**FEDERAL DEMOCRATIC REPUBLIC OF NEPAL**
**MINISTRY OF URBAN DEVELOPMENT**
**DEPARTMENT OF WATER SUPPLY AND SEWERAGE**

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

# FINAL REPORT

**October 2013**

**JAPAN INTERNATIONAL COOPERATION AGENCY**
**NJS CONSULTANTS CO., LTD.**

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| **Abbreviation** | **Definition** |
|---|---|
| | **Institutions/Organizations** |
| ADB | Asian Development Bank |
| B/S | Baseline Study |
| C/A | Capacity Assessment |
| CHRDU | Central Human Resource Development Unit |
| C/P | Counterpart |
| DWSS | Department of Water Supply and Sewerage |
| ERMSO | Eastern Regional Monitoring and Supervision Office |
| GDP | Gross Domestic Product |
| GoN | Government of Nepal |
| IC/R | Inception Report |
| JCC | Joint Coordinating Committee |
| JICA | Japan International Cooperation Agency |
| KTM | Kathmandu |
| MAT | Management Advisory Team |
| MET | Monitoring Evaluation Team |
| MIT | Maintenance Inspection Team |
| M/M | Minutes of Meeting |
| MoPPW | Ministry of Physical Planning and Works |
| MoUD | Ministry of Urban Development |
| OJT | On-the-job training |
| O&M | Operation and Maintenance |
| OVI | Objectively Verifiable Indicator |
| PDM | Project Design Matrix |
| PMC | Project Management Committee |
| P/O | Plan of Operation |
| PWT | Project Work Team |
| R/D | Record of Discussion |
| RMSO | Regional Monitoring and Supervision Office |
| SEIU | Sector Efficiency Improvement Unit |

| | |
|---|---|
| SOP | Standard Operational Procedure |
| ToT | Training of Trainers |
| TSC | Technical Support Center (ADB) |
| UNICEF | United Nation Children's Fund |
| WASMIP | Water Supply Management Improvement Project |
| WHO | World Health Organization |
| WTP | Water Treatment Plant |
| WSSDO | Water Supply and Sanitation Division Office |
| 2 WSSDOs | Morang WSSDO, Jhapa WSSDO |
| WUSC | Water Users and Sanitation Committee |
| 3 WUSCs | Dhulabari WUSC, Gauradaha WUSC, and Mangadh WUSC |

## Location Map


## Water Facilities Constructed under Japanese Grant Aid in 2007 in Targeted Project Area

WTP at Dhulabari


Chlorine facility at Dhulabari

Iron-removal plant at Gauradaha

Chlorine facility at Gauradaha

Iron-removal plant at Mangadh

Chlorine facility at Mangadh

# Contents of Final Report

The project has completed all planned activities in compliance with the PDM to achieve the set project objectives. This Final Report includes details of the activities carried out in the target area and highlights on the final achieved from January 2010 to September 2013.

The 1st year activities of the Project started on February 14, 2010 upon arrival of JICA Experts in Nepal. The 1st JCC meeting was held in the end of February 2010 to get concurrence on the general approach and methodology stated in the Inception Report (IC/R) for the implementation of the Project.

The Project aims at capacity development on water supply in semi-urban areas in Nepal. It includes various planned activities such as capacity assessment for C/P organizations, training on monitoring system and operation method, preparation of the draft Standard Operational Procedures (SOPs) on O&M of water supply facilities, OJT to the 3 WUSCs (Dhulabari, Gauradaha and Mangadh WUSC) on O&M of water supply facilities and water quality management, educational campaign for water users coaching on the efficient water business management, and initiation of water supply utilities.

Almost all of the mentioned activities were instigated in the first year of Project implementation. Progress achieved on these activities on the first year was summarized in the Interim Report 1 prepared in September 2010.

The 2nd year activities started on January 14, 2011 when the JICA Experts arrived in Nepal again. The training and educating activities to the 3 WUSCs continued based on the draft SOPs, such as OJT on O&M of water supply facilities. Workshops were organized on water tariff collection, customer complaints management. The educational campaign and coaching on the business plan preparation were continued. Trainings were conducted for DWSS/WSSDO staff on water quality inspection and monitoring. Following these activities, second liaison conference was held for water supply utilities of Jhapa and Morang districts, in which the 3 WUSCs shared their learning, knowledge and experience gained through project activities. Furthermore, the drafts of “Small and Medium-Sized Water Supply Management Model” and “Small and Medium-Sized Water Supply Support Model” were prepared in close consultation with DWSS. A workshop was held to introduce the “Water Supply Management Model” to WUSCs. 13 WUSCs of Jhapa and Morang districts participated in the workshop and got acquainted with the concepts of the Management model. The concept of the Management Model was also disseminated to other districts through Regional Workshops conducted by DWSS/RMSOs in other regions of the country. The JICA Mid-term Review Team was dispatched to Nepal in November 2011 in order to conduct the mid-term review of the Project. The outcomes of the evaluation were disclosed to the JCC held on 22 November 2011. The Mid-Term Review Team provided recommendations to increase efficiency in implementation to achieve the project goals, and also recommended to modify PDM. The recommendations were accepted by the JCC.

Progress achieved in the second year of implementation was summarized in the Project Completion Report of second year prepared in March 2012.

Following the second year activities, the third year activities of the Project started on June 5, 2012 upon arrival of JICA Experts in Nepal. The 3rd PMC meeting was held in the end of June 2012 to get concurrence on general approach and methodology for implementation of the Project presented in the third year Work Plan.

The planned activities in the third year included refresher training to the three WUSCs on O&M of water supply facilities. A training plan was also prepared to provide technical assistance to other 17 WUSCs in Jhapa and Morang districts. Based on the plan, trainings were conducted on the O&M of water supply facilities including electro-mechanical equipment, water quality management, water meter management and preparation of business plan. The first draft of the Water Supply Management Model and Support Model, prepared in the second year has been reviewed, which was also presented to the targeted 20 WUSCs in the workshops conducted in July and November 2012.

Activities on the public awareness and public relations were carried out intensively. Information, news and articles related to the project activities were posted in the website of JICA and DWSS. Project Logo, pamphlet, leaflet, and poster were developed and distributed to the stakeholders in order to make them aware on the objectives of the project and to familiarize Project activities among them.

Under the planned activities, the Project organized a training program in Cambodia from 1st December to 14th December, 2012 as a third country training to C/Ps. The training was organized by respective Water Supply Authorities in Phnom Penh and Siem Reap. All together 12 C/P personnel from MUD, DWSS and WSSDOs had participated in the third country training program.

The JICA Terminal Evaluation Team was dispatched to Nepal in February 2013 in order to conduct the terminal evaluation of the Project. The outcomes of the evaluation were disclosed to the JCC held on 3 March 2013. The Terminal Evaluation Team provided recommendations to be sustainable and to disseminate the two Models for other districts. The recommendations were accepted by the JCC.

The Maintenance Inspection Team (MIT) and the Management Advisory Team (MAT) activities which are tools of the Support Model have commenced since January 2013. The MIT activity was conducted 4 times in total and was conducted by August 2013. The MIT outcomes were presented in the joint workshop held in August 2013. The MIT activity was conducted 3 times in total in order to formulate the business plan for WUSCs Management Model in Morang district. The Monitoring Evaluation Team (MET) activity was conducted to WUSCs by DWSS and WSSDOs in Morang/Jhapa districts. The result and evaluation were presented in 4th Monitoring & Evaluation Liaison Conference.

On 9th August 2013, the project sharing meeting was held to introduce the WASMIP Model and its achievement.

On 27th August 2013, a workshop for introduction of the Management Model and the Support Model was held in Biratnagar. There were 90 attendees from 14 WSSDOs in Eastern region and 30 WUSCs in Jhapa and Morang districts. The sharing workshop was held on 13th September 2013 at the DWSS conference room to introduce the Management Model and the Support Mode under the initiative of

DWSS. There were a total of 39 attendees including the attendees from other donors and organizations such as ADB, UNISEF, SWISS embassy, MWSDB (Melamchi Water Supply Development Board), TDF (Town Development Fund) and DOLIDAR (Department of Local Infrastructure Development and Rural Roads).

Finally, the WASMIP model was accepted and it was also accepted that DWSS shall develop a plan for the dissemination the model and utilizing human resources trained through the Project, and the PDM ver5.0 and the Final Report of the WASMIP were approved in the 6$^{th}$ JCC held on 27 September 2013.

