufacturers. Also maintain quality of the structures and other activities. All the procurement related transactions should be publicly audited. In case low quality materials are accepted and transported to the field, UC will be responsible to replace those materials in their own cost.
- Ensure quality of construction and pipeline as mentioned in the attached design and estimate of the scheme.
- Conduct regular meetings to follow-up and record the status of work and any possible problems. These site meetings shall be minute in a site ledger book, and signed by all the participants.
- Conduct mass meetings for public hearing and public auditing and updates project briefing board to notify users and concerned bodies the real income and expenditures of the scheme in a transparent manner. UC is responsible to conduct public auditing before the second and final instalment upon completion of the activities of the scheme. Detail in regards to meaningful participation in scheme activities including in decision making process, income and expenditures, quality/quantity of materials, applied process and other any issues which have to be discussed and recorded in the public auditing.
- Participate in the meeting/seminars/trainings and mobilize community people from all groups, genders and clusters, in scheme activities
- Support and participate in monitoring activities
- Supervise the activities of the project implementation support unit staff. If any critical cases from their performance, UC will report to the project implementation support unit staff.
- Coordinate with Ward committee, LG office, Project and project implementation support unit staff as required.
- Cooperate with the LG and Project by providing any necessary documents, bills, receipts and vouchers for the monitoring and auditing purpose.
- Ensure regular collection of Water Tariff and maintenance of O & M fund; at least 1% of total estimated cost for the O&M fund of the scheme and maintain the account in reliable financial institution.
- Appoint VMW, fix water tariff and proper mobilization and management of operation and maintenance fund.
- UC shall prepare climate resilient water safety plan (WSP++) for post construction phase and implement after completion of the scheme.
- UC, on behalf of the users commit to manage following free labour work to the scheme as kind contribution, as mentioned in the design report

- Collection and transportation of local materials,
- Fee labour equivalent to one day per HH in sand and external materials transportation by head load (if any)
- Trench digging and burying (as mentioned in attached design report)
- Unskilled labour for construction of structures and tap stand.

4b. Role and Responsibilities of the LG /Ward Committee

The LG, through PMC is responsible to:

- release instalment from NRDF to UC's account timely
- provide technical backups to UC through PMC and project implementation support unit.
- monitor the performance of UC as well as the quality of material, workmanship and structures.
- Ensure quality human resources are mobilized by the project implementation support unit,
- monitor that the rights of all community members are respected with regard to water
- take necessary action for the activities not conducted properly by UC and project implementation support unit
- consider extending the duration of this contract upon a written request form the project implementation support unit staff. However, the LG will not cover any additional cost of the extended period.
- Deposit LG 's contribution amount in NRDF in timely manner, manage fund to the UCs from other sources in case donor's fund not available in time.
- provide necessary support and assistance to UC for successful completion of the scheme.
- Hold or deduct the payment to UC in case of poor performance by them.
- Suggest UC, staffs or the project for better performance, in case of low performance.
- Ensure all the activities are carried out according to approved norms and guidelines.

4.c Role and Responsibilities of project implementation support unit staff:

The project implementation support unit staff are responsible to

- Organize training, workshop, seminar, meeting and mass meetings as per step by step manual and community action plan.
- Monitor and ensure quality of external and local materials, depth of pipeline, and workmanship of the scheme and provide assistance to UC carrying out those activities as a part of capacity building process.
- Provide necessary support and on the job training to UC/Users on store management and recording, book keeping of accounts and support to produce financial statements to present in public auditing.
- Ensure proper maintenance of scheme book and minutes of meetings.
- Provide all type of technical support required for the scheme implementation
- Prepare measurement book and completion report of the scheme.
- Participate in scheme/ LG level monitoring as observer
- Support social mobilization, income generation and other activities that need to be implemented in the scheme area.
- Submit monthly scheme physical/financial reports to the LG.
- Assign following staffs for the implementation of the scheme

Sn	Name of Staff	Position	Duration (Months)	Remarks
1				
2				

3				
4				

- Staffs must inform to the LG in writing about the issues that can't be solved at scheme level and that may cause increase in cost of the scheme or obstruct to complete the scheme in mentioned timeframe.
- Other terms and conditions of the staffs shall be as per the contract signed between staffs and the LG.

5. SCHEME COST AND TOTAL COST ESTIMATE

As per design report and as specified in the Implementation Phase Proposal the total estimated cost of the scheme is (in words) NPR.

