M&E FRAMEWORK FOR WATER SUPPLY SYSTEM FUNCTIONALITY AND SUSTAINABILITY

(WITH REARRANGED INDICATORS)

ABSTRACT

This report presents the details of the Monitoring and Evaluation (M&E) framework of functionality and Long-term Sustainability for the Community Managed Water Supply Systems in Nepal. It has been developed by Project Management Unit of "Rural Water Supply and Sanitation Improvement Project, Component 2: Promoting long-term sustainability of community managed schemes" under the Ministry of Water Supply.

Contents

ABBREVIATIONS

CMWSS	Community Managed Water Supply System
DWRC	District Water Resource Committee
DWSS	Department of Water Supply and Sewerage
F&S	Functionality and Sustainability
ICT	Information and Communication Technology
M&E	Monitoring and Evaluation
MIS	Management Information System
MoPPW	Ministry of Physical Planning and Works
MoWS	Ministry of Water Supply
NDWQS	National Drinking Water Quality Standards
NMIP	National Management and Information Project
NWASH-MIS	National-WASH-MIS
O&M	Operation and Maintenance
PMU	Project Management Unit
PPMS	Project performance Management System
SDG	Sustainable Development Goal
SOP	Standard Operating Procedure
VMW	Village Maintenance Worker
WASH	Water Supply, Sanitation and Hygiene
WSS	Water Supply System
WSSDOs	Water Supply and Sanitation Division Office
WSUC	Watersupply and Sanitation Users Committee
SACOSAN	South Asian Conference on Sanitation

Government of Nepal

Ministry of Water Supply
Project Management Unit
Rural Water Supply and Sanitation Improvement Project –Component 2

1. Background

This report presents the details of the proposed Monitoring and Evaluation (M&E) framework of functionality and Long-term sustainability for the Community Managed Water Supply Systems (CMWSS) in Nepal. It has been developed by Project Management Unit of "Rural Water Supply and Sanitation Improvement Project, Component 2: Promoting long-term sustainability of community managed schemes" under the Ministry of Water Supply (PMU-MoWS) with the facilitation and support by the Project Support Team (PST) "

The report outlines the background and approaches to M&E in the CMWSS to assess progress of the sector towards achievement of Government policy outcomes and impacts.

A Results Framework is outlined that reviews the Nepal Rural Water Supply and Sanitation Sector Policy and arranges it into a hierarchical series of results - Goals (or impacts), outcomes and outputs and linkages to log-term sustainability. Utilizing this Result Framework, the project proposed the draft outlined Key Performance Areas in terms of functionality and sustainability and associated "Indicators" that would demonstrate progress towards, or achievement of, sector outcomes, goals and policy. The sectoral group meeting (August 7, 2016) finalized it with some recommendations.

This "Community Managed Water Supply System's functionality and sustainability M&E Framework (CMWSS F&S Framework)" will be the basis of the National WASH MIS, allowing stakeholders to assess performance, progress and gaps in the CMWSS and ultimately in WASH sector itself. The framework will be revised and updated regularly to ensure relevance and to account for improved data collection and monitoring approaches.

2. Notable government efforts and learning

2.1. DWSS Effort

The National Management and Information Project (NMIP) Section under DWSS is implementing a National Management and Information Project (NMIP) to monitor the water supply and sanitation sector performance. The NMIP manually uploads and updates the district level information/data made available by the WSSDOs to its M&E system. But, the M&E information/data are not updated regularly, as there is a lack of a consistent and reliable M&E system in its WSSDOs, but still it is the only comprehensive functional M&E System in Nepalese WASH sector. However, for proper base-line data as a start for the M&E framework development process the NMIP database, appeared to be the fairly accurate.

The NMIP has classified the functionality of water supply schemes in six categories as: (i) whole year supply, (ii) well-functioning, (iii) need minor repair, (iv) need major repair, (v) need rehabilitation and (vi) need reconstruction. It is, however, unclear how the schemes functionality were classified as in need of

minor repair, major repair, rehabilitation and reconstruction with the limited five (5) managerial indicators for piped scheme functionality (i) whole year supply, (ii) Have WSST, (iii) adequate tools, (iv) WSUC registered and (v) O&M fund as given in the NMIP reports.

Key Learnings: The need is to introduce ICT in data collection, uploading, updating and dissemination, so that Nepalese WASH sector gets slim, effective and cost-efficient WASH M&E system.

2.2. DFID effort

In 2006, the then MoPPW finalized a strategy paper for monitoring and evaluating the RWSS sector. Known as the "DFID" or "Icon" report, it formed the basis for establishing a functional M&E unit within the MoPPW. Its focus was on developing a clear set of indicators for monitoring performance of the sector towards achievement of the national policy. It proposed a set of "Golden" or "pragmatic" indicators and placed them within the framework of performance measurement, monitoring and management.

Key Learnings: The Nepalese WASH sector learned that only devising indicators is not the M&E system, this is only a small part of larger M&E effort. Efficient data updating mechanism, participation of users in data updating process, use of ICT in M&E system, Institualization of M&E systems within sector organizations, capacity development of MIS users and ownership of MIS by the sector ministry and sector actors are other key issues to be considered.

2.3. World Bank effort

The MoPPW under “Designing the Nepal RWSS Sector M&E/MIS/DSS” Project (World Bank- Loan Cr# 3911-NEP) had developed a web-based, RWSS Sector M&E system, that incorporates a Management Information System (MIS) and a Decision Support System (DSS). The system allowed all stakeholders to assess sector performance throughout Nepal. The intention of the project was to strengthen the RWSS M&E Unit so that it can undertake its duties - maintain a sector M&E framework and MIS/DSS; promote sector information exchange and cooperation; and assist with sector capacity building.

This had very appreciable M&E framework and MIS, which could be accessed through web. At that time, this introduction of ICT in this WASH M&E System had influenced other sector such as education, health and water resources to introduce ICT based M&E in their organization. Data used to be uploaded by WSSDO with computers.

The system was underutilized because of the absence of expected ownership and prioritization by the sector Ministry. The output of M&E system was not used in planning process. There was felt gap of capacity to use this system by the WSSDOs in districts. In the M&E System itself, the updating roles were not clearly defined.

Key Learnings: The Nepalese WASH sector learned that there is need of simple and efficient ICT based M&E System instead heavily ICT dominated system, ownership by the sector ministry and sector actors and the capacity of MIS users are crucial. Utilization of M&E system in planning process is the important contributor to the success of M&E.

2.4. Need of an ICT approach for M&E

Then the need of ICT backed, effective, efficient M&E System arises in Nepal WASH Sector, which should be simple not heavily inclined towards sophisticated technology.

This M&E System should be able to fulfill the M&E needs as envisaged by the Nepal water supply, sanitation and hygiene sector development plan (WaSH SDP):

- Sector M&E/MIS/DS System (Web based GIS enabled) with efficient and sustainable updating mechanism;
- M&E reporting system in line with National level targets and SDG;
- M&E/MIS system linked with the planning process;
- All implementing agencies will have Project Performance Management System (PPMS) and linked with sector M&E;
- Evidence based practice as an integral system of monitoring process.

3. M&E framework

This M&E Framework is gradually developed. Framework is started with the boarder and widely accepted definitions of functionality and sustainability. In many ways, this became the foundation for the framework, then it is elaborated into a hierarchical series of definitions of indicators relating it to goals, outcomes and outputs. These indicators are described in detail, including how they will be collected, who is responsible for collection, and the reports and decisions that they can support. An outline of reporting requirements is also presented. Only later is evaluations introduced. It is supposed that the information generated by the M&E system will also be integrated gradually into decision making. The underlying assumption of the framework is that if basic measurement can be undertaken of the functionality and sustainability, then we can be confident that it is possible to determine a range of performance measures across the sector.

4. Indicator selection criteria

The selection of proposed set of indicators for the Water Supply System F&S M&E framework was guided by the following criteria:

Sector Logic - Indicators should, to the extent possible, provide the most direct evidence of the condition or result they are measuring. Each indicator has to have strong causal link with the F&S of CMWSS and some link with Sector Policy - demonstrating in some way, progress of the sector towards policy objectives.

Minimal & Cost effective - Indicators those are publicly reported must have high credibility. They must provide information that will be both easily understood and accepted by important stakeholders. However, indicators that are highly technical or which require a lot of explanation (such as indices) may be necessary for those more intimately involved in programs. There needs to be an emphasis on a simple, efficient and effective system for monitoring and evaluating - emphasizing the approach of "minimum but sufficient".

Progressive introduction - Past M&E frameworks in the sector have achieved little in terms of sustainability because they tried to measure as many indicators as possible, resulting in an MIS that was unwieldy, complicated and poorly used. The development of this M&E framework has been to begin with the minimum number of indicators that can adequately measure performance, and to focus on the development of the user-friendly MIS to utilize the data.

Available indicators - Throughout the development of the framework many good indicators were suggested by stakeholders, and by a sector-wide workshop. It has been a difficult task to select the

minimum but sufficient indicators that can form the suggested framework. Selection, apart from strength of causality, has been based on the availability of data.

Well defined - Data on indicators must be collected frequently enough to be useful to decision-makers. Data on outcomes are often only available on an annual basis; those measuring outputs, processes, and inputs are typically available more frequently. To draw conclusions over a period of time, decision-makers must be certain that they are looking at data which measure the same phenomenon (often called reliability). The definition of an indicator must therefore remain consistent each time it is measured. Numeric indicators often provide the most useful and understandable information to decision-makers. Indicators have to be well defined. Definition has been based on the World Bank indicator selection criteria - **CREAM**. This stands for Clear, Relevant, Economic, Adequate, and Monitorable. The proposed indicators have been presented to the other stakeholders to ensure they are clear, adequate and monitorable. The inclusion in a causal relationship with policy shows their relevance. Focusing on indicators, for which data are available, reduces their cost (economic) and ensures they are also monitorable.

Link with National MIS - This CMWSS F&S Framework should closely be linked with the National WASH MIS (National Water Supply, Sanitation and Hygiene Management Information System). There have been several efforts in past to establish NWASH MIS, however could not materialized. This project proposed the development of Web-based GIS enabled National WASH MIS. This M&E framework forms the basis of the NWASH MIS.

Reporting: Furthermore, this Framework will fit within the wider reporting systems of Government and Donors. Primary importance is reporting of functionality and sustainability performance in time for the annual planning and budgeting period and the SDG.

5. Definition of basic terms

Before developing the framework, we need to be clear of frequently used basic terms in the framework.

Framework: A set of pre-set factor areas, indicators and sub-indicator questions with associated scores that can be contextualized and applied in WASH sector.

Indicators: A thing that indicates the state or level of something. Indicators can measure inputs, process, outputs, outcomes and impacts. Input indicators measure resources, both human and financial, devoted to a particular program or intervention. Output indicators measure the quantity of goods and services produced and the efficiency of production. Outcome indicators measure the broader results achieved through the provision of goods and services.

System: To be considered a water supply as a system (or water facility) there should at least be one permanent structure except tapstand. Water supply system here refers to the physical components as well as the management involved to run that system efficiently.

Service: A pre-determined, or normative, set of attributes that is expected to be provided to a population, often expressed in terms of quality, quantity, accessibility and reliability of supply.

Life-cycle costs: All the costs of a water, sanitation or hygiene service throughout its lifecycle.

Post-construction support: The ongoing support to water service providers (community-based or private)

consisting of aspects such as monitoring support, technical assistance, training and re-training, and advisory services.

Service provider: The institutions or individuals that deliver services to end users, including tasks such as operation, maintenance and administration. These may be community organizations (WSUC), small private operators, public sector utilities or companies, or NGOs and faith-based organizations.

Operation & Maintenance: The activities which are undertaken to operate or to run, and to maintain or keep in good order a facility, system, or piece of equipment.

Preventative maintenance: Maintenance undertaken on a regular basis to replace or repair worn parts, tighten bolts, change oils and other, which helps to keep the service continual without breakdown and hence provide a good service to the community.

Reactive maintenance or repair: Maintenance undertaken in response to breakdowns and complaints about poor service, often results in greater damage to parts and faster wear and tear to the equipment and more down time when the equipment is not operational.

6. Concept on WSS functionality and sustainability M&E

The following section describes how indicators for WSS functionality and sustainability are derived from the basic principle; this also describes how they are related to functionality and sustainability measurement.

6.1. Basic principles

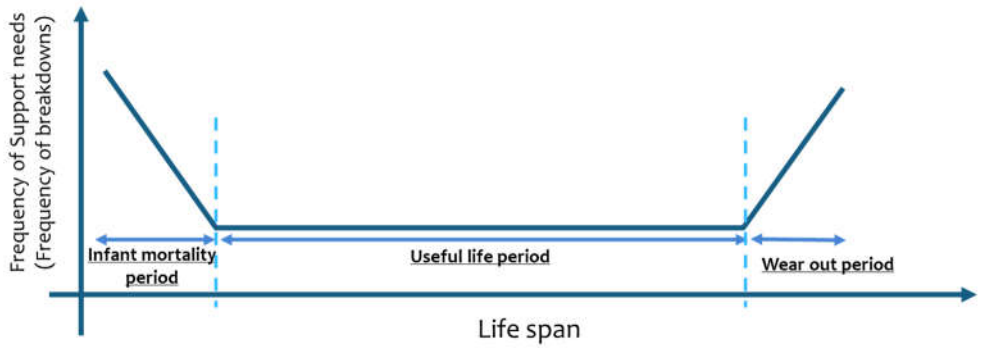
The following basic principles on WSS functionality and sustainability monitoring is considered here,

- Functionality and sustainability of any Water Supply System is directly related to the O&M need of that system.
- Water Supply System has different O&M needs at the different stages of its life cycle
- The nature of O&M interventions are different at different life cycle stages.
- The monitoring requirements are also different at the different stages of life cycle.

So the true understanding of water supply system's life cycle is needed to understand functionality and sustainability.

6.2. Life cycle of water supply system

The O&M needs of Water Supply System's life cycle is best explained by 'Bathtub Hazard Rate Curve'. In the early life (infant mortality period) of water supply system, the failure rate is high because of construction and management defects but rapidly decreases as defects are identified and corrected. In the mid-life (Useful life period) of the system, the failure rate is low and constant as there are operational defects only. In the late life (Wearout period) the failure rate increases, as age and wear increases



Aim of any functionality and sustainability improvement intervention should focus on establishing the system that reduces both infant mortality and wear out periods and increases useful life period. Any indicator designed to address the functionality and sustainability should be able to address the need of monitoring at these periods.

6.2.1. Monitoring area during Infant mortality period

S.N.	Area	Particular
1	Possible reasons for failure	Poor construction methods, poor processes and handling techniques, poor quality control, human error, incorrect startup, substandard parts and materials, substandard workmanship, incomplete final test, substandard calibration process, inadequate skill to run the system, Poor office management of WSUC
2	Nature of support	For new water supply system to i) rectify design and construction defect ii) increase the O&M skill of VMW
3	Support need	Support for water supply system debugging is needed: i) Needs intensive care and high technical support, ii) Decreasing external support
4	Support by	Municipality WASH Unit or Implementing Agency for the period of 2-3 Years
5	M&E area and M&E need	Construction defects, Capacity of VMW, Availability of tools, Availability of water source without dispute, Office management skill of WSUC

6.2.2. Monitoring area during useful life period

S.N.	Area	Particular
1	Possible reasons for failure	Low safety factors, undetected defects, human errors, system misuse, higher random stress than expected, natural failures
2	Nature of support	For operational water supply system to i) correct operational defects and ii) build the capacity of WSUC iii) institutionalize WSUC for continuity and quality of service delivery
3	Support need	Support for water supply system servicing is needed: i) Needs minor technical attention ii) Periodic external support

4	Support by	WSUC itself or outsourced service agency, Periodic support by Municipality WASH unit for 10-15 Years
5	M&E area and M&E need	institutionalization of WSUC, Conditions of taps and structures and pipelines, Availability of spare parts, Quality of service delivered by WSUC, Presence of Standard Operating Procedures (SOP)

6.2.3. Monitoring area during wear-out period

S.N.	Area	Particular
1	Possible reasons for failure	High wear due to incorrect operation, insufficient or improper maintenance, and incorrect overhaul practices, corrosion, limited design life of components, material degradation.
2	Nature of support	For aged (old) water supply system to i) Increase Financial strength ii) Overhaul the system
3	Support need	Support for water supply system refurbishing is needed: i) Needs high technical support and major financial attention, ii) Increasing external support
4	Support by	WSUC itself (if WSUC is financially strong) or by implementing agency after 15 years
5	M&E area and M&E need	Wear and tear of structures and pipelines, Financial strength of WSUC, Presence of Business Plan of WSUC

This M&E frame work along with indicators for monitoring WSS functionality and sustainability is designed to address these M&E areas and M&E needs.

7. Definition of functionality

Here for monitoring purpose, the functionality is defined as a measure of the percentage[4] of water facilities[1] that are working[2] at any given time[3].

Functionality is normally measured by a one-time check and when repeated over time is often used as a proxy measure for sustainability.

[1]Water facilities: the term 'Water facilities', as a whole indicates the water supply system which provides the services, it includes all the components from intakes, pipeline, reservoir, valves to tap.

To be considered the water supply system (or water facility) there should at least be one permanent structure except tap stand.

It would always be better to check the functionality of all these components, but would be very expensive and time consuming and making the measuring system more complicated, difficult and beyond the capacity. So, for measuring purpose we take "Tap" representing a water facility.

[2]Working: Defining 'working' is little bit complicated and needs comprehensive elaborations. Here we have limited the definition of terms 'working facility' as 'working tap' and working is taken synonymous as 'Functional'.

The 'working tap' indicates that water is 'running' through the tap. When we are considering about

'running' tap it indicates five characters viz. there is a) Quantity, b) Velocity, c) Pressure d) Quality of water at a tap and e) Duration of flow. Every tap is designed with different flow, velocity, pressure and quality of water and duration of flow. So, it is quite difficult, expensive and time consuming and lack of skill at present to measure all these five characters to check whether tap is working or not. So, for this monitoring purpose we will limit our self to only three characters- a) quantity, b) quality and c) duration of flow (supply hour), which are easy to measure.

8. Derivation of functionality indicators

The functional tap should meet the following three (ALL) conditions:

a. Tap should have sufficient water quantity, and
b. Tap should have acceptable water quality, and
c. Tap should have adequate supply hours.

These three conditions are described in detail below:

a) Sufficient quantity: Quantity in a tap indicates the quantity of water and is measured in liters/second. In a water supply system tap flow are designed to meet the demand of water of that population which the tap serves. Taps are often designed with different flow in different taps. Most of the taps in community managed water supply systems are not metered or even if metered not sensitive enough to show the small flow. Thus, for developing indicator, we will measure the quantity in the following five perception levels:

Level	Description
a	No water at all
b	There is water but not sufficient for drinking, cooking and toilet use
c	Sufficient for drinking, cooking and toilet use
d	Sufficient for drinking, cooking, washing utensil, toilet use and bathing
e	Sufficient for all daily needs

Only the tap with conditions 'c' or 'd' or 'e' is considered as the tap with 'sufficient water quantity'.

b) Acceptable quality: National Drinking Water Quality Standards (NDWQS) had defined the quality of water for community managed water supply projects. Though the NDWQS had demanded the regular water quality check in all parameter it is beyond the capacity of present service providers (WSUCs) in terms of their financial and human resource strength. So, to develop the indicator, we represent water quality in perspective of turbidity only other parameter as prescribed by NDWQS is not considered at this moment. When the technical and financial strength of WSUC is further developed, we can take other parameters of water quality also. For developing indicator, we will measure the quality in the following three levels:

Level	Description
a	No turbidity
b	Turbid water during rainy season
c	Always turbid water

Turbid during rainy season is only the seasonal condition, which lasts only about two months. So, this condition is also considered as the 'no turbid' condition for developing indicator.

Only tap with conditions ‘a’ or ‘b’ is considered as tap with acceptable water quality.

c) Adequate supply hour at tap: Most of the water supply projects have intermittent services. Only few of them have 24 hours supply, most of them are operating for few hours in a day. 'Supply hour' would be a good indicator to measure the service level. Supply hours can also be used to check the equitable service distribution.

When supply hour is at least two hours then it is considered as "adequate", because generally taps have 0.1 lps flow, so it means 0.1*2*60*60=720 liters in a day, which is sufficient for 720÷45= 16 persons for a day (@ 45 lpcd). The average family size in rural Nepal is 4.8, so this much supply hour is sufficient to cover 3.3 houses. The analysis of collected data from 4 pilot districts of this project has shown that there is in an average 2.7 household per taps, so assuming 2 hours of supply as adequate supply, which covers 3.3 houses, is fair enough.

Only tap, which has, at least two hours of supply is considered as tap with adequate supply hour.

[3]Given time: Given time is defined, as the time of monitoring activity be it by service provider itself, Municipality WASH Unit, WSSDO, or any other external agencies to service providers. It is taken as the time of spotting.

[4]Measure of the percentage: It is defined as the percentage of the number of taps in a water supply system, running at given time to the all the taps in the system. Or, it is percentage of the taps satisfying all three conditions, at the given time, to all taps in the system.

