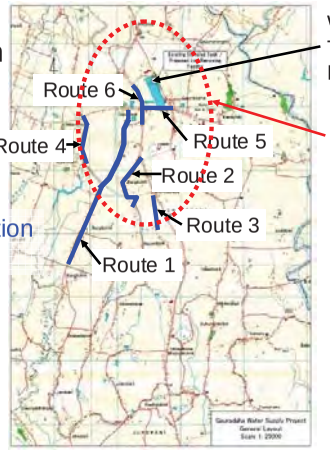
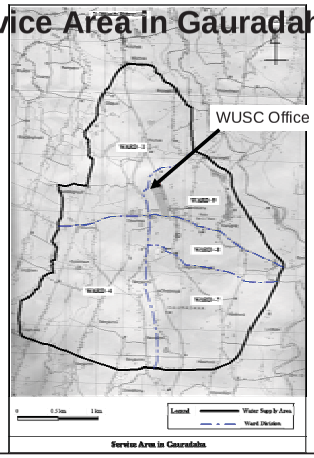
Transmission & Distribution Pipelines in Gauradaha

May 5, 2010

Distribution Pipelines



Service Area in Gauradaha



Distribution Network

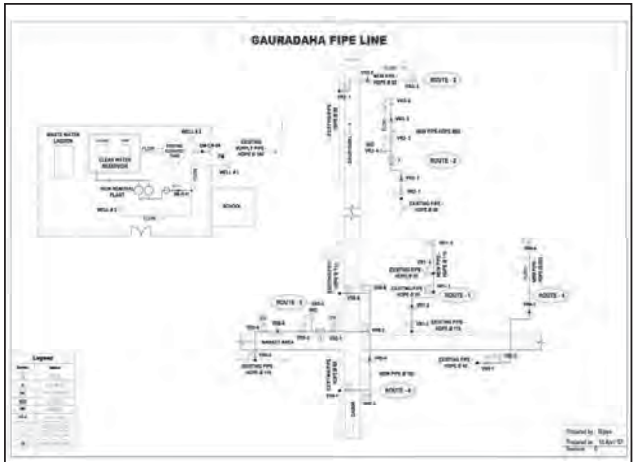
- Pipe routes
- Valve location

✓ Pipe diameter?
✓ Pipe material?
✓ Valve?
✓ Air valve?
✓ Washout?

Flow Diagrams

The aim is to make

- ✓ The operation simple and
- ✓ Less in maintenance work and
- ✓ Supply safe and
- ✓ Continuous potable water to the people of Gauradaha.



Water Pipeline Information

- Pipe Networks
- Location of Valves, Air valves, Washouts and Fire Hydrants
- Pipe Material (HDPE, CI, GI, etc.)
- Pipe Diameter
- Flow direction
- Flow meter

Legend (Sample)

Symbol	Details
	Valve
A	Air valve
FH	Fire Hydrant
WO	Washout
MH	Manhole
VR5-6	Valve Nos. (route Nos.+Nos.)
———	New pipe line
– – – – – –	Existing pipe line
10	River crossing

Available for What?

- Control and Maintenance
  Keep good water quality and pipe condition
  . Air valve
  Stop providing water . Valve
  Replace and clean a pipe . Valve, Washout
  Change a flow direction . Valve

- Repair
  . Location, pipe material, pipe size
- Fire
  . Location of Fire Hydrant

Water Facility Condition

- Reduce water supply ?
- Deterioration of water quality?
- No providing water in some areas?
- Extension of pipes
  . Water demand (Pipe Dia. Determination)
  Water Supply Plan
  . Connect to existing pipe
  . Pipe material
- No water . Out of Order?

Roles of each facility for pipes 1

Distribution pipe:
Cancellous pipe network to convey treated water to house connection

Valve:
Valves which are gate and butterfly valves control flow of water at different pipelines

Air valve:
Release trapped air from inside pipe. On the other hand, air valve has function to suction air under construction.
The valves located at higher elevations on pipe lines

Roles of each facility for pipes 2

Washout:
Washout drains are provided to keep the pipelines free from blockade. For keeping the pipe inside clean, sediment, deteriorated water shall be washed periodically.
At least every 3 months in dry season and once a month in rainy season

Fire Hydrant:
Fire hydrants can be used in case of fire.

Survey Staff

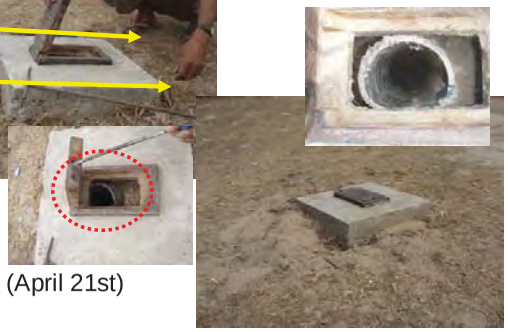
Date;
April 21-22, 2010

Staff;
WUSC Eng.

Targets;
Distribution Pipe

Valve Chamber (VR1-3)

.Repaired (April 22nd)



.Obliquity (April 21st)

Air valve Chamber (VR1-2)

No leakage (Repaired)
(April 21st,2010)

.

.

Leakage from air valve
(March 31st,2010)

Valve Chamber (VR1-5)

Reinstalled chamber
(April 22nd)

.

.

Removed chamber to
drain deteriorated water
from pipe end.
(April 21st)

Valve Chamber (VR4-4)

Removed chamber to drain deteriorated water from pipe end.
(April 21st)

Reinstalled chamber
(April 22nd)

Necessary to consistency Case-2

Air valve chamber under the road

- Entrance road is constructed on existing Air valve chamber (VR6-4).
- It is important to maintain and supervise water facilities.

Necessary to consistency with other project Case-1

Valve cover

- Road is constructed on existing Fire Hydrant (VR5-6).
- WUSC should announce the road department to avoid the water facilities.
- It is important to maintain and supervise water facilities.

Leakage from Air valve

Leakage from air valve
Need to fix and keep function and save water

Air Valve Cover Maintenance

It is not easy to open a cover.

Need to open and maintain valve/chamber periodically

Survey Format

Inspector:

Date: April 21, 2010

No.	Symbol	Pipe Dia. Material	Condition (Looks)	Valve working	Leakage	Sound, Etc.	Valve status
Sample							
1	VR5-4	OD160 HDPE	Need to clean, Rusty	Ok	No	No	Open
Other; Malfunction and Repair Records							

Valve Chamber (VR6-1)

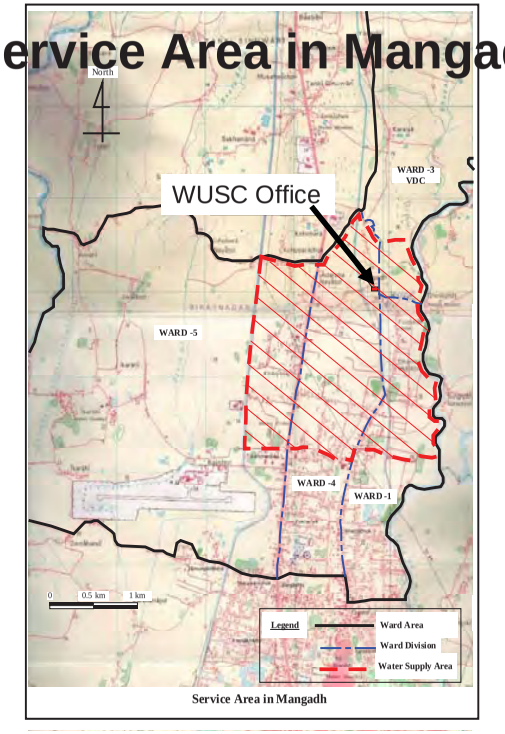
Recommendation

- Pipe network map is made up including existing and new pipes.
- Main water facilities which consist of valve, air valve, washout and fire hydrant are put on the network map.
- Periodical inspection for water facilities
- Record their conditions, malfunction and repair

Transmission & Distribution Pipelines in Mangadh

May 5, 2010

Service Area in Mangadh



Service Area in Mangadh

Flow Diagrams

The aim is to make

✓ The operation simple and

✓ Less in maintenance work and

✓ Supply safe and

✓ Continuous potable water to the people of Mangadh.

Water Pipeline Information

- Pipe Networks
- Location of Valves, Air valves, Washouts and Fire Hydrants
- Pipe Material (HDPE, CI, GI, etc.)
- Pipe Diameter
- Flow direction
- Flow meter

Legend (Sample)

Symbol	Details
	Valve
	Air valve
	Fire Hydrant
	Washout
MH	Manhole
VR5-6	Valve Nos. (route Nos.+Nos.)
	New pipe line
	Existing pipe line
	River crossing

Available for What?

- Control and Maintenance
  Keep good water quality and pipe condition
  . Air valve
  Stop providing water . Valve
  Replace and clean a pipe . Valve, Washout
  Change a flow direction . Valve

- Repair
  . Location, pipe material, pipe size
- Fire
  . Location of Fire Hydrant

Water Facility Condition

- Reduce water supply ?
- Deterioration of water quality?
- No providing water in some areas?
- Extension of pipes
  . Water demand (Pipe Dia. Determination)
  Water Supply Plan
  . Connect to existing pipe
  . Pipe material
- No water . Out of Order?

Roles of each facility for pipes 1

Distribution pipe:

Cancellous pipe network to convey treated water to house connection

Valve:

Valves which are gate and butterfly valves control flow of water at different pipelines

Air valve:

Release trapped air from inside pipe. On the other hand, air valve has function to suction air under construction.

The valves located at higher elevations on pipe lines

Roles of each facility for pipes 2

Washout:

Washout drains are provided to keep the pipelines free from blockade. For keeping the pipe inside clean, sediment, deteriorated water shall be washed periodically.

At least every 3 months in dry season and once a month in rainy season

Fire Hydrant:

Fire hydrants can be used in case of fire.

Survey Staff

Date;
April 21-22, 2010

Staff;
WUSC Eng.

Targets;
Distribution Pipe

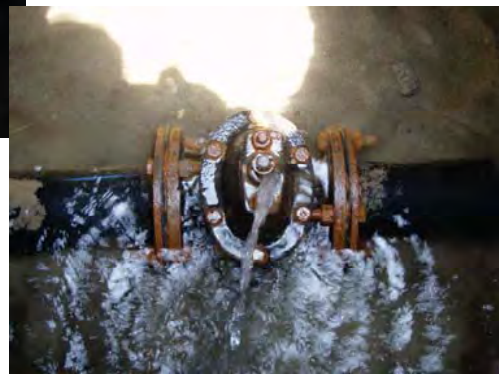
Valve Chamber

.

Water in chamber .

Valve

Leakage from valve



No bolt on valve

Air valve Chamber

Removed hook on cover

Inside air valve chamber

It took time to open the cover due to no hook.