The total estimated amount and contribution sharing is as following:

SN	Description	Cash	Kind	Total	%	Remarks
1	External Construction Materials					
	1.1 Pipes					
	1.1.1 GI Pipes					
	1.1.2 HPDE Pipes					
	1.2 GI/Brass Fittings					
	1.3 Tools					
	1.4 Solar Component					For lift schemes
2	Local Construction Materials (Sand, Stone, Aggregate, Wood etc) 2.1 Unskilled labour Local Materials Collection Local Materials transportation External Materials transportation Transmission Pipeline D/B Distribution Pipeline D/B GI Pipe Installation Work Tap Construction Other Structure Construction					
	2.2 Skilled Labour GI pipe installation					

	Structure Construction					
3	Transportation by Vehicle					
	3.1 Local Materials					
	3.2 External Materials					
4	Others					
	4.1 Store Rent (in road head)					
	4.2 Scheme information board					
	4.3 Cement packaging					
	4.4 Threading cost for larger sized pipe					
5	CCA/DRM related					
	5.1 Plantation					
	5.2 Recharge pits/ponds					
	5.3 other CCA/DRM components					
6	Total (1+2+3+4+5)					
7	Contingencies					
	7.1 Accident insurance of the Workers					
	7.2 UC Management Cost					
	7.3 Quotation notice publication and other related cost					
	Total Cost of the Scheme (6+7)					

The LG may approve revised design and estimate as per the formal on time request of UC in case it can be justified, e.g. due to unexpected rise in market price, changed natural conditions or by a natural calamity. Project implementation support unit staff will be responsible for the additional cost of the scheme that caused due to mistake/error in survey or designing of the scheme.

6. CONTRIBUTION PATTERN BY DIFFERENT STAKEHOLDERS

Sn	Stakeholder	%	Total	Cash	Kind
1	Community				
	Cash for investment				
	Kind/labour contribution				
	Community Total				

2	NRDF contribution				
	Government of Nepal				
	Government of Finland/EU				
	LG Contribution				
	NRDF Total				
3	Grand Total				
4	Community for O&M fund				

7. PAYMENT SCHEDULE TO UC

The LG shall release maximum of NPR from NRDF to the account of UC on instalment basis as specified below:

Installment	Description	%	NPR
First	After signing agreement between UC and Supplier for external materials supply and transportation	50%	
	In words NPR		
Second	After submitting evidence of expenditure of first instalment amount that is proven by public audit and verified by field monitoring. No instalment will be released without clearance of previous instalment.	30%	
	In words NPR		
Third	After completion of all the scheme work as per design and estimate, final evaluation and measurement book, all the expenditure publicly audited and verified and recommended by monitoring team.	20% (Max)	
	In words NPR		
	Total	100%	

Final instalment shall be released after receiving following documents.

- evaluation report of the cost as per the work done and MB
- completion of all the activities as per CAP
- submission of public auditing report
- submission of recommendation of ward office and project implementation support unit staff
- Report of field monitoring
- TAA or assigned project representatives written recommendation

All payments shall be made within two weeks of the receipt of written request of UC in case the necessary requirements are fulfilled. The last instalment will be paid up to 20% based on the actual expenditure incurred. No final instalment shall be made until Users contribution for investment and O&M deposited.

8. MONITORING COST

Travel cost of LG officials shall be covered from administrative cost allocated to the LGs. No other cost shall be paid from NRDF.

9. TAXES

UC should deduct 1.5% as a Tax Deduction at Source, while paying the supplier. This amount will be deducted by the LG while paying the final instalment to the UC. UC will be responsible to pay any other taxes that incurred according to prevailing rule and regulation of Government of Nepal / LG.

10. AUDITING

Book keeping of all financial transactions of UC will be audited by the users themselves by organizing public auditing at mass gatherings. Procurement of construction materials, stock of materials, and payment of skilled/unskilled labourers, transportation costs, bank deposits, and in-kind contributions of users will be the main subjects for discussion. The UC, with the assistance of the project implementation support Unit staff, is responsible to organize the event. Representation of each household is expected in the meeting, however 75% of the total households of the scheme area must finalize this auditing (with proportional representation of DAGs and 50% female). The UC, with the assistance of the project implementation support unit staff will update project information board, including the total scheme cost after completion of public auditing. Information will be presented in a way that is simple and easy to understand. This may include presenting in local languages where appropriate, to maximise understanding.

11. MONITORING AND SUPERVISION

The LG will arrange monitoring visits to the scheme as per the Step by Step Manual. In addition, the LG can assign its personnel to supervise the work on site at any time during the duration of the contract. The personnel of LG or monitoring team appointed by LG and Project shall have the right to visit the site. LG and Project personnel and monitoring team is entitled to have access to any information related to execution of activities under this contract.