# CHAPTER 1 OUTLINE AND ACHIEVEMENT OF THE PROJECT IMPLEMENTATION

## 1.1 Background of the Project

To secure safe drinking water is an urgent issue for the Government of Nepal (hereinafter referred to as "GoN") due to the deterioration in water quality together with an exponential increase in water demand, taking into consideration the recent population increase (population of 29,519,114 with growth rate of 2.095% estimated in 2008) and economical development ($1,200 per capita and growth rate of 2.5% of GDP estimated in 2007).

The selected transfer of ownership of the management and operation and management to the local bodies (municipalities and VDCs) was carried out in accordance to the "Local Self Governance Act" effectuated from 1999. However, local bodies and Water Users and Sanitation Committees (WUSCs) which are to take over the semi-urban waterworks including medium-scale urban areas have faced problems to overcome sound business management practices due to inadequate capacity and economic resources.

The Department of Water Supply and Sewerage (DWSS) under the Ministry of Urban Development (MoUD), conducts the budget arrangement for the facilities, to Medium scale Semi-urban area and rural communities. After the completion of construction works, the management and operation is transferred to the water supply utilities. However, since the organizational management and technical level of the water supply utilities in the medium-sized-scale semi-urban are still inadequate, support from the Water Supply and Sanitation Division will be required. However, the weakened support from RMSOs and WSSDOs has been an issue.

Under such background, the Government of Japan under the Grant Aid Program dispatched expert in charge of water policy as an advisor to the Ministry of Physical Planning and Works (MoPPW) (present MoUD) to carry out the improvement of urban water supply administration in parallel with promotional improvement, evaluation and construction of new water supply facilities throughout Nepal including semi-urban areas within the Katmandu Valley and in Jhapa and Morang districts, and other local areas. As a result, numerous issues such as vulnerability of water supply system, inadequate budget/ staffing, and the absence (insufficiency) of fiscal planning were manifested.

To increase the supply of safe drinking water in Nepal, technical improvements of water supply facilities and human resource development will be necessary. In order to enhance capacity of the said facilities, a clear set role of each organization along with capability strengthening of DWSS will be required. To achieve this objective, MoPPW (present MoUD) requested technical assistance from the Government of Japan.

Accepting such a request, JICA dispatched a Preparatory Study Team to Nepal on August 2008 and both countries agreed to conduct a Technical Assistance Project on the water supply utilities. This was conducted by WUSCs and DWSS /ERMSO /WSSDOs in two target districts (Morang and Jhapa) in

the Eastern area. The Record of Discussions (R/D) was signed and exchanged on 27th February 2009. The assistance on "The Project for Capacity Development on Water Supply in Semi-Urban Area" (hereinafter "the Project" or "WASMIP") is thus to be implemented based on this Agreement.

In February 2013, the terminal evaluation of the Project was carried out by the JICA Terminal Evaluation Team, and evaluation results were reported to the JCC which held on March 3, 2013. As a result of discussions the JCC agreed on the matters of evaluation result and recommendations.
The implementation of the Project was started in January 2010 and was completed by September 2013. As a wrap-up of the Project the final JCC was held on September 27, 2013. The draft Final Report was submitted to the JCC.

### 1.2 Objectives and Indicators of the Project

#### (1) Objectives of the Project

The objectives of the Project are:

a) To improve DWSS/WSSDOs' technical assistance capacity to conduct improvement programs in Morang and Jhapa independently.
b) To improve water services in 3 WUSCs through cooperative work between JICA Expert Team and DWSS.
c) To provide and facilitate DWSS activities aiming at strengthening technical assistance to WUSCs and improve water service of water business units.
d) To summarize enforcement process as a model/ manual/ others so that DWSS could expand the process in other water supply utilities.

#### (2) Overall Goals

1) Goal

DWSS technical support model for WUSCs established by the project will be disseminated to all over the country by MoUD (then MoPPW) and DWSS.

2) Indicators

a) 44 WUSCs (17 % of the total selected WUSCs) are strengthened by the support of DWSS.
b) The DWSS technical support model is reflected on the annual implementation plan of RMSOs and WSSDOs.

#### (3) Project Purpose

1) Goal

DWSS technical support system to WUSCs is improved in Morang and Jhapa districts.

2) Indicators

a) Based on the Technical Support Model established by DWSS/RMSO/WSSDO, workshop and training on "Small and Medium-sized Water Supply Management Model" are held at least one time and support system is introduced at other selected 9 WUSCs in Jhapa and 8 WUSCs in Morang districts.

b) The safe drinking water services provided by 3 WUSCs are improved in comparison to the beginning of the Project.

### (4) Project Output and Target Verifiable Indicators by PDM

The project output and target verifiable indicators are shown in **Table 1.1**

**Table 1.1 Project Output and Target Verifiable Indicators by PDM**

| Output | Verifiable Indicator |
|---|---|
| [Output 1] Basic information for the Project and necessary information for indicators are collected, and management of the Project is appropriately executed and monitoring is for appropriate water supply management is periodically implemented. | 1-1) PDM is revised.<br>1-2) Monitoring for indicators is regularly executed. |
| [Output 2] "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are developed as models for WSSDO/ERMSO and WUSC. | 2-1) "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are completed. |
| [Output 3] Model of Output 2 is disseminated in Jhapa/Morang districts. | 3-1) The other 17 WUSCs in Jhapa/Morang districts develop draft implementation plans to introduce "Small and Medium-sized Water Supply Management Model". |

### (5) Project Area (Target)

1）Project Area:

The Project area includes some of the water supply utilities selected in Jhapa and Morang districts. The primary WUSCs selected for water service improvements through cooperative work between JICA Expert Team and DWSS are

1. Dhulabari
2. Gauradaha, and
3. Mangadh

The other 17 WUSCs selected by DWSS in Jhapa and Morang districts for capacity development and service improvement through technical assistance from DWSS/WSSDOs are as follows:

| Jhapa district | Morang district |
|---|---|
| 1. Kakarbhitta | 1. Urlabari |
| 2. Budhabare | 2. Pathari |
| 3. Birtamode | 3. Salakpur |
| 4. Chandragadhi | 4. Rangeli |
| 5. Sanischare | 5. Jhorahat |
| 6. Topgachhi | 6. Haraicha |
| 7. Lakhanpur | 7. Tankisinuwari |
| 8. Damak | 8. Letang |
| 9. Surunga | |

### 1.3 The Project Major Achievement

**【Output 1】**

Basic information for the Project and necessary information for indicators are collected, and management of the Project is appropriately executed and monitoring for appropriate water supply management is implemented periodically.

**【Summary of Achievements】**

The Project is ultimately managed by the JCC and the PMC. The JCC was held 6 times and the PMC was held 4 times.

At the 2nd JCC Meeting, revision of PDM was approved (PDM ver.3). The percentage of supported WUSCs by DWSS was defined as 17% (i.e. 44 WUSCs) for the overall goal and 100% of target 2 districts (i.e. 20 WUSCs including the 3 WUSCs) for the Project goal.

At the 4th JCC Meeting, the mid-term review team proposed to revise the PDM ver.3 to clarify the framework of the Project, and it was approved (PDM ver.4).

At the 6th JCC Meeting, the PDM ver.4 and PO ver.4 were revised to change the organization name (i.e. from MoPPW to MoUD) .

The monitoring of water supply management has been implemented by the project evaluation team consisting C/P of DWSS, ERMSO and WSSDO. The monitoring results were shared among target WUSCs at the monitoring/evaluation liaison conference. At present, such monitoring was implemented 3 times and the monitoring/evaluation liaison conference was held three times.

The 4th Monitoring and Evaluation was implemented in July 2013 on the initiatives of C/P while the experts were away. The attendees from WSSDOs/WUSCs in the liaison conference shared their perception that WASMIP Model, composed of “Small and Medium-sized Water Supply Management Model” and “Small and Medium-sized Water Supply Support Model”, were effective in WUSCs’ facility O&M and running their services efficiently and committed that they would utilize it onward.

In addition, it was agreed that subcommittees would be organized after the completion of the project for the purpose of holding liaison conferences successively**,** implementing the monitoring regularly and setting up conferences to discuss and share their knowledge.

**【Output 2】**

"Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are developed as models for WSSDO/ERMSO and WUSC.

**【Summary of Achievements】**

Draft of "Small and Medium-sized Water Supply Support Model" was prepared for DWSS/WSSDO, and draft of "Small and Medium-sized Water Supply Management Model" was prepared for WUSCs. The Standard Operation Procedure (SOP), which is an element of the Management Model, has been revised through OJT/workshop conducted so far. Contents meeting the actual situation including check sheet, planning fundamentals and specifications for bore holes were added in SOP. Revised SOP was translated into Nepali and edited by WSSDO.