Chamber Cover

Survey Format

Inspector:

Date: April 21, 2010

No.	Symbol	Pipe Dia. Material	Condition (Looks)	Valve working	Leakage	Sound, Etc.	Valve status
Sample							
1	VR5-4	OD160 HDPE	Need to clean, Rusty	Ok	No	No	Open
Other; Malfunction and Repair Records							

Recommendation

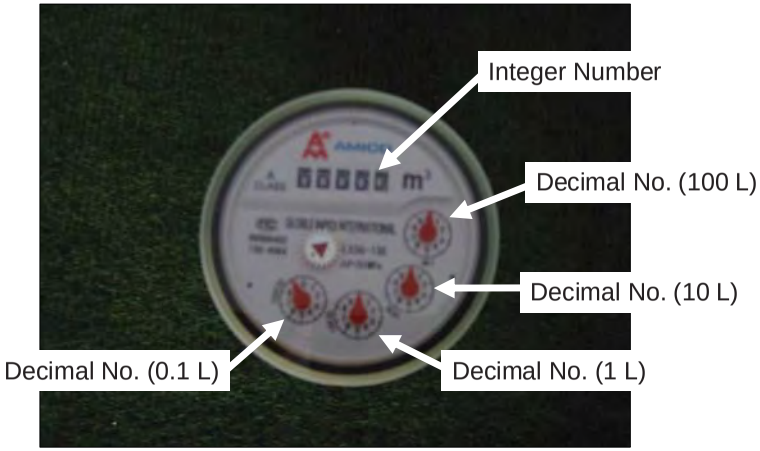
- Pipe network map is made up including existing and new pipes.
- Main water facilities which consist of valve, air valve, washout and fire hydrant are put on the network map.
- Periodical inspection for water facilities
- Record their conditions, malfunction and repair

Water Meter Calibration & Water Distribution Facilities On the Job Training

Jhapa WSSDO

1. OJT of Water Meter Calibration

1.1 Meter Reading up to 0.1L Decimal

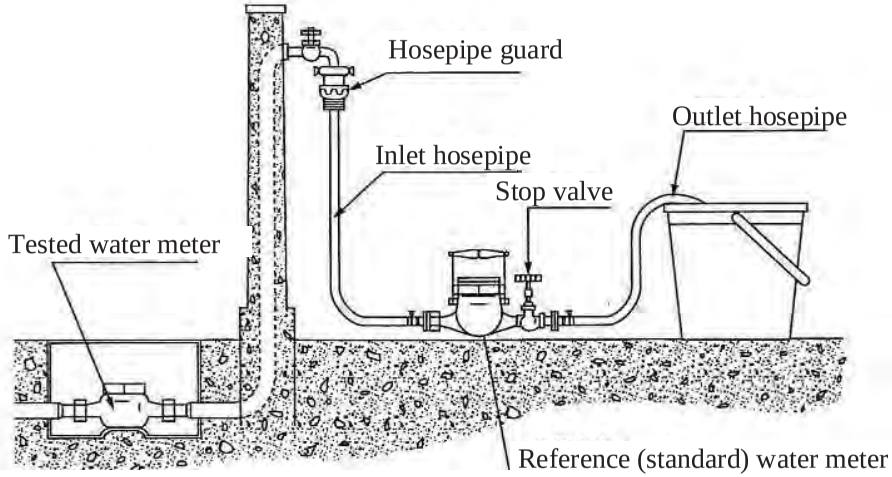


1.2 Instruction on Meter Reading

WUSC meter readers don't usually read decimal number to count consumption water

WSSDO staff instructing meter reading.

1.3 Setting for Calibrating the Meter



1.4 Setting for Calibrating the Meter

Checking if any leakage at the connection points

Checking flow indicator and moving

1.5 Reading the Actual Number

After calibration

Before calibration

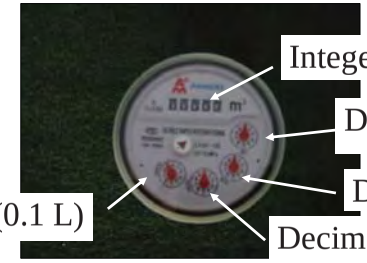
1.6 Calculation of instrumental Error

$$E = \frac{I - Q}{Q} \times 100$$

E: Instrumental error (%)

I: Indiscrete value of tested water meter (L)

Q: Indiscrete value of reference (standard) water meter (L)



1.7 Calculating the Error

Checking the error if within ±10%

WSSDO presenting the way to calculate the error

1.8 Assuring User's Meter

User has complaints that the meter shows higher amount than the actual use.

1.9 Calibration of User's Meter

User's Meter

Master Meter

1.10 Calculation of the Error

User' s meter was ideal one. It means it does not have any defect in the meter.

Instrumental error was 0% (it is within ±10%)

1.11 Wrong Installation

Vertical Type Meter
(Correct Installation)

Horizontal Type Meter
(Wrong Installation)

2. Water Distribution Facility Inspection

Main Purpose: To keep the facilities in good condition

- To confirm the current status of distribution facilities included in the existing facilities.
- To make inspection record, flow record and repair record of facilities

2.1 Instruction of Inspection

Gate valve chamber

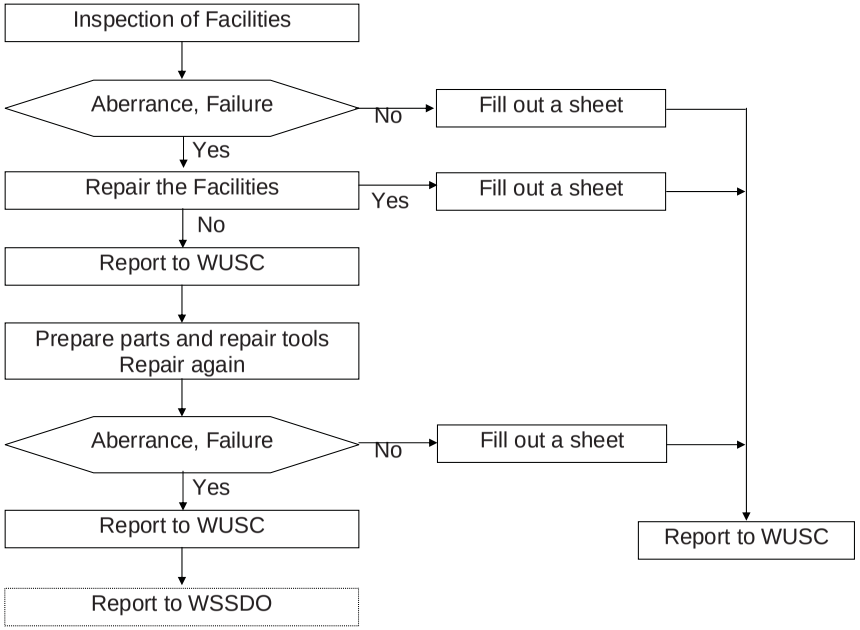
Recording actual condition on the inspection sheet

2.2 Conducting Inspection

Air valve chamber without cover

Instructing how to record the condition in the sheet and report it to their manager

2.3 Procedures of investigation and Report



Workshop

1. Day 1: Draft User Complaints Management Manual
   Water Supply and Public Hygiene Education
2. Day 2: Annual Report
3. Day 3: Business Planning

From 10:00-12:00

August 2010

Objectives:

- Understanding what is annual report
- Discussion of implementation

Annual Report

August 2010

Agenda

1. Concept of annual report
2. Items contained in annual report
3. Questions and answers
4. Discussion

1. Concept of annual report

2. Items contained in annual report

3. Questions and answers

4. Discussion

1. Concept of annual report

(1) Objective of annual report

- Why WUSC need to prepare annual report?
- Information dissemination to stakeholders
- Communication tool with stakeholder for get/maintain their understanding and support

1. Concept of annual report

(1) Objective of annual report

- Who is stakeholders of WUSC?
  - WUSC members (users)
  - DWSS
  - donor agencies
  - NGO
  - others

1. Concept of annual report

(2) What kind of information stakeholder wants?

1) WUSC member (user)

- How my member ship fee spend efficiently and effectively?
- Future of WUSC (what WUSC would be).
  - Could we keep access with safe water in future?
  - Could we keep getting safe water affordably?
  - Could we keep getting high quality customer service from WUSC?
  - Water rate is increasing? If so, how much?

(2) What kind of information stakeholder wants?

2) DWSS

- Capability of safe water supply. Could we trust WUSC?
- Does WUSC could keep providing sufficient member service regarding providing safe water?
- When WUSC can maintain sustainability and financial independency? Can WUSC do without subsidiary, technical and financial assistance?
- WUSC needs subsidiary in near future? If in that case, when and how much requires capacity of facility?

(2) What kind of information stakeholder wants?

3) Donor agencies

- Did technical and financial assistance meet with their demand and requirement?
- Did they really want our assistance based on real situation, neither based on day dream nor political ambition of politician?
- Does grant and financial assistance use efficiently and effectively?
- Could technical and financial assistance have impact for improving supply of safe water and reduce oral diseases, or improving standard of living?
- Could WUSC be trustable for our beneficially?

(3) What happen if WUSC does not get understanding and support from stakeholders?

- WUSC members (users)
  - If many of they stop to pay water bill and insist to use their own well, what happen?
  - If they doubt WUSC may do something wrong but hide, what happen?

(3) What happen if WUSC does not get understanding and support from stakeholders?

- DWSS
  - If DWSS stops subsidize anymore facility, what happen? WUSC does not need any more support?
  - If DWSS doubt management system and quality of WUSC (suspect corruption, insufficiency of capability, etc.), what happen?
  - If DWSS consider insufficiency and ask to WUSC to return subsidiary, what happen? Could you still keep providing safe water to members without subsidized facilities?

(3) What happen if WUSC does not get understanding and support from stakeholders?

- donor agencies and NGOs

  - If they stop grant and technical support anymore, what happen?

  - If they doubt management system and quality of WUSC (suspect corruption, insufficiency of capability, etc.), what happen?

  - If they consider insufficiency and ask through DWSS to return facility, or payment to financial and technical assistant, what happen? Could you still keep providing safe water to members?

(4) Present audit report and annual report gives answer to requirement of stakeholders?

- I don't know about other stakeholders, but from personal point as JICA expert from donor agency (JICA), I cannot satisfy with present annual report.

- Luck of information for what WUSC want to be. How could I contributing for achieving dream of WUSC?

- I can trust money used correctly, but I cannot trust money used effectively. There is no information about implementation strategy and financial plan. I cannot see how assistance and revenue contributing improvement. Therefore, I cannot trust WUSC.

- But this is my personal opinion.

(5) What is necessary for keep communicating with stakeholders for keep getting their understanding and support?

- Issues and problems WUSC try to overcome

- Information about what WUSC want to be

- Information and proof of "WUSC do best works", efficiently and effectively.

- Information about the organization has been working for customer satisfaction and providing safe water.

- Information and proof of improving and progressing by support of stakeholders

(1) Typical structure and items in annual report

1) Preface by chairperson

2) Progress, achievement and major event in the fiscal year

3) Plan, target and implementation strategy of medium term and next fiscal year

4) Organization

5) Executive board members and officers

6) Facilities

7) Financial performance of the fiscal year with audit

8) Budget of next year

9) Other information

1)Preface by chairperson

- Normally including policy, vision and mission, summary of achievement and future plan

2) Progress, achievement and major event in the fiscal year

- Normally including chorological major events and history
- Performance and achievements (number of users, revenue, number of staff, etc.)
- Progress of construction, project, action, program
- Survey and analysis result (e.g. customer satisfaction survey) for prove performance (e.g. high quality customer service)

3) Plan, target and implementation strategy of medium term and next fiscal year

- Medium term issues and problem, and demand projection
- Summary of business plan for next 5 years (facility improvement plan, target including service coverage ratio, population served, NRW, financial plan, etc.) for countermeasures to medium term issues and problems, and requirements from users
- Plan of next year (e.g. ceremonial event, construction project, program, target revenue, and other performance targets, etc.)
- Implementation strategy (e.g. focus activities, action plan, etc.)
- Summary of budget allocation

4) Organization

- Organizational chart

5) Executive board members and officers

- Name, title and roles of executive board members
- Name, title and roles of special committee members
- Name, title and roles of advisors
- Name, title and roles of officers

6) Facilities

- Major water supply facilities (e.g. intake facility, reservoir, water purification plant, filtration plant, pipeline network, with capacity)
- Issues and problem regarding facilities
- Countermeasures for issues and problem on facilities

7) Financial performance of the fiscal year with audit

- Income statement
- Balance sheet
- Cash flow statement
- Retaining and earning statement
- Auditor’s report

2. Items contained in annual report

8) Budget of next year

- Target revenue
  - Revenue from sales of water
  - Revenue from connection and sales of materials
  - Revenue from other operational activities
  - Revenue from grant, subsidiary or donation
  - Revenue from financial activities (loan, interest)

2. Items contained in annual report

8) Budget of next year

- Expenditure
  - Salaries and wages, cost for personal services
  - Power and fuel for pumping
  - Chemicals for purification and filtration
  - Other cost for operation and maintenance of facilities
  - Construction, facility renovation and other capital investment
  - Cost for financial services (loan repayment, etc.)