Representatives of project implementation support unit staff and UC shall participate in the monitoring. They will assist the LG monitoring team by providing all required information and by actively helping to inspect all the work done by UC. The views of local community members should be collected during monitoring visits.

The LG monitoring team shall update a monitoring book at the site, and verify it by signatures. Any disagreements between the monitoring team, project implementation support unit staff and UC shall be recorded in the monitoring book. The findings made during monitoring should be validated with the users. In the manner, monitoring book/report represents conclusions accepted by the stakeholder involved as well as issues, which need to be solved by competent authority of the LG and project implementation support unit staff.

12. TERMINATION OF CONTRACT

The LG has the right to terminate this contract if it is found that:

- The contract cannot be fulfilled satisfactorily due to poor performance of UC.
- Information provided by UC is found intentionally inaccurate or misleading.
- The scheme cannot be implemented within the cost estimate or due to any other reason resulting to considerable delay of work or increase of cost.
- There is misuse of funds or materials.
- There is no effective contribution of community resulting in delay of work, loss of material or increase of cost.
- The UC fail to maintain site records, books and accounts in a proper manner.

If the contract is terminated by LG for a reason beyond the control of the UC, all the expenditure till the date of termination shall be paid to the UC. In addition, reasonable cost of demobilization shall be compensated. If the contract is terminated for any reason caused by the UC, the LG shall have the right to withhold the pending or remaining payments and to capture the remaining materials and tools.

If the termination of the contract caused due to lack of support provided by the project implementation support unit staff, staffs shall be punished. The punishment shall be as mentioned in the contract between staff and the LG. If any damage caused due to negligence of staffs, the cost of damage shall be reimbursed by staffs.

If the scheme couldn't be implemented due to misuse of fund or materials released for the scheme or or used for personal benefits or failure for public auditing, LG has right to terminate the contract and take necessary legal action for reimbursement of entire scheme cost from fraud party/ies.

13. REDUCTION OF PAYMENT

The LG has right to deduct payment to UC in following case;

- the activities have been modified or the design changed resulting in reduction of quality or quantity of work, or services or materials have not been procured as per the specifications
- Final instalment mentioned in this agreement is maximum, the instalment shall be paid in actual basis. Cost reduced from competitive external material procurement, quantity reduced through low quality of structures or less pipeline depth shall be deducted from the payment.
- Final evaluation shall not be done more than estimated in specified heading/component.

The LG has the right to reduce the payments in case of Final instalment to UC shall be released based on the final evaluation of the work. Therefore, final instalment may not be equal or more than the amount mentioned in this agreement in all cases.

14. AMENDMENTS OR DISPUTES

The contracting parties can change this contract only in writing and approved and signed by all parties.

In case of any dispute all parties shall make all efforts to resolve it. If this is not possible the dispute will be solved as per the provision mentioned in project implementation manual (PIM). It is important that all parties are aware of the avenues of redress available, and where complaints can be made.

15. EXCESS FUND OR MATERIALS

Since the cost estimate is prepared on the basis of assumptions, any leftover material or construction tools at the construction site, if not specifically mentioned as returnable in the design report, shall be handed over officially to the UC as property of the community for the operation and maintenance of the scheme. If the materials left over are in huge quantity and can't be further utilized for O&M, it shall be as decided by PMC as recommended by the monitoring team.

Any fund for scheme cost not spent as per the design report shall remain as a property of the NRDF. Such surplus amount shall be adjusted while making the final payment to the UC. If the fund released in first and second instalment can't be expended as per final evaluation of the scheme, UC shall return surplus fund to NRDF.

16. SIGNATURES

This contract is prepared and signed, one for each contracting party and one for cluster Support Unit of the Project:

On behalf of the UC:
Signature:

On behalf of the LG:
Signature:

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

Name:
Position: Chairperson
Father's Name :
Fore Father's Name:
Citizenship No :
Stamp of UC

Name:
Position: Chief Administrative Officer
Date:
Stamp of LG:

Witnessed by:
Ward Committee
Signature:
Name:
Position: Ward Chairperson
Date:

LACC Project
Signature:
Name:
Position: TAA/NRM E/TO
Date:

Annexes:
a) Community Action Plan (CAP)
b) Design Report of the scheme
c) GEDSI Commitment

ANNEX 7: UC COMMITMENT TOWARDS GEDSI

Commitment to Gender Equality, Disability and Social Inclusion (GEDSI)