So, ‘Percentage of functional taps’ is taken as indicator. (F2A)

8.1. Extent of the functionality

If the functionality is expressed as the ‘tap functionality’ it does not gives us the clear picture, in term of extent of functionality, as shown in the following example:

Suppose a system has two Taps, T1 and T2, if T1 is not ‘working’ and T2 is ‘working’ then the functionality of the system is 50% (As measured by indicator F2A). Suppose T1 has 100 population and T2 has 8 population serving with, then will it still be logical to say functionality of system is 50%?.

So, this concept of weighted functionality with population is introduced. Then in this case, 92.59% of population are affected and only 7.41% of population are getting water from functional taps.

So, ‘Percentage of population served by functional taps’ is taken as indicators. (F1A)

8.2. Institutional efficiency

After the projects were handed over to the water user committees, the WSUC takes full responsibility to its operation and management, which includes production and distribution of water, day-to-day maintenance of the system, financial, administrative as well as consumer relations. Government’s support is sought only in case of major operation and maintenance problem.

WSUCs can operate and maintain the completed water supply system by engaging Village Maintenance Workers (VMWs) on their payrolls or outsourcing the maintenance service

So, 'Provision of operation and maintenance service' is taken as indicator (F3A)

Case I: When operation and maintenance service is outsourced

Some WSUCs may feel getting services of VMW for full time may not be good economical concept; instead, they choose to hire the service of third party maintenance person or agency for such services. It is the emerging practice among WSUCs.

So, 'Presence of outsourced maintenance service' is taken as Sub-indicator. (F3A-a)

OR

Case II: When VMW is engaged

Though VMWs have limited knowledge and skills, they are key to routine maintenance and taking care of the system. Active VMWs maintain the system, they also collect the tariff. VMWs is contributing to increase the better technical status of the system, and increased O&M fund.

So, 'Number of VMWs' is taken as Sub-indicator. (F3A-b)

It is no doubt that VMWs play central role in O&M of the system but it is also evident that there should be adequate number of VMWs to maintain the system. The adequacy is taken as:

At least 1 VMW per 200 community tap; and at least 1 VMW per 1000 yard tap

Note: Sub-indicator F3A-a and Sub-indicator F3A-b are mutually exclusive. First check with if the Sub-indicator F3A-a satisfies otherwise check with Sub-indicator F3A-b.

Tools are essential to maintain the system. Insufficient and inefficient use of funds for O&M restricts the availability of tools. Operation and maintenance tasks must be capable of being carried out using tools, which are commonly available and can be handled by VMW. Maintenance tool kits can be standardized and limited to the essential tools required.

So, 'Percentage of VMWs who perceive tools are adequate' is taken as indicator. (F3B)

8.3. Availability of water source

The possibility of supplying as much water to the coverage area as is needed during each period of the season depends primarily on the availability of the water at its source. Availability may vary a lot over the years, or even between one year and another. Secondly, the supply depends on the capacity of the facility installed to withdraw the water from the water source. Further, technicians should be aware that water must be available during each week or month of the season.

So, 'Number of months for which water source is available' is taken as indicator. (F4A)

8.4. Physical conditions of the system

Physical condition that maintains the ability of the structure to perform its function for which it is designed

is the key contributing factor for the functionality of the water supply system. Structure in very good condition, which is near new and requires only minimal predictive or preventative maintenance to maintain proper function, show the good management capacity of the WSUC and the good technical skill of VMW. Poor user understanding of how to correctly operate system can result in the misuse and damage of facilities.

1) **Key structures:** Only key structures such as intake, RVT, CC, DC, IC, BPT, Treatment Plant etc. whose physical conditions seriously affects the function of the system is taken in consideration. Tap stand is not considered as key structure.
2) **Repair need**: Only 'major repair' and 'reconstruction' are considered, minor repair is not considered.

(See annex III for definition of repairs)

So, 'Percentage of structures needing repair' is taken as indicator. (F4Bi)

Similarly, a significant amount of water is lost in the water supply system. Water leakages have been a major problem for many regions around the world. In some cases, water loss due to water leakages in the supply network exceeds 40% of the water in the supply system, which seriously affects the functionality of the system. Reduction of water leakages should be an important goal for WSUC, as it will mean a reduction in the amount of money and energy required on producing and pumping water. The reduction in water leakage also helps to increase satisfaction of consumer needs through improved reliability of the system.

Major leakages: Here, only major leakage, which seriously effects the system performance, is considered.

So, 'Number of leakages in conveyance' is taken as indicator. (F4Bii)

8.5. Result and input indicators

Indicators for functionality are divided in two parts as Result indicator and Input indicators. The result indicator provides the direct measurement of if the system is functional or not, it is also the service delivery efficiency indicator, while input indicators measure the inputs that create favorable environment to make the system functional. The result indicators assure the measure of functionality while input indicators only assure the favorable environment to produce result but do not assure the result. The result indicator is also further divided into two parts: Outcome indicator and output indictor.

A. Result Indicators:

1. Outcome indicators:

F1A: Percentage of population served by functional taps

2. Output Indicators:

F2A: Percentage of Functional Taps

- F2A-a: Number of taps with sufficient water quantity
- F2A-b: Number of taps with acceptable water quality
- F2A-c-: Number of taps with adequate supply hours

B. Input Indicators:

3. Institutional:

F3A: Provision of operation and maintenance service

F3B: Percentage of VMWs who perceive tools are adequate

4. Technical:

F4A: Number of months for which water source is available

F4Bi: Percentage of structures needing repair

9. Detail of functionality indicators

Indicators are an essential component of any effective M&E system. For example, at the national level, indicators provide technical experts and decision-makers with the data required to effectively manage a country's response to the functionality and sustainability. At the global level, harmonized indicator sets provide international agencies and organizations with much-needed strategic information, which influences their planning and allocation of resources. If indicators are not understood and used carefully, they can consume extensive resources and generate data with little or no value. The key challenge with indicators is to ensure their quality and integrity. Indicators should generate data that are needed and useful. They should be technically sound. They should be understandable, practical and feasible. In addition, they should have a proven record of performance.

The following chapter explains each indicator in detail. This is expected to bring common understanding of what indicator is and how data is collected and interpreted. The following parameter describes each indicator:

Indicator Number	*id of Indicators*
Measuring Area	*Area that indicator measures*
Key Monitoring Parameters	*Parameters that Indicator monitors*
Key Indicator	*Shows the presence or state of a situation or condition*
Unit	*Measurement unit*
Definition	*A clear and concise description of the indicators*
Purpose	*The reason that the indicator exists i.e. what it is for.*
Rationale	*The underlying principle(s) that justify the development and deployment of the indicator; i.e. why the indicator is needed and useful.*
Target	*Aim of action*
level	*Measurement level*
Result Area	*The area that indicator belongs to.*
Goal	*Desired result*
Method of Measurement	*The logical and specific sequence of operations used to measure the indicator*
Method of Calculating Score	*The specific steps in the process to determine the indicator Score*
Data Source and collection methods	*The general approaches (e.g. surveys, records, models, estimates) used to collect data.*
Frequency	*The intervals at which data are collected; e.g. quarterly, annually, bi-annual*
Collection level	*The smallest level in which data is collected*
Data Disaggregation	*The relevant subgroups that collected data can be separated into in order to more precisely understand and analyze the findings*
Aggregation	*The smallest reporting level*

Reporting frequency	*Reporting frequency*
Strength and weakness	*A brief summary of what the indicator does well and not so well.*
Guidelines to interpret and use data.	*Recommendations on how best to evaluate and apply the findings; e.g. outlining what it means if the indicator shows an increase or a decrease in a particular measure*
Challenges	*Potential obstacles or problems that may have an impact on the use of an indicator or on the accuracy/validity of its findings*

F1A: Percentage of population served by functional taps

Measuring Area	Extent of the functionality.	
Key Monitoring Parameters	Population served by functional system	
Unit	%	
Definition	Population served identifies the number of people that the selected facility serves.	
Purpose	This measures the benefited or effected population due to functionality of the system.	
Rationale	If we say system is functional it becomes vague term that does not give any clear picture such as how many taps are functional, then even if we expressed functionality in terms of number of functional taps then also it will be difficult to understand, as illustrated in this example: Suppose a system has two Taps, T1 and T2, if T1 is not working and T2 is working then the functionality of the system is 50%. Suppose T1 has 100 population and T2 has 8 population serving with, then will it still be logical to say functionality of system is 50%, won't it be false understanding?. So this concept of weighting functionality with population is introduced. Then in this case, 92.59% of population are affected and only 7.41% of population are getting water from functional taps.	
Target	100% population is served with the functional taps	
level	**Evaluation:** This indicator provides the direct measurement of whether system is functional or not. This assures the measure of functionality.	
Result Area	**Outcome:** It indicates whether a system is producing desired results, which in this case is the expectation that all population get water with functional taps.	
Goal	All population within service area get service from functional system.	
Method of Measurement	Numerator(N): ∑Population served by Functional Taps Denominator(D): ∑Population served by all taps in the system Calculation: (N÷D)*100=V(F1A)%	See Annex II for Example
Method of Calculating Score	<u>Linear Scoring:</u> S(F1A)=V(F1A)%*Fullmark(30) Here "S" stands for "Score" and "V" stands for "Value"	
Data Source and collection methods	<u>Data source:</u> 1) Population: Users, Tapstand caretakers, WSUC 2) Functionality conditions of each tap: Indicator F2A <u>Collection method:</u> 1) Population: WSUC's record check, interview with users of each tap 2) Functionality conditions of each tap: Indicator F2A <u>For interview:</u> 1. For private taps: Interview tap owner for population 2. For community Taps: Interview the tapstand care taker or randomly any user who is using this tap for population	

Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	System(Scheme)
Data Disaggregation	Sex, caste/ethnic groups
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing 'Percentage of population served by functional Taps' is strong concept to measure the effect of functionality. When the 'functionality condition' is weighted with the population, it provides the real picture of the extent of the functionality. **Method:** Interviewing the user at the tap level is very strong method of data collection for population as it provides primary information.
Guidelines to interpret and use data.	The higher result shows more population are benefited with the water supply system, which is functional. The higher percentage denotes that any interventions that may have been taken in the past to increase the functionality of the system is bringing the positive result.
Challenges	The weighting the extent of the functionality with the population may become difficult concept to understand.

F2A: Percentage of functional Taps

Measuring Area	Functionality of taps
Key Monitoring Parameters	Working Conditions of Taps
Unit	%
Definition	The 'functionality of water supply system' is represented by the 'functionality of taps'. The 'functional tap' indicates that water is 'running' through the tap. When we are considering about running tap it indicates minimum of five characters viz. a) Flow, b) Velocity, c) Pressure and d) Quality of water in a tap e) Duration of flow. It is quite difficult, expensive and time consuming and lack of skill of WSUC at present to measure all these five characters. So, for monitoring purpose we will limit our purpose to only three characters- **quantity, quality and duration of flow.** This indicator provides the ways to assess the tap that satisfies all three conditions which defines the functionality of Taps: 1) Taps with sufficient water quantity- Defined by sub indicator F2A-a 2) Taps with acceptable water quality- Defined by sub indicator F2A-b 3) Taps with adequate supply hours- Defined by sub indicator F2A-c
Purpose	This measures the functionality of the system.
Rationale	The term 'system' as a whole indicates the water supply system, which provide services, it includes all the components from intakes, pipeline, reservoir, valves to taps. It would always be very expensive and time consuming and making the measuring system more complicated and beyond the capacity to check the functionality of all these components. So, for this purpose we take "Tap" representing a water facility.
Target	100% taps are functional

level	**Evaluation:** These indicators provide the direct measurement of whether system is functional or not. This assures the measure of functionality.	
Result Area	**Output**: This is to measure whether the water supply system is functional or not.	
Goal	System delivers the services	
Method of Measurement	Numerator(N): ∑{Number of taps with sufficient quantity water∩ Number of taps with acceptable water quality∩ Number of taps with adequate supply hours}= ∑Taps satisfying all three conditions as described in F2A-a, F2A-b and F2A-c Denominator(D): ∑Number of all taps in the system Calculation: (N÷D)*100=V(F2A)%	See Annex I for Example
Method of Calculating Score	Linear Scoring: S(F2A)=V(F2A)%*Fullmark(30)	
Data Source and collection methods	Data source: 1) Total no. of taps: WSUC's record 2) Tap functionality: 2a) Taps with sufficient quantity water: Sub indicator F2A-a 2b) Taps with acceptable water quality: Sub indicator F2A-b 2c) Taps with adequate supply hours: Sub indicator F2A-c Collection method: 1) Total no. of taps: WSUC's record check, interview 2) Tap functionality: 2a) Taps with sufficient water quantity: Sub indicator F2A-a 2b) Taps with acceptable water quality: Sub indicator F2A-b 2c) Taps with adequate supply hours: Sub indicator F2A-c	
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.	
Collection level	Tap	
Data Disaggregation		
Aggregation	System(Scheme)	
Reporting frequency	Annual (mandatory) and/or when desired	
Strength and weakness	**Indicator:** Choosing 'Percentage of functional Taps' is strong concept to measure the output of functionality interventions. **Method:** It would have been better if we could have measured the functionality of all structures and pipeline, but it is difficult concept.	
Guidelines to interpret and use data.	The higher percentage shows more taps are functional.	
Challenges	The data collected are only the perception of the users, which may not truly express the reality of the field. The data on community tap is the representation of only one user selected randomly, who may not truly express the view of other users.	

F2A-a: Number of taps with sufficient water quantity

Measuring Area	Working Conditions of Taps
Key Monitoring Parameters	Flow Conditions of taps
Unit	Number
Definition	Flow conditions are categorized in 5 levels: (a) No water at all, (b) There is water but not sufficient for drinking, cooking and toilet use (c) Sufficient for drinking, cooking and toilet

	use (d) Sufficient for drinking, cooking, washing utensil, toilet use and bathing, (e) Sufficient for all daily needs The tap with sufficient water quantity has condition of either 'c' or 'd' or 'e' i.e. c) sufficient for drinking, cooking and toilet use or d) sufficient for drinking, cooking, washing utensil, toilet use and bathing, or e) sufficient for all daily needs
Purpose	This measures the sufficiency of water in a tap.
Rationale	**Quantity** of water is the primary factor, which the users first encounter, when the system is not functioning. The users can easily experience and express their feeling when system's service level is decreasing in terms of quantity. So, this quantity is taken as the primary indicator of the functionality.
Target	100% taps have the condition of 'Sufficient for all daily needs'
level	**Evaluation:** This indicator provides the direct measurement of whether system is functional or not. This assures the measure of functionality.
Result Area	**Output**: This is to measure whether the water supply system is functional or not.
Goal	System delivers the services
Method of Measurement	Numerator(N): ∑Number of Taps with flow conditions (c or d or e)
Method of Calculating Score	
Data Source and collection methods	Data source: Tap flow condition: User's perception Collection method: Tap flow condition: Interview For interview: 1. For private taps: Interview the tap owner for flow conditions and WSUC for total number of Taps 2. For community Taps: Interview the tapstand care taker or randomly any user who is using this tap for flow conditions and WSUC for total number of taps.
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	Tap
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing 'taps which has sufficient water quantity' is strong concept to measure the output of functionality conditions or interventions. **Method:** Tap flow is expressed in different 5 conditions. These five conditions are not actually measured but interviewed to users, it is perception of users. Expressing the available quantity of water by perception is a weak concept, it would have been stronger method if the flow of the taps were actually measured in every tap. But the measuring flow of each and every tap is very optimistic approach, very few taps were metered. The observer has to use bucket and watch method, it means he has to be there when there is water running in the tap. Most of the system are intermittent, so the observer has to spend a considerable amount of time in waiting water flowing through the taps to measure quantity. Further these data will be updated regularly by WSUC, so they need very simple method to be comfortable rather than technical methods such as 'bucket

	and watch'. Besides, in case of yard connection, the tap owner can express his own perception but in case of community, a representative user who is being interviewed has to express the perception on behalf of all users from that tapstand, which could be biased.
Guidelines to interpret and use data.	The higher percentage shows more taps are functional.
Challenges	The data collected are only the perception of the users, which may not truly express the reality of the field. The data on community tap is the representation of only one user selected randomly, who may not truly express the view of other users. The challenge lies in getting unbiased information.

F2A-b: Number of taps with acceptable water quality

Measuring Area	Working Conditions of Taps
Key Monitoring Parameters	Quality of water at the taps
Unit	Number
Definition	Water of 'acceptable' quality is, here, presented by non-turbid water. Tap may have three turbidity conditions: a) No turbidity, b) Turbid water during rainy season, c) Always turbid water Tap with acceptable water quality has either condition 'a' or 'b' i.e. a) No turbidity or b) Turbid water during rainy season. Here for monitoring purpose, Tap which has 'always turbid water' is only considered as the 'turbid water tap'. Seasonal turbidity at taps are also considered as the clean water taps. Clean (non-turbid) water is the visual perception of the consumer.
Purpose	This measures the quality of water in a tap
Rationale	NDWQS had defined the **quality** of water for community managed water supply projects. Though the NDWQS requires the regular water quality check it is beyond the capacity of WSUCs in terms of their financial and human resource status. So, for this purpose, we measure this in terms of **turbidity.** If not removed, turbidity can promote regrowth of pathogens in the distribution system, leading to waterborne disease outbreaks. Turbidity can provide food and shelter for pathogens, that is why it is here considered as influential indicator for water quality. High turbidity can result in blocked pipelines and valves as well as in a drastic reduction in water quality.
Target	100% taps are no turbidity taps.
level	**Evaluation:** This indicator provides the direct measurement of whether system is functional or not. This assures the measure of functionality.
Result Area	**Output**: This is to measure whether the water supply system is functional or not.
Goal	System delivers the services
Method of Measurement	Numerator(N): ∑Number of Taps with conditions ('a' or 'b')
Method of Calculating Score	

Data Source and collection methods	Data source: Turbidity: User's perception Collection method: Turbidity: Interview For interview: 1. For private taps: Interview owner for turbidity and WSUC for total number of Taps 2. For community Taps: Interview the tapstand caretaker or randomly any user who is using this tap for turbidity and WSUC for total number of taps.
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	Tap
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing turbidity as an indicator for water quality is a fair concept; it would have been stronger indicator if the water quality was expressed by all the WQ-Tests parameters as prescribed by National Drinking Quality Standard Nepal (NDWQS). But, conducting all tests for water quality is not economical concept and beyond capacity of WSUCs. **Method:** The measuring method of turbidity would have been stronger if it was expressed in NTU, but here it is expressed as visual perception of users, though there is WQ-Test prescribed by NDWQS for turbidity. Measuring turbidity of each and every tap is very optimistic approach. Most of the system are intermittent, so the observer has to spend a great amount of time in waiting water flowing through the taps to measure turbidity in NTU unit. Further, these data will be updated regularly by WSUC, so they need very simple method to be comfortable rather than very technical methods using test kits, so perception of users for turbidity measurement is considered. Besides, in case of yard connection, the tap owner can expressed his own perception but in case of community, a representative user who is being interviewed has to express the perception on behalf of all users from that tapstand, which could be biased.
Guidelines to interpret and use data.	The higher percentage shows there are more taps with clean water.
Challenges	The data collected are only the perception of the users, which may not truly express the reality of the field. The data on community tap is the representation of only one user selected randomly, who may not truly express the view of other users.

F2A-c-: Number of taps with adequate supply hours

Measuring Area	Working Conditions of Taps
Key Monitoring Parameters	Water supply hours at Taps
Unit	Number
Definition	Taps with adequate supply hour are taps having at least two hours of water supply.
Purpose	This measures the actual duration of supply at the taps

Rationale	Most of the water supply projects have intermittent services. Only few of them have 24 hours supply, most of them are operating for few hours in a day. 'Supply hour' would be a good indicator to measure the service level. Supply hours can also be used to check the equitable service distribution. **When supply hour is >= 2 hours then it is considered as "adequate"**, because generally taps have 0.1 lps flow, so it means 0.1*2*60*60=720 litres in a day, which is sufficient for 720÷45= 16 persons for a day (@ 45 lpcd). The average family size in rural Nepal is 4.8, so this much supply hour is sufficient to cover 3.3 houses. The preliminary analysis of collected data from 4 pilot districts of this project has shown that there is in an average 2.7 household per taps, so assuming 2 hours of supply as adequate supply, which covers 3.3 houses, is fair enough.
Target	100% Taps have 24 hours supply
level	**Evaluation:** This indicator provides the direct measurement of whether system is functional or not. This assures the measure of functionality.
Result Area	**Output**: This is to measure whether the water supply system is functional or not.
Goal	System delivers the services
Method of Measurement	When supply hour is >= 2 hours then it is considered as "adequate". Supply hours can also be used to check the equitable service distribution. Numerator(N): ∑Number of Taps who have supply hour >=2
Method of Calculating Score	
Data Source and collection methods	Data source: Supply hours: User's experience Collection method: Supply hours: Interview For interview: 1. For private taps: Interview owner for supply hours and WSUC for total number of Taps 2. For community Taps: Interview the tapstand care taker or randomly any user who is using this tap for supply hours and WSUC for total number of taps.
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	Tap
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired

Strength and weakness	**Indicator:** Measuring the supply hours of each and every taps to know the equity on distribution is very strong indicators. Sometimes, measuring service level with supply hour as an indicator may provide false information, suppose one water supply system has 2 hours of supply and another has 4 hours of supply. In first instance, the second water supply system looks better, but if it supply water in night-time then, the first system looks better. The time of supply as well as duration of supply, (supply hour) is important. Here, we have assumed that the WSUCs are practical enough not to supply in the night-time. **Method:** If the supply hour of each tap were actually measured in the field it would have been better methods, but most of the schemes have intermittent supply, so going to each taps and waiting long hours to measure the actual supply hour would be impractical method, so the method of interviewing users to know supply hour is prescribed. This gives the perception of users only so it is not that strong method. Besides, in case of yard connection, the tap owner can expressed his own perception but in case of community, a representative user who is being interviewed has to express the perception on behalf of all users from that tapstand, which could be biased.
Guidelines to interpret and use data.	The higher percentage shows there are more taps that have adequate supply hours.
Challenges	The data collected are only the perception of the users, which may not truly express the reality of the field. The data on community tap is the representation of only one user selected randomly, who may not truly express the view of other users.