Based on the SOP, engineers of DWSS, CHRDU and WSSDOs are playing a role as a trainer for OJT/workshop on O&M of water distribution facilities and water meter control.

Regarding water quality management, staffs of DWSS and WSSDO were brought up as a trainer and they provided training to WUSCs, which is regarded as a practical way of support work to WUSCs.

Workshops on introducing the revised Management Model and Support Model were conducted in July and November. Eighty six percent of the participants understood the concept of the models and 99% of them responded that the models were effective for WUSC management.

A Nepali consultant was hired in April and May 2013. The Management Model and Support Model are revised to Nepali version with DWSS cooperation. The two model concepts were presented and familiarized to C/Ps.

In the 6th JCC meeting held on 27th September 2013, it was accepted that DWSS shall approve and formalize the Management Model and the Support Model and continue to take activities like MIT (Maintenance Inspection Team), MAT (Management Advisory Team), MET (Monitoring Evaluation Team) and OJTs as its annual program. In addition, it was also accepted that DWSS shall develop a plan for the dissemination utilizing human resources trained through the Project. DWSS shall revise the Management Model and Support Model (the WASMIP Model) for its implementation in other part of the country as necessitates. DWSS shall incorporate the provision to adopt and effectively utilize the two Models in the "Implementation Guidelines of the Directives on Water Supply Service Operation 2069."

**【Output 3】**

Model of Output 2 is disseminated in Jhapa/Morang districts.

**【Summary of Achievements】**

Draft of "Small and Medium-sized Water Supply Support Model" and draft of "Small and

Medium-sized Water Supply Support Model" were prepared, and workshop for disseminating the Models to WSSDOs and WUSCs was held two times (July and November 2012). Support for preparing business plan, which aims at proper water supply management, was carried out to 5 WUSCs except for the 3 WUSCs.

Training plan on water distribution facilities and meter control was prepared and training to the 17 WUSCs was implemented based on SOP. Engineers of DWSS, CHRDU and WSSDO instructed the WUSCs as a trainer, and information exchange between WSSDO and WUSCs was also carried out. These activities would be connected to dissemination of the Models.

Regarding water quality management, trainers were selected from staffs of WSSDO, and they provided training to 14 WUSCs. This is an achievement as part of disseminating the Support Model.

Maintenance Inspection Team (MIT) has been set up in WSSDOs in Jhapa and Morang District in order to build up DWSS/WSSDO support system to WUSCs as part of Support Model. MIT plays a role of interface between DWSS, WSSDO and WUSCs. Periodic report on site situation will be made to the upper organizations by MIT. Engineers of WSSDO are assigned as main members of MIT, and training on preventive maintenance is provided to such engineers. Trained engineers will provide technical instruction to WUSC staff while they patrol the site. Organization and activity plan of MIT has been agreed by WSSDO and DWSS.

Maintenance Inspection Team (MIT) has conducted by the team members who are engineers from WSSDOs/WUSCs in total 4 times until August 2013.The results and achievement were reported in the joint workshops in total 3 times.

Several workshops on business planning for WUSCs were held in August, 2012 and from November 2012 to middle of February 2013 as part of the MAT activities. Through the workshops, the WUSCs gained the necessary management knowledge and skills such as revising the business plan, proper raise of water tariff, proper arrangement of personnel and a sound financial management. Not only in the 3 target WUSCs but also in Urlabari, Salakpur and Lakhanpur WUSCs, the business plans had been officially approved by a general assembly and they now operate their services based on the plan. The other WUSCs also intend to approve their business plans in the coming assembly which will be held next November or December. In future, each WUSC will revise its own business plan with advice given by MAT.

The sharing workshops were held in August and September 2013 to introduce the draft of "Small and Medium-sized Water Supply Management Model" and "Small and Medium-sized Water Supply Support Model" under the initiative of DWSS. There were a total of 39 attendees including the attendees from other donors organizations such as ADB, UNICEF, SWISS Embassy, MWSDB (Melamchi Water Supply Development Board), TDF (Town Development Fund) and DOLIDAR (Department of Local Infrastructure Development and Rural Roads). The WASMIP Model and its achievement were also introduced at the project sharing meeting held on 9$^{th}$ August, 2013.

DWSS officially committed that it was going to approve the WASMIP model and disseminate it to all of the other regions as their tools. DWSS will enhance the functionality of WUSCs by means of setting up screening criteria for WUSCs to apply for the Model and implementing water quality test at

the sites. DWSS also clearly mentioned that they are going to take the ownership of the Model and check the effectiveness of it by conducting monitoring and evaluation while they are disseminating it.
DWSS and WSSDOs shall take lead of activities like MIT, MAT and MET and OJTs as its annual program and secure adequate budget to continue activities envisioned in the Models. SOPs and Business Plans developed under the Project shall be continued in the project districts as well as introduce in other WUSCs. Human Resources trained in different items under the Project shall be utilized to undertake training and capacity development of DWSS, CHRDU, RMSOs, WSSDOs and WUSCs respectively.
Network among WSSDOs and WUSCs developed through the Project such as liaison conference shall be maintained since the network make communication among stakeholders good and facilitate learning.

### 1.4 Recommendations from the WASMIP

Seven recommendations based on the recommendations of Terminal Evaluation are proposed in order to disseminate and utilize the WASMIP model in the whole Nepal.

#### (1) Ensuring implementation of the two models

JICA Experts had prepared the drat Management model and Support model. JICA Experts hired a Nepali local consultant to adjust the two models in the local context of Nepal in cooperation with DWSS. As a result of the revisions by the consultant and DWSS, the two models got more usability and familiar form for C/P to utilize.

1) The Management model structure and formulation
The management model includes;

- Achievement goal for WUSC
- Business plan
- SOP on water treatment plant O&M
- SOP on water quality management
- SOP on O&M of water distribution facilities
- SOP on water meter reading and meter calibration control

The business plan and SOPs are defined as tools for supporting the WUSCs activities and help them to achieve a desirable status. WSSDO was assigned to implement on-the-site instructions to WUSCs along with these tools. WSSDO has already learnt how to give the instructions through the project activities so far in the form of continuous OJT/workshops and distribution of printouts of the WASMIP model documents (Nepali version).

2) The Support model structure and the formulation
The Support model consists of not only the concept but also the organization and structure of the O&M Inspection Team (MIT) and Management Advisory Team (MAT).
In the Support model, it is introduced the support that DWSS needs to give to WUSCs, basically to

support and promote WUSCs to implement their own business plan. The Support model describes how to support WUSCs in detail on each aspect such as organization, institution, skills, information exchange, financial and equipment. MIT and MAT organize the support system on DWSS in the field of operation and maintenance for water supply facility and water supply management working on the project. According this system, the activity is sustainable even if personnel transfer or personnel exchange occur. Thus, the activities can establish to C/P.

Establishment of the Management model and Support model on Jhapa and Morang districts reported not only introducing the contents of the models but also its achievement of 20 WUSCs on the project achievement sharing workshop (at Biratnagr on August 27th, 2013). As the result of the project achievements, activities on the targeted WUSC are improving due to the activities based on the SOPs, and formulating the business plan and supporting activity from WSSDO. Therefore, it can be said that the both models are established enough in WSSDO and WUSC.

**(2) Strengthening communication among C/Ps, Experts and JICA Nepal Office**

A number of strategies were taken into account in order to build a tide communication among the C/Ps, the experts and JICA. One was to publish the WASMIP model information on both JICA and DWSS website. As the other strategy, a number of workshops were carried out for the targeted WUSCs and the WASMIP model (the Management and Support Model) were introduced to other donors at the project sharing meeting. In addition, 2 types of pamphlets and leaflets written in Nepali were distributed at the workshops, CHRDU and the JICA Nepal Office. These leaflets help to announce the project activities. Posters and stickers were also distributed to all targeted WUSCs. These materials were available and used at the WUSC offices and DWSS/WSSDO in order to disseminate the WASMIP concept to DWSS/WSSDO and the residents.

Regarding the residents who are direct beneficiaries, workshops were held and leaflets were distributed to them to educate and introduce the WASMIP concepts. Each WUSC cooperatively committed they would also distribute the leaflets and introduce the Project at the meeting with the residents onward.

**(3) Obtaining feedback on the models from relevant stakeholders**

In order to obtain the feedback for the WASMIP Model from relevant stakeholders, the Model was introduced in a project sharing meeting and also Achievement Sharing Workshop was carried out by DWSS.

At the project sharing meeting, WHO brought attention to the following points;

- WASMIP should be incorporated with WSP (Water Safety Plan) and WOP (Water Operation Partnership) with support from CHRDU in association with ADB and WHO. Such incorporation can play as an effective tool to support WUSCs and strengthen their technical, financial and management capacities.
- The WASMIP Model should not be limited to two districts (Jhapa and Morang) but be also utilized for the other DWSS projects.