Gender Equality, Disability, and Social Inclusion (GEDSI) Commitment has been prepared to be mandatorily followed and enforced by the formulated/reformulated Users Committees to implement the schemes under Local Adaptation to Climate Change Project. This commitment will apply to all Users' Committees that have signed agreements to implement schemes under the project and will remain as an annex to the Users' Committee agreement. During the scheme agreement, the members of the Users' Committee must read, understand, and sign this commitment.

a) Gender Equality, Disability, and Social Inclusion

- While forming and operating the Users' Committee, inclusion of gender, caste, and marginalized groups will be ensured in the main Users' Committee, sub-committees, and even in the selection of skilled and unskilled laborers, as prescribed by the Project Implementation Manual.
- The scheme will be implemented with the participation of single female, Dalits, households with persons with disabilities, and vulnerable households within the scheme area, and equal access to the benefits of the scheme will be ensured for all classes, castes, and ethnic groups.
- If any household residing within the scheme area is excluded from the list of beneficiary households due to any reason and information or complaints are received that a household has been deprived of the benefits of the scheme, such marginalized households can be identified at any phase of scheme implementation. The Users' Committee will make a special decision to include such families and bring them into the project's benefits.
- In the trainings or workshops on Gender Equality, Disability, and Social Inclusion organized by the Rural Municipality/Municipality and the Project, there will be inclusive and active participation from the Users' Committee based on gender and caste, and the learnings from such training will be fully applied in practice.
- While constructing scheme-related structures such as taps, toilets, Improved Cooking Stoves, Improved Water Mills, greenhouse etc., will be constructed accessibility, inclusiveness, and user-friendly manner with the support of the Technical Team.
- Community-level agriculture, forest, and livelihood programs will be conducted with the inclusive participation of female, Dalits, households with persons with disabilities, and vulnerable households. The traditional knowledge and skills of Dalits, indigenous people, and other locals related to sustainable use of community forest conservation and non-timber forest products will be respected.

b) Scheme Implementation Based on Non-Discriminatory Approach

- Any form of social discrimination, whether direct or indirect, on the basis of caste, gender, religion, physical ability, or any other grounds will be opposed. During the stages of project implementation, the Users' Committee members will not engage in or cause caste-based, gender-based, religious, ability-based, or any other form of discrimination.
- The Users' Committee will work to spread public awareness in their society against traditional harmful practices such as gender-based discrimination, *Chaupadi* (menstrual seclusion), caste-based discrimination, and discrimination based on physical condition. And such discriminatory acts will not be committed by the members of Users' Committee.

- The project will be implemented on the basis of “equal pay for equal work” and gender-friendly working approach. Children under 16 years, pregnant female, and persons with different physical abilities will not be involved in hazardous or physically demanding labor during the project.
- If female with children, menstruating female, or persons with disabilities participate in the scheme construction works, special arrangements (such as childcare, menstrual hygiene pads, first aid supplies, etc.) will be made at the construction site.

c) Project Construction, Proportional Participation, and Labor Contribution

- In terms of the cash contribution and labor contribution from users as stated in the project agreement, each household will contribute not on the basis of equal shares but on the basis of proportional and fair distribution. For example, in an irrigation project, when contributing cash and labor, those with more irrigated land must contribute more, while those with less irrigated land will contribute proportionally less to both cash and labor.

Signatures of the present Users’ Committee members:

ANNEX 8: ENVIRONMENTAL IMPACT MITIGATION AND MONITORING PLAN-EMMP

.....Water Supply/MUS/Irrigation Scheme					
Environmental Impact Mitigation and Monitoring Plan					
.....Rural Municipality/Municipality				Ward Number.....	
Area and Phase of Scheme	Potential Environmental and Social Impacts/Effects	Possible Mitigation Measures	Means of Verifications	Responsibility	Monitoring By
Preparatory Phase					
Sources and Spring Shed	☐ Contamination of source ☐ Other.....	☐ Climate Change and Vulnerability Capacity Assessment Survey ☐ Water Quality Testing ☐ Fencing/Mesh Wire Fencing ☐ Estimation of bleaching powder for system chlorination ☐ Design of inline Chlorination Unit	☐ Climate Change and Vulnerability Capacity Assessment of Water Source and Structures form fill up ☐ Fill up potential vulnerability assessment table ☐ Water Quality Test Result ☐ Design and estimate	WRT and Sub-Engineer	Technical Officer
Structure	☐ Soil Erosion ☐ Flooding ☐ Landslide ☐ Drought ☐ Earthquake	☐ Recharge Pits ☐ Recharge Trench ☐ Recharge Pond ☐ Plantation ☐ Chek dam ☐ Worship Place Establishment ☐ Gabion and retaining wall	☐ These mitigation measures are reflected in the design and estimate	WRT and Sub-Engineer	Technical Officer or Project Engineering Team