F3A: Provision of operation and maintenance service

F3A-a: Presence of outsourced maintenance service

Measuring Area	Institutional efficiency
Key Monitoring Parameters	Outsourced services
Unit	Y/N
Definition	Outsourcing, here, is defined as the practice of having certain job functions done outside a WSUC instead of having a fulltime VMW to handle them; functions can be outsourced to either a company which provides such services or an individual.
Purpose	This indicator is used when WSUC does not have provision of VMW but provision of other such services that adequately helps to operate and maintain the system.
Rationale	Some WSUCs may feel getting services of VMW for full time may not be good economical concept; instead, they choose to hire the service of third party maintenance person or agency for such services. It is the emerging practice among WSUCs.
Target	Presence of outsourced maintenance service.
level	**Monitoring:** This measures the input that creates the favorable environment for functionality. This assures the favorable environment to produce result but does not assure the results.
Result Area	**Institutional:** It indicates whether the institutional arrangement are able to contribute to produce desired results.
Goal	Institutional arrangement are capable to carryout O&M.

Method of Measurement	If there is provision of outsourced maintenance service then is considered as presence of adequate number of VMWs to get full score. If outsourced service is present then V(F3A-a)="Yes" else V(F3A-a)="No"
Method of Calculating Score	Pass fail scoring: If V(F3A-a)="Yes" then Fullmark(8) Else V(F3A-a)="No" In case V(F3A-a)="No" use indicator F3A-b
Data Source and collection methods	Data source: Presence of outsourced maintenance service: WSUC Collection method: Presence of outsourced maintenance service: WSUC's record check, interview For interview: Interview WSUC to know the presence of outsourced maintenance service
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved
Collection level	System(Scheme)
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing 'presence of outsourced maintenance service' as an indicator to measure the institutional capacity to maintain the functionality of the system is very strong concept. If WSUCs do not prefer to appoint the VMWs, they can outsource the maintenance service. **Method:** Interviewing WSUCs or checking the record of WSUC to know the presence of outsourced maintenance service is also the strong method. Judging the quality of services provided by such outsourced person or agency is difficult task. The WSUCs may need the skill of performance evaluation, so here only the presence or absence of outsourced services is taken as an indicator. If there is presence then it scores full marks. This in any cost do not perfectly evaluates if the services, which the VMWs are expected to carry, are also carried out by this outsourced agency.
Guidelines to interpret and use data.	If there is provision of outsourced maintenance service then it can safely be assumed that the system is functional.
Challenges	One cannot guarantee that having the provision of outsourced maintenance service will solve all the functionality problem.

F3A-b: Number of VMWs

Measuring Area	Institutional efficiency
Key Monitoring Parameters	Adequacy of VMW or outsourced services
Unit	Number
Definition	VMW is considered in broader terms as whoever is looking after the maintenance of the system.
Purpose	This measures the adequacy of VMW or out sourced O&M services

Rationale	WSUCs are operating and maintaining the completed water supply system by engaging village maintenance workers (VMWs) on their payrolls. Though VMWs have limited knowledge and skills, they are key to routine maintenance and taking care of the system. Active VMWs maintain the system, they also collect the tariff. VMWs contributes to increase the better technical status of the system, and increased O&M fund.
Target	1) At least 1 VMW per 200 community tap 2) At least 1 VMW per 1000 yard tap
level	**Monitoring:** This measures the input that creates the favorable environment for functionality. This assures the favorable environment to produce results but does not assure the results.
Result Area	**Institutional:** It indicates whether the institutional arrangement are able to contribute to produce desired results.
Goal	Institutional arrangements are capable to carryout O&M
Method of Measurement	If there is presence of outsourced operation and maintenance service use indicator F3A-b, otherwise use F3A-a The expected provision is: 1) At least 1 VMW per 200 community tap 2) At least 1 VMW per 1000 yard tap Numerator(Nc)=Total number of community taps Denominator(Dc)= 200 Numerator(Ny)= Total number of yard taps Denominator(Dy)= 1000 Calculations: (Nc÷Dc) + (Ny÷Dy)=V(F3A-b)
Method of Calculating Score	Linear Scoring: If V(F3A-b)<=Actual Number of VMWs then Fullmark(8) Else {Fullmark(8)÷V(F3A-b)}*Actual Number of VMWs
Data Source and collection methods	Data source: Number of VMWs: WSUC Collection method: Number of VMWs: WSUC's record check, interview For interview: Interview WSUC for number of VMWs
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	System(Scheme)
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing number of VMWs as an indicator to measure the institutional capacity to maintain the functionality of the system is very strong concept. **Method:** Interviewing WSUCs or checking the record of WSUC to know the number of VMWs is also the strong method.

Guidelines to interpret and use data.	If the WSUC has adequate number of VMWs then, it can safely be assumed that the system is functional.
Challenges	This provides only the required number of VMWs; this does not interpret the skill that VMW are having. So merely counting VMWs without incorporating their skill may not truly reflect the essence of this indicator.

F3B: Percentage of VMWs who perceive tools are adequate

Measuring Area	Institutional efficiency
Key Monitoring Parameters	Adequacy of Tools
Unit	%
Definition	If VMW is happy with the tools he is having with, then he has 'adequate' tools. O&M works should be able to being carried out with these 'adequate' tools.
Purpose	This measures the adequacy of tools/ equipment for O&M
Rationale	Tools are essential to maintain the system. Insufficient and inefficient use of funds for O&M restricts the availability of tools. Operation and maintenance tasks must be capable of being carried out using tools, which are commonly available and can be handled by VMW. Maintenance tool kits can be standardized and limited to the essential tools required.
Target	100% VMWs perceive tools are adequate.
level	**Monitoring:** This measures the input that creates the favorable environment for functionality. This assures the favorable environment to produce results but does not assure the results.
Result Area	**Institutional:** It indicates whether the institutional arrangement are able to contribute to produce desired results.
Goal	Institutional arrangement are capable to carryout O&M.
Method of Measurement	Numerator(N): ∑Number VMWs who perceives tools are adequate Denominator(D): V(F3A) Calculation: (N÷D)*100=V(F3B)%
Method of Calculating Score	Linear Scoring: If V(F3B)%>=100% then Fullmark(7) else V(F3B)%*Fullmark(7) When Maintenance service is outsourced it is assumed that 100% VMWs perceive tools are adequate.
Data Source and collection methods	Data source: 1) Total no. of VMWs: WSUC 2) Number of VMWs who perceive tools are adequate: VMW Collection method: 1) Total no. of VMWs: WSUC's record check, interview 2) Number of VMWs who perceive tools are adequate: Interview For interview: 1. For total no. of VMWs: Interview WSUC 2. For number of VMWs who perceive tools are adequate: Interview VMW
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	System(Scheme)
Data Disaggregation	

Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired.
Strength and weakness	**Indicator:** Choosing 'percentage of VMWs who perceive tools are adequate' as an indicator to measure the institutional capacity to maintain the functionality of the system is strong concept. **Method:** Using interview to know the perception of VMW to measure the adequacy of tools is fairly strong method of data collection. It would have been stronger method if an exhaustive list of tools was prepared and used to check the adequacy of tools. However, preparing exhaustive list is difficult concept, as tools are basically scheme specific. Interviewing VMWs to know the perception on adequacy of tools is strong method.
Guidelines to interpret and use data.	If this percentage is higher, then we can safely assume that the more VMWs are satisfied with the tools they are having with. This in turn shows that VMWs are maintaining the functionality of the system as they are having the sufficient tools.
Challenges	The VMWs who express their satisfaction on availability of tools may actually be exaggerating their need.

F4A: Number of months for which water source is available

Measuring Area	Dependability of the source
Key Monitoring Parameters	Availability of water at source
Unit	Months
Definition	'Water source' is the source with that much quantity of water, which has been tapped to use.
Purpose	This measures the reliability of water source.
Rationale	The possibility of supplying as much water to the coverage area as is needed during each period of the season depends primarily on the availability of the water at its source. Availability may vary a lot over the year, or even between one year and another. Secondly, the supply depends on the capacity of the facility installed to withdraw the water from the water source. Further, technicians should be aware that water must be available during each week or month of the season.
Target	Whole year availability.
level	**Monitoring:** This measures the input that creates the favorable environment for functionality. This assures the favorable environment to produce result but does not assure the results.
Result Area	**Technical:** It indicates whether the physical asset of the system and their management are technically capable to contribute to deliver services.
Goal	Water Supply System has dependable source of supply.
Method of Measurement	Number of months for which water source is available(N)= VF4A <u>For multiple sources:</u> Number of month is weighted with the tapped discharge to find the weighted average, the formula is: =SUMPRODUCT(numbers, weights)/SUM(weights) i.e. SUMPRODUCT(months of water available from that source, tapped discharge of that source)÷SUM(tapped discharges of all sources)= V(F4A)

	While calculating sumproduct assume i) Whole year=12 ii) >11 months=11.5 and iii)<11 months=10.5
Method of Calculating Score	Range Scoring: If V(F4A)=12 then Fullmark(7) else if V(F4A)<12 and =11 then Marks(5) else Marks(0)
Data Source and collection methods	Data source: Number of months in which water source is available :WSUC, VMW Collection method: Number of months in which water source is available : Interview For interview: Interview WSUC or VMW for number of months in which water source is available
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	Water Sources
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing 'Number of months in which water source is available' to measure the availability of source water is very strong concept. **Method:** Interviewing WSUC or VMW to know 'the actual number of months for which the source water is available' is strong method for data collection.
Guidelines to interpret and use data.	If water sources are available for whole year there is chances that the system will be functional. If it is not then WSUC has to look for alternative sources.
Challenges	

F4Bi: Percentage of structures needing repair

Measuring Area	Working conditions of system
Key Monitoring Parameters	Conditions of the water supply system's structures.
Unit	%
Definition	1) Only key structures such as intake, RVT, CC, DC, IC, BPT, Treatment Plant etc. whose physical conditions seriously affects the function of the system is taken in consideration. **Tapstand is not considered as key structure.** 2) Only 'major repair' and 'reconstruction' are considered, minor repair is not considered.
Purpose	This measures the overall physical condition of system components.

Rationale	Physical condition that maintains the ability of the structure to perform its function for which it is designed is the key contributing factor for the functionality of the water supply system. Structure in very good condition, which is near new and requires only minimal predictive or preventative maintenance to maintain proper function, show the good management capacity of the WSUC and the good technical skill of VMW. Poor user understanding of how to correctly operate system can result in the misuse and damage of facilities.
Target	No structures require repair. (Absolute target is 0% structures need repair). Here, for scoring purpose if more than 50% key structures require repair then it scores 0.
level	**Monitoring:** These measures the input that create the favorable environment for functionality. These assure the favorable environment to produce result but do not assure the results.
Result Area	**Technical:** It indicates whether the physical asset of the system and their management are technically capable to contribute to deliver services at a given time
Goal	Water Supply System's physical components are in working conditions.
Method of Measurement	Numerator(Nm): ∑Number of Key structures that require major repair Numerator(Nr): ∑Number of Key structures that require reconstruction Denominator(D): ∑Number of all Key structures Calculation: {(Nm+Nr)÷D}*100=V(F4Bi)%
Method of Calculating Score	Linear Scoring for 0-50% repair need and no score for > 50% repair need: If V(F4Bi)>50% then no Marks(0) else {(100-VF4Bi)*Fullmark(11)}÷100
Data Source and collection methods	Data source: 1) Total no. of Key Structures: VMW, WSUC's record 2) Number of Key structures that require repair: Participant's observations, VMW Collection method: 1) Total no. of Key Structures: Participant's observations, VMW/WSUC's record check, interview 2) Number of Key structures that require repair: Participant's observation, interviewed to VMW For interview: 1. Total no. of Key Structures: WSUC 2. Number of Key structures that require repair: VMW
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	Structures
Data Disaggregation	Repairing need (major repair, reconstruction)
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing 'Percentage of structures needing repair' to measure the working conditions of structures is very strong concept. If the structures are in good conditions then they can perform the functions for which they are designed, this indicator exactly measures the situation. **Method:** Observing all structures to assess their repair need is very strong method of data collection as it provides the actual status. Interviewing VMW to know the repair need is fairly strong method as it depends on how VMW interprets the repair needs, he may be biased.

	Besides, defining 'major repair' and 'reconstruction' is complex task; there is always chances that it becomes bias as it depends on the perception of the observers.
Guidelines to interpret and use data.	If this percentage is higher, then more key structures are requiring repair, which means we can assume the system has problem.
Challenges	There is always challenges to distinguish among different repair needs such as 'major repair' 'reconstruction'.

F4Bii: Number of leakages in conveyance

Measuring Area	Reliability of the conveyance network.
Key Indicator	Conditions of the water supply system's pipeline.
Unit	Numbers
Definition	Only major leakage, which seriously effects the system performance, is considered.
Purpose	This measures the overall physical condition of system components
Rationale	A significant amount of water is lost in the water supply system. Water leakages have been a major problem for many regions around the world. In some cases, water loss due to water leakages in the supply network exceeds 40% of the water in the supply system. Reduction of water leakages is an important goal for WSUC, as it will mean a reduction in the amount of money and energy required on producing and pumping water and also satisfaction of consumer needs through improved reliability of the system.
Target	No leakages in conveyance. For scoring purpose, if there is more than one leakages per two kilometer then it scores 0.
level	**Monitoring:** This measures the input that creates the favorable environment for functionality. This assures the favorable environment to produce result but does not assure the results.
Result Area	**Technical:** It indicates whether the physical asset of the system and their management are technically capable to contribute to deliver services at a given time
Goal	Water Supply System's physical components are in working conditions.
Method of Measurement	Numerator(Nt): ∑Number of major leakages in transmission pipeline Numerator(Nd): ∑Number of major leakages in distribution pipeline Denominator(Dt): ∑Length (kilometer) of transmission pipeline Denominator(Dd): ∑Length (kilometer) of distribution pipeline Calculation: number of leakages in every 2 km=2*{(Nt+Nd)÷(Dt+Dd)}=V(F4Bii)
Method of Calculating Score	Linear Scoring with the provision that no leakage=Fullmark, one leakage= 5 marks and more than one= no score: if V(F4Bii)=0, fullmarks(7) else If V(F4Bii)>1 then no marks(0) else Fullmark(7)-{Fullmark(7)-Intermediate marks(5)}*V(F4Bii)

Data Source and collection methods	Data source: 1) Total pipe length: VMW, WSUC's record 2) Number of leakages: Participant's observations, VMW Collection method: 1) Total pipe length: Participant's observations, interview 2) Number of leakages: Participant's observation, interview For interview: 1. Total pipe length: WSUC or VMW 2. Number of leakages: VMW
Frequency	Once in a year (mandatory) and updated whenever there is problem in a system and again updated when that problem is resolved.
Collection level	Pipeline
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	**Indicator:** Choosing 'Number of leakages in conveyance per kilometer' to measure 'Working conditions of conveyance' is very strong concept. If the conveyances do not have major leakages then they can delivery water. **Method:** Observing all pipeline to assess the leakage is very strong method for data collection as it provides the actual status. Interviewing VMW to know the repair need is fairly strong method as it depend on how VMW interprets the repair needs, he may be biased. Besides, defining 'major leakage' is complex concept, there is always chances that it depends on the perception of the observers.
Guidelines to interpret and use data.	If this percentage is higher, then more pipe length is required for repair, which means we can assume the system's functionality is at risk.
Challenges	There is always challenges to spot the leakages. It is also difficult to distinguish between minor and major leakages.

10. Functionality scoring system

Functionality Indicators		100			
Result Indicators: (60% Weightage)			60		
1. Outcome indicators:				30	
F1A	Percentage of population served by functional Taps.				30
A	100% Population covered by functional taps				30
B	X% Population covered by functional Taps (score linearly distributed between 0 to 30)				=X%*30
C	0% Population covered by functional taps				0
2. Output Indicators:				30	
F2A	Percentage of functional taps				30
A	100% taps are functional				30

B	X% taps are functional (score linearly distributed between 0 to 30)				=X%*30
C	0% taps are functional				0
Input Indicators:(40% Weightage)		40			
3. Institutional:			15		
F3A	Provision of operation and maintenance service			8	
	Note: Indicators F3A-a and F3A-b are mutually exclusive				
F3A-a	Presence of outsourced maintenance service				
a	Presence of service				8
b	Absence of service				0
OR					
F3A-b	Number of VMWs				
a	At least 1 VMW per 200 community taps and/or 1000 yard taps				8
b	X (number) VMWs				=(X*8)÷{(Tc÷200)+(Ty÷1000)}
c	No provision of VMW or outsourced services				0
F3B	Percentage of VMWs who perceive tools are adequate			7	
a	100% VMWs perceive tools are adequate				7
b	X% VMWs who perceive tools are adequate				=X%*7
c	No tools available or 0% perceive tools are adequate				0
4. Technical:			25		
F4A	Number of months in which water source is available			7	
a	Whole year availability				7
b	11 to <12 months				5
c	Less than 11 months available				0
F4Bi	Percentage of structures needing repair			11	
a	No key structures need repair (X%=0)				11
b	X% of Key structures need repair (Where X<=50%)(Linear distribution 0 and 11)				=(1-X%)*11
c	More than 50% of Key structures need repairs				0
F4Bii	Number of leakages in conveyance			7	
a	No major leakages in a system				7
b	X (number of leakages per 2 kilometer) (where 0<X<1) (Linear distribution 5 and 7)				={7-(7-5)*X}
c	1 Leakage per 2 kilometer				5
d	More than 1 major leakages per 2 Kilometer				0

11. Presentation of functionality score

Indicators for functionality are divided in two parts as Result Indicators (60%) and Input Indicators (40%). The result indicator is the **'service delivery efficiency indicator'** while the input indicator is '**favorable environment indicators'.** The first measures if the system is delivering its service or not, while the second measure if the system has the enough favorable environment to deliver those services.

Further, the results indicators are divided in two parts outcome indicator and output indicator.
The score on result indicator provides the direct measurement of if the water supply system is functional or not. While, score on input indicator only measures the input or efforts that create favorable environment that leads to functionality of the system, but does not assures the functionality.

Such that:

The score on functionality indicators (100%) = Score on outcome Indicator (30%) + Score on output Indicator (30%) + Score on input indicator (40%)

Or,

The score on functionality indicators (100%)= Score on 'Percentage of population served by functional Taps' (30%) + Score on 'Percentage of functional taps' (30%) + score on input indicators(40%)

12. Interpretation of functionality score

According to score, the functionality shall be interpreted as:

Total Score	Interpretation
>= 70	No or less risk for functionality
>=60 to < 70	Some risk for functionality
<60	High risk for functionality

Example of Interpretation:

Example Score	Example Score Breakdown	Interpretation
Example I 70=15+25+30 (No or less risk for functionality)	Score on outcome Indicator (Population served by functional Taps, full marks=30)= 15	%Score on outcome indicator=15/30=50% %Score on output indicator=25/30=83.33% %Score on input indicator=30/40=75% Here, score on input indicator and output indicator are good, it means there exists favorable environment for functionality and functionality of taps is good (83.33% taps are functional). Even in such good condition, the population served by functional taps are only 50%, which means the taps, which are not functioning, are serving remaining 50% population. That means 16.67% non-functional taps are serving rest 50% population. It indicates, increasing the functionality of only 16.67% taps can increase the serving population by 50%. It means if immediate attention is provided to those non-functional taps, the functionality will largely increase.
	Score on output Indicator (Functional Taps, full marks=30)=25	
	Score on input indicator (Favorable environment, full marks=40)=30	
Example II 70=25+15+30 (No or less risk for functionality)	Score on outcome Indicator (Population served by functional Taps, full marks=30)= 25	%Score on outcome indicator=25/30=83.33% %Score on output indicator=15/30=50% %Score on input indicator=30/40=75% Here, score on outcome indicator and input indicator are good, it means there exists favorable environment for functionality, even then only 50% taps are functional. Though 50% taps are non-functional, the population served by functional taps are
	Score on output Indicator (Functional Taps, full marks=30)=15	

	Score on input indicator (Favorable environment, full marks=40)=30	quite optimistic, i.e. 83.33%, it means the taps, which are not functioning, are serving less population than other functional taps. It means even immediate attention is provided, the functionality will not largely increase as in Example I.
<u>Example III</u> 70=25+25+20 (No or less risk for functionality)	Score on outcome Indicator (Population served by functional Taps, full marks=30)= 25 Score on output Indicator (Functional Taps, full marks=30)=25 Score on input indicator (Favorable environment, full marks=40)=20	%Score on outcome indicator=25/30=83.33% %Score on output indicator=25/30=83.33% %Score on input indicator=20/40=50% Here, score on outcome indicator and output indicator is good whereas score on input indicator is not that much appreciable. It means 83.33% Taps are functional and serving 83.33% population. Though the system is serving now immediate attention is needed in either VMWs or tools or water source. This may also be due to the worsening situation of structures or pipeline. Detail interpretation is needed as below.