DWSS plans to invite other donors to share opinions on the two models after the Project completion after October 2013.
At the Sharing Workshop on the Project Outcomes for other donors, which held on 13th September 2013, DWSS stated that at first it is significant to promote all WUSCs to prepare their business plan and SOPs based on their own visions in order to make for DWSS to support them easier with the limited budget of the government.

**(4) Stipulation of the Support Model into the Guideline**

DWSS is now formulating the Water Supply Service Operation Guideline (hereafter 'the Guideline') and plans to finalize it by December 2013. The Guideline aims to strengthen the WUSC water supply service through occasional monitoring, evaluation, and instructions by DWSS.
WASMIP model aims that strengthening the technical support system to WUSC by DWSS. Therefore, the WASMIP Model accords with the purpose of the Guideline. DWSS approved that the Guideline states the utilization and dissemination activity and enhancement of the sustainability for two models.

**(5) Formulating a specific dissemination plan for the two models**

DWSS also plans to further disseminate the two models after the project completion. It includes:

1. Workshops for introducing the models and the achievements will be organized for 5 RMSOs. WSSDOs and priority WUSCs, including overall target WUSCs, are mainly targeted.

2. The models were originally made for Morang and Jhapa districts as the pilot project. In case the models are applied in mountain or basin areas, they will need to be customized. If required, the models are also disseminated by dispatching engineers from Morang and/or Jhapa WSSDO, which are successful examples for applying the two models.

3. If the customized models are applied for other sites, DWSS with former the PWT member will conduct a follow-up for M&E. Appropriate models are formulated base on the local conditions such as water resource, water quality, water treatment facility and the pipeline network.

4. As mentioned above, the Management model consists of concept, business plan, SOP on water treatment plan O&M, SOP on water quality management, SOP on O&M of water distribution facilities, and SOP on water meter management. The Support model has MET, MAT and MIT tools. The Management and Support models do not need to be disseminated together to WUSCs. In case of corresponding to an urgent issue in a targeted WUSC, these tools are disseminated separately. However, the frames of business plan are retained in order to introduce the Management Model.

5. The project conducts human resource development at the central water quality laboratory in DWSS. Thus, technical transfer of water quality analysis will be implemented by dispatching the laboratory engineers to local water quality analysis center and WSSDO.

6. CHRDU plans to conduct workshop on formulating a business plan for WUSC. WUSCs are then required to formulate their own business plans based on the Management model. In designing the plans they apply the facility and financial capacity considerations techniques learned from the workshop (Refer to business plans formulated on each WUSC in Morang and Jhapa districts). DWSS decides how to allocate the budget to WUSC considering the formulated plans.

7. The business plan implementation will be reviewed by DWSS and WSSDO through the monitoring evaluation in order to examine any disjunction between plan and actual. DWSS and WSSDO will also evaluate the necessity of a financial support for the management plan. As occasion demands or in order to disseminate the Models on nationwide, MET and MAT can be reorganized and the function of them can be set in the DWSS. Especially, it is desirable that DWSS be responsible for the financial evaluation and budget allocation based on this evaluation.

**(6) Presenting the Management model and Support models at the DWSS national and regional conferences**

Workshops for introducing the two models and the achievements will be organized for 5 RMSOs by DWSS. The WASMIP model was also introduced at the regional and national WSSDO meetings.

**(7) Estimating budget for implementation of the Support model**

Experts submitted a necessary budget based on the actual MET, MIT and MAT activities as reference. DWSS confirmed and allocated the budget for disseminating and implementing the model more than the one in this fiscal year.

DWSS will secure the budget for establishing the Guideline this year and will allocate the budget to the priority WSSDO.

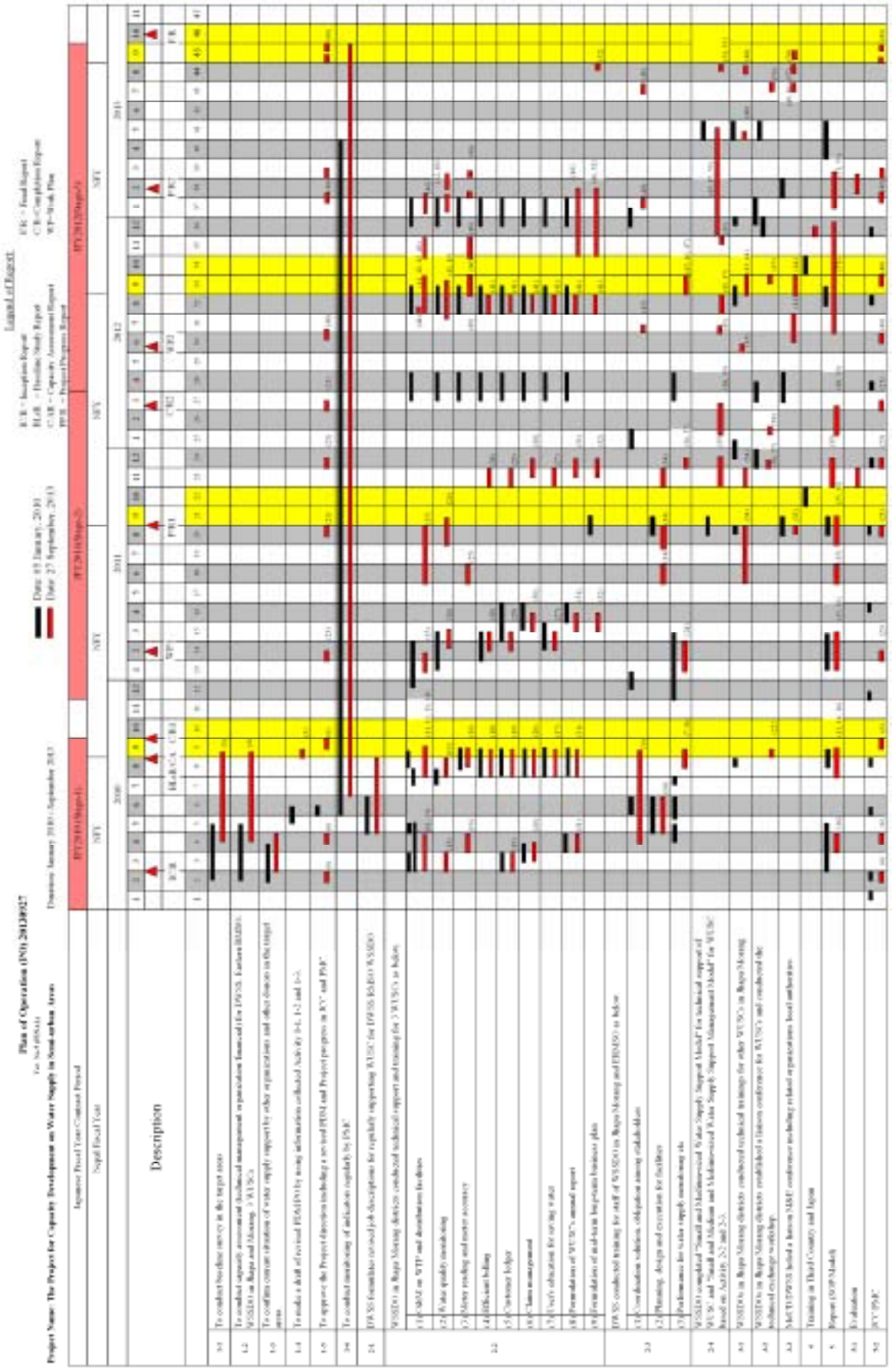
### 1.5 PDM and PO

The final PDM and PO are shown below.