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

		☐ Cable Crossing ☐ GI crossing ☐ Bio-engineering			
Social Issue	☐ Scheme Area Delineation issue ☐ Source Dispute ☐ Land acquisition ☐ UC Formation ☐ Community Cash and Kind Contribution	☐ WUMP, Feasibility Study Report, LG recommendation ☐ Good community consultation on condition of water sources and its existing uses ☐ Fix Location of structure with community participation ☐ Discussion with ward representatives ☐ Cash and Kind contribution decision from mass meeting ☐ UC formation/re-formation as per PIM ☐ Take Consent from land owner in written form	☐ Decisions of different stakeholder meeting ☐ Minute of UC formation ☐ Consent Paper ☐ Other Decisions	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, First Monitoring
Safety of labor/work forces	Occupational health safety	☐ Safety gears and first aid kit	☐ Safety gears and first aid kit in estimate of scheme	WRT and Sub-Engineer	Technical Officer or Project Engineering Team
Implementation Phase					
Structure Construction	☐ Soil Erosion in excavated area ☐ Monsoon flooding ☐ Gully cutting/riling	☐ Soil excavation in fixed areas only and its proper management ☐ Management of diversion channel ☐ Construction work is start in dry season if possible	☐ Supervision and follow up of construction site ☐ Photos	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, Second Monitoring

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	☐ Water source contamination	☐ Reinstatement of excavated soil immediately if construction is completed ☐ Implement the protection work as per design and estimate	☐ Monitoring and supervision checklist (Monitoring Book) ☐ Implement as per design and estimate ☐ Field or Trip report/Issue logs		
	☐ Waste Management	☐ Waste Segregation based on nature of waste ☐ Dust of GI pipe threads are fixed in mortar ☐ Collecting pieces of polythene pipes for recycling/reuse ☐ Properly opening and storing cement bags so that they can be reused later ☐ Excavated soil Management	☐ Supervision and follow up of construction site ☐ Photos ☐ Monitoring and supervision checklist (Monitoring Book) ☐ Implement as per design and estimate ☐ Field or Trip report/Issue logs	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, Second Monitoring

Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS

	☐ Damage to trees/forest and vegetation	☐ Build structures only in open and flat areas and reduce deforestation as much as possible. ☐ Do not construct structures on sloping land (>25°), landslide-prone areas, farmland, forests, or religious sites. ☐ For every 1 tree cut, plant 10 local trees (local species such as sal, peepal, rudraksha, etc.)	☐ Supervision and follow up of construction site ☐ Photos ☐ Monitoring and supervision checklist (Monitoring Book) ☐ Implement as per design and estimate ☐ Field or Trip report/Issue logs	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, Second Monitoring
Social Issue	☐ Land disputes on private agricultural or community land during pipelines/construction ☐ Use of child labor in construction ☐ Gender-based wage inequality during construction ☐ Discrimination and restrictions ☐ Use of skilled labor from outside the community	☐ Select the location of the structure based on the consent of landowner ☐ Adhere to the project's GEDSI & HRBA ☐ Use skilled local labors much as possible ☐ Adhere to national laws and regulations on child protection.	☐ Supervision and follow up of construction site ☐ Photos ☐ Monitoring and supervision checklist (Monitoring Book) ☐ Implement as per design and estimate ☐ Field or Trip report/Issue logs	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, Second Monitoring

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

	Occupational Health Safety	○ Group insurance for workers ○ Enforce health and safety regulations ○ Conduct regular safety inspections and incident recording systems before construction begins, and orient workers on hygiene and sanitation ○ Quality Water Facility at construction site ○ Encourage the use of safety equipment such as boots, goggles, gloves, and masks while working. ○ Provide training on occupational injuries and first aid to workers before construction begins. ○ Provide safety equipment such as helmets, boots, shoes, gloves, and other safety equipment and health kits at the construction site	○ Availability of safety equipment such as helmets, boots, shoes, gloves, etc. and health kits at the construction site standards ○ Supervision and follow up of construction site ○ Photos ○ Monitoring and supervision checklist (Monitoring Book) ○ Implement as per design and estimate ○ Field or Trip report/Issue logs	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, Second Monitoring
Post-construction phase					
Sustainable Operation and Maintenance Management	Water Supply System Functionality and Sustainability	○ Collect 1% Operation and Management (O & M) fund at the beginning of implementation ○ Appointment of VMW/Pum Operator with gender balance and timely training	○ UC decisions ○ Water tariff fixation decisions ○ Photos	Social Mobilizer, Filed Coordinator, WRT, Sub Engineer	TOs, NRM Expert, TA Advisor, Third Monitoring