2. Items contained in annual report

(2) Difference of annual report and audit report

- No need to be same
- Audit report purposes to reporting financial performance and money used correctly to committee member, and getting their approval
- Audit report should be prepared before annual assembly
- Annual report purposes to reporting activity, achievement, performance and plan of following years to stakeholders for getting their understanding and support

2. Items contained in annual report

(3) Issues and problems to make annual report

- **WUSC does not have medium term business plan** right now
- WUSC does not have sufficient capability to make medium term business plan

(3) Issues and problems to make annual report

- Business plan must including:
  - Projection of water consumption and service demand
  - Engineering plan for expansion and facility improvement for achieving water and service demand for next 5 years
  - Capital investment plan including financial arrangement (grant, subsidiary or loan, necessary water rate increasing) for achieving engineering plan
  - Financial plan including projection of revenue and expenditure
  - Staffing plan
  - Performance target

Discussion:

- Could you make business plan?
- Could you make annual report already discuss in this workshop?

2. Items contained in annual report

(3) Issues and problems to make annual report

1) Preface by chairperson	-> narrative and chairperson can do
2) Progress, achievement and major event in the fiscal year	-> narrative and WUSC has data and information
3) Plan, target and implementation strategy of medium term and next fiscal year	**-> this part is difficult without medium term business plan**
4) Organization	-> WUSC has information, easy
5) Executing board member	-> WUSC has list and it is easy
6) Facilities	-> WUSC can prepare
7) Financial performance of the fiscal year with audited	-> can use audit report. It is not so difficult.
8) Budget of next year	-> can use budget. It is easy.
9) Other information	

Workshop for Business Planning (2)

February 18th 2011

Water Demand Projection and Investment Plan

1. General

Water demand projection is a fundamental factor for determining the scale of a water supply system.

The target year for the investment plan of water supply facilities is set as follows in general:

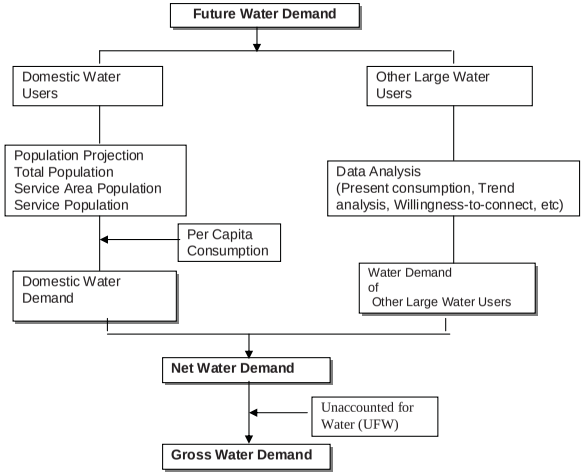
- Mid-term investment plan: 5 years after present
- Long-term investment plan: 10 years after present

The investment plan has to be prepared based on the water demand projection in the target year.

2. Water Demand Projection

- In general, existing consumption data of the water users are served as a baseline of the demand projection.
- In case of WUSCs, the water users would be classified into two main categories, namely, domestic users, and other large water users.
- Therefore, water demand in these two categories should be projected separately, and summing up the respective demand, the total demand is estimated.

Methodology of Water Demand Projection

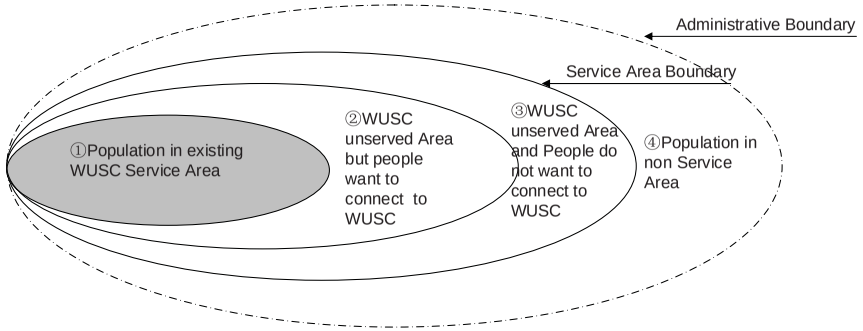


2.1 Domestic Water Demand

2.1.1 Population Projection

- Population projection serves as the basis for determining the water demand in a service area.
- Population is classified into the following category.
  - Total population
  - Service area population
  - Service population

Definition of Total and Service Population



Total population: ①+②+③+④
Service area population: ①+②+③
Service population: ①+②

(1) Projection of Total Population

- Using available past census data, perform a trend analysis on past growth rate and the factors which might have influenced it.
- Based on field conditions, future developments as well as data obtained in step 1 above, project future growth rate up to the target year.
- Using the projected growth rate determined in step 2, the population for each year can be obtained using the formula:

$$Pn = Pa\ (1 + r)^n$$

Where:

Pn = population after n years

Pa = population in base year

r = growth rate

n = number of years

Example of Past Population Trend Analysis

Ward	Population (Census)				Average annual growth Rate (%)		
	1995	2000	2005	2010	95-00	00-05	05-10
Ward1	4575	5303	6088	6888	3.0	2.8	2.5
Ward2	8039	9095	10441	12162	2.5	2.8	3.1
Ward3	8204	10077	12260	14916	4.2	4.0	4.0
Ward4	2350	2804	3314	3936	3.6	3.4	3.5
Total	23168	27279	32103	37902	3.3	3.3	3.4

Example of Total Population Projection

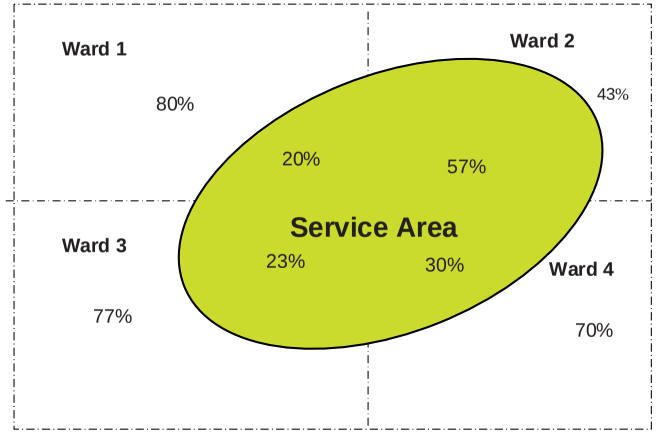
Ward	Population 2010	Annual Growth Rate 10-15	Population 2015	Annual Growth Rate 15-20	Population 2010
Ward1	6888	2.5	7800	2.0	8600
Ward2	12162	3.0	14100	2.5	16000
Ward3	14916	4.0	18100	3.0	21000
Ward4	3936	3.2	4600	2.6	5200
Total	37902	3.3	44600	2.6	50800

(2) Service Area Population

In most cases, only a certain percentage of the ward (administrative unit) population is within the service area.

- Determine the existing service area. This is done by defining the area covered by the existing transmission and distribution system.
- Project the future service area for each year up to the target period based on population distribution, settlement patterns, and existing and future development project if any.
- Determine the percentage of the ward population covered by the present and future service area. The projected percentage is calculated for the various future years based on settlement patterns and population density.

Example of Population Percentage Allocated to Service Area



Example of Service Area Population

Ward	Present (2010)		2015		2020	
	Service Area Popul'n	% of Total Popul'n	Service Area Popul'n	% of Total Popul'n	Service Area Popul'n	% of Total Popul'n
Ward1	1378	20	2300	30	3400	40
Ward2	6932	57	8700	62	10700	67
Ward3	3431	23	6300	35	9900	47
Ward4	1181	30	1800	40	2500	48
Total	12922	34	19100	43	26500	52

(3) Service Population

Each WUSC should have a goal of the service coverage rate in the target year (e.g. not less than 50%) considering the following factors:

- Survey the population's ability-to-pay and willingness to connect.
- Estimate the population of public faucet users.
- Determine the service coverage rate in the target year.
- Calculate the population served by individual connections and public faucets, respectively.

Example of Service Population

Ward	Present (2010)		2015		2020	
	Service Coverage Rate (%)	Service Popul'n	Service Coverage Rate (%)	Service Popul'n	Service Coverage Rate (%)	Service Popul'n
Ward1	10	138	25	580	40	1360
Ward2	30	2080	40	3480	50	5350
Ward3	32	1098	42	2650	52	5150
Ward4	25	295	40	720	60	1500
Total	28	3611	39	7430	50	13360

2.1.2 Per Capita Consumption, Domestic Water Demand

Per capita consumption is a basic parameter for the projection of domestic water demand.

- From past data or analysis, determine average present per capita consumption.
- In the absence of these data, figures based on records of different WUSCs may be used as a basis.
- In general, daily per capita consumption for individual connections ranges from 80 to 150L/c/d depending on particular conditions of the town.
- Per capita consumption of public faucet users usually ranges from 25 to 50L/c/d.
- According to the DWSS guidelines, the design per capita consumption is 100L/c/d for individual connections and 45L/c/d for public faucet users.
- Domestic water demand = Service population x Per capita consumption

2.2 Demand of Other Water Users

- Water users in the service area such as big hotels, hospitals, factories, and public institutions are included in this category.
- Water demand projections for such users is made .separately
- Appropriate data concerning their location, present water consumption, and willingness-to connect should be determined.

2.3 Net Water Demand

Net Water Demand = Domestic Water Demand + Demand of Other Water Users

Example of Net Water Demand

	Present (2010)	Mid-term (2015)	Long-term (2020)
. Service Popul'n (Individual)	3250	6690	12020
. Service Popul'n (Public Faucet)	361	740	1340
. Service Popul'n (Total)	3611	7430	13360
Per Capita Cons'n for . (Lpcd)	85	100	100
Per Capita Cons'n for . (Lpcd)	40	45	45
Domestic Demand for . (m3/d)	276	669	1202
Domestic Demand for . (m3/d)	14	33	60
Domestic Demand Total (m3/d)	290	702	1262
Demand of Other Users (m3/d)	60	70	80
Net Water Demand Total (m3/d)	350	772	1342

2.4 Unaccounted-for Water (UFW)

- From the field investigation of the existing system as well as the water production and meter reading records, estimate unaccounted-for water including wastage, and water losses.
- Unaccounted-for water should be reduced step by step according to the established UFW reduction plan.
- Ideally, it is desirable to reduce UFW to less than 30%.