**Project Design Matrix (PDM) 20130927**

Project Name: **The Project for Capacity Development on Water Supply in Semi-urban Areas in Nepal**
Period: **January 2010 - September 2013** **Ver. No. 5 (FINAL)**
Target Area: **Morang District & Jhapa District** **Target Group: DWSS, WUSCs & Water Users (Approximately 21,000)** **Date: 27 September 2013**

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumption |
|---|---|---|---|
| **Super Goal**<br>Safe drinking water will be supplied stably in Semi-urban areas in Nepal. | Numerous households of which the safe drinking water can be supplied. | 1. Statistics reports of MoUD (5-year Plan, etc.)<br>2. Statistics of MDGs | |
| **Overall Goal**<br>DWSS technical support model for WUSCs established by the Project will be disseminated to all over the country by MoUD & DWSS. | 1. 44 WUSCs (17% of all WUSCs) are strengthened by the support of DWSS.<br>2. The DWSS technical support model reflects to annual schedule of every RMSO & WSSDO. | 1. DWSS annual report<br>2. DWSS annual report | 1. The construction of appropriate water supply facilities is promoted.<br>2. People's awareness for the importance of safe water is improved. |
| **Project Purpose**<br>DWSS technical support system to WUSCs is improved in Morang and Jhapa districts. | 1. Based on the support model established by DWSS-RMSO-WSSDO, workshop and training on "Small and Medium-sized Water Supply Management Model" are held at least one time and the support system to the other 17 WUSCs in Jhapa-Morang districts is introduced.<br>2. The safe drinking water services by 3 WUSCs is improved in comparison with beginning of the Project. | 1-1 WUSC annual report (Management, Water Quality Monitoring, Future Business Plan)<br>2-1 DWSS monitoring report<br>2-2 Annual periodical reports of DWSS-RMSO-WSSDO | 1. Necessary budget and human resources for expansion of WUSC support model in semi-urban areas are allocated. |
| **Output**<br>1. Basic information for the Project and necessary information for indicators are collected, and management of the Project is appropriately executed and monitoring for appropriate water supply management is implemented periodically.<br>2. "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are developed as models for WSSDO-ERMSO and WUSC.<br>3. Model of Output 2 is disseminated in Jhapa-Morang districts. | 1-1 PDM is revised.<br>1-2 Monitoring for indicators is regularly executed.<br>2-1 "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are completed.<br>3-1 The other 17 WUSCs in Jhapa-Morang districts develop draft implementation plans to introduce "Small and Medium-sized Water Supply Management Model". | 1-1 Revised PDM<br>1-2 Monitoring report<br>2-1 "Small and Medium-sized Water Supply Management Model"<br>2-2 "Small and Medium-sized Water Supply Support Model"<br>3-1 WUSC annual reports<br>3-2 ERMSO-WSSDO-DWSS annual reports | 1. National Water Policy is not changed drastically.<br>2. Authority of DWSS including ERMSO-WSSDO is not changed drastically.<br>3. Counterpart personnel of the Project works continuously during the Project period. |
| **Activities**<br>1-1 To conduct baseline survey in the target area<br>1-2 To conduct capacity assessment (technical-management-organization-financial) for DWSS, Eastern RMSO, WSSDO in Jhapa and Morang, 3 WUSCs<br>1-3 To confirm current situation of water supply support by other organizations and other donors in the target areas.<br>1-4 To make a draft of revised PDM-PO by using information collected Activity 1-1, 1-2 and 1-3.<br>1-5 To approve the Project direction including a revised PDM and Project progress in JCC and PMC.<br>1-6 To conduct monitoring of indicators regularly by PMC<br>2-1 DWSS formulates revised job descriptions for regularly supporting WUSC for DWSS-RMSO-WSSDO<br>2-2 WSSDO in Jhapa-Morang districts conducted technical support and training for 3 WUSCs as below.<br>(1) O&M on WTP and distribution facilities<br>(2) Water quality monitoring<br>(3) Meter reading and meter accuracy<br>(4) Efficient billing<br>(5) Customer ledger<br>(6) Claim management<br>(7) User's education for saving water<br>(8) Formulation of WUSC's annual report<br>(9) Formulation of mid-term long-term business plan<br>2-3 DWSS conducted training for staff of WSSDO in Jhapa-Morang and ERMSO as below.<br>(1) Coordination solution, obligation among stakeholders<br>(2) Planning, design and execution for facilities<br>(3) Performance for water supply monitoring<br>2-4 WSSDO completed "Small and Medium-sized Water Supply Support Model" for technical support of WUSC and "Small and Medium and Medium-sized Water Supply Support Management Model" for WUSC based on Activity 2-2 and 2-3.<br>3-1 WSSDOs in Jhapa-Morang districts conducted technical trainings for other WUSCs in Jhapa-Morang.<br>3-2 WSSDOs in Jhapa-Morang districts established a liaison conference for WUSCs and conducted the technical exchange workshop.<br>3-3 MoUD-DWSS holed a liaison M&E conference including related organizations-local authorities. | **Input**<br>1. **Japanese Side**<br>(1) The dispatch of experts<br>a. Chief-Strengthening Governance Body<br>b. O&M on WTP-Water Quality Control-Electric Machinery<br>c. Maintenance-Planning of Distribution Facilities<br>d. Management<br>e. Training Management-Public Relation-Coordinator<br>(2) Provision equipment<br>a. Vehicles, Motorbikes<br>b. Water quality test instruments<br>c. Computers and test equipment<br>d. Spare parts and tools for distribution maintenance<br>e. Spare parts and tools for WTP maintenance<br>f. Office generator/inverters<br>(3) Training in-country and third countries, in Japan<br>2. **Nepalese Side**<br>(1) Assignment of counterpart personnel<br>(2) Office facilities in DWSS and Jhapa-Morang WSSDO (Office Space, Electronic power source, Telephone, Internet, Feed water, Furniture)<br>(3) Necessary budget (the Project related budget, Domestic transportation/accommodation allowance for training/workshop, Telephone charges, Electric charges, etc.) | 1. Necessary electricity is stably supplied in the Project sites.<br>2. The price of fuel for generators at WTP does not rise rapidly.<br>3. Natural disaster such as heavy floods or landslides at the sluice gates etc. is not appeared during the Project implementation.<br><br>**Pre-conditions**<br>1. Security situation in Morang and Jhapa districts does not worsen more than current situation.<br>2. The function of related organization of the Government (Central, Local) does not change drastically. |



### 1.7 WASMIP Model

The Project for Capacity Development on Water Supply in Semi-urban Areas, nicknamed as Water Supply Management Improvement Project (WASMIP), implemented in 20 water supply utilities in Jhapa and Morang districts has produced two models for water supply service improvement in semi-urban areas in Nepal. One is "Small and Medium-sized water supply support model", under which DWSS provides supports to WUSCs to perform service improvement activities. The other is "Small and Medium-sized Water Supply Management Model", under which WUSCs operate and manage water supply systems to provide water services to the citizens.

**(1) Small and Medium-Sized Water Supply Management Model ("Management Model")**

WUSC management model simply sets the concept of an ideal status of water supply services in the future by WUSCs and designs the way to achieve such status through business plan and SOPs. Strengthening sufficient institutional, functional and financial capability through technical and financial support from stakeholders, WUSCs can implement the business plan and achieve that ideal status.

There are mainly four tools to improve WUSC management capacity.

1) Business Plan

The business plan has mainly two purposes. One is a tool that WUSCs introduce the Management Model in WUSC management. The other is for formulation of water policy of DWSS based on the business plan and allocation of a budget to WUSCs.

2) SOP on Water Treatment Plant O&M and Water Quality Management

The SOP consists of water purification process management and water quality analysis.

3) SOP on O&M of Water Distribution Facilities

The SOP consists of O&M of water distribution facilities and new planning formulation of water distribution facilities.

4) SOP on Water Meter Reading and Meter Calibration Control

The SOP instructs water meter management and calibration.

**(2) Small and Medium-sized Water Supply Support Model ("Support Model")**

"Small and medium sized water supply support model" provides a guideline for DWSS/WSSDO on how to support WUSCs for their organizational, technical and financial capacity development required for sustained service. This support model, shown in **Figure 1.1** and **Figure 1.2**, is for supporting and enhancing management capabilities of WUSCs. The main concept of support model is to support WUSCs in technical and financial areas to implement business plan, to operate and maintain WUSC's water facilities properly to realize the ideal status. Thus, it is very essential for WUSCs to prepare their own business plan and SOPs for DWSS to be well acquainted of it.

There are mainly four ways that DWSS can support WUSC called (1) Maintenance Inspection Team (MIT), (2) Management Advisory Team (MAT), (3) Monitoring and Evaluation Team (MET) and (4) Practical trainings (**Figure 1.2**). MET and MAT generally supports for Business Plan and Financial Records. MIT supports for SOPs and O&M records. Practical training is for overall capacities under Management models

of WUSC.

Concept of the Support Model, objectives, roles and activities of the teams are summarized in the tables.