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

		○ Prepare Climate Resilient Water Safety Plan (CR-WSP) ○ Establish water tariff collection system			
	○ Waterlogging problem in settlements ○ Soil erosion due to overflow of RVT ○ Inlet blocked due to soil and silt accumulation in intake	○ Drainpipe for wastewater management ○ Pipe for water overflow management ○ Multi-use of water ○ Proper Intake packing with boulders and use of strainers	○ Photos ○ Monitoring and Supervision Checklist ○ Implementation as per Design and Cost Estimate	Social Mobilizer, WRT, Field Coordinator	LACC Project Officer, TOs, Monitoring Team
	Potential conflict in community over water supply operation issues	○ Appoint and Mobilization of VMW/Pump Operator ○ Water Tariff fix ○ Record of UC assets/tools/materials ○ O&M fund management and mobilization and its increment ○ CR-WSP preparation	○ UC decisions ○ Water tariff fixation decision ○ Photo ○ Book keeping ○ CR-WSP	Social Mobilizer, WRT, Field Coordinator	LACC Project Officer, TOs, Monitoring Team

ANNEX 9: WATER TARIFF FIXATION GUIDELINE

For the quality and continuity of services provided by any scheme, financial resources must be available. In the scheme, 1) for the regular operation, maintenance, and replacement of the various constructed structures, 2) for the management of quality services of the scheme, and 3) for arranging the funds required for the upgrading of services in the future, financial provisions must be made from now.

What is the water tariff for?

1. For the salary and other benefits of the working technical and other staff.
2. For office management.
3. For the necessary stationery and related materials for the office.
4. For maintenance and to purchase pipes, fittings, and tools required, and keep them in stock.
5. For the replacement of structures and machinery parts.
6. To keep some portion of the initial investment as reserve for major maintenance works.

Water Tariff Determination Process:

In all types of private tap system scheme, water meters are installed in the design. The water meter records the amount of water consumed by the users each month. The tariff rate is determined on the basis of the volume of water consumption recorded in the meter. Before fixing the water tariff rate, the estimated future expenses of the project must be calculated. The tariff rate should be determined based on the estimated expenses.

The water tariff rate is mainly determined based on the following two methods:

a) Flat Tariff Rate:

This type of tariff rate is mostly applied in public tap systems. No matter how much water a person consumes, the tariff remains the same, meaning both low and high consumers pay the same amount. In this system, the demand, consumption, and timing of water do not affect the tariff, and generally, water meters are not installed. There is a risk of water misuse under this system.

- Estimate the annual expenses. This includes maintenance of structures, salaries and other benefits of maintenance staff, office operation, stationery costs, reserve funds for maintenance, communication, etc.
- Divide the estimated annual expenses by 12 months and then divide the monthly expenses by the total number of households consuming water. The resulting amount is the monthly water tariff rate per household.
- It is better to increase this tariff rate by 5 to 10 percent “for contingencies.” This additional amount will go into the maintenance fund as savings.

b) Consumption Based Tariff Rate:

This tariff rate system is mostly applied in private tap system schemes. The tariff rate is determined based on the monthly volume of water consumption. A minimum tariff is set for a certain consumption level, and if water consumption exceeds this level, an additional tariff must be paid accordingly. Even if less water than the minimum consumption limit is used, the minimum tariff must still be paid. The committee may fix a separate tariff rate or provide discounts in the prescribed tariff rate for the ultra-poor, female-headed households, single male/female, and households with low-income sources.

- Estimate the annual expenses. This includes maintenance of structures, salaries and benefits of maintenance staff, meter readers, office managers, office operations and office utilities, stationery costs, reserve funds for maintenance, communication, etc.
- Calculate the total annual volume of water available from the source. From this amount, deduct some percentage considering leakage, theft, and days when water supply may be interrupted (generally take around 80%).
- Divide the estimated annual expenses by the adjusted annual water volume to determine the rate per cubic meter (1,000 liters). Increase this amount by a certain percentage to finalize the tariff rate.

Collection of tariff based on consumption per thousand liters

Whatever the amount of water consumed, the total tariff is calculated by multiplying the fixed rate per thousand liters. For example, if the rate is NPR 15 per thousand liters (1 unit), and 15 units are consumed, then $15 \times 15 = \text{NPR } 225$ will be collected as the tariff.