Elaborated interpretation of score on Input indicator on Example III:

<u>Example III-a (Input Indicator only)</u> 20=8+7+0+5+0	Score on input indicator (Number of adequate VMWs, full marks=8)= 8 Score on input indicator (Percentage of VMWs who perceive tools are adequate, full marks=7)= 7 Score on input indicator (Number of months in which water source is available, full marks=7)= 0 Score on input indicator (Percentage of structures needing repair , full marks=11)= 5 Score on input indicator (Number of leakages in conveyance, full marks=7)= 0	%Score on Number of VMWs =8/8=100% %Score on VMWs who perceive tools are adequate =7/7=100% %Score on Number of months in which water source is available =0/7=0% %Score on structures needing repair=5/11=45.45% %Score on leakages=0/7=0% Here, though there is adequate VMWs and tools, the system still does not have favorable environment because physical structures are not good as 45.45% structures require repair and the water source is not reliable serving less than 11 months and there is more than 1 leakages per two kilometer in pipeline.
<u>Example III-b (Input Indicator only)</u> 20=0+0+7+11+2	Score on input indicator (Number of adequate VMWs, full marks=8)= 0 Score on input indicator (Percentage of VMWs who perceive tools are adequate, full marks=7)= 0 Score on input indicator (Number of months in which water source is available, full marks=7)= 7 Score on input indicator (Percentage of structures needing repair , full marks=11)= 11	%Score on Number of VMWs =0/8=0% %Score on Percentage of VMWs who perceive tools are adequate =0/7=0% %Score on Number of months in which water source is available =7/7=100% %Score on Percentage of structures needing repair=11/11=100% %Score on number of leakages=2/7=28.57% Here, though the physical condition of the system is quite good, there is no VMWs, means the system will not capable in maintaining services. This also may indicate that the system is relatively new (as physical conditions are good), but in absence of VMWs and tools the functionality may further worsen. This also indicate that though the structures are in good conditions,

	Score on input indicator (Number of leakages in conveyance, full marks=7)= 2	the pipeline is having some problem as its score 2. Therefore, we need to pay some attention to pipeline also.

How to address the popular question "Is the scheme functional?"

This question can be addressed with reference to the indicator F2A (the output indicator), which provides the direct measure of how many taps are functional. Suppose if the scheme scores 25 marks in this indicator then we can interpret that 25÷30= 83.33% {(score obtained for F2A) ÷ (Fullmarks for F2A)}, taps are functional.

The tap is the representation of the system so we can say system is 83.33% functional.

13. Definition of sustainability

13.1. Definition for general purpose

Sustainability is a term with numerous interpretations, one of the most basic and useful being by Abrams (1998) as: "whether or not something continues to work over time" (meaning, in this case, the indefinite provision of a water, sanitation or hygiene service (with certain agreed characteristics) over time). It is the likelihood of structures, facilities, projects, initiatives continuing to provide a good service over the longer term beyond the lifetime of the project. The length of time that the same are expected to be sustainable depends on the design of the facility or project and may be time bound, or sustainability may be interpreted as having no time-line but continuing forever.

A service is sustainable when:

- It functions and is being used;
- It is able to deliver an appropriate level of benefits (quality, quantity, convenience, comfort, continuity, affordability, efficiency, equity, reliability, health);
- It continues over a prolonged period of time (which goes beyond the life-cycle of the system and equipment);
- Its management is institutionalized (community management, gender perspective, partnership with local authorities, involvement of formal / informal private sector);
- It's operation and maintenance, administrative and replacement costs are covered at local level (through user fees, or alternative financial mechanisms);
- It can be operated and maintained at local level with limited but feasible, external support (technical assistance, training, monitoring)
- It does not affect the environment negatively.

13.2. Definitions for M&E purpose

13.2.1. Definition

For M&E purpose, when functionality is repeated over time, it is often used as a proxy measure for sustainability. This definition is simple and easy to measure. The most of data collected for functionality will also serve the purpose, thus it is cost-effective and affordable definition.

13.2.2. Trend of functionality

The functionality shows the 'present status' of the system. That is why we say, "The system is functional." Whereas the sustainability shows the 'trend' of the system. That is why we say "The system tends to be sustainable". The sustainability only shows if the system is likely to be sustain for coming years.

When we have to find the future trend, the best and simple way is to forecast the trend based on the past years' performances (generally 3 years).

14. Derivation of sustainability indicator

14.1. Overall sustainability

Sustainability is vague concept to measure. Taking the continuity of functionality over the years as proxy measure of sustainability is simple and easy to measure. If the population served by the functional system is continued over the years, we can term this as the system, which can be sustainable for, long-term.

So, 'Percentage of population served by functional system (in last three years)' is taken as overall sustainability indicator (S1A)

14.2. Institutional context

14.2.1. Activeness of WSUC

The regular meeting shows how WSUC is active and it also shows the concern of WSUC about the wellbeing of the water supply system. It helps WSUC members to reach a common decision when urgent and crucial matters need to be discussed and brainstormed through personal interaction. This also helps to keep everyone informed and up to date. When members are included in discussions and decisions of certain issues, it will be good for their morale and motivation and increases the sense of belongingness.

Minutes that capture the purpose of the meeting and its agreed outcomes are a record that can be referred back to and can be used for follow-up purposes. They also act as an accountability tool because they make it clear whose duty it was to perform which action.

So, 'Number of meetings with decision recorded per year (In last three years)' is taken as indicator. (S2A)

14.2.2. Transparency of WSUC

AGM is the gathering of the WSUC members and the representative of a tap owner. The main purpose of the AGM is to maintain the transparency within WSUC in critical issues such as the presentation and approval of the audited accounts, election of WSUCs executives and tariff fixation, if necessary. AGM is one of the critical activity in WSUC Institualization.

So, 'Annual general meeting conducted with decision recorded (AGM) (in last three years)' is taken as indicator. (S2B)

14.2.3. Financial administration

The members of WSUC contribute voluntarily to maintain the services of the water supply system. They do not have time, knowledge and skill to maintain the financial records. Most of the disputes that are arising in AGM are related to financial management, such disputes may seriously affect the functions and reputation of the WSUCs. So, if the account is looked after by the accountant such disputes may not arise.

The WSUC has to audit its financial transaction by the registered auditor. If the competent accountant keep the account, it will be systematic so that it will be easier for auditor to understand.

So, 'Account is looked after by the employed accountant (last three years)' is taken as indicator. (S2C)

14.3. Technical context

14.3.1. Quality of water supplied

There is growing health conscious among water user. The WSUCs are also showing their concern on the quality of the water they are supplying through their system. People are opting the alternative arrangement if the quality of supplied water is not as per their satisfaction, this is resulting the limited use of the water supply system. This is bringing growing concern for WSUC as they are not able to generate sufficient tariff, resulting to the worsening financial health of the system. If the quality of supplied water is not as per user's expectation, the system may not be accepted by users, leading to the sustainability of that system at risk.

So, 'Need of treatment (in last three years)' is taken as indicator. (S3A)

14.3.2. Standardization of routine procedures

Most of the water supply systems are looked after by VMWs. VMWs have limited knowledge and skills, so they need a sort of instruction manual, which helps them carry out routine operations.

Standard operating procedures (SOPs) are step-by-step instructions that act as guidelines for VMW work processes. Whether written up in numbered steps or formatted as flow charts, effective SOPs are complete, clearly written, and based on input from the workers who do the job.

If SOP is prepared and 'followed' there is, chances that the maintenance will be carried out routinely and with standardized methods, that is expected to lead to the sustainability.

So, 'Standard Operating Procedure (SOP) of regular inspection prepared and followed (in last three years)' is taken as indicator. (S3B)

14.4. Social and Environmental Context

14.4.1. Ownership, possession and enjoyment of the water sources

A wide range of water conflicts appear throughout history, water has historically been a source of tension and a factor in conflicts. Water conflicts arise for several reasons, including territorial disputes, a fight for resources, and strategic advantage. The history has shown that several water supply systems have

become non-usable due to source dispute leading to non-sustainability.

Registration is the legal way to establish ownership and avoid dispute of the source. So, knowing source registration is good way to interpret that the source is legally secured and that there will be little or no chances that dispute will arise.

If the sources are registered and available without dispute for long-term enjoyment to WSUC then there will be chances that the system will be sustainable.

So, 'Source registration and dispute in the source (in last three years)' is taken as indicator. (S4A)

14.4.2. Productive use of water

When people are getting some financial benefit from any system, they wish the system be sustainable. The practice of using wastewater for income generation, such as using in kitchen garden, shows people are earning something that is providing financial help to them. Therefore, they always wish the water supply system be sustainable.

This earning also helps household to some extent to share the water tariff. If they are able to pay their tariff regularly, the system become financially strong.

So, 'Percentage of households using water for income generating activities (in last three years)' is taken as indicator (S4B)

14.4.3. Inclusion in WSUC

Greater participation of women in water management and decision-making is expected to improve outcomes for both women and the wider community. Global evidence indicates that women's participation in Water User Committees (WUCs) has been limited; yet their involvement in management has correlated with more effective water systems.

So, 'Percentage of Women representation on Water and Sanitation User Committee (in last three years)' is taken as indicator (S4C)

14.5. Financial Context

14.5.1. Financial discipline

Most of the WSUC do not have their own accountant to keep their financial documents as required by the government. During AGM the financial discipline is always the matter of discussion, which some time fails to create confidence on WSUC by users. This may seriously affect the sustainability of the system. Whereas auditing system provides the opportunity to WSUC to show they are more transparent on their accounting system and that they keep their accounting system by following rule's and regulation as set by government.

So, 'Presence of financial auditing system (In last three years)' is taken as indicator. (S5A)

14.5.2. Retention of skill

Most of VMWs after they acquire knowledge, skill and experience leave the present job in search of higher opportunity, even to abroad. The government had spent lots of money in capacity development of VMW. The new VMW may not have that much skill as the previous one and WSUC will also not have financial capacity to develop new VMW. The retention of VMW is prime challenge for WSUC.

Remuneration is the key retention factor for VMW. It is also social justice to pay sufficient remuneration for the work one has done.

So, 'Presence of provision of remuneration for VMW (In last three years)' is taken as indicator. (S5B)

14.5.3. Financial risk sharing mechanism

The rural water supply policy of Nepal assumes that it is WSUC's responsibility for minor repair. Though the Government fully understands that it is her responsibility to assist the communities for major repair, rehabilitation and reconstruction, the Government has resources limitations. These WSUC have to wait a long to get government's assistance. While WSUC wait for the assistance, the problem compounds and system completely become nonfunctional. This contributes to the large number of nonfunctional water supply projects.

So, In this regard the insurance of Water Supply System is becoming growing practice among WSUC in Nepal. The insurance companies in Nepal usually insures water supply project in seven different categories like Fire, Earthquake, Flood, Vandalism, Landslide, Terrorism, Riots and Strikes.

So, 'Presence of provision of water supply system insurance (In last three years)' is taken as indicator. (S5C)

14.5.4. Financial efficiency of WSUC

Most of WSUCs in Nepal have very low tariff rate, as tariff is the only regular source of income, the income may not fully support the operating expenditures. In such cases, external supports are needed. When the WSUC is largely depending on external support to operate its scheme, the system's sustainability may come into risk.

So, 'Operation Ratio (in last three years)' is taken as indicator (S5D)

15. Result and Input indicator

Indicators for sustainability are also divided in two parts as Result indicator and Input indicators. The result indicator provides the direct measurement of if the system is functional/sustainable or not while input indicators measure the inputs that create favorable environment for functional/sustainable system. The result indicators assure the measure of functionality/ sustainability while input indicators only assure the favorable environment to produce result but do not assure the result.

A. Result Indicators:

1. Overall Indicator

S1A: Percentage of population served by functional system in last three years

B. Input Indicators:

2. Institutional

S2A:Number of meetings with decision recorded per year (In last three years)

S2B:Annual general meeting conducted with decision recorded (AGM) (in last three years)

S2C:Account is looked after by the employed accountant (last three years)

3. Technical

S3A: Need of treatment (in last three years)

S3B: Standard Operating Procedure (SOP) of regular inspection prepared and followed (in last three years)

4. Social and Environmental

S4A: Source registration and dispute in the source (in last three years).

S4B: Percentage of households using water for income generating activities (in last three years).

S4C: Percentage of Women representation on Water and Sanitation User Committee (in last three years).

5. Financial

S5A: Presence of financial auditing system (In last three years)

S5B: Presence of provision of remuneration for VMW (In last three years)

S5C: Presence of provision of water supply system insurance (In last three years)

S5D: Operation Ratio (in last three years).

16. Linkage to definition

The following table presents the indicator and linkages to definition (as described in 12.1):

Definition of sustainability	Indicator	Intensity	Causal linkage
It functions and is being used;	S1A	Strong linkage	S1A measures the population served (measure of being used) by functional system (measure of functioning).
It is able to deliver an appropriate level of benefits (quality, quantity, convenience, comfort, continuity, affordability, efficiency, equity, reliability, health);	S1A	Strong linkage	S1A is related to quality, quantity, convenience, continuity, efficiency, equity, reliability and health benefit of the system.
	S3A	Weak Linkage	This indicator is weak in demonstrating safe water availability at the household level. Even though water is treated at source, there is no clear indication if the water is still "treated" by the time it reaches the tap. Additionally the efficacy and quality of the treatment is not measured. In the absence of any other indicator at present, this proxy will suffice.
It continues over a prolonged period of time (which goes beyond the life-cycle of the system and equipment);	Three years evaluation	Strong linkage	Concept of three years evaluation tests whether there is the trend that the system will continue over prolonged period of time.
Its management is institutionalized (community management, gender perspective, partnership with	S4C	Strong linkage	This represents the management in gender perspective.
	S2A	Strong linkage	This helps to institutionalize transparency in decision process.

local authorities, involvement of formal / informal private sector);	S2B	Strong linkage	This helps to institutionalize the community participation in decision process, this also creates social accountability.
	S2C	Strong linkage	This helps to institutionalize sound financial administration.
	S4A	Strong linkage	This helps to gain legal status of the water source which provides ownership, possession and enjoyment of the water source, otherwise there may arise dispute in future.
	S5A	Strong linkage	This helps to maintain financial discipline.
It's operation and maintenance, administrative and replacement costs are covered at local level (through user fees, or alternative financial mechanisms);	S5C	Strong linkage	The provision of insurance strongly demonstrates that there exists the alternative financial mechanism.
	S5D	Strong linkage	This tests whether the operational costs are covered by internal income or not.
It can be operated and maintained at local level with limited but feasible, external support (technical assistance, training, monitoring)	S5B	Strong linkage	This not only tests if there is presence of VMW (the local level skill to operate and maintain the system), but also tests whether there is provision of remuneration for VMW.
	S3B	Strong linkage	The SOP is prepared in such a way that it provides the guidance to operate and maintain the system with the involvement of local level skill.
It does not affect the environment negatively.	S4B	Proxy	When wastewater is used in economic activities such as kitchen garden, it helps to maintain greenery. This is also the best way to manage wastewater which otherwise may pond to become habitat for mosquito. This also prevents scouring of the soil surface and prevents landslide.

17. Details of sustainability indicators

The following chapter explains each sustainability indicator in detail. This is expected to bring common understanding of what indicator is and how data is collected and interpreted. This also explains how data is collected and converted to score.

Here, the concept of **Value** (V), **Marks** (M) and **Score** (S) is introduced. We need to clearly understand this concept to interpret sustainability in numerical values.

Explanation and Example:

There are three steps to find the score of any indicator as described below:

1. Find the **Value**:

For eg. for indicator S2A if number of meetings conducted within a year is 3 then **value**=V(S2A)=3,

2. Find the **Marks**

The marking criteria for this indicator is:
If V(S2A) >= 4 then M(S2A)= 5, else
If V(S2A) = 3 then M(S2A)= 4, else
If V(S2A) =2 then M(S2A)= 3, else
M(S2A)= (0)

So, the **marks** obtained for the present (say, 2018 AD) year= M(S2A)=4

3. Find the **Score**

To relate with 12.2.2, suppose, this indicator had scored 5 in 2017 AD and 3 in 2016 AD, (when the NWASH is fully functional, we can get these previous year's record from NWASH MIS).
Then we have as:
$M(S2A)_{2018} = 4$, $M(S2A)_{2017} = 5$ and $M(S2A)_{2016} = 3$

The present year's progress matters a lot. If the present year has lower progress than the previous it indicates that the system is worsening. Similarly, if the present year has higher progress than the previous years' then it indicates the system is progressing. So, the present year's progress has been heavily weighted as 50%. The progress of the previous years is used to find the trend or pattern of the progress so given the lower weightage as 30% and 20% for previous two years.
It means, 50% weightage for n year, 30% weightage for n-1 year and 20% weightage for n-2 year is provided. Here, 'n' is present year, 'n-1' is previous year and 'n-2' is year before previous year.

Then, the final **score** = S(S2A) = $S(S2A)=50\%*M(S2A)_n+30\%*M(S2A)_{n-1}+20\%*M(S2A)_{n-2}$= 50% of 4 +30% of 5 + 20% of 3 = 2+1.5+.6 = 4.1

For previous two years, data source is NWASH-MIS, but If the System (Scheme) is surveyed for the first time, it is natural that the NWASH-MIS will not have the data of that indicator for previous one or two years, we can assume the latest data, valid for the past one or two years also. This is also true for the recently constructed scheme, the recent year data can be considered for other years also.

S1A: Percentage of population served by functional system (in last three years)

Measuring Area	Continuity of functionality (Proxy for Sustainability)
Key Monitoring Parameters	Population served by functional taps over the years
Unit	**%**
Definition	Functionality of the system is represented by the functionality of the taps. Functional taps are defined in Indicator F2A. When functionality is repeated over time, it is used as a proxy measure for sustainability.
Purpose	This measures, over the years, the benefited population at those taps, which are functional.
Rationale	Sustainability is vague concept to measure. Taking the continuity of functionality over the years as proxy measure of sustainability is simple and easy to measure. The most of data collected for functionality will also serve the purpose, thus it is cost-effective and affordable definition. The functionality shows the 'present status' of the system. That is why we say, "The system is functional." The sustainability shows the 'trend' of the system. That is why we

	say, “The system tends to be sustainable”. The sustainability only shows if the system is likely to be sustain for coming years.
Target	100% population served by functional taps for all three years.
level	**Output:** These indicators provide the direct measurement of whether system is functional for long time or the trend of system is toward the sustainability.
Result Area	**Effect:** It indicates whether a system is producing desired results, which in this case is the expectation that all population get water with functional taps over long time.
Goal	To measure if the system is sustainable
Method of Measurement	Percentage of population served by functional taps for n year $V(S1A)= V(F1A)\%_n$ here, “V” stands for “Value” Here n is the present year.
Method of Calculating Score	<u>Marking (For present year):</u> Marks obtained for percentage of population served by functional taps for n year $M(S1A)= V(S1A)\%_n *50$ Here “M” stands for “Marks”. <u>Scoring for three years (Final score for Sustainability):</u> $S(S1A)=50\%*M(S1A)_n+30\%*M(S1A)_{n-1}+20\%*M(S1A)_{n-2}$ Here “S” stands for “Score”
Data Source and collection methods	<u>Data source:</u> % of population served by functional system: Data from NWASH-MIS <u>Collection method:</u> Extract from NWASH-MIS (nwash.mowss.gov.np/)
Frequency	Once in a year, say in the month of July/August or whenever there is problem in a water supply system and again when that problem is resolved.
Collection level	System(Scheme)
Data Disaggregation	Sex, caste/ethnic groups, Quantity, Quality and supply hrs. at taps
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Though this is the proxy indicator to measure the functionality it is the strong method. Sustainability is the vague concept, so difficult to measure. But, this method provides the direct method to measure the population served by the system, which is functional over the years. This measurement can be considered as the measurement of the sustainability.
Guidelines to interpret and use data.	The higher result shows more population are benefited with the water supply, which is tending towards sustainability. The higher result denotes that any interventions taken to increase the sustainability of the system is bringing the positive result.
Challenges	The quality of data for this indicator is directly dependent on the quality of data, which is in NWASH-MIS. If there is any data missing within the last three years, the interpretation of the data may become the unrealistic.