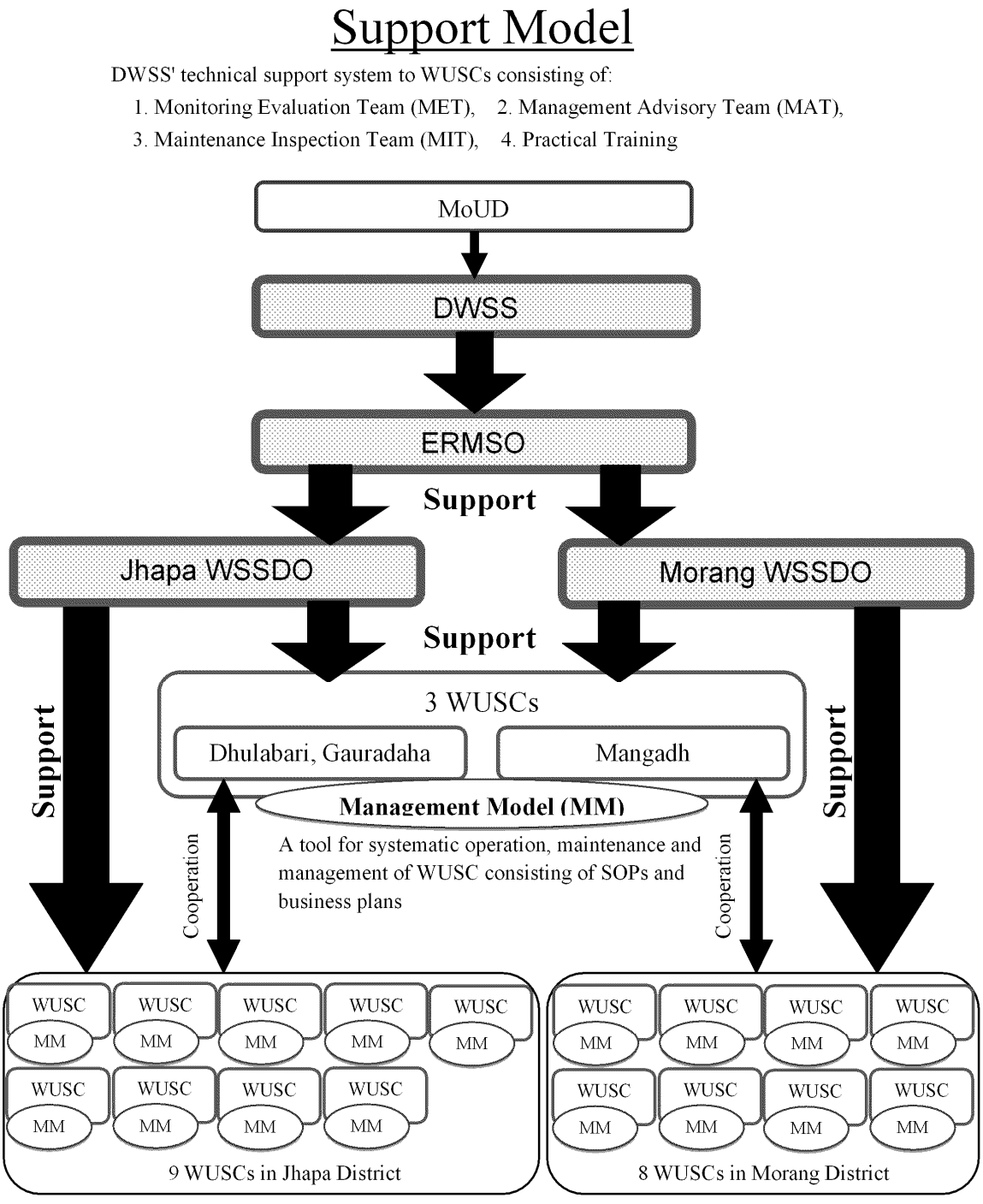
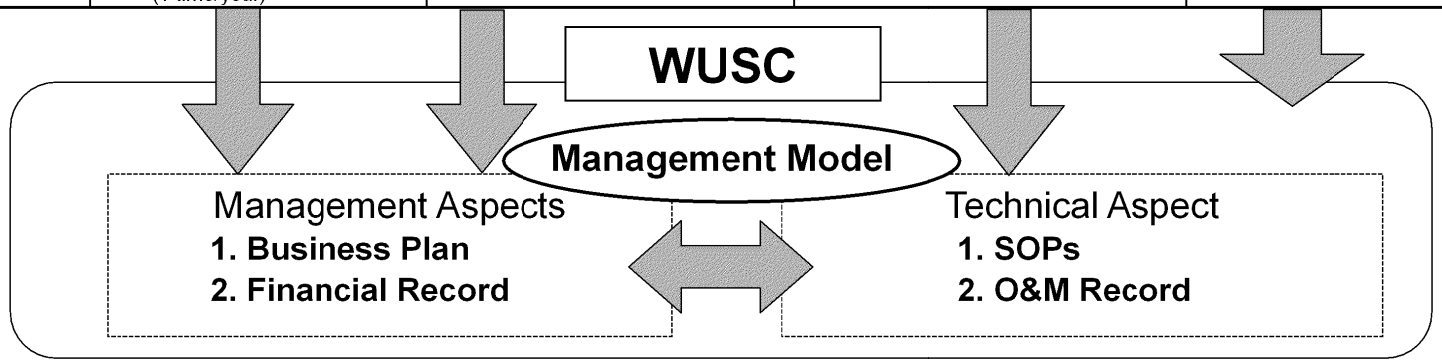



**Figure1.1 Support Model Concept**

**Figure 1.2 Tools of Support Mode**

| Support Model | | | | |
|---|---|---|---|---|
| **Items** | **Monitoring Evaluation Team (MET)** | **Management Advisory Team (MAT)** | **Maintenance Inspection Team (MIT)** | **Practical Training** |
| **Responsible Organization** | DWSS, ERSMO, WSSDOs | WSSDOs, WUSCs | WSSDOs, WUSCs | DWSS, WSSDOs, WUSCs |
| **Objectives** | ・ Evaluate the capacity improvement effect of WUSCs | ・ Provide advice for the business management | ・ Provide advice for the operation and maintenance (O&M) of water supply facilities<br>・ Ensure implementation of the regular routine work of the facilities | ・ Provide training based on the needs identified through the activities of MET, MAT and MIT |
| **Roles** | ・ Evaluate technical and administrative management capacity of WUSC and its staff<br>・ Collect key Performance Indicators (PIs) | ・ Provide assistance in the formulation of a business plan<br>- Check the implementation status of a business plan<br>- Reflect MIT's recommendation on facility improvements on a business plan<br>・ Provide instruction on the preparation of a monthly report including management indicators | ・ Provide directions for record keeping of O&M<br>・ Provide directions for the facility inspection and implementation of preventive maintenance<br>・ Provide directions of water quality management<br>・ Evaluate existing facilities<br>・ Make recommendations of the facility improvement<br>・ Share the information with MAT | ・ Provide training on O&M based on the Standard Operational Procedures (SOPs)<br>・ Provide training on the preventive maintenance<br>・ Provide assistance in the formulation of a business plan<br>・ Provide directions for revising the SOPs to suit each WUSC's condition |
| **Activities (Frequency)** | ・ Site Visit for the Monitoring of Operation and Management (1 time/year)<br>・ Joint M&E Conference (1 time/year)<br>・ Evaluation Report (1 time/year) | ・ Site Visit for Business Planning (1 time/year)<br>・ Activity Report (1 time/year) | ・ Site Visit for the Facility Inspection (4 times/year)<br>・ Activity Report (4 times/year)<br>・ O&M Monitoring Workshop (1 time/year) | ・ Practical Training (at least 1 time/year and as needed) |



# CHAPTER 2 PROJECT IMPLEMENTATION AND ACHIEVEMENTS

## 2.1 Scope of Work

This Project was implemented in accordance with the Minutes of Meeting (M/M) signed on 15th of August 2008 and Record of Discussion (R/D) signed on 27th of February 2009 between the Government of Nepal and JICA Nepal Office. The duration of the project is from January 2010 to September 2013. **Table 2.1** summarizes the project output performed according to the indicators set by PDM, and the work flow of the project activities is shown in **Figure 2.1**.