Collection of tariff based on minimum consumption and additional consumption

The minimum water consumption can be set as follows:

- Suppose a person requires 45 liters of water per day for drinking and personal hygiene. If there are 6 family members in a household, they require 270 liters daily and 8,100 liters monthly. Therefore, 8,000 liters or 8 cubic meters or 8 units of water can be fixed as the minimum consumption quantity.
- The total estimated annual expenses divided by the total consumption of households at 8,000 liters will determine the minimum tariff rate. Households consuming up to 8,000 liters must pay this minimum tariff.
- Households consuming more than 8,000 liters must pay additional charges on top of the minimum tariff. For example, the minimum tariff up to 8,000 liters is NPR 150.
- For consumption above 8 units (1,000 liters = 1 unit), the charges will apply as follows: from 8 to 13 units at NPR 20 per unit, and from 14 to 18 units at NPR 25 per unit, and so on progressively increasing.
- For example, if a household consumes 15 units of water:
 - Up to 8 units = NPR 150 minimum tariff
 - Next 5 units (up to 13) = NPR 100 (5×20)
 - Next 2 units (14–15) = NPR 50 (2×25)
 - Total = NPR 300 water tariff ($150 + 100 + 50$).
 -
- Things to Remember While Fixing Tariff Rates
 - Water may be available “free of cost” at the source, but a large amount of money has already been spent to bring water to the households, and more funds will be needed to ensure continuous service. Therefore, the tariff rate must be sufficient to cover all types of expenses.
 - The tariff rate must be fair and affordable (within the capacity of the people).
 - The money collected from the water tariff must not be spent on other facilities.
 - The water tariff rate must be known to all consumer households.

- The water tariff rate must be easily understandable for everyone.
- The water tariff rate must be reviewed every year.
- The water tariff rate must be easy to implement.

—

— Note:

- If new households want to be included in the water supply system, they must contribute a certain percentage equivalent to the community labor contribution made during the project construction. This must be decided in the meeting of all consumers.
- One unit on the water meter equals 1,000 liters.

Water Tariff Based on Cost Recovery

Necessary Information:

- Estimated cost of Scheme
- Design life
- Estimated Annual O&M cost
- Staff annual salary and incentives
- Annual office running and management cost
- Total households and Population
- Growth Rate (Annual in %)
- Water Demand per day per person
- Annual Inflation rate

Formula for Water Tariff Calculation

$$\text{Monthly Tariff rate per HH} = \frac{\text{Annual recovery cost of scheme} + \text{Annual Operational Cost}}{12 \times \text{Households Number}}$$

$$\text{Tariff rate per liters} = \frac{\text{Annual recovery cost of scheme} + \text{Annual Operational Cost}}{\text{Annual Water Consumption in liters}}$$

Estimate Details	First Year	Second Year	Third Year
a) Scheme Recovery Cost	Total Estimated Cost ÷ Design Period (Years)	Previous Year Recovery Cost X (1+Inflation Rate in %)	Previous Year Recovery Cost X (1+Inflation Rate in %)
Total (a)=.....	Total (a)=.....	Total (a)=.....	Total (a)=.....
b) Annual Operation Cost			
▪ Annual O&M Expenditure	2 to 3% of Total Estimated cost of Scheme	Previous Year Recovery Cost X (1+Inflation Rate in %)	Previous Year Recovery Cost X (1+Inflation Rate in %)

**Local Adaptation to Climate Change Project
Step by Step Manual – Water Supply, Irrigation and MUS**

▪ Staff Salaries and Incentives	Staff Salaries and Incentives for first year	Previous Year Recovery Cost X (1+Inflation Rate in %)	Previous Year Recovery Cost X (1+Inflation Rate in %)
▪ Annual Office Running Cost and UC management cost	Annual Office Running Cost and UC management cost for first year	Previous Year Recovery Cost X (1+Inflation Rate in %)	Previous Year Recovery Cost X (1+Inflation Rate in %)
Total (b)=....	Total (b)=....	Total (b)=....	Total (b)=....
Total(a+b)=....	Total(a+b)=....	Total(a+b)=....	Total(a+b)=....
c) Contingency Cost=5 to 10% of Total (a+b)	5 to 10% of Total (a+b)	5 to 10% of Total (a+b)	5 to 10% of Total (a+b)
d) Total Adjusted Cost (a+b+c)	d) Total Adjusted Cost (a+b+c)	d) Total Adjusted Cost (a+b+c)	d) Total Adjusted Cost (a+b+c)

$$\text{Monthly Tariff rate per HH} = \frac{\text{Total Adjusted Cost}}{12 \times \text{Households Number}}$$