2.5 Gross Water Demand

Gross Water Demand = Net Water Demand + Unaccounted-for Water (UFW)

Example of Gross Water Demand

	Present (2010)	Mid-term (2015)	Long-term (2020)
. Net Water Demand (m3/d)	350	772	1342
UFW Rate (%)	50	40	30
. UFW (m3/d)	350	515	575
.=.+. Daily Average Gross Water Demand (m3/d)	700	1287	1917
.=.x1.2 Daily Maximum Gross Water Demand (m3/d)	840	1544	2300

Daily Average: is used for the basis of O&M plan
Daily Maximum: is used for the basis of facility plan

3. Investment Plan

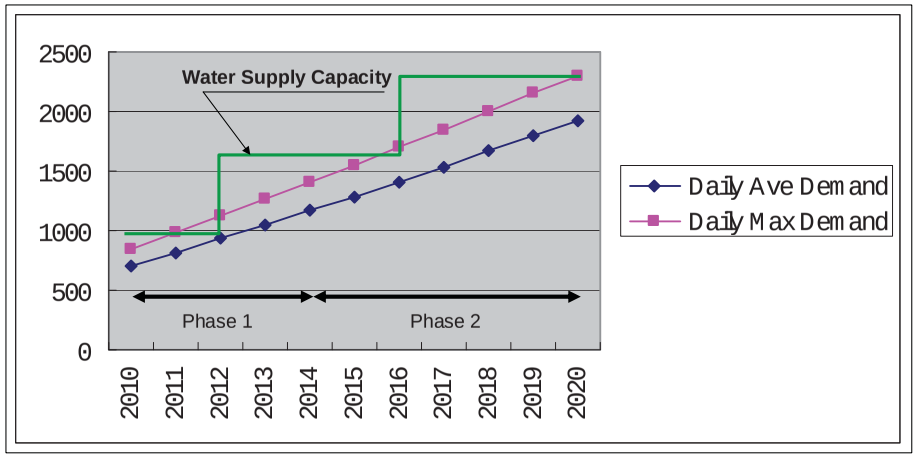
3.1 Demand and Supply Balance

- (Demand of each year) < (Capacity of water supply facility)
- Formulate a phased facility development plan to meet the demand

Example of Demand and Supply Balance (m3/d)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Daily Ave Demand	700	817	934	1052	1169	1287	1413	1539	1665	1791	1917
Daily Max Demand	840	980	1121	1262	1403	1544	1696	1847	1998	2149	2300
Present Capacity	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Expansion (Phase1)			600	600	600	600	600	600	600	600	600
Expansion (Phase 2)							700	700	700	700	700
Total Capacity	1000	1000	1600	1600	1600	1600	2300	2300	2300	2300	2300

Example of Demand and Supply Balance



3.2 Facility Expansion Plan

- Determine the target service area for Phase 1 (mid-term) and for Phase 2 (long-term).
- The facility expansion plan will include:
  - New Water Sources Development
  - Construction of New Transmission Pipelines
  - Expansion of Water Treatment Plant
  - Expansion of Distribution Network
  - Rehabilitation of Old Existing Facilities
  - Development of UFW/NRW Reduction Program

3.3 Construction Plan

- Estimate the bill of quantity (BOQ) of each facility.
- Prepare the construction schedule of each facility.

Description	Unit	Quantity	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Well Intake Facilities Construction	well	xx										
Well Intake Facilities Rehabilitation	well	xx										
Expansion of Water Treatment Plant	site	xx										
Water Tower Construction (V = xx m³)	site	xx										
Transmission Pipeline (xx mm)	m	xx										
Booster Pump Station	site	xx										
Main Distribution Pipeline (>100mm)	m	xx										
Secondary Distribution Pipeline (50mm to 100mm)	m	xx										
NRW Reduction	LS.	1										

3.4 Cost Estimate

■ Estimate the cost of each year based on BOQ and construction schedule.

■ The cost includes the capital cost and the O&M cost.

(1) Capital Cost

Construction cost, Procurement cost, Land acquisition cost, Engineering service cost, VAT, etc.

(2) O&M Cost

Human cost, Chemical cost, Power cost, NRW reduction cost, Others (spare parts procurement, etc.)

3.5 Summary of Investment Plan

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
. Water Demand (m3/d)		980	1121	1262	1403	1544	1696	1847	1998	2149	2300
. Water Supply Capacity (m3/d)		1000	1600	1600	1600	1600	2300	2300	2300	2300	2300
. Investment (Rs)	Capital Cost	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	O&M Cost	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	Total	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

Appendix-3

- Pictures of the Project Activity -

Photo-1

2012/9/5 Jhapa WSSDO

Confirming the procured equipment

JICA Expert explaining treatment of equipment

Photo-2

2012/9/5 Jhapa WSSDO
Procured Mechanical jack

CHRDU Engineer instructing the setting of HDPE pipes

Photo-3

2012/9/5 Jhapa WSSDO
Procured pipe drilling machine

CHRDU Engineer instructing the setting and usage.

Photo-4

2012/9/6 Dhulabari WUSC
Procured electric pipe cutter

Training of the pipe cutting

Photo-5

2012/9/6 Dhulabari WUSC

Procured mechanical jack and electric heating plate

Jhapa WSSDO Engineer instructing the setting

Photo-6

2012/9/6 Dhulabari WUSC

Procured pipe drilling machine

Jhapa WSSDO Engineer instructing the setting

Photo-7

2012/9/6 Dhulabari WUSC

Procured ultrasonic flow meter

Demonstration of the flow meter

Photo-8

2012/9/6 Dhulabari WUSC

The staff moving the stabilizer according to JICA Expert instruction. The staff will reconnect cable from the panel board.

Photo-9

2012/9/7 Gauradaha WUSC
Procured pipe drilling machine

The staff using it to drill GI pipe.

Photo-10

2012/9/7 Gauradaha WUSC

Section of welded HDPE. Inspection succeed due to good jointing

Photo-11

2012/9/7 Gauradaha WUSC
Procured pipe cutter machine

WUSC staff cutting the GI pipe.

Photo-12

2012/9/9 Mangadh WUSC
Procured mechanical jack and electric heating plate

Photo-13

2012/9/9 Mangadh WUSC

Pipe drilling machine

Morang WSSDO Engineer instructs the setting.

Photo-14

2012/9/9 Mangadh WUSC

Mechanical jack and electric heating plate

Mangadh WUSC staff trying to use them.

Photo-15

2012/9/9 Mangadh WUSC

Replaced Water level tube (spare part)

Photo-16

2012/9/9 Mangadh WUSC

Replaced flow cell

Morang WSSDO Engineer inspecting it.

Photo-17

Gauradaha WUSC

Renewal of distribution pipe map

Staff updating pipe information such as route, diameter and material.

Photo-18

Gauradaha WUSC

Improved cable from the stabilizer according to JICA Expert.

The cable was hung down previously.

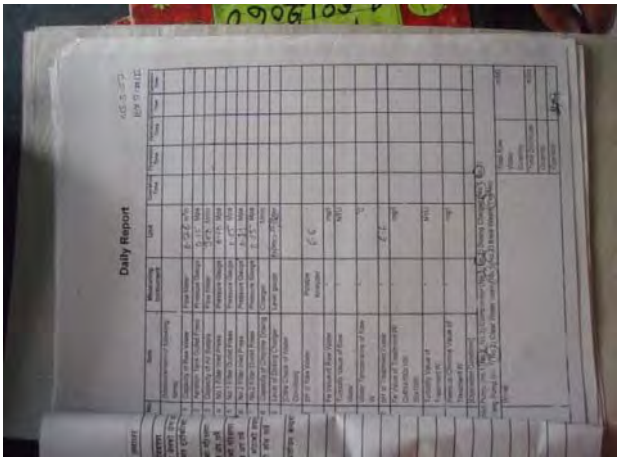


Photo-19

Gauradaha WUSC

Mechanical and electrical equipment check list. Recording was started after workshop/OJT.

Photo-20

Gauradaha WUSC

WUSC staff reporting DWSS Engineer the record.

Photo-21

WASMIP Sticker

WASMIP sticker on the door

Photo-22

Workshop in Haraicha WUSC

Trainers are Morang WSSDO and CHRDU Engineers

Photo-23

Workshop in Haraicha WUSC

Trainers are Morang WSSDO and CHRDU Engineers

Photo-24

Workshop in Haraicha WUSC

OJT of the distribution facility inspection

Staffs confirm the valve in the chamber.

Photo-25

OJT in Haraicha WUSC

OJT of water meter calibration
Engineers instructing meter reading.

Photo-26

Workshop in Haraicha WUSC

Engineer explaining how to use the electric heating plate.

Photo-27

OJT in Haraicha WUSC

Staffs using the pipe drilling machine.

Photo-28

Workshop in Haraicha WUSC

Confirmation of the their distribution map
Information of pipe routes, pipe diameter and material is confirmed.

Photo-29

Workshop in Birtamode WUSC

Trainer is Jhapa WSSDO Engineer

Photo-30

Workshop in Birtamode WUSC

Engineers responding questions from trainees.

Photo-31

OJT in Birtamode WUSC

OJT of the distribution facility inspection
Engineers guiding how to inspect and fill out on check sheets.

Photo-32

OJT in Birtamode WUSC

OJT of the distribution facility inspection
The staff removing some sediments from the fire hydrant.

Photo-33

OJT in Birtamode WUSC

OJT of water meter calibration
Engineers instructing how to calculate the instrument error.

Photo-34

OJT in Birtamode WUSC

Pipe drilling machine

Photo-35

Visit to nonparticipated WUSC

WSSDO Engineers visit to WUSC for interview because WUSC didn't take part in Workshop/OJTs of JICA Experts.

Photo-36

Visit to participated WUSC
Interview about current O&M
The WUSC was cooperative.

Workshop in Mangadh WUSC by Morang WSSDO staff and JICA Expert

Discussion among trainees in the workshop

Workshop in Mangadh WUSC by Morang WSSDO staff

Lecture of proper treatment of the water meter

Examination of instrumental error with reference (standard) water meter for Mangadh WUSC's water meter

Connecting the water meters

Meter reading

Exercise of water distribution pipeline planning
Calculation of water demand, design flow and pressure head on pipeline.

Discussion among trainees in the workshop

Workshop in Gauradaha WUSC

Exercise of water distribution pipeline planning
Calculation of water demand, design flow and pressure head on pipeline.

Examination of instrumental error with reference (standard) water meter for Gauradaha WUSC's water meter

Connecting the water meters

Examination of the existing water meter at the complaining customer's house

Explanation to the customer by Gauradaha WUSC staffs

Workshop in Dhulabari WUSC

Discussion among trainees in the workshop

Exercise of water distribution pipeline planning
Calculation of water demand, design flow and pressure head on pipeline.

Site survey for water distribution facility

Inspection of the fire hydrant

Site survey for water distribution facility

Inspection of the air valve

Examination of instrumental error with reference (standard) water meter for Dhulabari WUSC's water meter

Calculation of instrumental error

Examination of the existing water meter at the customer's house

Technical Support Center (TSC)

Lecture on the water meter calibration equipment for trainees of Dhulabari, Gauradaha and Mangadh WUSC staffs.

Setting WUSCs' water meters in the calibration equipment

Meter reading

Calculation of instrumental error

Lecture on welding joints of HDPE by Mangadh WUSC staffs

Dhulabari and Gauradaha WUSC adopt Butt welding.

Mangadh WUSC use the handmade socket type conjugation tube which can reduce leakage of water.

Lecture by Mangadh WUSC staffs

Dhulabari WUSC staff trying to make the handmade socket type conjugation tube.

Exercise by Gauradaha WUSC staff

Examination of instrumental error with reference (standard) water meter

Connecting the water meter

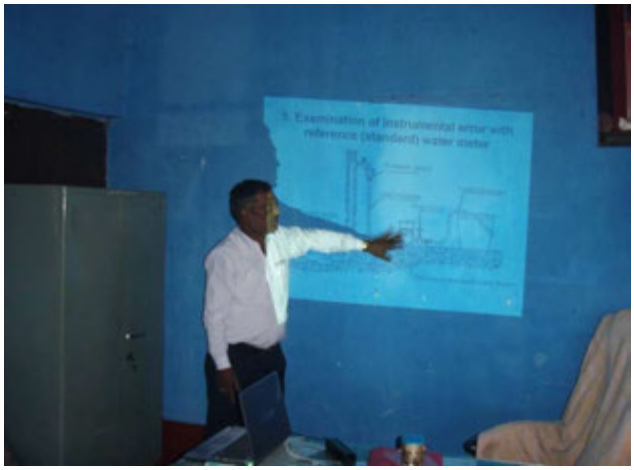
Meter reading

Calculation of instrumental error

Jhapa WSSDO

Workshop on New Planning Formulation of Water Distribution Facilities

Presenter: Mr. Anuj Upadhayay of Morang WSSDO Engineer



Jhapa WSSDO

Workshop on Proper Treatment of a Water Meter and Suggestion of Water Meter

Presenter: Mr. Anuj Upadhayay of Morang WSSDO Engineer
and
Mr. Jagannath Purbey of Jhapa Division Chief

Jhapa WSSDO

Audience: Jhapa WSSDO Engineers and Technicians

Regarding the draft SOP, the opinions and corrections were voiced by WSSDO

Jhapa WSSDO

Introduction of butt welding tools and the method

Dhulabari WUSC

Examination of instrumental error with reference (standard) water meter

Training of set for the reference water meter and instrumental error calculation

Dhulabari WUSC

Making of the water distribution network ma

Distribution pipelines: location, material and diameter
Valve, washout and fire hydrant: location and type
Planned pipelines

Dhulabari WUSC

Water distribution network map

It is useful for a supervisor to maintain the distribution pipelines, and easy to think problems/solutions and to make a extension

Dhulabari WUSC

WUSC engineer had the presentation of site survey.