**Table 2.1 Project Output Performed to Target Verifiable Indicators by PDM**

| Output | Verifiable Indicator | Activities and Output Performed |
|---|---|---|
| [Overall Goal]<br>DWSS technical support model for WUSCs established by the Project will be disseminated to all over the country by MoUD & DWSS. | 1. 44 WUSCs (17% of all WUSCs) are strengthened by the support of DWSS. | ----- |
| | 2. The DWSS technical support model deflects to annual schedule of every RMSO & WSSDO. | ----- |
| [Project Purpose]<br>DWSS technical support system to WUSCs is improved in Morang and Jhapa districts. | 1. Based on the support model established by DWSS/RMSO/WSSDO, workshop and training on "Small and Medium-sized Water Supply Management Model" are held at least one time and the support system to the other 17 WUSCs in Jhapa/Morang districts is introduced. | Record of workshop/training conducted for the other WUSCs in Jhapa/Morang district is as follows:<br>・ All of the 17 WUSCs from the two target districts had participated in the workshop of business plan conducted in February 2011.<br>・ 6 other WUSCs from Jhapa and Morang other than selected in the Project had participated in the Monitoring & Evaluation Liaison Conference held in August 2011.<br>・ All of the 17 WUSCs had participated in the workshop of business plan and public campaign program conducted in November 2011.<br>・ 10 other WUSCs had participated in the WUSCs Liaison Conference held in February 2012.<br>・ 10 other WUSCs had participated in the workshop organized for the introduction of "Small and Medium-sized Water Supply Management Model" held in February 2012.<br>・ OJT/workshop on water supply facility management and water meter management was conducted for WSSDO/WUSCs in Jhapa and Morang in January 2012.<br>・ A 3 day OJT/workshop had been conducted for 17 WUSCs in Jhapa and Morang on water distribution facility management in February 2012.<br>・ OJT/workshop on operation and maintenance for mechanical and electrical equipment was conducted for 24 WUSCs in Jhapa and Morang in August 2012.<br>・ OJT/workshop on water quality management was conducted for 14 WUSCs in Jhapa and Morang between August and September 2012.<br>・ Workshop on business plan for implementing WASMIP |

| | | |
|---|---|---|
| | | management model was conducted for 6 WUSCs in Jhapa and Morang from November 2012 to January 2013.<br>・ 16 other WUSCs had participated in the workshop organized for the dissemination of "Small and Medium-sized Water Supply Management Model" held in July and November 2012.<br>・ 15 out of 17 WUSCs participated in the workshop for disseminating the WUSC supporting model (especially, MIT) which was conducted in February 2013.<br>・ Training on the WUSC supporting model (especially, MAT) was conducted for DWSS and 2 WSSDOs in March 2013.<br>・ 20 WUSCs participated in the Monitoring & Evaluation Liaison Conference held in July 2013.<br>・ Project output sharing workshop and the WUSCs technical exchange Liaison Conference were conducted for 14 WSSDOs in Eastern area and 27 WUSCs in Jhapa and Morang.<br>・ Project output sharing workshop was conducted with DWSS and other donors (UNICEF, ADB, and SWISS Embassy) in September 2013. |
| | 2. The safe drinking water services by 3 WUSCs are improved in comparison with beginning of the Project. | ・ The overall evaluation result of the 3rd monitoring/evaluation survey conducted in 3 WUSCs in February 2012 was as follows:<br>a. Customer satisfaction: Good<br>b. Importance for water quality: Very good<br>c. Addressing demand for new connection, increasing coverage: satisfactory<br>d. Leakage control: Good<br>e. Resource generation, financial management, investment plan, asset accumulation: Good<br>・ The result of water quality test of the 3 WUSCs conducted in August 2012 was good.<br>・ The overall result of the 4th monitoring/evaluation survey conducted for 14 WUSCs in Jhapa and Morang in July 2013 was as follows: Evaluation was estimated on 6 items such as organization management, financial management, complain handling, management plan, water quality management and operation record (out of 60 pts.)<br>Jhapa: 1st place Mangadh (46 pts.), 2nd place Gauradaha and Urlabari (44 pts.), 3rd place Dhulabari and Suranga WUSC (43 pts.) |
| [Output 1] Basic information for the Project and necessary information for indicators are collected, and management of the Project is appropriately executed and monitoring is for appropriate water supply management is periodically implemented. | 1-1) PDM is revised. | ・ The revised PDM ver.3 was approved by the 2nd JCC Meeting in September 2010. The percentage of supported WUSCs by DWSS has been set at 17% (i.e. 44 WUSCs) for the overall goal and at 100% of Jhapa and Morang districts (i.e. 20 WUSCs including the 3 WUSCs) for the Project goal.<br>・ In the 4th JCC Meeting held in November 2011, the mid-term review team proposed to revise PDM ver.3 to clarify the framework of the Project. The revised PDM ver.4 was approved by the same Meeting.<br>・ In the 6th JCC Meeting held in September 2013, the name of organization was changed due to the change in the name of the Nepali organization.(PDM ver.5) |
| | 1-2) Monitoring for indicators is regularly executed. | Record of Monitoring activities is as follows:<br>・ The 1st monitoring was conducted in September 2010.<br>・ The 2nd monitoring was conducted in August 2011. |

| | | |
|---|---|---|
| | | ・ The 1st Monitoring & Evaluation Liaison Conference was held in August 2011.<br>・ The 3rd monitoring was conducted in February 2012.<br>・ The 2nd Monitoring & Evaluation Liaison Conference was held in February 2012.<br>・ The 4th Monitoring & Evaluation Liaison Conference was held in July 2013. |
| [Output 2] "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are developed as models for WSSDO/ERMSO and WUSC. | 2-1) "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are completed. | ・ The number of training/workshop conducted up to December 2012 has been more than 20.The draft SOPs have been prepared for O&M of water treatment plant, O&M of water distribution facilities, and water quality management through the training/workshop. The business plan has also been prepared for the 3 WUSCs.<br>・ From August 2012, refresher training has been provided to the 3 WUSCs.<br>・ A draft of" Small and medium-sized water supply management model " was prepared and a workshop was conducted for the introduction of this model in February 2012.<br>・ The first draft of "Small and Medium-sized Water Supply Support Model" was prepared and a brainstorming workshop was conducted in February 2012 in order to make the model more applicable.<br>・ In August 2012, a part of contents of "Management Model" and "Support Model" were reviewed.<br>・ Workshops on introducing the revised Management Model and Support Model were conducted in July and November. 86% of the participants understood the concept of the models and 99% of them responded that the models were effective for WUSC management.<br>・ A Nepali consultant was hired in April and May 2013. Management Model and Support Model are revised to Nepali version with DWSS cooperation. |
| [Output 3] Model of Output 2 is disseminated in Jhapa/Morang districts. | 3-1) The other 17 WUSCs in Jhapa/Morang districts develop draft implementation plans to introduce "Small and Medium-sized Water Supply Management Model". | ・ A training plan had been prepared for the other 17 WUSCs, which was presented in the workshop held in July 2012.<br>・ Based on the training plan, trainings were conducted for other 17 WUSCs on the O&M of water treatment plant, water distribution facilities, water quality management and business management.<br>・ Workshop on business plan for implementing the WASMIP model was conducted for 6 WUSCs in Jhapa and Morang and the business plan was established.<br>・ Dissemination of Support Model was conducted from January 2013. The MIT activity was conducted 4 times in total and was conducted by August 2013. The model was disseminated to WUSCs under DWSS/WSSDO's initiative.<br>・ The workshops for introducing and sharing the output on revised the Management and Support models were conducted 4 times in July, August, and September 2013.<br>・ Business plan for implementing the WASMIP model was established by the MAT activity from August 2012 to February 2013.<br>・ DWSS and Morang WSSDO conducted the workshop for formulating a business plan to Jhorahaat, Haraicha and Rangeli WUSC which had not made own business plan.<br>・ A refresher training for establishing annual plan and medium and long term plans was conducted in August 2013. The monitoring/evaluation guideline was established. |

| | | |
|---|---|---|
| | | ・ The WASMIP model was accepted and it was also accepted that DWSS shall develop a plan for its dissemination in the 6th JCC meeting held on 27th September, 2013. |