S2A: Number of meetings with decision recorded per year (In last three years)

Measuring Area	Transparency in decision making process with in WSUC
Key Monitoring Parameters	Meetings and decisions by WSUCs
Unit	Numbers
Definition	A meeting is a formal gathering of majority of WSUC members that has been convened for the purpose of achieving a common goal through verbal interaction, such as sharing information or reaching agreement. The term decision recorded implies that the meeting is minuted. Meeting minutes are the written or recorded documentation that is used to inform attendees and non-attenders about what was discussed or what happened during a meeting.
Purpose	It gives ideas about WSUC member's participation to make system functioning This also helps to make the governance within WSUC more transparent.
Rationale	The regular meeting shows how WSUC is active and it also shows the concern of WSUC about the wellbeing of the water supply system. It helps WSUC members to reach a common decision when urgent and crucial matters need to be discussed and brainstormed through personal interaction. This also helps to keep everyone informed and up to date. When members are included in discussions and decisions of certain issues, it will be good for their morale and motivation and increases the sense of belongingness. Minutes that capture the purpose of the meeting and its agreed outcomes are a record that can be referred back to and can be used for follow-up purposes. They also act as an accountability tool because they make it clear whose duty it was to perform which action.
Target	At least 4 meeting every year with recorded decisions.
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Institutional:** It indicates whether the institutional arrangement are able to contribute to produce the desired result.
Goal	To measures, whether WSUC is capable to maintain transparency in its decision. It also measures whether there is participatory decision process within WSUC.
Method of Measurement	Number of meetings conducted within a year is counted=V(S2A)
Method of Calculating Score	Marking (For present year): If V(S2A) >= 4 then M(S2A)= 5, else If V(S2A) = 3 then M(S2A)= 4, else If V(S2A) =2 then M(S2A)= 3, else M(S2A)= (0) Scoring for three years (Final score for Sustainability): $S(S2A)=50\%*M(S2A)_n+30\%*M(S2A)_{n-1}+20\%*M(S2A)_{n-2}$
Data Source and collection methods	Data source: 1) Meeting: WSUC's record, interview Collection method: 1)Meeting: WSUC's minute book record check, Questionnaire For interview: 1. For nos. of meetings and minute books: ask with WSUC member
Frequency	Once in a year
Collection level	WSUC

Data Disaggregation	Meetings minute book
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Number of WSUC meeting with decision recorded' as an indicator to measure the 'transparency in decision making process within WSUC' is strong indicator, because it helps to measure whether the WSUC are active or not. The strength of this indicator is that it is very easy to collect but powerfully demonstrates its ability to measure the activeness of the WSUC.
Guidelines to interpret and use data.	If more than 4 WSUC meeting conducted regularly all three years then there is chances that the system will be tend to be sustainability. The high score demonstrates that the WSUC is more functioning, active and that the transparency in their decision is also high.
Challenges	The data collected are totally depend upon the WSUC record (Minute) book and interview to WSUC member. Nos. of meeting held will be true because it is taken from record book, but involvement of all member and their active participation in taking all decision is not sure, influence of some key person are seem to be lead role to take all these decision making.

S2B: Annual general meeting conducted with decision recorded (AGM) (in last three years)

Measuring Area	Transparency among WUA members
Key Monitoring Parameters	AGM held or not
Unit	Yes/No
Definition	AGM is the gathering of the WSUC members and the representative of a tap owner.
Purpose	The purpose of this indicator is to measure whether the decisions taken by WSUC are in greater interest of the customers.
Rationale	The main purpose of the AGM is to maintain the transparency within WSUc in critical issues such as the presentation and approval of the audited accounts. This also includes election of WSUCs executives and tariff fixation, if necessary. AGM is one of the critical activity in WSUC Institualization.
Target	AGM held every year
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Institutional:** It indicates whether the institutional arrangement are able to contribute to produce desired result.
Goal	To measures whether WSUC is capable to maintain transparency in its decision and decisions are in public favors.
Method of Measurement	If AGM is held then V(S2B)="Yes" otherwise V(S2B)=""No"
Method of Calculating Score	Marking (For present year): If V(S2B)="Yes" then M(S2B)=5 else M(S2B)= 0 Scoring for three years (Final score for Sustainability): $S(S2B)=50\%*M(S2B)_n+30\%*M(S2B)_{n-1}+20\%*M(S2B)_{n-2}$
Data Source and collection methods	Data source: 1) AGM Meeting: WSUC's record, interview Collection method: 1)AGM Meeting: record check, questionnaire

	For interview: 1. For AGM and minute book: ask with WSUC member
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Annual general meeting conducted with decision recorded' to measure 'transparency among WUA members' is the strong indicator. Checking WSUC minute book to find 'whether AGM is held and whether decisions are recorded' are strong method of data collection.
Guidelines to interpret and use data.	If evidence shows that, the AGM is held every year, then there is chances that the WSUC is practicing more transparency. This is contributing factor towards sustainability.
Challenges	

S2C: Account is looked after by the employed accountant (last three years)

Measuring Area	Financial Administration
Key Monitoring Parameters	Trusted account keeping
Unit	Yes/No
Definition	Accounting: Financial accounting is the field of accounting concerned with the summary, analysis and reporting of financial transactions pertaining to a business. This involves the preparation of financial statements available for public consumption Employed: Part-time or fulltime involvement with mutually agreed remuneration between employer and employee. Accountant: A person who is competent in looking after the account, whether with or without academic degree for it. If the WUA member is looking after the account, on spirit of volunteerism, it cannot be considered as employed staff.
Purpose	The purpose of this indicator is to measure if the financial statements are good enough and understandable to make available for public consumption.
Rationale	The members of WSUC contribute voluntarily to maintain the services of the water supply system. They do not have time, knowledge and skill to maintain the financial records. Most of the disputes that are arising in AGM are related to financial management, such disputes are seriously effecting the functions and reputation of the WSUCs. So, if the account is looked after by the accountant such disputes may not arise. The WSUC has to audit its financial transaction by the registered auditor. If the competent accountant keep the account it will be systematic so that it will be easier for auditor to understand.
Target	Account is looked after by employed accountant.
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Institutional:** It indicates whether the institutional arrangement are able to contribute to produce desired result.
Goal	To measure whether WSUC is capable to maintain its financial transparency.

Method of Measurement	a. Always by accountant then V(S2C)="Yes(a)" b. Some months by accountant and rest months by WSUC member then V(S2C)="Yes(b)" c. Only by WSUC V(S2C)="Yes(c)" d. No one is responsible V(S2C)="Yes(d)"
Method of Calculating Score	Marking (For present year): a) If V(S2C)= Yes(a) then M(S2C)= 4, else b) If V(S2C)= Yes(b) then M(S2C)= 3, else c) If V(S2C)= Yes(c) then M(S2C)= 2, else d) If V(S2C)=)= Yes(d) then M(S3A)= 0 Scoring for three years (Final score for Sustainability): $S(S2C)=50\%*M(S2C)_n+30\%*M(S2C)_{n-1}+20\%*M(S2C)_{n-2}$
Data Source and collection methods	Data source: 1) Engagement of accountant for services: WSUC's record, interview, salary slip Collection method: 1) Engagement of accountant for services: financial record check, questionnaire For interview: 1. Service of accountant engaged: Ask WSUC member
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Account is looked after by the employed accountant' to measure, the state of financial management is strong indicator. If the service of the accountant is engaged then there is chance that financial discipline is maintained. Checking financial record to know whether the service of accountant is engaged or not is the strong method for data collection. Whereas interviewing the WSUC member for the same purpose is weak method of data collection as WSUC member may not have the proper understanding of what is accountant and in what condition his service is termed as 'employed'.
Guidelines to interpret and use data.	If the score is high then there is possibility that the system will be sustainable.
Challenges	There might be confusion to interpret who is accountant, is he 'employed'?

S3A: Need of treatment (in last three years)

Measuring Area	Quality of water supplied
Key Monitoring Parameters	Quality of source water
Unit	Yes/No
Definition	A system is sustainable only if it provide safe drinking water to the consumers.
Purpose	The main purpose of this indicator is to find whether the source water is safe in all respect in term of quality or whether there is need of treatment facility.

Rationale	There is growing health conscious among water user. The WSUCs are also showing their concern on the quality of the water they are supplying through their system. People are opting the alternative arrangement if the quality of supplied water is not as per their satisfaction, this is resulting the limited use of the water supply system. This is bringing growing concern for WSUC as they are not able to generate sufficient tariff, resulting to the worsen financial health of the system. If the quality of supplied water is not as per users' expectation, the system may not be accepted by users, leading to the sustainability of that system at risk.
Target	Clean water round the year, naturally or with aided treatment
level	**Monitoring:** These measures the input that create the favorable environment for sustainability. These assure the favorable environment to produce result but do not assure the results.
Result Area	**Technical**: It indicates whether a system technical input is sufficient to delivering quality services or not.
Goal	Water Supply System serving quality (safe) water timely for long time(year)
Method of Measurement	Measurement: a) If appropriate treatment facility exists="yes" and working="yes" then V(S3A)= "Yes(a)" b) If clean round the year/ treatment may or may not needed then V(S3A)= "Yes(b)" c) If turbid/dirty in rainy season/minor treatment needed then V(S3A)= "Yes(c)" d) If turbid/dirty round the year/major treatment needed then V(S3A)= "Yes(d)" If WSP is implemented and no need of treatment facility round the year we can indicate as "Yes(a)"
Method of Calculating Score	Marking (For present year): a) If V(S3A)= Yes(a) then M(S3A)= 4, else b) If V(S3A)= Yes(b) then M(S3A)= 3, else c) If V(S3A)= Yes(c) then M(S3A)=2, else d) If V(S3A)= Yes(d) then M(S3A)= 0 For multiple sources: Score is weighted with the tapped discharge to find the weighted average, the formula is: =SUMPRODUCT(numbers, weights)/SUM(weights) i.e. SUMPRODUCT(Marks, tapped discharge of that source)÷SUM(tapped discharges of all sources) Scoring for three years (Final score for Sustainability): $S(S3A)=50\%*M(S3A)_n+30\%*M(S3A)_{n-1}+20\%*M(S3A)_{n-2}$
Data Source and collection methods	Data source: 1) Treatment facility available: WSUC record, interview 2) Treatment facility needed: Users interview, observation Collection method: 1) Treatment facility available: WSUC's record, interview 2) Treatment facility needed: Interview, observation For interview: 1. Treatment facility available: Interview WSUC and record check Treatment facility needed: Interview with WSUC and field observation
Frequency	Once in a year

Collection level	System(Scheme)
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Need of treatment facility' as an indicator to measure 'Quality of water supplied' is the strong indicator as it indicates the direct measurement of the treatment need. Filed observation to determine the need of treatment facility is strong method of data collection, as it provides true and primary information.
Guidelines to interpret and use data.	The higher score indicates the system is safe in respect of water quality. It also indicates that there might not be need of constructing treatment facility.
Challenges	The data collected are only the perception of the users, which may not truly express the reality of the field. The data on source is the representation of only one user selected randomly, who may not truly express the view of other users. Again, by the observation of watercolor we cannot say treatment is required or not.

S3B: Standard Operating Procedure (SOP) of regular inspection prepared and followed (in last three years)

Measuring Area	Standardization of routine procedures
Key Monitoring Parameters	checklist, processes and procedures of operations
Unit	Yes/No
Definition	A standard operating procedure (SOP) is a set of step-by-step instructions compiled by WSUC to help workers carry out routine operations. SOPs aim to achieve efficiency, quality output and uniformity of performance. For WSUC, any checklist that helps worker to carryout operations can be considered as SOP. The 'followed' is the evidence that the SOP is used for operations.
Purpose	The purpose of this indicator is to measure whether the WSUC has standardized its work procedures.
Rationale	Most of the water supply systems are looked after by VMWs. VMWs have limited knowledge and skills, so they need a sort of instruction manual, which helps them carry out routine operations. Standard operating procedures (SOPs) are step-by-step instructions that act as guidelines for VMW work processes. Whether written up in numbered steps or formatted as flow charts, effective SOPs are complete, clearly written, and based on input from the workers who do the job. If SOP is prepared and 'followed' there is, chances that the maintenance will be carried out routinely and with standardized methods, that is expected to lead to the sustainability.

Target	SOP in place and followed.
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Technical**: It indicates whether this technical input is sufficient to delivering quality services or not.
Goal	To measure whether the routine operations are optimized or not?
Method of Measurement	If SOP exist=”Yes” and followed=”Yes” then V(S3B)="Yes" otherwise V(S3B)= "No".
Method of Calculating Score	Marking (For present year): If V(S3B)= "Yes” then M(S3B)=4, else If V(S3B)= "No" then M(S3B)=0 Scoring for three years (Final score for Sustainability): $S(S3B)=50\%*M(S3B)_n+30\%*M(S3B)_{n-1}+20\%*M(S3B)_{n-2}$
Data Source and collection methods	Data source: 1) SOP: VMW interview and SOP check Collection method: 1) SOP: Observation for SOP prepared and Interview for SOP followed For interview: 1. Interview VMW to check if SOP is 'followed'.
Frequency	Once in a year
Collection level	System(Scheme)
Data Disaggregation	
Aggregation	System(Scheme)
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing SOP as an indicator to measure 'maintenance routine and procedure' is strong indicator. Checking SOP to know whether it is being followed is strong method of data collection. Whereas interviewing VMW to know whether SOP is being 'followed' is fairly strong method, because VMW may interpret 'followed' differently. He may actually interpret his routine works as being followed without actually referring to SOP.
Guidelines to interpret and use data.	If the score of this indicator is higher, the contribution that this indicator is expecting to provide towards the sustainability is positive.
Challenges	It is difficult to know if SOP is 'followed'.

S4A: Source registration and dispute in the source (in last three years).

Measuring Area	Ownership, possession and enjoyment of the source
Key Monitoring Parameters	Water source conflict
Unit	Yes/No
Definition	**Source:** Water source, such as stream, spring, lakes, rivers, wells, rainwater etc., which is used for water supply purposed. Registration: Registration of water source at District Water Resource Committee. **Dispute:** Water source dispute or obstruction is a term describing a conflict between and within community, which try to manage water resources. Water disputes result from opposing interests of water public or private users.
Purpose	The purpose of this indicator is to find whether water source, that the system is using, has the disputed sources.

Rationale	A wide range of water conflicts appear throughout history, water has historically been a source of tension and a factor in conflicts. Water conflicts arise for several reasons, including territorial disputes, a fight for resources, and strategic advantage. The history has shown that several water supply systems have become non-usable due to source dispute leading to non-sustainability. Registration is the legal way to establish ownership and avoid dispute of the source. So, knowing source registration is good way to interpret that the source is legally secured and that there will be little or no chances that dispute will arise. If the sources are registered and available without dispute for long-term enjoyment to WSUC then there will be chances that the system will be sustainable.
Target	Registered and no obstruction in source.
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Social and Environment:** It indicates whether the social and environment arrangement are able to contribute to produce desired result.
Goal	The goal of this indicator is to establish the ownership, possession and enjoyment of water source for water supply system.
Method of Measurement	a. Source registered and no dispute then V(S4A)="Yes(a)" b. Source registered but dispute then V(S4A)="Yes(b)" c. Source not registered and no dispute V(S4A)="Yes(c)" d. Source not registered and dispute V(S4A)="Yes(d)"
Method of Calculating Score	Marking (For present year): a. If V(S4A)="Yes(a)" then M(S4A)=5 b. If V(S4A)="Yes(b)" then M(S4A)=4 c. If V(S4A)="Yes(c)" then M(S4A)=3 d. If V(S4A)="Yes(d)" then M(S4A)=0 For multiple sources: Score is weighted with the tapped discharge to find the weighted average, the formula is: =SUMPRODUCT(numbers, weights)/SUM(weights) i.e. SUMPRODUCT(Marks, tapped discharge of that source)÷SUM(tapped discharges of all sources) Scoring for three years (Final score for Sustainability): $S(S4A)=50\%*M(S4A)_n+30\%*M(S4A)_{n-1}+20\%*M(S4A)_{n-2}$
Data Source and collection methods	Data source: 1) Source Registered: WSUC record, DWRC office 2) Source location and dispute: WSUC and User Collection method: 1) Source Registered: Certificate of source registration 2) Source location and dispute: interview, field observation For interview: 2. Source location and dispute: Interview with WSUC and field observation
Frequency	Annual or whenever there is dispute and again when that dispute is resolved
Collection level	System
Data Disaggregation	

Aggregation	System
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing registration of source as an indicator to find the ownership and possession of the source is very strong concept. Registration is a strong indicator that gives the ownership of the source that indicates the source is permanently available to the WSUC. Knowing the dispute in the source is also strong indicator to determine whether the source can be continuously available to WSUC for enjoyment. Checking the certificate of source registration is strong method. Similarly, interviewing WSUC to know the dispute in source is also strong method. Because, these methods provides primary and true information.
Guidelines to interpret and use data.	If the sources are registered and available without dispute for long-term the system can be sustainable.
Challenges	

S4B:Percentage of households using water for income generating activities. (in last three years)

Measuring Area	Productive use of water
Key Monitoring Parameters	Use of wastage water for income generation.
Unit	%
Definition	Income generating activities: Use of wastaged or excessed water in such activity that gives direct or indirect financial benefit, example is kitchen garden.
Purpose	The purpose of this indicator is to find if household are getting financial benefit from the system.
Rationale	When people are getting some financial benefit from any system, they wish the system be sustainable. The practice of using wastewater for income generation, such as using in kitchen garden, shows people are earning something that is providing financial help to them. Therefore they always wish the water supply system be sustainable. This earning also helps household in some extent to share the water tariff. If they are able to pay their tariff regularly, the system become financially strong.
Target	100% of household use water for income generating activities
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Social and Environment:** It indicates whether the social and environment arrangement are able to contribute to produce desired result.
Goal	The goal of this indicator is to engage households in income generating activities using wastaged and excessed water.
Method of Measurement	Numerator(N): ∑Number of household using water as income generation Denominator(D): Total number of Household served by the system Calculation: (N÷D)*100=V(S4B)%
Method of Calculating Score	<u>Marking (For present year):</u> If V(S4B) % >=50% then M(S4B)=3, else M(S4B)= V(S4B)%*3/50 <u>Scoring for three years (Final score for Sustainability):</u> $S(S4B)=50\%*M(S4B)_n+30\%*M(S4B)_{n-1}+20\%*M(S4B)_{n-2}$

Data Source and collection methods	Data source: 1) Number of household using water as income generation : interview 2) Total number of households served by the system: WSUC record Collection method: 1) Number of household using water as income generation : questionnaire 2) Total number of households served by the system: Observation of the WSUC record of tap connections For interview: 1) Number of household using water as income generation : Interview WSUC
Frequency	Once in a year
Collection level	System
Data Disaggregation	
Aggregation	System
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'using water in income generation' as an indicator to measure the Productive use of water is strong concept. Using interview to know the percentage of Household use water in income generation is fairly strong method. It would have been stronger, if method of interviewing each household to know their productive use of water was used, but Interviewing all users is time consumption and impractical. Checking the record of tap connection to know the number of household served by this system is fairly strong method as it gives the true information. It would have been very strong if all the household in the community were interviewed to know if they are getting service from this system
Guidelines to interpret and use data.	If this percentage is higher, then we can assume more household are using water from this system for income generation.
Challenges	It is always challenging to know the true percentage of household using water form this system for income generation. Interviewing WSUC for this only provides fair guess.

S4C: Percentage of Women representation in Water and Sanitation User Committee (in last three years)

Measuring Area	Social inclusion in WSUC
Key Monitoring Parameters	Women representation in WSUC
Unit	Percentage
Definition	Here representation indicates the number of women in WSUC with at least one in Key post. Key posts are chairperson, or deputy chairperson or secretary or treasurer.
Purpose	The purpose of this indicator is to measure if voice of women could properly be respected in the WSUC.
Rationale	Greater participation of women in water management and decision-making is expected to improve outcomes for both women and the wider community. Global evidence indicates that women's participation in Water User Committees (WUCs) has been limited; yet their involvement in management has correlated with more effective water systems.
Target	Women Representation>=33% with at least one woman member in key post

level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Social and Environment:** It indicates whether the Social and Environment arrangement are able to contribute to produce desired result.
Goal	The goal of this indicator is to make the user committee representative of all segment of the society.
Method of Measurement	Numerator(N): ∑Number of women member in WSUC Denominator(D): ∑Total number of member in WSUC Calculation: (N÷D)*100=V($S4C_1$)% Number of women members in key post=V($S4C_2$)
Method of Calculating Score	Marking (For present year): If V($S4C_1$)>=33 and V($S4C_2$)>=1 then M(S4C)=4, else If V($S4C_1$)>=33 and V($S4C_2$)>=0 then M(S4C)=3, else If V($S4C_1$)>=20 and V($S4C_2$)>=1 then M(S4C)=3, else If V($S4C_1$)>=20 and V($S4C_2$)>=0 then M(S4C)=2, else M(S4C)=0 Scoring for three years (Final score for Sustainability): $S(S4C)=50\%*M(S4C)_n+30\%*M(S4C)_{n-1}+20\%*M(S4C)_{n-2}$
Data Source and collection methods	Data source: Number of women member in WSUC with key post :WSUC Collection method: Number of women member in WSUC with key post : Interview For interview: Interview WSUC member to find the number of women member in WSUC and in key post
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	name, cast, contact number
Aggregation	WSUC
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'percentage of women in WSUC' to measure the gender equality is good concept. It would have been stronger indicator if it would have been possible to measure the actual level of participation by measuring how woman member is taking part in decision-making process, and how her role is respected. Only judging women's participation just by counting the head would not provide the proper interpretation of their participation. Interviewing WSUC member and checking their record to know 'the women percentage in WSUC and number of women in key post' is strong method.
Guidelines to interpret and use data.	Women's involvement in management and decision making process has correlated with more effective water systems.
Challenges	

S5A: Presence of financial auditing system (in last three years)

Measuring Area	Financial discipline
Key Monitoring Parameters	Soundness of financial management

Unit	Yes/no
Definition	Auditing is the process that provides an objective independent examination of the financial statements, which increases the value and credibility of the financial statements produced by WSUC thus increases user confidence in the financial statement.
Purpose	The purpose of this indicator is to measure whether there exists the financial auditing system in WSUC.
Rationale	Most of the WSUC do not have their own accountant to keep their financial documents as required by the government. During AGM, the financial discipline is always the matter of discussion, which some time fails to create confidence on WSUC by users. This may seriously affect the sustainability of the system. Whereas auditing system provides the opportunity to WSUC to show they are more transparent on their accounting system and that they keep their accounting system by following rule's and regulation as set by government.
Target	Presence of auditing system for all three years.
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Financial:** It indicates whether the Financial arrangement are able to contribute to produce desired result.
Goal	The goal of this indicator is to create the system that maintains the financial discipline.
Method of Measurement	If there is presence of auditing system V(S5A)="Yes" otherwise V(S5A)="No" Only audit by register auditor is taken in consideration as an "auditing system"
Method of Calculating Score	Marking (For present year): If V(S5A)="Yes" then M(S5A)= 4 else M(S5A)=0 Scoring for three years (Final score for Sustainability): $S(S5A)=50\%*M(S5A)_n+30\%*M(S5A)_{n-1}+20\%*M(S5A)_{n-2}$
Data Source and collection methods	Data source: Audit System: Audit report of WSUC Collection method: Audit System: Observation of audit report
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	
Aggregation	
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Presence of financial auditing system' as an indicator to measure, the financial discipline is the strong concept. The auditing is done by the independent registered auditor so can be expected to follow all rules, regulation and standard set forth by government for auditing. Observing the financial audit report as an evidence of presence of auditing system is also strong method of data collection as it provides the true primary data, which is free of any biased information.
Guidelines to interpret and use data.	If Yearly auditing practice in a WSUC then the system is institutionally and financially, sound, and benefited people will believe them and timely pay their tariff. This tend to a system toward sustainability.
Challenges	The main challenges lies in finding registered auditor in remote areas of Nepal.