He explained landslide at intake site and disconnected raw water transmission pipe.

Gauradaha WUSC

Examination of instrumental error with reference (standard) water meter

WUSC engineers calibrated the existing water meter which the customer has

Gauradaha WUSC

Making of the water distribution network map (handmade)

Distribution pipelines: location, material and diameter
Valve, washout and fire hydrant: location and type
Planned pipelines

Gauradaha WUSC

Water distribution network map

Gauradaha WUSC

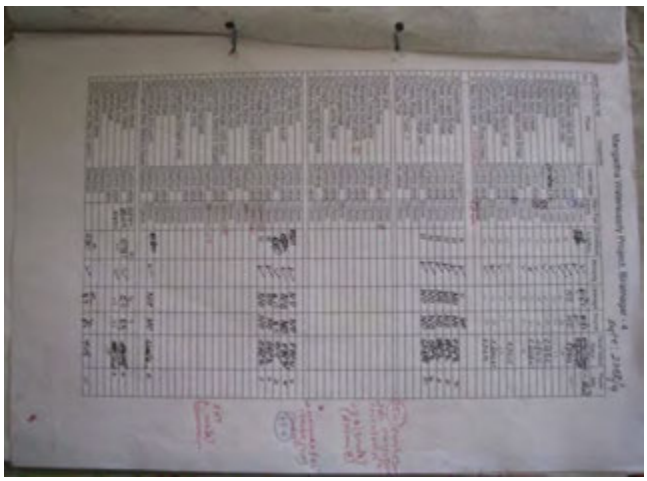
WUSC engineer explained to manager and chairperson how to use the map.
They discussed problems in service area and considered solutions with the map.

Mangadh WUSC

Making of the water distribution network map (handmade)

Mangadh WUSC

Equipment of instrumental error examination with reference (standard) WUSC made the water meter calibration equipment by themselves.



Mangadh WUSC

Valve, washout and fire hydrant check list

WUSC conducts facility survey periodically, once in a month.

Mangadh WUSC

Water distribution network map

Listed facility numbers meet the check list number. Therefore, it is easy to maintain

Photo-1

2012/9/5 Jhapa WSSDO

Confirming the procured equipment

JICA Expert explaining treatment of equipment

Photo-2

2012/9/5 Jhapa WSSDO
Procured Mechanical jack

CHRDU Engineer instructing the setting of HDPE pipes

Photo-3

2012/9/5 Jhapa WSSDO
Procured pipe drilling machine

CHRDU Engineer instructing the setting and usage.

Photo-4

2012/9/6 Dhulabari WUSC
Procured electric pipe cutter

Training of the pipe cutting

Photo-5

2012/9/6 Dhulabari WUSC

Procured mechanical jack and electric heating plate

Jhapa WSSDO Engineer instructing the setting

Photo-6

2012/9/6 Dhulabari WUSC

Procured pipe drilling machine

Jhapa WSSDO Engineer instructing the setting

Photo-7

2012/9/6 Dhulabari WUSC

Procured ultrasonic flow meter

Demonstration of the flow meter

Photo-8

2012/9/6 Dhulabari WUSC

The staff moving the stabilizer according to JICA Expert instruction. The staff will reconnect cable from the panel board.

Photo-9

2012/9/7 Gauradaha WUSC
Procured pipe drilling machine

The staff using it to drill GI pipe.

Photo-10

2012/9/7 Gauradaha WUSC

Section of welded HDPE. Inspection succeed due to good jointing

Photo-11

2012/9/7 Gauradaha WUSC
Procured pipe cutter machine

WUSC staff cutting the GI pipe.

Photo-12

2012/9/9 Mangadh WUSC
Procured mechanical jack and electric heating plate

Photo-13

2012/9/9 Mangadh WUSC

Pipe drilling machine

Morang WSSDO Engineer instructs the setting.

Photo-14

2012/9/9 Mangadh WUSC

Mechanical jack and electric heating plate

Mangadh WUSC staff trying to use them.

Photo-15

2012/9/9 Mangadh WUSC

Replaced Water level tube (spare part)

Photo-16

2012/9/9 Mangadh WUSC

Replaced flow cell

Morang WSSDO Engineer inspecting it.

Photo-17

Gauradaha WUSC

Renewal of distribution pipe map

Staff updating pipe information such as route, diameter and material.

Photo-18

Gauradaha WUSC

Improved cable from the stabilizer according to JICA Expert.

The cable was hung down previously.

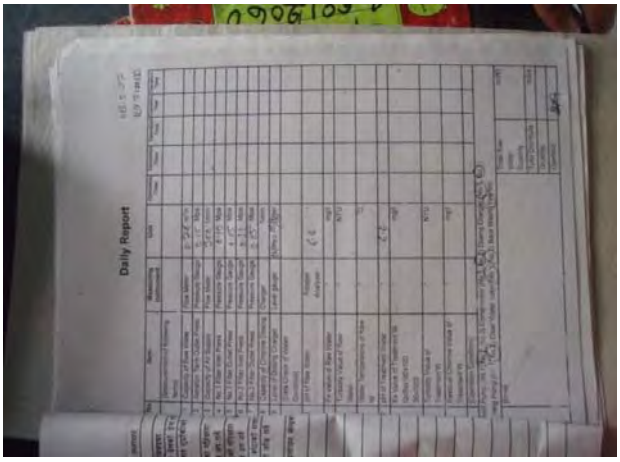


Photo-19

Gauradaha WUSC

Mechanical and electrical equipment check list. Recording was started after workshop/OJT.

Photo-20

Gauradaha WUSC

WUSC staff reporting DWSS Engineer the record.

Photo-21

WASMIP Sticker

WASMIP sticker on the door

Photo-22

Workshop in Haraicha WUSC

Trainers are Morang WSSDO and CHRDU Engineers

Photo-23

Workshop in Haraicha WUSC

Trainers are Morang WSSDO and CHRDU Engineers

Photo-24

Workshop in Haraicha WUSC

OJT of the distribution facility inspection

Staffs confirm the valve in the chamber.

Photo-25

OJT in Haraicha WUSC

OJT of water meter calibration
Engineers instructing meter reading.

Photo-26

Workshop in Haraicha WUSC

Engineer explaining how to use the electric heating plate.

Photo-27

OJT in Haraicha WUSC

Staffs using the pipe drilling machine.

Photo-28

Workshop in Haraicha WUSC

Confirmation of the their distribution map
Information of pipe routes, pipe diameter and material is confirmed.

Photo-29

Workshop in Birtamode WUSC

Trainer is Jhapa WSSDO Engineer

Photo-30

Workshop in Birtamode WUSC

Engineers responding questions from trainees.

Photo-31

OJT in Birtamode WUSC

OJT of the distribution facility inspection
Engineers guiding how to inspect and fill out on check sheets.

Photo-32

OJT in Birtamode WUSC

OJT of the distribution facility inspection
The staff removing some sediments from the fire hydrant.

Photo-33

OJT in Birtamode WUSC

OJT of water meter calibration
Engineers instructing how to calculate the instrument error.

Photo-34

OJT in Birtamode WUSC

Pipe drilling machine

Photo-35

Visit to nonparticipated WUSC

WSSDO Engineers visited to WUSC for interview because WUSC didn't take part in Workshop/OJTs.

Photo-36

Visit to participated WUSC
Interview about current O&M
The WUSC was cooperative.

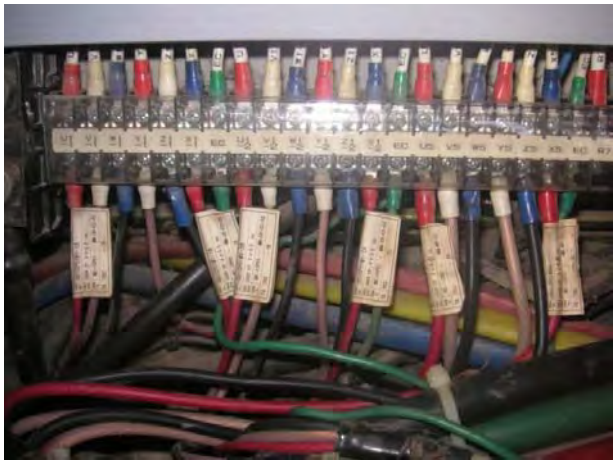


Photo-37
Mechanical&Electrical O&M Training

A situation inside a panel incluging cabling got improved by WUSC staff immideately after a lecture.

Photo-38
Mechanical&Electrical O&M Training

WUSC staff independently put in practice how to maintain compressor as soon as receiveing a lecture.

Photo-39
Mechanical&Electrical O&M Training

Instruction of how to maintain a dosing pum

Photo-40
Mechanical&Electrical O&M Training

WUSC staff asked about check items of their existing maintenance record.

Photo-41
Mechanical&Electrical O&M Training

Trainees was taking a note of water purification process and procedure of making a maintence record.

Photo-42
Mechanical&Electrical O&M Training

Some Trainees asked about target values such as pressure and electrical current with explaining their own facility and

Photo-43
Mechanical&Electrical O&M Training

A WUSC manager orderd staff to fill up a gate with the greese as soon as pointed out by JICA Expert.

(1) Monitoring Morang MIT activities

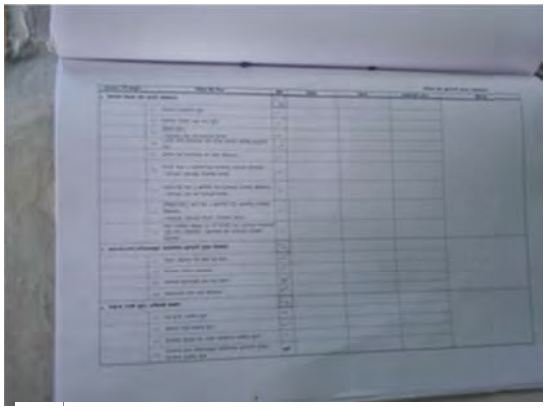
(2) Morang MIT how to evaluate at Mangadh WUSC

(3) Bundle of printed record formats at Mangadh WUSC

(4) Checking reliability of chlorine test kits and reagents (Right: JICA test kit (new), Middle: WHO test kit, Left: JICA Test kit (0ld), Right and middle showed almost same color:

(5) Preparation of color and turbidity dilute standard solutions at Jhapa District Office

(6) Instruction of Analysis at Gauradaha WUSC



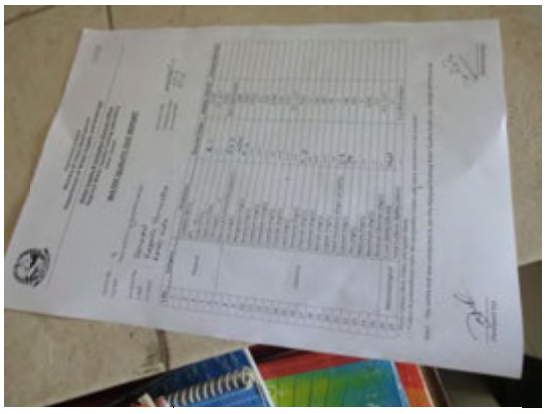
(7) Monitoring Jhapa MIT how to evaluate at Gauradaha WUSC

(8) Sampling filtrate at Gauradaha WUSC

(9) Right bottle: Filtrate just after backwash (pink), Left bottle: Filtrate after 10 minutes from backwashing, Front: Residue by filtration (Gauradaha WUSC)

(10) Dried sand to be washed at one of four slow sand filter ponds at Dhulabari WUSC

(11) Brown algae at one of four slow sand filter ponds at Dhulabari WUSC



(12) Test Result (Itahari Lab.)