Or

$$\text{Tariff rate per liters} = \frac{\text{Total Adjusted Cost}}{\text{Annual Water Consumption in liters}}$$

$$\text{Monthly Tariff rate per HH} = \frac{\text{Total Adjusted Cost}}{12 \times \text{Water in liters}}$$

Monthly Water Tariff Record Card Format:

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

Information for Users	Water Supply and Sanitation User CommitteeRural Municipality,.....,
Water tap connection will be cut if regular water tariff is not collected in time. User will pay NER. 10 for the first time issue of this card. They should pay NER. 20 for reissue each time if they lose or damage of this card. User committee will take action if they find misuse of water tap. User should inform VMW or user committee if they find taps or dis line damaged. Users should get detail financial information (income and expenditure) during annual mass meeting or general assembly. Regular water tariff collection day is of each month. Regular monthly water tariff should be collected by their own chairperson of mother child tap group. User will pay extra charge as a punishment according to UC regulation if they do not pay regular water tariff in time.	Clean Tap Sfe Water Tap Drawing Card No. User Name:..... Address (Tole): Tap No: Household No:

FY:							FY:						
Month	Monthly Tariff	Extra Tariff (punishment)	Total Amount	Signature of Amount Paid	Signature of Amount Received	Remarks	Month	Monthly Tariff	Extra Tariff (punishment)	Total Amount	Signature of Amount Paid	Signature of Amount Received	Remarks
March							March						
April							April						
May							May						
June							June						
July							July						
August							August						
September							September						
October							October						
November							November						
December							December						
January							January						
February							February						

.....Water Supply and Sanitation User CommitteeRural Municipality, Ward-.....,.....											
No:	Cash Receipt						Date:.....				
I certify that I have received thank you.											
Received by						Paid by					
.....											
Signature						Signature					
Name						Name					

ANNEX 10: SCHEME COMPLETION CERTIFICATE



.....Rural Municipality/Municipality
Office of the Rural Municipality/Municipality
Local Adaptation to Climate Change Project

SCHME COMPLETION CERTIFICATE

As per the agreement concluded between the Office of the Rural Municipality/Municipality, and Users' Committee, the construction of the water supply/Irrigation/MUS scheme has been completed, and in the presence of the beneficiary community, the completion certificate of the scheme, as per the following details, has been formally handed over to the Users' Committee on the date 2025.../...../.....



Table 23 Scheme Details for Scheme Completion Certificate

SOCIAL AND PHYSICAL DESCRIPTION										FINANCIAL DETAILS	
UC Name:										Description	Actual Cost
UC Registration No.:											
Settlements					Irrigation land (Ropani)					External Construction Materials	
Construction Duration:		2025...../..../...		To	2026...../...../.....		Till	Local Materials Collection and Unskilled labor cost			
Beneficiaries Households										Skilled Labor cost	
BCTS		Dalit		Janajati		Other		Total		Transportation by vehicle	
										Transportation by Pooter	
Beneficiaries Population										Store Rent (Road Head)	
B/C/T/S		Dalit		Janajati		Other		Total		UC management and Other cost	
F	M	F	M	F	M	F	M	F	M	Total	-
UC Details										Finding Agency	
BCTS		Dalit		Janajati		Other		Total		Description	Actual Cost
F	M	F	M	F	M	F	M	F	M		
										User Contribution	
PHYSICAL STRUCTURE DETAILS										Kind Contribution	
S.N.	Components			No.	S.N.	Components			No.	Cash Contribution	
1	Intake				6					Natural Resource Development Fund (NRDF)	

Local Adaptation to Climate Change Project Step by Step Manual – Water Supply, Irrigation and MUS

	RVT		7			LG Cash	
2	Tap		8			Government of Nepal	
3			9			Government of Finland & the European Union	
4			10			Total	-
5			11			O&M Fund Details	
CCA/DRM and Source Protection Structures/Activities						Cash Collection before agreement	
						Cash Collection up to scheme completion	
Proposed -----, -----, -----, -----, -----, -----, -----, -----, ----- -----			Completed -----, -----, -----, -----, -----, -----, -----, -----, ----- -----, -----, -----, -----			Water Tariff per HH or per unit.	
Trained Human Resources in Scheme						LG Representative Name: Position: Signature: Office Stamp	
S.N.	Description	Total		Contact Number			
		F	M				
1	VMW						
2	Operator/Care Taker						
Certificate Receiver: Chairperson: Name: Signature: UC Stamp							