S5B: Presence of provision of remuneration for VMW (in last three years).

Measuring Area	Retention of skill
Key Monitoring Parameters	Retention of VMW
Unit	Yes/No
Definition	VMW: VMW operates and maintains the system. Here, VMW is considered in broader terms as whoever is looking after the maintenance of the system. Remuneration: It is financial reward paid for work; it can be in cash and/or kind. It is mutually agreed between WSUC and VMW but should be fair enough to retain the VMW.
Purpose	The purpose of this indicator is to measure whether there is adequate skill retention provision that exists in WSUC.
Rationale	Most of VMWs after they acquire knowledge, skill and experience leave the present job in search of higher opportunity, even abroad. The government had spent lots of money in capacity development of VMW. The new VMW may not have that much skill as the previous one and WSUC will also not have financial capacity to develop new VMW. The retention of VMW is prime challenge for WSUC. Remuneration is the key retention factor for VMW. It is also social justice to pay sufficient remuneration for the work one has done.
Target	Remuneration for VMW for all 3 years
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Financial:** It indicates whether the Financial arrangement are able to contribute to produce desired result.
Goal	The goal of this indicator is to create the system that retains the skills.
Method of Measurement	If there is provision of remuneration for VMW then V(S5B)="Yes" else V(S5B)="No" If there some VMWs are getting remuneration and some are not getting then if more than 50% of VMWs are getting remuneration then consider V(S5B)="Yes"
Method of Calculating Score	Marking (For present year): If V(S5B)=”Yes” then M(S5B)=4 else M(S5B)=0 Scoring for three years (Final score for Sustainability): $S(S5B)=50\%*M(S5B)_n+30\%*M(S5B)_{n-1}+20\%*M(S5B)_{n-2}$
Data Source and collection methods	Data source: Remuneration for VMW: Payslip Collection method: Remuneration for VMW : Observation of pays lip
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	Cash, Kind
Aggregation	WSUC
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Presence of provision of remuneration for VMW' is very strong indicator. If there is provision of remuneration for VMW then VMW will be motivated to provide his service in fullest. It would have been better if the 'fair remuneration' was chosen as an indicator. Observing the pay slip to find the provision of remuneration is the strongest method of data collection as it provides the true information.

Guidelines to interpret and use data.	If there is provision of remuneration for VMW for all three years then we can safely say the system is tending towards sustainability.
Challenges	

S5C: Presence of provision of water supply system insurance. (in last three years)

Measuring Area	Financial risk sharing mechanism
Key Monitoring Parameters	Financial protection against risks
Unit	Yes/No
Definition	Insurance of water supply system refers to the non-life insurance of the system components such as structures and pipeline.
Purpose	The purpose of this indicator is to measure whether there is financial risk sharing mechanism for water supply system.
Rationale	The rural water supply policy of Nepal assumes that it is WSUC's responsibility for minor repair. Though the Government fully understands that it is her responsibility to assist the communities for major repair, rehabilitation and reconstruction, the Government has resources limitations. These WSUCs have to wait a long to get government's assistance. While WSUC wait for the assistance, the problem compounds and system completely become nonfunctional. This contributes to the large number of nonfunctional water supply projects. So, In this regard the insurance of Water Supply System is becoming growing practice among w in WSUCs Nepal. The insurance companies in Nepal usually insures water supply project in seven different categories like Fire, Earthquake, Flood, Vandalism, Landslide, Terrorism, Riots and Strikes.
Target	Insurance of water supply system for all three years.
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Financial:** It indicates whether the financial arrangement are able to contribute to produce desired result.
Goal	the goal of this indicator it to establish the risk sharing mechanism for protection against critical repair needs in case of Fire, Earthquake, Flood, Vandalism, Landslide, Terrorism, Riots & Strikes
Method of Measurement	If there is provision of insurance system then " V(S5)="Yes" else V(S5C)="No"
Method of Calculating Score	Marking (For present year): If V(S5C)="Yes" then M(S5C)=2 else M(S5C)=0 Scoring for three years (Final score for Sustainability): $S(S5C)=50\%*M(S5C)_n+30\%*M(S5C)_{n-1}+20\%*M(S5C)_{n-2}$
Data Source and collection methods	Data source: Insurance of Project Structure: Insurance premium pay sheet Collection method: Insurance of Project Structure : observation
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	
Aggregation	WSUC

Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing ' Presence of provision of water supply system insurance' to measure 'Financial risk sharing mechanism' is strong concept. Choosing premium pay slip as an evidence of provision of insurance is very strong method of data collection as it provides true and primary information.
Guidelines to interpret and use data.	If there is provision of insurance system for the three years, we can safely assume that the WSUC has establish risk protection mechanism.
Challenges	

S5D: Operation Ratio (in last three years)

Measuring Area	Financial efficiency of WSUC
Key Monitoring Parameters	Income and operating expenditure
Unit	%
Definition	Operating ratio is WSUC's operating expenses as a percentage of revenue.
Purpose	The purpose of this indicator is to measure the income and operating expenditure.
Rationale	Most of WSUCs in Nepal have very low tariff rate, as tariff is the only regular source of income, the income may not fully support the operating expenditures. In such cases, external supports are needed. When the WSUC is largely depending on external support to operate its scheme, the system's sustainability may come into risk.
Target	Operational ratio less than 75%
level	**Input:** This measures the input that create the favorable environment for sustainability. This assures the favorable environment to produce result but does not assure the result.
Result Area	**Financial:** It indicates whether the Financial arrangement are able to contribute to produce desired result.
Goal	The goal of this indicator is to make the WSUC financially efficient.
Method of Measurement	Numerator(N): ∑Annual operating Expenditure Denominator(D): ∑Annual Internal income Calculation: (N÷D)*100=V(S5D)%
Method of Calculating Score	<u>Marking (For present year):</u> If V(S5D)% <75 then M(S5D) =6, else If V(S5D)% =75 to 100 then M(S5D) =4, else If V(S5D)% > 100 (external support needed) then M(S5D) =2, else If No tariff system or no income or dependent on external support for all expenditure then M(S5D) =0 <u>Scoring for three years (Final score for Sustainability):</u> $S(S5D)=50\%*M(S5D)_n+30\%*M(S5D)_{n-1}+20\%*M(S5D)_{n-2}$
Data Source and collection methods	<u>Data source:</u> tariff system, Annual Internal income, Annual Expenditure: WSUC <u>Collection method:</u>

	Tariff system, Annual Internal income, Annual Expenditure : observation of financial statements
Frequency	Once in a year
Collection level	WSUC
Data Disaggregation	Tariff, Income, expenditure
Aggregation	WSUC
Reporting frequency	Annual (mandatory) and/or when desired
Strength and weakness	Choosing 'Operation Ratio' to measure 'financial efficiency' of WSUC (System) is very strong concept. It provides clear picture on how much is expended to maintain the service. Observing financial documents to determine operation ratio is very strong method of data collection, as it provides true and primary information.
Guidelines to interpret and use data.	If this ratio is 75% or lower, it indicates there is 25% surplus in the system for future planning. If this ratio is lower, it indicates that there might be regular source of income such as tariff that helps to generate the required expenditure to maintain the system functional.
Challenges	There is challenge to determine which is income and which is operating expenditure at the WSUC level. As WSUC is expected to update data yearly, they might feel uncomfortable to interpret the financial data.

18. Sustainability marking system

This presents the marking system for the **present** year:

Sustainability Indicators	**100**			
Result Indicator (50% weightage)		**50**		
1. Overall Sustainability			**50**	
S1A: Percentage of Population served by functional system			50	
a X % of population served by functional taps				=50*X%
Marks Obtained=				M(S1A)
Input Indicators (weightage 50%)		**50**		
2. Institutional			**14**	
S2A: Number of meetings with decision recorded per year			5	
a More than 3 meetings				5
b 3 meetings				4
c 2 meetings				3
d less than 2 meetings or no WSUC formed				0
Marks Obtained=				M(S2A)
S2B: Annual general meeting conducted with decision recorded (AGM)			5	
a Yes				5
b No				0
Marks Obtained=				M(S2B)
S2C: Account is looked after by the employed accountant			4	

a	Always by accountant			4
b	Some months by account and rest months by WSUC member			3
c	Only by WSUC member			2
d	No one is responsible			0
Marks Obtained=				M(S2C)
3. Technical: System is delivering quality services		**9**		
S3A: Need of treatment			4	
a	Appropriate treatment facility exists and working			4
b	Clean round the year/ treatment may or may not needed			3
c	Turbid/dirty in rainy season/minor treatment needed			2
d	Turbid/dirty round the year/major treatment needed			0
Marks Obtained=				M(S3A)
S3B: Standard Operating Procedure (SOP) of regular inspection prepared and followed			5	
a	Yes			5
b	No			0
Marks Obtained=				M(S3B)
4. Social and Environment		**12**		
S4A: Source registration and dispute in the source.			5	
a	Source registered & no obstruction			5
b	Source registered, in public land & obstructed by local community			4
c	Source not registered, in public land & obstructed by local community			3
d	Source in private land & obstructed by owner			0
Marks Obtained=				M(S4A)
S4B: Percentage of households using water for income generating activities			3	
a	>=50% household			3
b	X% (Linear distribution of total marks 3 between 0% to 50 %)			2*X%*3
c	0% household			0
Marks Obtained=				M(S4B)
S4C: Percentage of Women representation on Water and Sanitation User Committee			4	
a	>=33% with female member in executive post			4
b	>=33% with no female member in executive post			3
c	>=20% with female member in executive post			3
d	>=20% with no female member in executive post			2
e	Other conditions			0
Marks Obtained=				M(S4C)
5. Financial: System is financially sound		**15**		
S5A: Presence of financial auditing system			3	
a	Yes			3
b	No			0
Marks Obtained=				M(S5A)

S5B: Presence of provision of remuneration for VMW		4	
a	Yes		4
b	No		0
Marks Obtained			M(S5B)
S5C: Presence of provision of water supply system insurance		2	
a	Yes		2
b	No		0
Marks Obtained=			M(S5C)
S5D: Operation Ratio		6	
a	Operating ratio less than 75% (internal income more than expenditure)		6
b	Operating ratio 75-100%		4
c	Operating ratio > 100% (External support needed)		2
d	No tariff system or no income or dependent on external support for all expenditure		0
Marks Obtained=			M(S5D)

19. Sustainability scoring system

Rational: One of the components of the definition of sustainability is "It functions and is being used". When we have to find the future trend, the best and simple way is to forecast the trend based on the past years' performances (generally three years).It is assumed that if the system is serving as desired over the three years we can safely assume that the system is tending towards sustainability. The Marks obtained on each indicators for three years are weighted as 50% for the present year (n), 30% for previous year (n-1) and 20% for the year before previous year (n-2).

For previous two years, data source is NWASH-MIS, but If the System (Scheme) is surveyed for the first time, it is natural that the NWASH-MIS will not have the data of that indicator for previous years, we can assume the latest data, valid for the past years also. This is also true for the recently constructed scheme, the recent year data can be considered for other years also.

This represents the final score for reporting:

Sustainability Indicators	**100**			
Result Indicator (50% weightage)		**50**		
1. Overall Sustainability			**50**	
S1A: Percentage of Population served by functional system (in last three years)			50	
a Marks obtained in (n) Year				$M(S1A)_n$*50%
b Marks obtained in (n-1) Year				$M(S1A)_{n-1}$*30%
c Marks obtained in (n-2) Year				$M(S1A)_{n-2}$*20%
Score(S1A)=				Sum_S1A(a,b,c)
Input Indicators (weightage 50%)		**50**		
2 .Institutional			**14**	
S2A: Number of meetings with decision recorded per year (in last three years)			5	

a	Marks obtained in (n) Year	$M(S2A)_n$*50%
b	Marks obtained in (n-1) Year	$M(S2A)_{n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S2A)_{n-2}$*20%
Score(S2A)=		Sum_S2A(a,b,c)
S2B: Annual general meeting conducted with decision recorded (AGM) (in last three years)	5	
a	Marks obtained in (n) Year	$M(S2B)_n$*50%
b	Marks obtained in (n-1) Year	$M(S2B)_{n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S2B)_{n-2}$*20%
Score(S2B)=		Sum_S2B(a,b,c)
S2C: Account is looked after by the employed accountant (in last three years)	4	
a	Marks obtained in (n) Year	$M(S2C)_n$*50%
b	Marks obtained in (n-1) Year	$M(S2C_{(n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S2C)_{n-2}$*20%
Score(S2C)-		Sum_S2C(a,b,c)
3. Technical: System is delivering quality services	**9**	
S3A: Need of treatment (in last three years)	4	
a	Marks obtained in (n) Year	$M(S3A)_n$*50%
b	Marks obtained in (n-1) Year	$M(S3A)_{n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S3A)_{n-2}$*20%
Score(S3A)=		Sum_S3A(a,b,c)
S3B: Standard Operating Procedure (SOP) of regular inspection prepared and followed (in last three years)	5	
a	Marks obtained in (n) Year	$M(S3B)_n$*50%
b	Marks obtained in (n-1) Year	$M(S3B)_{n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S3B)_{n-2}$*20%
Score(S3B)=		Sum_S3B(a,b,c)
4. Social and Environment	**12**	
S4A: Source registration and dispute in the source. (in last three years)	5	
a	Marks obtained in (n) Year	$M(S4A)_n$*50%
b	Marks obtained in (n-1) Year	$M(S4A)_{n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S4A)_{n-2}$*20%
Score(S4A)=		Sum_S4A(a,b,c)
S4B: Percentage of households using water for income generating activities (in last three years)	3	
a	Marks obtained in (n) Year	$M(S4B)_n$*50%
b	Marks obtained in (n-1) Year	$M(S4B)_{n-1}$*30%
c	Marks obtained in (n-2) Year	$M(S4B)_{n-2}$*20%
Score(S4B)=		Sum_S4B(a,b,c)
S4C: Percentage of Women representation on Water and Sanitation User Committee (in last three years)	4	
a	Marks obtained in (n) Year	$M(S4C)_n$*50%
b	Marks obtained in (n-1) Year	$M(S4C)_{n-1}$*30%

c Marks obtained in (n-2) Year		$M(S4C)_{n-2}*20\%$
Score(S4C)=		Sum_S4C(a,b,c)
5. Financial: System is financially sound	**15**	
S5A: Presence of financial auditing system(in last three years)	3	
a Marks obtained in (n) Year		$M(S5A)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5A)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5A)_{n-2}*20\%$
Score(S5A)=		Sum_S5A(a,b,c)
S5B: Presence of provision of remuneration for VMW (in last three years)	4	
a Marks obtained in (n) Year		$M(S5B)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5B)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5B)_{n-2}*20\%$
Score(S5B)=		Sum_S5B(a,b,c)
S5C: Presence of provision of water supply system insurance (in last three years)	2	
a Marks obtained in (n) Year		$M(S5C)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5C)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5C)_{n-2}*20\%$
Score(S5C)=		Sum_S5C(a,b,c)
S5D: Operation Ratio (in last three years)	6	
a Marks obtained in (n) Year		$M(S5D)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5D)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5D)_{n-2}*20\%$
Score(S5D)=		Sum_S5D(a,b,c)

The Total Sustainability Score(S-Score)= Sum of scores of all indicators = Score(S1A)+ Score(S2A)+ Score(S2B)+……+ Score(S5D)

20. Presentation of sustainability score

Indicators for sustainability are divided in two parts as Result Indicators (50%) and Input Indicators (50%). The score on result indicator provides the direct measurement of if the water supply system is tending towards sustainability or not. While, score on input indicators only measures the input or efforts that create favorable environment that leads to sustainability of the system, but does not assures the sustainability.
Such that:

The score on sustainability indicators (100%) = Score on result Indicator (50%) + Score on input indicator (50%)

21. Interpretation of sustainability score

According to score, the sustainability shall be interpreted as:

Total Score	Interpretation
>= 70	No or less risk for sustainability
>=60 to < 70	Some risk for sustainability
<60	High risk for sustainability

Example of Interpretation:

Example Score	Example Score Breakdown	Interpretation
Example I 75=30+45 (No or less risk for Sustainability)	Score on result Indicator (Overall sustainability, full marks=50)=30	%Score on result indicator=30/50=60% %Score on input indicator=45/50=90% Here, score in result indicator is not that promising, whereas score on input indicators is very good. It means the scheme has problem in functioning either this year or previous two years. However, it is not the matter of that much worry, as the favorable environment is very good, that means the WSUC has realized that their sustainability will be at risk and had worked on interventions that increases the score on result indicators.
	Score on input indicator (Favorable environment, , full marks=50)=45	
Example II 75=45+30 (No or less risk for Sustainability)	Score on result Indicator (Functional Taps, full marks=50)=45	%Score on result indicator=45/50=90% %Score on input indicator=30/50=60% Here, score on result indicator is very good whereas in input indicator it is not that much promising. It indicates that the scheme is new so functionality in this year and previous year seems good which helped to get higher score. However, its matter to worry that, the favorable environment that was helping to get score is slowly worsening. It means there might be problems in areas measured by indicators S2A to S5D
	Score on input indicator (Favorable environment, full marks=50)=30	

22. Management Information System

This M&E Framework is the basis of the web-based NWASH-MIS, allowing stakeholders to assess performance, progress and gaps in the sector. The framework can be revised and updated annually to ensure relevance and to account for improved data collection and monitoring approaches.

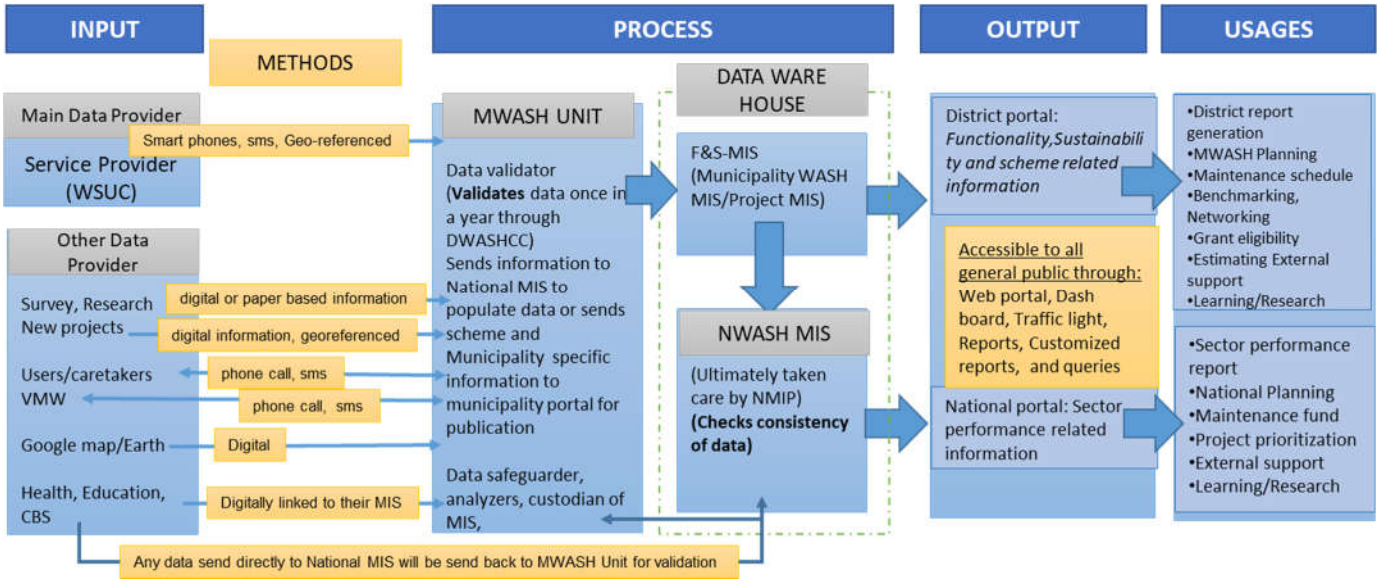
It is fully flexible, user friendly and expandable. Baseline and updated data is stored in a data warehouse, and can be presented/downloaded in geographical, graphical and tabular form for all geographical levels in Nepal. The MIS can incorporate new indicators, additional data and more extensive queries. It has GIS functionalities to make thematic maps of the indicators on different geographic levels. Reports of indicators can be generated to get proper insight about the indicators so they can be used for decision-making.