(13) Newly Installed Generator (Itahari

(14) Demonstration of Training by Trainers at Central Laboratory-1

(16) Demonstration of Training by Trainers at Central Laboratory-2

(15) Demonstration of Training by Trainers at Central Laboratory-3

Photo-1
2013/9/6 CHRDU Training Center
Workshop for water meter readers

JICA expert explains contents of leaflets to water meter readers

Photo-2
2013/9/8 Bitamod WUSC
Meeting with WUSC manager

JICA experts requests the manager to organize the general assembly for public

Photo-3
2013/9/18 Chandragadh WUSC
General assembly for public awareness in Chandragadh
JICA expert explains contents of leaflets to residents

Photo-4
2013/9/19 Dhulabari WUSC
General assembly for public awareness in Dhulabari
JICA expert explains contents of leaflets to residents

Photo-5

2013/9/19 Bitamod WUSC
General assembly for public awareness in Bitamod

Residents attend the general asswembly

Photo-6

2013/9/20 Lakhanpur WUSC
General assembly for public awareness in Lakhanpur

Residents attend the general asswembly

Photo-7

2013/9/21 Pathari WUSC
General assembly for public awareness in Pathari
JICA expert explains contents of leaflets to residents

Photo-8

2013/9/22 Tanksinuwari WUSC
General assembly for public awareness in Tanksinuwari
JICA expert explains contents of leaflets to residents

Photo-1
Third country Training in PPWSA in Cambodia
Lecture by Phnom Penh Water Supply Authority (PPWSA)

- Orientation & Human Resource Managem
- Business Management
- Water Treatment Plant
- Water Quality Management
- Water Distribution Facilities Maintenance
- Water Meter

Photo-2
Third country Training in PPWSA in Cambodia
Lecturer explaining to trainees in detail.

Photo-3
Third country Training in PPWSA in Cambodia
Site visiting in Water Treatment Plant

Photo-4
Third country Training in PPWSA in Cambodia
House connection construction site
Connecting from distribution pipe

Photo-5
Third country Training in PPWSA in Cambodia
MoUD & DWSS discussing the contents of lectures after PPWSA's lectures

Photo-6
Third country Training in PPWSA in Cambodia
Water Treatment Plant construction site visiting
Installation of pumps in the intake facility

Photo-7
Third country Training in PPWSA in Cambodia
PPWSA explaining O&M in the Water Treatment Plant

Photo-8
Third country Training in PPWSA in Cambodia
On the final day of the training in PPWSA, improvement of water supply management and O&M were actively discussed among all participants with PPWSA staff.

Photo-9
Third country Training in SRWSA in Cambodia
Lecture by Siem Reap Water Supply Authority (SRWSA)

・Present on overview of Siem Reap water supply system and future development
・Iron and manganese removal of Siem Reap

Photo-10
hird country Training in SRWSA in Cambod
Site Visit of Intake Facility
Lectured about Monitoring System of Intake Facility at the sites

Photo-11
hird country Training in SRWSA in Cambod
Site Visit of Water Treatment Plant
Lectured about water quality test in the laboratorv

Photo-12
Third country Training in SRWSA in Cambodia
On the final day of the training in SRWSA, imformation and opininons about water supply management and O&M were vigorously exchanged between trainees and SRWSA staff.

Appendix-4

- Procured Equipment List -

Appendix－4：Procured Equipment List

Items	Date (y/m)	Nos	Place	Situation
Generator	2010.5	2set	DWSS Office	Used for regular works at the office
Digital Camera	2010.4	1set		Used for document preparation
Scanner	2010.4	1set		Used for document preparation
Projector	2010.4	1set		Used for workshops/conferences
Photocopy machine	2010.4	1set	3Offices(DWSS, Morang/JhapaWSSDO)	Used for document preparation
PC	2010.4	4set		
Printer	2010.4	3set		
UPS	2010.4	3set		Used for regular works at the offices
Water Quality Test Kit	2011.7	1set	DWSS Central Laboratry, Morang/Jhapa WSSDO, 3WUSCs	Used for OJT at DWSS Central Lab, Morang/Jhapa WSSDOs and 3WUSCs Offices
Electric Spare parts for panel	2012.2	1set	GauradhaWUSC	Replacement of the parts
Mechanical jack (for HDPE pipe jointing)	2012.3	2set	Morang/JhapaWSSDO Offices	Used for OJT of Water Distribution Facility and managed properly by WSSDOs staffs
Automatic die set 2" to 3"	2012.3	2set		
Chain Wrench 48"	2012.3	2set		
Pipe wrench 48"	2012.3	5set		
Pipe cutter different size (electric)	2012.3	2set		
Grander machine (electric)	2012.3	2set		
Electrical Mechanical tool box	2012.3	5set	Morang/Jhapa WSSDO Offices, 3WUSCs	Used for OJT of Mechanical and Electrical Facility and managed properly by the staffs
Goti Wrench (socket wrench)	2012.3	5set		
Generator	2012.12	1set	Morang/Jhapa WSSDO Offices	Used for regular works at the offices and OJT given by the Experts
Water Quality Test Kit	2012.7	1set	DWSS Central Laboratory, Morang/JhapaWSSDO Offices, 3WUSCs	Used for OJT at DWSS Central Lab, Morang/Jhapa WSSDOs and 3WUSCs Offices
Net for aeration tank	2012.11	1set	Gauradha WUSC	Replacement of the parts
Mobile ultrasonic flow meter	2012.12	1set	DWSS Office	Used for OJT and managed by DWSS staff
Clamp Meter	2012.8	5set	Morang/Jhapa WSSDO Offices, 3WUSCs	Used for OJT of Mechanical and Electrical Facility and managed properly by the staffs
Chain Pully 3 Ton	2012.9	5set	Morang/JhapaWSSDO Offices, 3WUSCs	Used for pump and pipe maintenance at the sites and managed properly at the offices
Electric heating plate	2012.6	2set	Morang/Jhapa WSSDO Office	Used for pipe welding and OJT and managed properly at the offices
Welding machine with generator	2012.6	2set		
Pipe Drill	2012.9	5set	Morang/JhapaWSSDO Offices, 3WUSCs	Used for pipe installation and OJT and managed properly at the offices
Rubber expansion joint	2012.7	1set	3 WUSCs	Used for OJT and replacement of the parts
Water level tube/Flow Cell	2012.7	1set	Mangadha WUSC	Replacement of the parts

Appendix-5

- Operational Expenses from Japanese side -

Appendix－5　Operational Expenses from Japanese side

Unit: JPY

Item	1st year	2nd year	3rd year	Total
Base Line Survey and Capacity Assessment (Sub-contract)	923,000	-	-	923,000
Training on Peace Building/ Conflict Management (Sub-contract)	1,111,000	-	1,592,687	2,703,687
C/P Training in Japan (a total of 8 personnel)	7,278,086	588,243	-	7,866,329
General Administration Fee	2,938,000	5,132,000	14,176,000	22,246,000
Total	12,250,086	5,720,243	15,768,687	**33,739,016**

Note 1: The 1st year is from January to September 2010. The 2nd year is from January 2011 to March 2012. The 3rd year is from June 2012 to September 2013.

Note 2: The general administration fee of the 3rd year is as of September, 2013.

Appendix-6

- The 3rd Country Training Materials –

KINGDOM OF CAMBODIA
NATION RELIGION KING

THE PROJECT FOR CAPACITY DEVELOPMENT
ON
WATER SUPPLY IN SEMI-URBAN AREAS IN NEPAL

TRAINING REPORT

WATER SUPPLY MANAGEMENT FOR IMPROVEMENT OF TECHNICAL SKILL AND KNOWLEDGE OF LOCAL WATER SUPPLY UTILITIES IN NEPAL

BY

PHNOM PENH WATER SUPPLY AUTHORITY
(PPWSA)

DECEMBER, 2012

CONTENT

1. Introduction

According to the contract agreement on The Project for The Project for Capacity Development on Water Supply in Semi-Urban Areas in Nepal Between NJS Consultants Co., Ltd. (NJS) and Phnom Penh Water Supply Authority (PPWSA). PPWSA agreed to arrange a training course about **"Water Supply Management for Improvement of Technical Skill and Knowledge of Local Water Supply Utilities in Nepal".**

The scope of the training service is in-class training and field training with relevant training materials and equipment according to the schedule provided.

2. Training Schedule

The training course was designed for 5 days (December, 03rd – 07th 2012) (See Annex 1)

	Objective	Trainer	Type of Training
1	Human Resource Management	Mr. Khut Vuthiarith	*In class training*
2	Business Management	Mr. Long Naro	*In class training*
3	Water Treatment Plant (1)	Mr. Tann Bunneth	*In class & Field training*
4	Water Treatment Plant (2)	Mr. Kem Kanvicheth	*In class & Field training*
5	Water Quality	Mr. Keo Heng	*In class training*
6	Distribution Facility	Mr. Pheng Ty	*In class & Field training*
7	Water Meter	Dr. Chea Visoth	*In class & Field training*

3. Training Facilitators

The training course was facilitated by the following experts:

1.	Mr. Oniki Sartoru	Senior Engineer of NJS	JICA Expert
2.	Dr. Chea Visoth	Vice General Director	Trainer
3.	Mr. Khut Vuthiarith	Vice General Director	Trainer
4.	Mr. Long Naro	Vice General Director	Trainer
5.	Mr. Pheng Ty	Deputy Director	Trainer
6.	Mr. Tan Bunneth	Chief of Cham Karmorn WTP	Trainer
7.	Mr. Kem Kanvicheth	Vice Chief of Electrical Office	Trainer
8.	Mr. Keo Heng	Chief of Laboratory	Trainer

4. Training Content

The content of this course focuses on:

A. Human Resource Management

- Restructuring.
- Model managers.
- Staff capacity building.
- Motivation evaluation.
- Recruitment process.

B. Business Management

- Management change / PPWSA transformation.
- Reducing NRW.
- Increase production to cover demand.
- PPWSA's mission and vision.
- External finance support.
- Collection efficiency.

C. Water Treatment Plant (1)

- Summary of Phum Prek WTP.
- Summary of facilities and water flow.
- Maintenance manual of each facility.
- Role of the staff.
- Check and maintenance of facilities.

D. Water Treatment Plant (2)

- Safety work.
- Periodical Checking.
- How to use measuring machine.
- Basic of Sequence Circuit.

E. Water Quality

- Objective of water quality management.
- Water quality criteria.
- Frequency of sampling and water analysis.
- Water quality analysis methods.
- Data management.
- Disclosure of information.

F. Distribution Facilities

- Objective of water supply maintenance.
- Distribution facilities maintenance.
- Incentive and Penalty.
- Conclusion.

G. Water Meter

- Why water meter?
- Choose the RIGHT water meter.
- Quality control at delivery.
- Water meter and Service connection.
- Ensuring and accuracy of water meter.
- 10 attributes of effectively managed water utilities.
- Pillars of water business.

5. List of Trainees

All trainees are listed in Annex 2.

6. Training Implementation

6.1 Training Activities

- **Day 1**
  In the morning, all the trainees were invited to introduce themselves and informed about the training schedule. After that, Mr. Khut Vuthiarith delivered the orientation where they could learn the PPWSA's background and reform history, and the lecture on Human Resource Management covering staff capacity building, motivation program, performance evaluation and recruitment process. In the afternoon, Mr. Long Naro facilitated the lecture on Business Management, mainly focusing on the NRW reduction, expansion of production facilities to cover the water demand, and the collection efficiency.
- **Day 2**
  In the morning, the trainees learned about Water Treatment Process (1) facilitated by Mr. Tan Bounneth. After the session, they had a visit to Phum Prek water treatment plant, located inside PPWSA's headquarter complex, where they could see the real facilities, the operation and the line of water production, along with many questions. Then, they moved to laboratory to see the practice of water quality control and management, ranging from raw water to clean water. The afternoon session started with the lecture on Water Treatment Plant (2) trained by Mr. Kem Kanvicheth, followed by the visit to Chroy Changwar water treatment plant and a demonstration on periodical checking program, how to use the testing machine, etc.
- **Day 3**
  In the morning, as a facilitator, Mr. Keo Heng provided the trainees with theory on Water Quality whereas Mr. Pheng Ty gave the lecture on Distribution Facilities in the afternoon, emphasizing the maintenance of distribution facilities.
- **Day 4**
  In the morning, the trainees were led by Mr. Pheng Ty to visit telemeter panel on site (outside PPWSA) and then led by Mr. Om Athorous to visit the metering worksite in the outskirts. In the afternoon session, the lecture on Water Meter was delivered by Dr. Chea Visoth, enabling the trainees to understand about how to choose the right meter, meter accuracy control, service connection and some more points related to Business Management. At the end of the session, there was an observation to see the meter test bench, where they leaned about its operation, accuracy testing, and so on.
- **Day 5**
  In the morning, the trainees were allowed to visit Niroth water treatment plant (phase 1) with a capacity of 13,000m3/day, which is under construction, as well as the site of transmission pipelines installation done by PPWSA's own staff. In the afternoon, all the trainees attended the wrap-up and discussion session with the participation from all the trainers, JICA experts and a representative from Ministry of Industry, Mines and Energy (MIME), in which they could not only share their knowledge and experience, but also receive a lot of feedback and recommendations. At last, a certificate of completion was delivered to each trainee.

6.2 Training Evaluation

All the 12 trainees evaluated that the course content was quite understandable providing new knowledge, except one. He argued that its usefulness and applicability were limited for their job.

All the 8 trainees who did the evaluation proved that the trainers' interactions were positive and fruitful – their communication with the participants was good and the explanation was clear and understandable. Furthermore, time for session, discussion and demonstration was enough.

All the 10 trainees who evaluated the course indicated that the training materials provided were advantageous and understandable.

At last, all the 9 trainees participating in the evaluation acknowledged that the training management, especially in the session environment including voice, volume, visibilities, etc., was good enough.

The summary and individual training evaluations are in Annex 3.

7. Conclusion and Recommendations

Overall, the trainees were dynamic during the class. Knowledge and experience were shared between the trainers and the trainees, in line with the exchange of Q&A. Most importantly, the site visit, observation and demonstration were highlighted enabling the trainees to quickly understand the theory they learned in the class. With the 5 days' training course, they can adapt the gained knowledge and know-how for their performance at the water supply utilities in their home Nepal in the future.

Annex

Annex 1 : Training Schedule

Annex 2 : Attendance List

Annex 3 : Training Evaluation

Annex 4 : Photos

Annex 5 : Certificate

Annex 1

Annex 1

Kingdom of Cambodia
King Religion Nation

Phnom Penh Water Supply Authority

Training Schedule

	Day	Administrative Section		Practical Section
Day 1	Dec 03 (Mon)	9.00 - 12.00	Orientation & Human Resource Management *Mr. Khut Vuthiarith*	
		1.30 - 4.30	Business Management *Mr. Long Naro*	
Day 2	Dec 04 (Tue)	9.00 - 12.00	Water Treatment Plant (1) *Mr. Tan Bunneth*	Phum Prek WTP
		1.30 - 4.30	Water Treatment Plant (2) *Mr. Kem Kanvicheth*	Chroy Changwar WTP
Day 3	Dec 05 (Wed)	9.00 - 12.00	Water Quality *Mr. Keo Heng*	
		1.30 - 4.30	Distribution Facility *Mr. Pheng Ty*	
Day 4	Dec 06 (Thu)	9.00 - 12.00		HC & Water Meter *Mr. Pheng Ty & Mr. Attharos*
		1.30 - 4.30	Water Meter *Dr. Chea Visoth*	Water Meter Accuracy
Day 5	Dec 07 (Fri)	9.00 - 12.00		Niroth WTP & Main pipe laying
		1.30-4.30	Discussion & Certificate	

Annex 2

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Region Nation King

Date: December, 03rd 2012
Time : 9h00 to 12h30

Attendance list

" Human Resource Management "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer		
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer		
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Region Nation King

Date: December, 03rd 2012
Time : 14.30 to 16.30

Attendance list
" Business Management "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer	Rajeeb	
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer	Bhandari	
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Region Nation King

Date: December, 04th 2012
Time : ....9h00....to ....11h30....

Attendance list
" Water Treatment Plant (1) "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer		
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer		
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Region Nation King

Date: December, 04th 2012
Time : 13.30 to 14.30

Attendance list

" Water Treatment Plant (2) "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer		
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer		
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

Kan Kanvichith

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Region Nation King

Date: December, 05th 2012
Time : 9h00 to 17h00

Attendance list
" Water Quality Management "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer		
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer		
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

Keo Heng

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Region Nation King

Date: December, 05th 2012
Time : 14.30 to 16.30

Attendance list
" Distribution Facilities "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer		
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer		
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

PHENG TY

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Date: December, 06th 2012
Time : 1:30 to 5:00

Attendance list
" Water Meter "

No	Name	Position	Signature	Mark
1	Mr. Teeka Ram Pandey	Under Secretary (Legal)		
2	Mr. Bishnu Prassad Jnawali	Under Secretary (Finance)		
3	Mr. Deepak Puri	Senior Divisional Engineer		
4	Mr. Rajeeb Ghimire	Senior Divisional Engineer		
5	Mr. Sudarshan Bhandari	Senior Divisional Engineer		
6	Ms. Binu Bajracharya Kunwar	Divisional Engineer		
7	Mr. Dhruva Mani Pauel	Senior Divisional Engineer		
8	Mr. Ganesh Bahadur Thapa	Division Chief (Morang)		
9	Mr. Binod Kumar Agrawal	Division Chief (Jhapa)		
10	Mr. Anoj Upadhayay	Engineer		
11	Mr. Babu Kaji Shrestha	Engineer		
12	Mr. Pramod Kumar Dutta	Engineer		

Trainer's Signature

Annex 3

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Evaluation Summury of

" Water Supply Management for Improment of Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1	**What is his/her purpose of participation in this course?**					
	- To Strength then knowledge on business plan of water supply project, experience sharing - To replicate the positive aspects of training in Nepalese context. - The purpose of this course seems to give information and to experience how the PPWSA operated its drinking water supply system in capital area of Cambodia. - To understand about the successful operation of a water supply system for a whole city with fully consumers satisfaction. - To acquire knowledge on the masterful management and water supply utilities. - My purpose in this course fully electromechanical and other necessary in technical parts theory 20% and practical 80%. It should be nice. Skill and knowledge improve and must be including sanitation pert is and other water quality cabin practical all parameters. - I am purpose the fully and detail of electromechanical workshop it is utilities in our project but course contain as not very theoretical clas it must be very useful for practical class like 25% theoretical 75% practical. - My purpose to participate in this course to know about working process of Phnom Penh Water Supply authority and how this project successful. And also I want to share the knowledge to owe project in Nepal. - Purpose of participant is how PPWSA's success story can be applied in water supply project of Nepal. - Exposure to the success of PPWSA and find the ways to use it contextually in our small water utilities. - To gain new knowledge of whole water supply management at all level to gain or achieve the objective of the organization. - The main purpose of participant is to know about the management, technical aspect which are more effective and practical for our job fiel The key thing which are learned from this training are very useful to move a project sustainability, the learned subject matters are practically suitable for appreciate in our project in our country.					
		V.Good	Good	Fair	Poor	Total
2	**Course contents**	**25.00%**	**66.67%**	**6.25%**	**2.08%**	**100.00%**
	- The Contents are easy to understand.	58.33%	41.67%	0.00%	0.00%	100.00%
	- I received new knowledge.	8.33%	91.67%	0.00%	0.00%	100.00%
	- They are useful for my job.	16.67%	66.67%	16.67%	0.00%	100.00%
	- I am able to apply them in my work.	16.67%	66.67%	8.33%	8.33%	100.00%
	Comment - Some lectures should be prepared in depth. - I did not found any theoretical materials about drinking water treatment plant. - Course contents were very good. It would be more effective if we could know about the present financial status of this project in more detailed. - Some of the contents and its depth are prepared without analyzing the target group; however all of them are good. - It is sufficient, I am tried to apply them it my working. Our country has not autonomous system of water supply, it is undertaking government but we will try and motivate them. - All information are given but information are differ sometime. Trainers are try to give new information and easy to understand. I think course contents for lower level staff but participants are high level and administrative level. So course and participants are not match. - Course contents need more duration than allowed in this training. - There was success stories much talked about, but the business plan was not much shared. Course content would have been more suitable if some object of management was also discussed. - Useful to increase my knowledge but I can try to apply only, culture and environment. - Course contents are more beneficial for us. These course contents are very useful to avoid the many problems and rising in our project.					
3	**Trainer**	**43.33%**	**36.67%**	**0.00%**	**0.00%**	**80.00%**
	- Trainer explained clearly and understandbly.	66.67%	33.33%	0.00%	0.00%	100.00%
	- Trainer answered trainees' question clearly.	66.67%	33.33%	0.00%	0.00%	100.00%
	- It was good communication between trainer and trainees.	50.00%	50.00%	0.00%	0.00%	100.00%
	- How well did you understand the trainer's explanation?	33.33%	66.67%	0.00%	0.00%	100.00%

	Comment - The trainers tried their best to share their experience. - All trainers were hold working and laborious, they did their best. - Since the field of work and background as similar and day to day facing were raise d by the presenter, no difficult to understand. - Simple presentation, easy to understand so I think trainers are very good and helpful for us. - Trainees are well trained and experienced. - The subject taught to us are appreciate to project in our country.					
4	**Materials**	**31.25%**	**18.75%**	**0.00%**	**0.00%**	**50.00%**
	- How advantageous are the materials provided by trainers?	50.00%	50.00%	0.00%	0.00%	100.00%
	- I receiv ed new knowledge.	75.00%	25.00%	0.00%	0.00%	100.00%
	Comment - Some theoretical material should be included in the training like this. - All training materials were advantages for us. Couse under business management (real) would be better to incorporeal. - Training materials are good. Sufficient for teach and understandable. I think it is better color printed hand out should provide to participa - Materials like AV, document etc… should also to be useful. - Materials provided were very qualitative. They are concise and to the points. - The handout provided to us are useful and interesting.					
5	**Training Management**	**50.00%**	**25.00%**	**0.00%**	**0.00%**	**75.00%**
	- Time for session was enough.	58.33%	41.67%	0.00%	0.00%	100.00%
	- Time for discussion and practice was enough.	58.33%	41.67%	0.00%	0.00%	100.00%
	- Session environment (voice, volume, desk space, visible, etc.)	83.33%	16.67%	0.00%	0.00%	100.00%
	Comment - Time management was good. - The allocated time is sufficient, I feel comfortable during the training period. - Training management is very good. I am highly appreciated to the training management. - Training management was excellent. - Training management is very good.					
6	**Comment**					
	- Training contents did not match the level of participants. - The dedication, discipline and determinately of organization and its staffs are inspiring may they can use in the level of my organization and individual level too. The overall impression of the program is 95% successful in my perception. - Training management should be aware for the training course contents and the training participant should be matched. - Overall training was useful for us and in can be applicable in WSP of Nepal as a model. - The training course was well designed. Trainers were good and management was excellent. In overall the training was able to deliver its objective successfully. - If this training design for management at all level, which is very much useful for use in aspect of hole organization. - Capacity building training is very necessary for us. The difference topics in this training are more beneficial for us. Such type of training should be given for us at time interval. Lecture method and demonstration method as well as field visit are more interesting.					