In the design of MIS, seven basic sequential stages were followed. These are: (1) identification of the information need, (2) collection of information, (3) classification of the information collected, (4) storage of information, (5) retrieval of data, (6) analysis of data and (7) use of data for decision-making. Such information helps aid the management in taking operational, tactical and strategic decisions. Some of the basic principles of MIS are indicated as under:

- Use of Log frame/result frame while designing MIS
- Periodical authentication and validation of data

- Periodicity of data reporting under MIS
- Data should be easily accessible to public/community.
- Utilization of data
- User-friendly MIS website

The following flowchart indicates the MIS that supports this M&E Framework:



23. Use of ICT

This M&E System is using the latest technology in ICT field. All data will be collected through mobile apps. The following mobile apps are developed.
These apps are available in google play store for free at
https://play.google.com/store/aaps/details?id=np.com.softwel.appmenu

1. NWASH Inventory: This app is used to collect scheme attributes in the form georeferenced data.
2. NWASH Project Sustainability: This app is used to collect WSUC's data.
3. NWASH Condition Reporting: This app is used to report i) when there is problem in a water supply asset ii) when that problem is resolved iii) even if there is no problem at least once a year to update the MIS.
4. NWASH Map: This interactive app is used to look at the scheme information.

In addition to these, there is another system for problem reporting and seeking technical assistance:

1. WASH Interactive voice response (IVR)

The user's manual and training manual of these apps can be found in nwash.mowss.gov.np/

These apps can be used for a) baseline data collection b) problem reporting and annual reporting and c) data updating

23.1. Baseline creation

a. Scheme data: The **'NWASH inventory'** app is used to collect scheme attributes in the form georeferenced data. It is used to exactly replicate the scheme, it basically digitizes the scheme. The WSUC will not use this app. Municipality WASH Unit or trained enumerators of any agency will use this app for data collection. These data collection efforts creates the baseline of MIS. This is one-time effort in a history. There will absolutely no need of periodic census such as in every 5 years. In near future this app is expected to completely replace NMIP paper based data collection system. When this M&E System is rolled out to 75 districts of Nepal, other agencies will also start using this mobile app for data collection.

b. WSUC data: The '**NWASH project sustainability'** app is used to collect WSUC's data i.e. Management data such as name of WSUC members, Presence or absence of VMW, Audit report, meetings, minutes, AGM etc. For the first time the trained enumerator uses this app, then after WSUC uses it to report.

23.2. Reporting by WSUC

i) Problem reporting: The WSUC uses '**NWASH condition reporting'** app to report whenever there is problem in their system. This is also used to report when that problem is solved. This app is for WSUC use and not intended for data collection. When WSUC reports the problem, the MIS officer at Municipality WASH Unit will immediately get notification of it and he provides backstopping support. Depending upon the nature of the problem the M&E Officer consults WASH Officer and can even send the technician for the repair.

Even if there is no problem, the WSUC uses this app to report the condition of the asset once in a year.

ii) Annual reporting: Even if the WSUCs do not have any problem they will report using '**NWASH project Sustainability'** app annually. On one hand this updates the existing data base on other hand this shows WSUCs are active.

23.3. System for technical assistance (IVR)

Besides these apps, the WSUC will also have Interactive Voice Response (IVR) system. (Explanation: Interactive Voice Response (IVR) is a technology that allows a computer to interact with humans through the use of voice and DTMF (Dual-tone multi-frequency signaling) tones input via keypad. In telecommunications, IVR allows customers to interact with a company's host system via a telephone keypad or by speech recognition, after which services can be inquired about through the IVR dialogue. IVR systems can respond with prerecorded or dynamically generated audio to further direct users on how to proceed.)

The IVR service is available at +977-1-4104077

The **WASH IVR** is useful for both a) technical assistance and b) problem reporting. If WSUCs or VMWs have any technical problem in their system, they can use WASH-IVR to seek technical assistance. The WASH IVR has predefined sets of technical guidance recorded as human voice. This prerecorded voice guides the WSUC to solve the problem. The WSUC can also report the problem using this WASH IVR. This reported problem will be updated in NWASH-MIS and the functionality and sustainability score will change accordingly.

24. Data updating

Most M&E System fails due to lack of updating system. How any MIS lives to its full potential with regular revisions and update in database is the most important factor for the success of any M&E System.

While we review the prevailing M&E system in Nepal, and also while we review the past M&E efforts in Nepal we found the main cause of failure is the lack of efficient and cost effective data updating system. Most of them are one-time data collection effort. Their system has room to update information of new projects, but seriously lacks the system for updating the existing (running) schemes. If they have to update the information of running scheme, they again have to send the enumerators to entire schemes, which is apparently doing new survey again and very cost consuming. This M&E system has the updating system for both running and new schemes:

24.1. New scheme update

Updating MIS with newly completed system (entering the information which is not in MIS): When any agency completes water supply system, they need to obtain "unique id" for the scheme. The Municipality WASH Unit will provide this id. Either implementing agency itself or engineer/M&E officer from Municipality WASH Unit will add the scheme features of new scheme to MIS with this id.

24.2. Existing scheme update

Updating information of scheme, which is already in MIS: This M&E system has unique system of updating existing database. We do not have to resurvey each year as NMIP and others are doing all these years.

The method is very easy, efficient and cost effective- the WSUC itself will update the data using apps. There are four ways for updating: i) updating through problem reporting apps ii) Updating through IVR iii) Updating through annual reporting iv) Updating through computer

- **Updating through problem reporting:** when WSUC reports problem through 'NWASH Condition Reporting' app, the data will be changed accordingly in the scheme information of the database. If WSUC have problem and if that is reported to the district MIS, the functionality and sustainability score of that particular scheme will be reduced, which shows that the scheme needs attention. When that problem is solved, the WSUC will report it through app and that information will be updated in MIS, and their score on functionality and sustainability will be increased.
- **Updating through annual reporting:** Even if the WSUCs do not have any problem, they will report annually using 'NWASH Condition Reporting' and 'NWASH Project Sustainability' apps. On one hand, this update the existing database and on the other hand, this shows that WSUCs are active.
- **Updating through IVR**: The other way of updating database of existing scheme is through Interactive Voice Response (IVR). Whenever WSUCs have problem they will report through IVR and that will be stored in MIS as data.
- **Updating through computer**: If the WSUCs feel comfortable, they can also update data through computer. If they do not have facilities, they can also go to nearest cyber café and update information.

25. Data accuracy and consistency

To draw conclusions over a period of time, decision-makers must be certain that they are looking at data, which measure the same phenomenon (often called reliability). The definition and measuring methods of

an indicator must therefore remain accurate and consistent each time it is measured. So, there will be continuous training and orientations.

WASH Unit at Municipality will be responsible for overall control and coordination of the data collection process. They will form data sharing agreements with agencies, and initiate the collection of annual data. They will also be responsible for quality control and oversight of data integrity prior to the data being formally added to the MIS.

25.1. Quality control of inventory data for first time survey

When creating baseline there will be stakeholders involvement during data collection, quality assurance and validation. The data collection team needs to check the completeness of data capture before leaving the scheme. The team develops layout map before leaving the scheme, the representative of the scheme will sign the testimony of the completeness, with his name and contact number, on the layout map.

The team needs to check if all schemes in a ward are captured before leaving the ward. Do not leave the ward unless all schemes are captured. The member or ward representative from ward office will certify that the every schemes in a ward is visited and captured.

Before leaving the district, the data-collecting agency MUST present the district scenario to DWASHCC and get feedback.

25.2. Quality control during data update

There might be chances that the WSUCs exaggerate or minimize their scheme data to portray that their scheme need major attention thinking that this may help them to secure government fund for maintenance.

It is proposed that once in a year the Municipality WASH Unit will prepare the scheme performance report against each agreed indicators. The Municipality WASH Unit will share this report to DWASHCC members. The DWASHCC is the forum of WASH stakeholder in the district, so every stakeholders will have opportunity to review the performance report. If they feel some indicators are incorrectly interpreted, then the actual filed verification can be made. This process will also increase the District's ownership on its data.

26. Use of scoring system: know your rank

When the WSUC reports the problem (through app or IVR), the problem will affect the score of respective indicator and score will automatically be lowered. This indicator based scoring will be displayed in dashboard and MIS officer sitting at the Municipality WASH Unit could see it through his dashboard. As soon as the score of that particular scheme is lowered, the MIS officer at the district would know what is the factor, which is contributing to lower the scheme's score. Then M&E officer/ engineer will suggest the WSUC the ways to improve that indicator and again to gain the score. If the problem is beyond the capacity of WSUC, then Municipality WASH Unit sends the technician to support them. Once the problem in scheme is solved, the WSUC reports it through mobile app and then the score will be increased in MIS and ultimately will be seen at the dashboard after verification by WASH Unit.

The scoring system will also help the WSUC to find where they actually are standing in the list, i.e. their rank in the municipality/district. They also know which indicator they need to improve so that they can

gain their rank in the list. The lower scored WSUC can contact higher scoring WSUC to learn best practice. They can even share each other how they can improve score in a particular indicator.

This ensures communication between WSUCs and Municipality WASH Unit and among WSUCs also.

27. Networking through MIS

One of the ways of building network could be the use of this MIS. For example, the private entrepreneur at the district can use this MIS to know which WSUC is frequently having the problem on which area. Then he can contact that WSUC and propose services like: supply of spare parts, supply of trained skill or even can ask the WSUC to outsource the O&M and servicing of that scheme to private party.

This MIS will also have the contact number and address of entrepreneurs in the district, so whenever WSUCs have problem they will contact entrepreneurs requesting their services.

28. NWASH website (nwash.mowss.gov.np/)

A web-site is developed as an information platform for the public and all stakeholders. On the web-site all relevant documents and information is published. Besides that, the web-site is the portal to the NWASH- MIS. The web-site and the web-based MIS have user-login based access levels, so though all reports can be viewed even by general users, the editing can only be done by authorized users.

29. Reporting

There are a number of ways that the M&E framework will be reported.

Interactive Reporting - This will be by the interrogation of the MIS database through the comparison of one or more criteria delivered as a results table and represented on a map. The resultant table/map can be exported to a file (for further analysis or graphical representation) or printed. The general users can access this interactive reporting through nwash.mowss.gov.np/ or **'NWASH Map'** app.

Annual Performance Report - The Municipality WASH Unit will produce an annual sector report outlining key performance indicators and tracking progress of the results framework. It is assumed that the report will be a collation of the status of key indicators over the year; progress over time, and a limited range of key comparative assessments relating to sector impacts.

Such annual performance report will be in i) scheme level ii) municipality level

Such predefined reports will mainly have two components:

a. Summary of condition assessment that determines functionality and sustainability status of the Water Supply System(s)
b. Summary of the interventions required to bring back the system(s) in the functional and sustainable status.

Annual performance reports of scheme and/or municipality can be downloaded from nwash.mowss.gov.np/

User-defined analyses - Occasionally there will be the need for special reports from the Municipality WASH Unit utilizing more detailed interrogation and analysis of the MIS. These may result from reports

that indicate a discrepancy between what was expected and what is reported. This will be checked for errors, and if further analysis required, the Municipality WASH Unit will use the MIS data as the basis for undertaking a detailed evaluation report.

30. Sustainability of M&E system and its utilization

Even if the web based MIS and M&E system and framework were considered a good product, they remain mostly underutilized. This section briefly describes the possible extent of this WSS M&E framework in decision-making process.

The expected outcome of the M&E System utilization is *"all sector partners and agencies within and across WASH sector use this M&E System for their WASH related decision making process*". This M&E system may make this decision-making process more practical, realistic, efficient, participatory and transparent.

The following table illustrates the core definition of the sustainability of M&E system.

Hierarchy	Area	Definition
R_3	Sustainability	This relates to the likelihood that the M&E system will survive a change in policy, administration or in government ministers or top officials. The world Bank's publication "Ten steps to a result based Monitoring and Evaluation System" describes six Critical Components of Sustaining Results-Based M&E Systems as: Demand, Clear Roles and Responsibilities, Trustworthy and Credible Information, Accountability, Capacity, Incentives
R_2	Institutionalization	When the utilization of M&E System is firmly embedded—that is, mainstreamed—in core government decision-making processes such as the budget cycle, it can be said the system is institutionalized.
R_1	Utilization	The utilization of the system is taken as the measure of success of M&E system. It defines to which extent M&E System is actually used, and for what specific purposes. When M&E has only a handful of key supporters or is little used, or if it is largely funded by donors rather than by the government itself, then system is underutilized and hence, there is risk of not being used to the optimum.
R_0	Demand of the M&E System	When decision-makers want to use evidence from M&E systems to assist them in making choices, there is a demand for M&E.
R_{-1}	M&E System as a prerequisite	M&E system has to be seen as a prerequisite for all sector interventions by all sector actors. The M&E and the MIS developed is to be considered as the only national WASH database for all sector interventions.

31. M&E utilization defined

The term "Utilized" is used to describe many different conditions towards improving the use of the M&E System. M&E System is considered "utilized" when it meets certain criteria such as; MOWS as the sole custodian and enforcement agency, information generated by the M&E system is needed by the sector partners and hence there is a demand to use the M&E system, that the system is simple to use, robust and user-friendly and flexible, that the sector partners include the system in their planning, monitoring and evaluation purposes and performance reviews and all partners who have M&E section in their program include M&E strategy, policy, plan and vision and budget in their programming cycle. The sector partners recognize that the M&E system is the only national WASH M&E system and hence is to be seen as a pre-requisite for WSS sector interventions.

32. Guiding principle of M&E utilization

The fundamental aim of this principle is to streamline, synchronize and standardize the scattered and uneven efforts of the sector actors for a common national goal. Therefore, for effective implementation of WASH program, all the concerned government agencies, local bodies, donors, I/NGOs, and other WASH actors should strictly adhere to the following guiding principles while using this M&E Framework.

1. All WASH sector actors recognize that it is the only national M&E System and that they will show institutional ownership and commitment and contribute to their maximum capacity and ability to sustain and use this M&E System.
2. All sector actors recognize that M&E is an integral part of programme implementation. They will use this N-WASH-M&E System for their decision making purpose. They will evaluate and report their performance through this N-WASH-M&E System.
3. MOWS is the sole custodian of the WASH M&E System and owns it. The MOWS will be strong and influential leader as the enabler, promoter and regulator of this M&E System. The MOWS will put its every effort to make data transparent, accurate, accessible, relevant and timely.
4. All WASH agencies have their own M&E section with enabling institutional framework through their organizational mandates, structures and relationships aligned with policy and/or a set of standards that describe roles, responsibilities and expectations for the operation of the M&E system and the use of M&E information.

33. Key areas of WASH M&E system utilization

This Framework envisages nine key areas of M&E system Utilization. These key areas are for guiding purposes only, the sector actor can use all or any of these areas depending on the nature of its implementation. There can also be other areas of utilization deemed necessary as per the nature of the interventions. Key utilization areas enable the sector to have clearly defined areas and achievable goals, measure and communicate sector progress in terms of identified areas and targets, manage WASH sector skills development and identify areas for development in M&E System utilization, obtain timely communications and feedback that will allow the WASH Sector to stay aligned and change direction as appropriate.

The M&E system, through the use of mobile apps, can be used to gather baseline data for the existing and/or new schemes. The skilled personnel are provided with the skills on the use of the mobile apps and get all information on the schemes and feed to the MIS for updates. The simple mobile apps developed for WSUC representatives for problem reporting (such as broken taps, leakage in the water tanks etc.) and annual reporting is another creative aspect of the M&E system. The IVR (interactive voice recording) system (similar to frequently asked questions for trouble shooting) developed by the project can also be used for reporting problems through voice messages and provides technical advice to solve basic problems (fixing the leaking taps etc.). These recorded problems are reflected in MIS and hence the MIS is updated. The information on data thus updated can be used for planning purposes and further could be used for academic purposes.

The below matrix explains the key areas of utilization:

S.N.	Key areas	Utilization
1	Reporting towards goals	This M&E System can be used to report the performances towards national and international goals. Nepal had set the universal coverage of basic water supply and sanitation by 2017. Nepal also has commitments to international forum like SDG,

		JMP and other regional forum such as SACOSAN. Besides, it has certain commitment towards donor communities, this N-WASH-M&E System will help to measure the progress towards these commitments.
2	Benchmarking	Benchmarking is a tool that can be used to evaluate performance and identify best practices on different processes by comparing key indicators. By measuring and comparing the performance of WSUCs, MOWS can implement rewards and incentives for WSUCs who are providing better services. WSUCs can identify and adopt best practices among themselves.
3	Performance improving, monitoring and evaluation	The N-WASH-M&E System can be used to monitor the performances of the water supply system. It is the process to compare WSUCs of all sizes and capacities. MOWS will develop the WSS Performance Indices that will be the standard to rank WSUCs. By assessing how WSUCs are improving water and sanitation compared to best in class WSUCs at similar levels of water and sanitation coverage, such Indices provide a fair comparison of progress.
4	Networking, Market Search, Service Promotion and Partnership Building	This N-WASH-M&E System can be utilized to network i) between and among the WSUCs , ii) between WSUCs and maintenance service providers and iii) WASH entrepreneurs such as suppliers and manufacturers . The WASH Network is a peer-to-peer networking and resource affinity group focused on water, sanitation, and hygiene (WASH). It will assist WSUCs, CBOs, Manufacturers, Suppliers, service providers etc. in meeting the demands and sustaining the quality of services of the schemes that they serve.
5	Special Study, Research, Learning, Innovation and Development	This N-WASH-M&E System can be used as the learning platform for WSUCs. Access to timely and reliable data and information is vital to efficient management today. This MIS connects researchers who are carrying out fundamental and application-oriented research on WASH and all the factors that influence WASH. This N-WASH-M&E System could also connect learning researchers to WASH innovators. This could help to network researchers with the leading learning researchers and learning centers in Nepal, for intellectual exchange. They can exchange the data and finding using this System.
6	Backstopping and technical advice	This refers to advisory services, supervision, support and continuity in the knowledge level with regard to a water supply system management. Experts at Municipality WASH Unit can provide WSUCs with inputs (technical, social, financial advice and consultancy), compensate for weaknesses and emphasize strengths. Technical advice includes areas such as finding grant opportunities for O&M, rehab, extension of the scheme and capacity development opportunities for WSUCs. Capacity enhancement training could also be organized for WSUCs.
7	WSUC grading and Grant Eligibility	This N-WASH-M&E System examines the rankings of water service providers within the province and the country as a whole. It may include factors such as functionality, sustainability, water supply and sewerage coverage. It is envisioned that this continuous annual assessment helps in setting performance targets of service providers, which ultimately improves service provision. The grant eligibility and WSUC grading criteria are intended to clarify liability for repairs, rehabilitation and replacement costs; to generate incentives for WSUCs and local governments to manage their water supply systems and sanitation facilities better; and to encourage regular and reliable monitoring of system performance and sustainability.
8	WASH Planning and prioritization	The Municipality WASH Plan is a strategic tool for the municipality to plan and prioritizing the municipalities to implement the WASH interventions. In this regard, this N-WASH-M&E System could be the basis to supply necessary data for the decision making process while planning the district for WASH services. The information regarding coverage data, population of the un-served etc. can be obtained from this N-WASH-M&E System.

9	Transparency of WASH sector	This N-WASH-M&E System could be a tool to promote increased transparency of WASH sector. The MOWS and other related agencies can use this system to have the public confidence and approval on what they have been doing.

34. Roles and responsibilities of sector actors

This matrix is designed to provide guidance on the assignment of responsibilities across M&E functions as they relate to the sustainability of the M&E System. This matrix is not an exhaustive list of all M&E System business practices. The purpose of this matrix is to assign departments or individuals to activity categories, define role responsibilities, and define relationships between groups. This matrix would help in detailed resource allocating or scheduling.

The goals of the roles and responsibilities matrix are to:

- Define roles and responsibilities of sector actors.
- Improve overall sector actors' communication.
- Proactively identify gaps in assignments, accountability, or resources.
- Clarify cross-functional interactions between sector actors.

Keys:

●●●	Strong roles and responsibilities. Accountable for successful completion of task. Responsible to undertake effective actions and demonstrate its commitment and capacities to lead and attain the task.
●●	Moderate roles and responsibilities. Responsible for completion of task. Despite some recognized deficiencies in commitment, financial resources or operational capacities this sector actor is expected to undertake task and attain that part of the result which is assigned to it.
●	Thin roles and responsibilities. Supports task. This sector actor will under the task but comprehensive or substantial results cannot be expected.