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

To Strengthen knowledge on business plan of water supply project, Experience sharing.
- To replicate the ~~Positive~~ aspects of traing in Nepalese Context.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

Some leetures Should be prepared in depth

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☐	☑	☐	☐
3.2- Trainer answerd trainees' question clearly.	☐	☑	☐	☐
3.3- It was good communication between trainer and trainees.	☑	☐	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☐	☑	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☐	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☐	☐	☐

Comments :

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☐	☑	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments :

6- Comments :

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

The purpose of this course seems to give information and to experience how the PPWSA operated its drinking water supply system in capital area of Cambodia.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

I did not found any theoritical materials about drinking water treatment plant.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☑	☐	☐	☐
3.4- How well did you understand the trainer's explanation?	☑	☐	☐	☐

Comments :

The trainers tried their best to share their experience

December, 06th 2012

1/2

2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☐	☑	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☑	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☐	☐	☐

Comments :

some theoritical material should be included in the training like this.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments : No comment

6- Comments :

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

To understand about the successfull operation of a Water supply system for a whole city with fully consurmers satisfaction.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

Course contents were very good. It would be more effictive. if we could know about the present financial status of this project in more detail.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☐	☑	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

All Trainers ~~were~~ were hard worker and laborous. They did ~~their~~ their best.

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☑	☐	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☐	☑	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☑	☐	☐

Comments :

All traiing materials were advantageous for us. Course under business management (real) would be better to incorporate.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☐	☑	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments :

Time management was good.

6- Comments :

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

To acquire knowledge on the successful management of water supply utilities.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☑	☐	☐	☐
3.4- How well did you understand the trainer's explanation?	☑	☐	☐	☐

Comments :

December, 06th 2012

1/2

4

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☐	☑	☐	☐
4.2- Are the meterials understandable?	☐	☑	☐	☐
4.3- What materials did the trainers use for their teaching?	☐	☑	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☐	☐	☐

Comments :

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☐	☑	☐	☐
5.2- Time for discussion and practice was enough.	☐	☑	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☐	☑	☐	☐

Comments :

6- Comments :

- Training contents did not match the level of participants.

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

to learn the sucess story on implimentati of water and treatment of water in the urban and semi urban area. The operation and maintenance system that make project sustainable. The business management, preperati and implementati of SOP in Imp and O/M of water and treatment system.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

Some of the content and its depth are prepared without analysing the target group however, all of them are good.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☑	☐	☐	☐
3.4- How well did you understand the trainer's explanation?	☑	☐	☐	☐

Comments :

since the field of work and background is similar and day to day facing problem were raised by the presenter, no difficulty to understand.

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☑	☐	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☑	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☑	☐	☐

Comments :

material As such are very good, few of them ~~are~~ were not in depth as expected

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments :

The allocated time is inefficient, & I feel comfortable during the training period.

6- Comments :

The dedication, discipline and determination of organization and its staffs are inspiring. May things can rise in the level of my organization and individual level. Too. The overall impression of the program is 95% Sucessfull in my perception.

Thanks You !

December, 06th 2012

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Nation Region King

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

My propise in this course fully electromechanical and other Nessary wsa in Technical parts, Theory 20% and practical 80%. It should be like. and skill and knowledge Improve and must be Including Sanitation parts. and other water quality, lab in practical. all parameters.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☐	☑	☐	☐
2.2- I received new knowledge.	☑	☐	☐	☐
2.3- They are useful for my job.	☑	☐	☐	☐
2.4- I am able to apply them in my work.	☑	☐	☐	☐

Comments

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☐	☑	☐	☐
3.3- It was good communication between trainer and trainees.	☐	☑	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☑	☐	☐	☐
4.2- Are the meterials understandable?	☐	☑	☐	☐
4.3- What materials did the trainers use for their teaching?	☐	☑	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☑	☐	☐	☐

Comments :

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☐	☑	☐	☐
5.2- Time for discussion and practice was enough.	☐	☑	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments :

6- Comments :

Thanks You !

December, 06th 2012

2/2

Phnom Penh Water Supply Authority

Kingdom of Cambodia
Nation Region King

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

I am purbase the fully & Detail of Electromechanical workshob
It is very utilise ~~is~~ in our project ~~Bett~~ But course conteins
are Not very theoritical class it most be very use full for
practical class Like 25% theoritical & 75% practical.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☐	☑	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☐	☑	☐
2.4- I am able to apply them in my work.	☐	☐	☐	☑

Comments

It is sufficent, I am try to abbly them it my work in
Sermall. ~~#~~ our country has not Atomations ~~is~~ system
of water supply. It is under taking Government But we
will try & Motivate them. Mins. WUC. water users committee

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☐	☑	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☐	☑	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

No comment

December, 06th 2012 1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☐	☑	☐	☐
4.2- Are the meterials understandable?	☐	☑	☐	☐
4.3- What materials did the trainers use for their teaching?	☐	☑	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☐	☐	☑

Comments :

No comment

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☐	☑	☐	☐
5.2- Time for discussion and practice was enough.	☐	☑	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☐	☑	☐	☐

Comments :

No comment

6- Comments :

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

My purpose to participate in this Cource to know about working process of Phnom penh water supply authority and how this Project Cucessful. And also I want to share the Knowledge to our Project in Nepal.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments All information are given but information are differ for Sometime. Trainers are ~~try~~ to give new information. ~~And~~ easy to understand. I ~~think~~ think Course Contents for lower Level Staff but participants are hiju Level and administ-tive Level. So Course and participants are not match.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☑	☐	☐	☐
3.4- How well did you understand the trainer's explanation?	☑	☐	☐	☐

Comments : Simple Presentation, easy to understand. So I think Trainers are very good and helpful for us.

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☑	☐	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☑	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☑	☐	☐	☐

Comments: Training materials are good. Sufficient for teach and understandable. I think it is better Colour printed handout should provided to participatent.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments: Training managment is very good. I am highly appriciate to the Training managment.

6- Comments :

Training managment should be aware for the training course coontants and the training participants should be matched.

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

Purpose of participation is how PPWSA's success story can be applied in water supply Projects of Nepal.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☐	☑	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

Course contents need more duration than allowcated in this training.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☐	☑	☐	☐
3.2- Trainer answerd trainees' question clearly.	☐	☑	☐	☐
3.3- It was good communication between trainer and trainees.	☑	☐	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

Trainers theoretical concept a bit poor.

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☐	☑	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching? Power Point	☐	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☐	☐	☐

Comments :

Materials like AV, Documentary etc. should also to be used.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☐	☑	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments :

Training Management was excellent.

6- Comments :

Overall Training was useful for me and it can be applicable in WSP of Nepal as a Model.

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

Exposure to the Success of PPWSA and find the ways to use it contextually in our small water utilities.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☐	☑	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☐	☑	☐
2.4- I am able to apply them in my work.	☐	☐	☑	☐

Comments There was Success Stories much talked about, but the business plan was not much shared. Course content would have been more suitable if some aspect of management was also discussed.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☐	☑	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

Trainers are well trained and experienced.

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☑	☐	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☐	☑	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☐	☐	☐

Comments : Materials provided were very qualitative. They are concise and to the points.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments : Training management was excellent.

6- Comments :

The training course was well designed. Trainers were good and management was excellent. In Overall the training was able to deliver its objective successfully.

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

To gain New Knowledge of whole water Supply management at all level to gain or achieve the objective of the organization.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☐	☑	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☐	☑	☐	☐
2.4- I am able to apply them in my work.	☐	☑	☐	☐

Comments

useful to increase my knowledge but I can apply to only. culture and environment

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☐	☑	☐	☐
3.2- Trainer answerd trainees' question clearly.	☐	☑	☐	☐
3.3- It was good communication between trainer and trainees.	☐	☑	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments :

NA

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☐	☑	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☑	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☑	☐	☐	☐

Comments :

If provide all the presentation in pendrive is be Help.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☐	☑	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments :

NA

6- Comments :

If this training ~~[illegible]~~ design for management at all level, which is very very much useful for us in aspect of hole organization.

Thanks You !

December, 06th 2012

2/2

Kingdom of Cambodia
Nation Region King

Phnom Penh Water Supply Authority

Trainee's Evaluation of

" Water Supply Management for Improment of "

Technical Skill and Knowledge of Local Water Supply Utilities in Nepal "

1- What is his/her purpose of participation in this course?

The main purpose of participation is to know about the management, technical aspects which are more effective and practicable for our job field. The key things which are learned from this training are very useful to move a project sustainability, the learned subject-matter are practically suitable for application in our project in our country.

2- Course contents	V.Good	Good	Fair	Poor
2.1- The Contents are easy to understand.	☑	☐	☐	☐
2.2- I received new knowledge.	☐	☑	☐	☐
2.3- They are useful for my job.	☑	☐	☐	☐
2.4- I am able to apply them in my work.	☑	☐	☐	☐

Comments: Course Contents are more beneficial for us. These Course Contents are very useful to avoid the many problems arising in our project.

3- Trainer	V.Good	Good	Fair	Poor
3.1- Trainer explained clearly and understandbly.	☑	☐	☐	☐
3.2- Trainer answerd trainees' question clearly.	☑	☐	☐	☐
3.3- It was good communication between trainer and trainees.	☐	☑	☐	☐
3.4- How well did you understand the trainer's explanation?	☐	☑	☐	☐

Comments : The subject teached to us are applicable to project in our Country.

December, 06th 2012

1/2

4- Materials	V.Good	Good	Fair	Poor
4.1- How advantageous are the materials provided by trainers?	☑	☐	☐	☐
4.2- Are the meterials understandable?	☑	☐	☐	☐
4.3- What materials did the trainers use for their teaching?	☑	☐	☐	☐
4.4- What extra materials should the trainers use to improve their teaching?	☐	☑	☐	☐

Comments : The handouts provided to us are useful and interesting.

5- Training Management	V.Good	Good	Fair	Poor
5.1- Time for session was enough.	☑	☐	☐	☐
5.2- Time for discussion and practice was enough.	☑	☐	☐	☐
5.3- Session environment (voice, volume, desk spece, visible, ect.)	☑	☐	☐	☐

Comments : Training management is very good.

6- Comments :

Capacity building training is very necessary for us. The different Topics in this training are more beneficial for us. Such type of training should be given for us at time interval. Lecture method and demonstration method as at well as site visit are more interesting.

Thanks You !

December, 06th 2012

2/2

Annex 4

Day 1

Human Resource Management




Business Management




Day 2

Water Treatment Plant (1)




Water Treatment Plant (2)




Day 3

Water Quality




Distribution Facilities




Day 4

Site Visited (House Connection & Distribution Facility)

Day 4




Water Meter




Day 5

Site Visited (Niroth WTP & Main Pipe Laying)




Discussion and Certificate




Annex 5

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. BINOD KUMAR AGRAWAL

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. GANESH BAHADUR THAPA

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. DURUVA MANI PAUEL

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MS. BINU BAJRACHARYA KUNWAR

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. SUDARSHAN BHANDARI

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. RAJEEB GHIMIRE

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. DEEPAK PUN

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. BISHNO PRASSAD JNAWALI

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. TEEKA RAM PANDEY

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. ANOU UPADHAYAY

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)

Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. BABU RAM SHRESTHA

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Oniki
JICA Expert

Kingdom of Cambodia
Nation Religion King

Phnom Penh Water Supply Authority

Japan International Cooperation Agency

Certificate

This is certify that

MR. PRAMOD KUMAR DUTTA

has successfully completed the training course on

Water Supply Management for Improment of Technical Skill And Knowledge of Local Water Supply Utilities in Nepal

Facilitated by Phnom Penh Water Supply Authority (PPWSA)
Under fund of Japan International Cooperation Agency (JICA)
Phnom Penh
December, 03rd - 07th, 2012

Mr. Sim Sitha
General Director of PPWSA

Mr. Satoru Onitki
JICA Expert