S. N.	Key tasks on utilization of NWASH-M&E system	Sector actors																					
		NPC	Ministry of Finance	M&E Coordination Committee at MoWS	M&E Unit at MoWS/DWSSM	WASH Related Ministries	DWSSM	WSSDO	Municipality WASH Unit	INGO	NGO	WSUC	DWASHCC	DCC	Donor Agencies	WASH Central Level Agency	WASH District Level Agency	MEAL Platform	Formal and Informal Gathering	Individual WASH Professionals	General Users	Civil Societies	Academic institutions	Third Party
1	Prepare, reviews plans, policies, strategies and recommend them for approval and coordinate between ministries on sector financing for M&E	•••		•••																				
2	Budget allocation and release to executing/implementing agencies and coordinate with donors to address resources gap		•••																					
3	Coordinate between ministries on M&E issues.			•••	•••																			
4	Owns and is the sole custodian of the WASH M&E System and its indicators. Show itself as the strong and influential leader as the enabler, promoter and regulator of this M&E System. Puts every effort to make data transparent, accurate, accessible, relevant and timely.				•••																			
5	Operationalization of N-WASH-M&E System:- Daily Operations, System Upgrade, System Customization and Introduction of Latest ICT Innovations				•••																			
6	Recognize that M&E is the integral part of programme implementation. Use this N-WASH-M&E System for decision making purpose.			•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
7	Recognize that it is the only national WASH M&E System and will show institutional ownership and commitment and contribute with the maximum capacity and ability to sustain and use this M&E System.			•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••

8	Establish own M&E section with enabling institutional framework through their organizational mandates, structures and relationships aligned with policy and/ or a set of standards that describe roles, responsibilities and expectations for the operation of the M&E system and the use of M&E information.				•••	•••	•••	•••	•••	••	••	•••		•••	••	••	••						•	
9	Data Collection and update						•	•••	•••	••	•••	•••					••							
10	Data Consistency Check and Validation				••	••	••						•••											
11	Information Use				•••	••	•••	•••	•••	••	••	••		••	•	•	••	••	•	•	•		•••	
12	Financing/Resource Allocation (cost of M&E activities are budgeted every year)				•••	••	•••	••		•	•	•		••	•••	••	••							
13	Promotion and increasing the visibility of N-WASH-M&E System				•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	
14	Compliance and Data Audit				•••																			•••
15	Learning, Sharing and Special Study				•••	••	•••	••	•••	••	••	•	•••	•••	••	••	••	•••	•••	••		••	••	
16	Networking, Partnership and Coordination for utilization of N-WASH-M&E System				•••	••	•••	•••	•••	•••	•••	••	•••	•••	•••	••	••	•••	•••	••		•	••	
17	Capacity Building in WASH M&E				•••	••	•••	•••	••	•••	•••		••	••	•••	••	••	•••	••				•••	
18	Promotion of communication, Advocacy, Demand Creation and Culture of M&E Utilization			•••	•••	••	•••	•••	••	•••	•••	••	•••	•••	•••	••	••	•••				•••	•••	
19	Supportive Supervision			•••	•••	•••	•••			•••			•		•••									
20	Data Dissemination				•••	••	•••	•••	•••	•••	•••	•	•••	•••	•••	••	••	•						
21	Revision of M&E Frameworks and Introduction of new Indicators, get commitment from sector actors to provide capacity and resources on the part of new indicators to continue tracking them			•••	•••																			
22	M&E Infrastructure Development:- Capacity and infrastructures are functional and adequate to actively involve themselves for planning, collecting, analyzing, reporting,				•••	••	•••	••	•••	•••	••			•••	•••	••	••							

	interpreting and reviewing performance information against each indicator.																							
23	Evaluation of M&E System Itself				•••																			•••
24	Incentivize the Use of M&E System				•••	•••	•••	•••	•••	•••	•••		••		•••	•••	•••	•••					••	
25	Incentive For the Staff of M&E Unit				•••	•••	•••	•••	•••	•••	•••	••	••	••	•••	•••	•••	•••					••	
26	Promote Transparency, Access To Information, Fair and Balanced Reporting, Accountability in M&E System utilization			•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
27	Recognition of Best M&E Users. Recognition at Government level and agency level.			•••	•••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••			••
28	Enforce the policy that unless the new project is reflected (entered) in the MIS, the project shall not be considered as completed.			•••	•••	•••	•••																	
29	Define reporting channel, communication protocol to align reporting with the national and international development goals (Such as SDG)			•••	•••																			

35. Incentive to utilize M&E System

Unless there is direct benefit, the WSUCs will not be motivated to use this M&E System. There should be ways to motivate and incentivize the WSUCs to use this MIS. One of them is to provide high priority for the grant to those WSUCs who regularly use this MIS.

36. Conclusion

The M&E framework and the associated NWASH-MIS allow for a dynamic approach to assessing sector performance in terms of functionality and sustainability. With time, it is expected that it will become demand driven, developing to meet the changing needs of stakeholders and accommodating new data and indicators. A major requirement of the M&E framework is that the sector becomes more aligned - cooperating in the provision of data and supporting the Municipality WASH Unit as the primary coordinator of M&E in the municipality. The Unit will require additional capacity in the form of an MIS expert, and training to improve capability for undertaking its enhanced role. The M&E framework is dynamic and subject to ongoing review and enhancement. With time, it should become a significant and sustainable component of an improved WASH Sector.

ANNEX I

SUMMARY OF INDICATORS

Functionality Indicators		100			
Result Indicators: (60% Weightage)			60		
1. Outcome indicators:				30	
F1A	Percentage of population served by functional Taps.			30	
A	100% Population covered by functional taps				30
B	X% Population covered by functional Taps (score linearly distributed between 0 to 30)				=X%*30
C	0% Population covered by functional taps				0
2. Output Indicators:				30	
F2A	Percentage of functional taps			30	
A	100% taps are functional				30
B	X% taps are functional (score linearly distributed between 0 to 30)				=X%*30
C	0% taps are functional				0
Input Indicators:(40% Weightage)			40		
3. Institutional:				15	
F3A	Provision of operation and maintenance service			8	
	Note: Indicators F3A-a and F3A-b are mutually exclusive				
F3A-a	Presence of outsourced maintenance service				
a	Presence of service				8
b	Absence of service				0
OR					
F3A-b	Number of VMWs				
a	At least 1 VMW per 200 community taps and/or 1000 yard taps				8
b	X (number) VMWs				=(X*8)÷{(Tc÷200)+(Ty÷1000)}
c	No provision of VMW or outsourced services				0
F3B	Percentage of VMWs who perceive tools are adequate			7	
a	100% VMWs perceive tools are adequate				7
b	X% VMWs who perceive tools are adequate				=X%*7
c	No tools available or 0% perceive tools are adequate				0
4. Technical:				25	
F4A	Number of months in which water source is available			7	
a	Whole year availability				7
b	11 to <12 months				5
c	Less than 11 months available				0
F4Bi	Percentage of structures needing repair			11	
a	No key structures need repair (X%=0)				11

b	X% of Key structures need repair (Where X<=50%)(Linear distribution 0 and 11)		=(1-X%)*11
c	More than 50% of Key structures need repairs		0
F4Bii	Number of leakages in conveyance	7	
a	No major leakages in a system		7
b	X (number of leakages per 2 kilometer) (where 0<X<1) (Linear distribution 5 and 7)		={7-(7-5)*X}
c	1 Leakage per 2 kilometer		5
d	More than 1 major leakages per 2 Kilometer		0

Presentation of functionality score

Indicators for functionality are divided in two parts as Result Indicators (60%) and Input Indicators (40%). The result indicator is the **'service delivery efficiency indicator'** while the input indicator is '**favorable environment indicators'.** The first measures if the system is delivering its service or not, while the second measure if the system has the enough favorable environment to deliver those services.

Further, the results indicators are divided in two parts outcome indicator and output indicator.
The score on result indicator provides the direct measurement of if the water supply system is functional or not. While, score on input indicator only measures the input or efforts that create favorable environment that leads to functionality of the system, but does not assures the functionality.

Such that:

The score on functionality indicators (100%) = Score on outcome Indicator (30%) + Score on output Indicator (30%) + Score on input indicator (40%)

Or,

The score on functionality indicators (100%)= Score on 'Percentage of population served by functional Taps' (30%) + Score on 'Percentage of functional taps' (30%) + score on input indicators(40%)

Interpretation of functionality score

According to score, the functionality shall be interpreted as:

Total Score	Interpretation
>= 70	No or less risk for functionality
>=60 to < 70	Some risk for functionality
<60	High risk for functionality

Sustainability Indicators	**100**			
Result Indicator (50% weightage)		**50**		
1. Overall Sustainability			**50**	
S1A: Percentage of Population served by functional system			50	
a X % of population served by functional taps				=50*X%
Marks Obtained=				M(S1A)
Input Indicators (weightage 50%)		**50**		
3. Institutional			**14**	
S2A: Number of meetings with decision recorded per year			5	
a More than 3 meetings				5
b 3 meetings				4
c 2 meetings				3
d less than 2 meetings or no WSUC formed				0
Marks Obtained=				M(S2A)
S2B: Annual general meeting conducted with decision recorded (AGM)			5	
a Yes				5
b No				0
Marks Obtained=				M(S2B)
S2C: Account is looked after by the employed accountant			4	
a Always by accountant				4
b Some months by account and rest months by WSUC member				3
c Only by WSUC member				2
d No one is responsible				0
Marks Obtained=				M(S2C)
3. Technical: System is delivering quality services			**9**	
S3A: Need of treatment			4	
a Appropriate treatment facility exists and working				4
b Clean round the year/ treatment may or may not needed				3
c Turbid/dirty in rainy season/minor treatment needed				2
d Turbid/dirty round the year/major treatment needed				0
Marks Obtained=				M(S3A)
S3B: Standard Operating Procedure (SOP) of regular inspection prepared and followed			5	
a Yes				5
b No				0
Marks Obtained=				M(S3B)
4. Social and Environment			**12**	
S4A: Source registration and dispute in the source.			5	
a Source registered & no obstruction				5
b Source registered, in public land & obstructed by local community				4
c Source not registered, in public land & obstructed by local community				3
d Source in private land & obstructed by owner				0

Marks Obtained=			M(S4A)
S4B: Percentage of households using water for income generating activities		3	
a >=50% household			3
b X% (Linear distribution of total marks 3 between 0% to 50 %)			2*X%*3
c 0% household			0
Marks Obtained=			M(S4B)
S4C: Percentage of Women representation on Water and Sanitation User Committee		4	
a >=33% with female member in executive post			4
b >=33% with no female member in executive post			3
c >=20% with female member in executive post			3
d >=20% with no female member in executive post			2
e Other conditions			0
Marks Obtained=			M(S4C)
5. Financial: System is financially sound	**15**		
S5A: Presence of financial auditing system		3	
a Yes			3
b No			0
Marks Obtained=			M(S5A)
S5B: Presence of provision of remuneration for VMW		4	
a Yes			4
b No			0
Marks Obtained			M(S5B)
S5C: Presence of provision of water supply system insurance		2	
a Yes			2
b No			0
Marks Obtained=			M(S5C)
S5D: Operation Ratio		6	
a Operating ratio less than 75% (internal income more than expenditure)			6
b Operating ratio 75-100%			4
c Operating ratio > 100% (External support needed)			2
d No tariff system or no income or dependent on external support for all expenditure			0
Marks Obtained=			M(S5D)

One of the components of the definition of sustainability is “It functions and is being used”. When we have to find the future trend, the best and simple way is to forecast the trend based on the past years’ performances (generally three years).It is assumed that if the system is serving as desired over the three years we can safely assume that the system is tending towards sustainability. The Marks obtained on each indicators for three years are weighted as 50% for the present year (n), 30% for previous year (n-1) and 20% for the year before previous year (n-2).

For previous two years, data source is NWASH-MIS, but If the System (Scheme) is surveyed for the first time, it is natural that the NWASH-MIS will not have the data of that indicator for previous years, we can assume the latest data, valid for the past years also. This is also true for the recently constructed scheme, the recent year data can be considered for other years also.

This represents the final score for reporting:

Sustainability Indicators	**100**			
Result Indicator (50% weightage)		**50**		
1. Overall Sustainability			**50**	
S1A: Percentage of Population served by functional system (in last three years)			50	
a Marks obtained in (n) Year				$M(S1A)_n$)*50%
b Marks obtained in (n-1) Year				$M(S1A)_{n-1}$*30%
c Marks obtained in (n-2) Year				$M(S1A)_{n-2}$*20%
Score(S1A)=				Sum_S1A(a,b,c)
Input Indicators (weightage 50%)		**50**		
2 .Institutional			**14**	
S2A: Number of meetings with decision recorded per year (in last three years)			5	
a Marks obtained in (n) Year				$M(S2A)_n$*50%
b Marks obtained in (n-1) Year				$M(S2A)_{n-1}$*30%
c Marks obtained in (n-2) Year				$M(S2A)_{n-2}$*20%
Score(S2A)=				Sum_S2A(a,b,c)
S2B: Annual general meeting conducted with decision recorded (AGM) (in last three years)			5	
a Marks obtained in (n) Year				$M(S2B)_n$*50%
b Marks obtained in (n-1) Year				$M(S2B)_{n-1}$*30%
c Marks obtained in (n-2) Year				$M(S2B)_{n-2}$*20%
Score(S2B)=				Sum_S2B(a,b,c)
S2C: Account is looked after by the employed accountant (in last three years)			4	
a Marks obtained in (n) Year				$M(S2C)_n$*50%
b Marks obtained in (n-1) Year				$M(S2C(_{n-1}$*30%
c Marks obtained in (n-2) Year				$M(S2C)_{n-2}$*20%
Score(S2C)-				Sum_S2C(a,b,c)
3. Technical: System is delivering quality services			**9**	
S3A: Need of treatment (in last three years)			4	
a Marks obtained in (n) Year				$M(S3A)_n$*50%
b Marks obtained in (n-1) Year				$M(S3A)_{n-1}$*30%
c Marks obtained in (n-2) Year				$M(S3A)_{n-2}$*20%
Score(S3A)=				Sum_S3A(a,b,c)
S3B: Standard Operating Procedure (SOP) of regular inspection prepared and followed (in last three years)			5	
a Marks obtained in (n) Year				$M(S3B)_n$*50%
b Marks obtained in (n-1) Year				$M(S3B)_{n-1}$*30%

c Marks obtained in (n-2) Year		$M(S3B)_{n-2}*20\%$
Score(S3B)=		Sum_S3B(a,b,c)
4. Social and Environment	**12**	
S4A: Source registration and dispute in the source. (in last three years)	5	
a Marks obtained in (n) Year		$M(S4A)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S4A)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S4A)_{n-2}*20\%$
Score(S4A)=		Sum_S4A(a,b,c)
S4B: Percentage of households using water for income generating activities (in last three years)	3	
a Marks obtained in (n) Year		$M(S4B)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S4B)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S4B)_{n-2}*20\%$
Score(S4B)=		Sum_S4B(a,b,c)
S4C: Percentage of Women representation on Water and Sanitation User Committee (in last three years)	4	
a Marks obtained in (n) Year		$M(S4C)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S4C)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S4C)_{n-2}*20\%$
Score(S4C)=		Sum_S4C(a,b,c)
5. Financial: System is financially sound	**15**	
S5A: Presence of financial auditing system(in last three years)	3	
a Marks obtained in (n) Year		$M(S5A)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5A)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5A)_{n-2}*20\%$
Score(S5A)=		Sum_S5A(a,b,c)
S5B: Presence of provision of remuneration for VMW (in last three years)	4	
a Marks obtained in (n) Year		$M(S5B)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5B)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5B)_{n-2}*20\%$
Score(S5B)=		Sum_S5B(a,b,c)
S5C: Presence of provision of water supply system insurance (in last three years)	2	
a Marks obtained in (n) Year		$M(S5C)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5C)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5C)_{n-2}*20\%$
Score(S5C)=		Sum_S5C(a,b,c)
S5D: Operation Ratio (in last three years)	6	
a Marks obtained in (n) Year		$M(S5D)_{n}*50\%$
b Marks obtained in (n-1) Year		$M(S5D)_{n-1}*30\%$
c Marks obtained in (n-2) Year		$M(S5D)_{n-2}*20\%$
Score(S5D)=		Sum_S5D(a,b,c)

The Total Sustainability Score(S-Score)= Sum of scores of all indicators = Score(S1A)+ Score(S2A)+ Score(S2B)+……+ Score(S5D)

Presentation of sustainability score

Indicators for sustainability are divided in two parts as Result Indicators (50%) and Input Indicators (50%). The score on result indicator provides the direct measurement of if the water supply system is tending towards sustainability or not. While, score on input indicators only measures the input or efforts that create favorable environment that leads to sustainability of the system, but does not assures the sustainability.
Such that:

The score on sustainability indicators (100%) = Score on result Indicator (50%) + Score on input indicator (50%)

Interpretation of sustainability score

According to score, the sustainability shall be interpreted as:

Total Score	Interpretation
>= 70	No or less risk for sustainability
>=60 to < 70	Some risk for sustainability
<60	High risk for sustainability

ANNEX II

Example to calculate F1A and F2A

This example is based on randomly generated data, so some data may look logically incorrect.

Tap Nr.	Pop. served	F2A-a		F2A-b		F2A-c		F2A		F1A
		Water quantity *	meets condition (Y/N)	Water Quality**	meets condition (Y/N)	Supply hours	meets conditions (Y/N)	Meets all three conditions? (Y/N)	Conditions (Functional /Not Functional)	Served Population
T1	38	d	Y	a	Y	24	Y	Y	F	38
T2	19	d	Y	a	Y	17	Y	Y	F	19
T3	33	c	Y	a	Y	17	Y	Y	F	33
T4	14	c	Y	b	Y	7	Y	Y	F	14
T5	24	e	Y	b	Y	12	Y	Y	F	24
T6	16	c	Y	c	N	16	Y	N	NF	0
T7	32	e	Y	a	Y	9	Y	Y	F	32
T8	33	a	N	a	Y	22	Y	N	NF	0
T9	29	c	Y	a	Y	6	Y	Y	F	29
T10	45	c	Y	a	Y	8	Y	Y	F	45
T11	32	e	Y	a	Y	17	Y	Y	F	32
T12	23	a	N	b	Y	9	Y	N	NF	0
T13	42	c	Y	b	Y	10	Y	Y	F	42
T14	11	d	Y	b	Y	10	Y	Y	F	11
T15	46	d	Y	b	Y	23	Y	Y	F	46
T16	20	e	Y	a	Y	21	Y	Y	F	20
T17	19	e	Y	a	Y	3	Y	Y	F	19
T18	7	e	Y	b	Y	5	Y	Y	F	7
T19	32	b	N	b	Y	17	Y	N	NF	0
T20	8	a	N	b	Y	24	Y	N	NF	0
T21	23	e	Y	b	Y	9	Y	Y	F	23
T22	27	a	N	c	N	6	Y	N	NF	0
T23	26	e	Y	a	Y	1	N	N	NF	0
T24	22	a	N	b	Y	21	Y	N	NF	0
Total	621		**18**		**22**		**23**	**16**		**434**
%								16/24= 66.67%		434/621= 69.89%

* (a) No water at all, (b) There is water but not sufficient for drinking and cooking, (c) Sufficient for drinking, cooking and toilet use (d) Sufficient for drinking, cooking, washing utensil, toilet use and bathing, (e) Sufficient for all daily needs

** a) No turbidity, b) Turbid water during rainy season, c) Always turbid water

Percentage of pop. served by functional taps (F1A)	69.89 %	**Percentage of functional taps (F2A)**	66.67%

ANNEX III

MAINTENANCE CONDITIONS

Conditions	Definition	Asset Physical Conditions	Asset Functional Status	Asset Defects			Applicability	For schemes
				Extent	Severity	Priority		
Good	Structures/schemes that need no repair	An asset in very good condition is near new and requires only minimal predictive or preventative maintenance to maintain proper function.	**No Loss of Function:** Little or no loss of service, however, minor disruption to functional performance that can be tolerated for an extended period of time.	Insignificant	Insignificant	No	Structures and schemes (System)	When all key components are in good condition
Need Minor Repair	Structures/schemes that are functioning and need repairs that are within the capacity of users (with no external inputs required)	An asset in this condition is assumed to require average levels of predictive and preventative maintenance and may require minimal corrective maintenance or minor adjustments to optimize performance and restore it to near new condition	**Functional Inconvenience:** No major loss of service, however some disruption to functional performance of the asset can be tolerated for short periods.	Minor	Mild	Low	Structures and schemes (System)	When one or more key components need minor repair
Need Major Repair	Structures/schemes that are functioning but need major repairs (with external inputs for construction components and technical supports required).	An asset in this condition is operational but requires significant, timely refurbishment to avoid further deterioration and/or failure. If attention is not received, the asset could decline to a condition where corrective action is no longer cost effective	**Major Functional Disruption:** Significant disruption to the functional performance with elements of the asset being unstable, requiring immediate rectification.	Significant	Moderate	Medium	Structures and schemes (System)	When one or more key components need major repair
Need Re-construction	Structures/schemes that are serving least and need major technical and financial inputs from external sources as well as sizeable contributions from users before they can function again.	An asset in this condition is generally past cost effective refurbishment and needs to be replaced, and/or the asset is likely to fail in the near future	**Loss of Function:** The whole or majority of the asset is unusable, causing very significant disruption to asset users and major disruption to functional performance, requiring immediate rectification or replacement.	Considerable	Severe	High	Structures and schemes (System)	When one or more key components need reconstruction