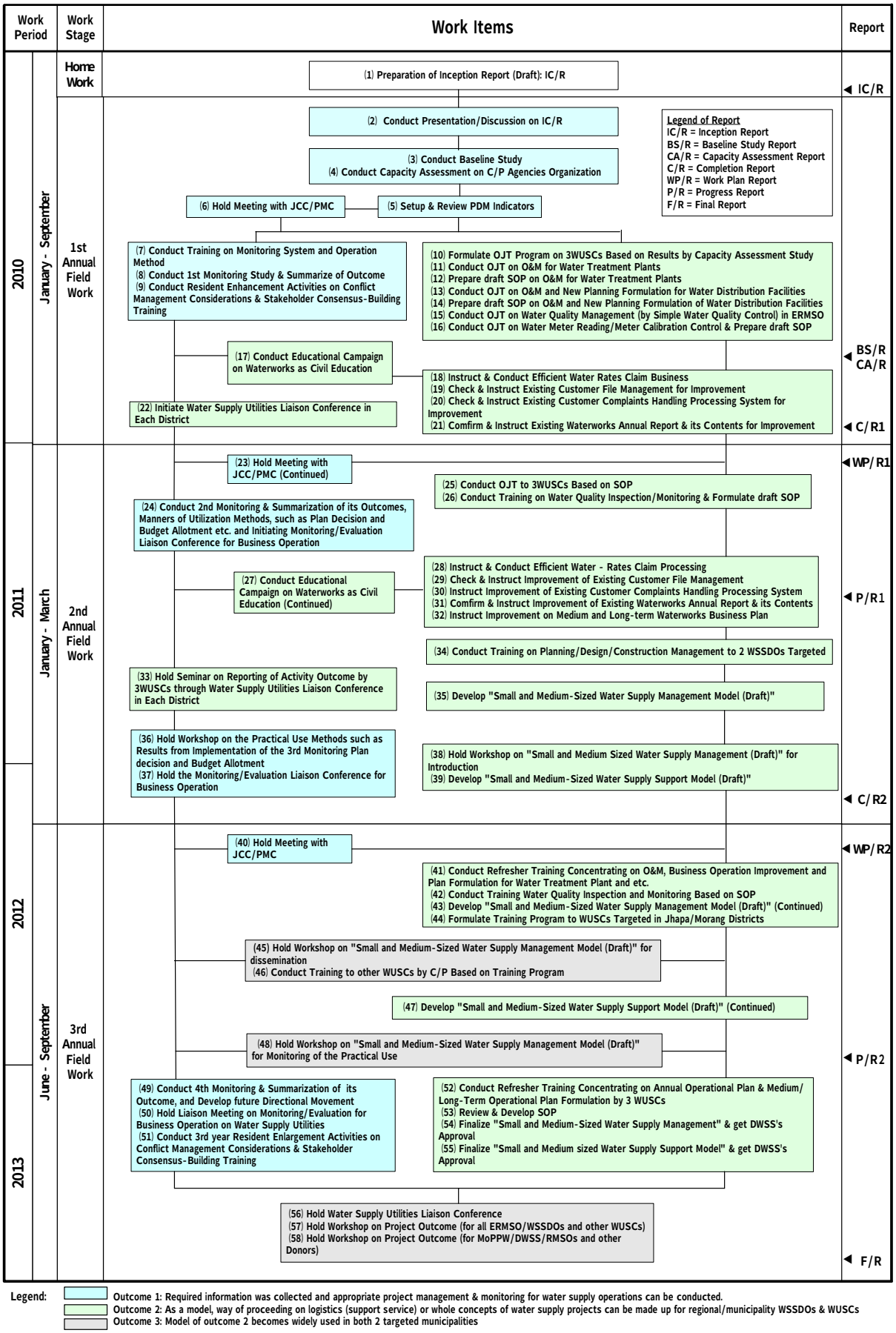



**Figure 2.1 Work Flow**

## 2.2 Persons Involved

Persons involved in the project are shown below.

| | | |
|---|---|---|
| 1. Japanese Expert | Team Leader/Water Supply/Water Distribution Facilities Management and Planning | |
| | Operation and Maintenance on Water Treatment Plant/Water Quality Management | |
| | Management Improvement/Administrative Buildup | |
| | Maintenance of Mechanical Equipment | |
| | Maintenance of Electrical Equipment/Project Coordinator / Monitoring | |
| | Public Awareness | |
| | The 3rd Country Training(1) | |
| | The 3rd Country Training(2) | |
| 2. Nepalese C/P | Project Manager | DWSS, Deputy Director General |
| | Project Work Team Team Leader | DWSS, Section Chief, Foreign Aid Coordination and Planning Section |
| | C/P Member | DWSS, Section Chiefs |
| | | NGO and Community Mobilization Section |
| | | Project Design Appraisal, Progress M&E Section |
| | | Water Quality Improvement and Monitoring Section |
| | | Human Resource Development, Training and Research Section |
| | | DWSS, Senior Divisional Engineer |
| | | CHRDU, Chief, Senior Divisional Engineer |
| | | ERMSO, Regional Chief, Senior Divisional Engineer |
| | | Morang/Jhapa WSSDO, Division Chief, Engineer |
| | | Gauradaha WUSC, Chairperson, Secretary, Manager |
| | | Mangadh WUSC, Chairperson, Secretary, Manager |
| | | Dhulabari WUSC, Chairperson, Secretary, Manager |
| 3.JCC (Joint Coordination Committee) | Co-Chairperson | MoUD, Joint Secretary |
| | | DWSS, Director General |
| | Member | DWSS, Deputy Director General |
| | | DWSS, Section Chiefs |
| | | Foreign Aid Coordination and Planning Section |
| | | Project Design Appraisal, Progress M&E Section |
| | | Human Resource Development, Training and Research Section |
| | | Water Quality Improvement and Monitoring Section |
| | | NGO and Community, Mobilization Section |
| | | MoUD, Monitoring and Evaluation Unit, Unit Chief and Officers |
| | | MoUD, Related Chiefs and Officers |
| | | ERMSO, Regional Chief |
| | | Morang/Jhapa WSSDO, Division Chiefs |
| | | Representative from JICA Nepal Office |
| | | JICA Expert on Water Supply Management |
| 4.PMC (Project Management Committee) | Chairperson | DWSS, Deputy Director General |
| | Member | DWSS, Section Chiefs |
| | | Foreign Aid Coordination and Planning Section |
| | | Project Design Appraisal, Progress M&E Section |
| | | Human Resource Development, Training and Research Section |
| | | Water Quality Improvement and Monitoring Section |
| | | NGO and Community, Mobilization Section |
| | | MoUD, Monitoring and Evaluation Unit, Unit Chief and Officers |
| | | MoUD, Related Chiefs and Officers |
| | | ERMSO, Regional Chief |
| | | Morang/Jhapa WSSDO, Division Chiefs |
| | | 3model WUSCs (Mangadh, Dhulabari, Gauradaha), Representative |
| | | Representative from JICA Nepal Office |
| | | JICA Expert on Water Supply Management |

## 2.3 Japanese Experts and Personnel Schedule

Fields of expertise of Japanese experts assigned to the Project are shown in **Table 2.2 – 2.4**.

**Table 2.2 Field of Expertise of Japanese Experts (1st year)**

| Name | Field of Expertise |
|---|---|
| Mr. Satoshi Shibazaki | Team Leader/Water Supply |
| Mr. Tetsuo Izawa | O&M on Water Treatment Plant/water Quality Management |
| Mr. Toru Suetake | Management Improvement/Administrative Buildup |
| Mr. Satoru Oniki | Water Distribution Facilities Management/ Planning |
| Mr. Joshi Pratyoush | Coordinator |

The performed input of each Expert was as planned, i.e. a total of 15.33 MM was input by the end of September 2010. (Refer to **Table 2.5**)

**Table 2.3 Field of Expertise of Japanese Experts (2nd year)**

| Name | Field of Expertise |
|---|---|
| Mr. Norihisa Taoka | Team Leader/Water Supply |
| Mr. Tetsuo Izawa | O&M on Water Treatment Plant/water Quality Management |
| Mr. Toru Suetake | Management Improvement/Administrative Buildup |
| Mr. Satoru Oniki | Water Distribution Facilities Management/ Planning |
| Mr. Satoru Oniki | Water Distribution Facilities Management/ Planning/ Coordinator |

The performed input of each Expert was as planned, i.e. a total of 18.67 MM was input by the end of March 2012. (Refer to **Table 2.6**)

**Table 2.4 Field of Expertise of Japanese Experts (3rd year)**

| Name | Field of Expertise |
|---|---|
| Mr. Norihisa Taoka | Team Leader/Water Supply |
| Mr. Satoru Oniki | Team Leader/Water Supply/Water Distribution Facilities Management/ Planning |
| Mr. Tetsuo Izawa | O&M on Water Treatment Plant/water Quality Management |
| Mr. Toru Suetake | Management Improvement/Administrative Buildup |
| Mr. Satoru Oniki | Water Distribution Facilities Management/ Planning |
| Mr. Masaru Kasahara | O&M on Mechanical Equipment |
| Mr. Akira Hasebe | O&M on Electric Equipment |
| Mr. Akira Hasebe | O&M on Electric Equipment/Coordinator/Monitoring |
| Ms. Yasumi Tsutsui | Public Awareness/Coordinator |
| Mr. Kazuhiko Nakamura | Public Awareness |
| Mr. Akira Hasebe | The 3rd Country Training (1) |
| Mr. Satoru Oniki | The 3rd Country Training (2) |

The performed input of each Expert was as planned, i.e. a total of 34.77 MM was input by the end of September 2013. (Refer to **Table 2.7**)

**Table 2.5 Input of Experts (The 1st Year)**

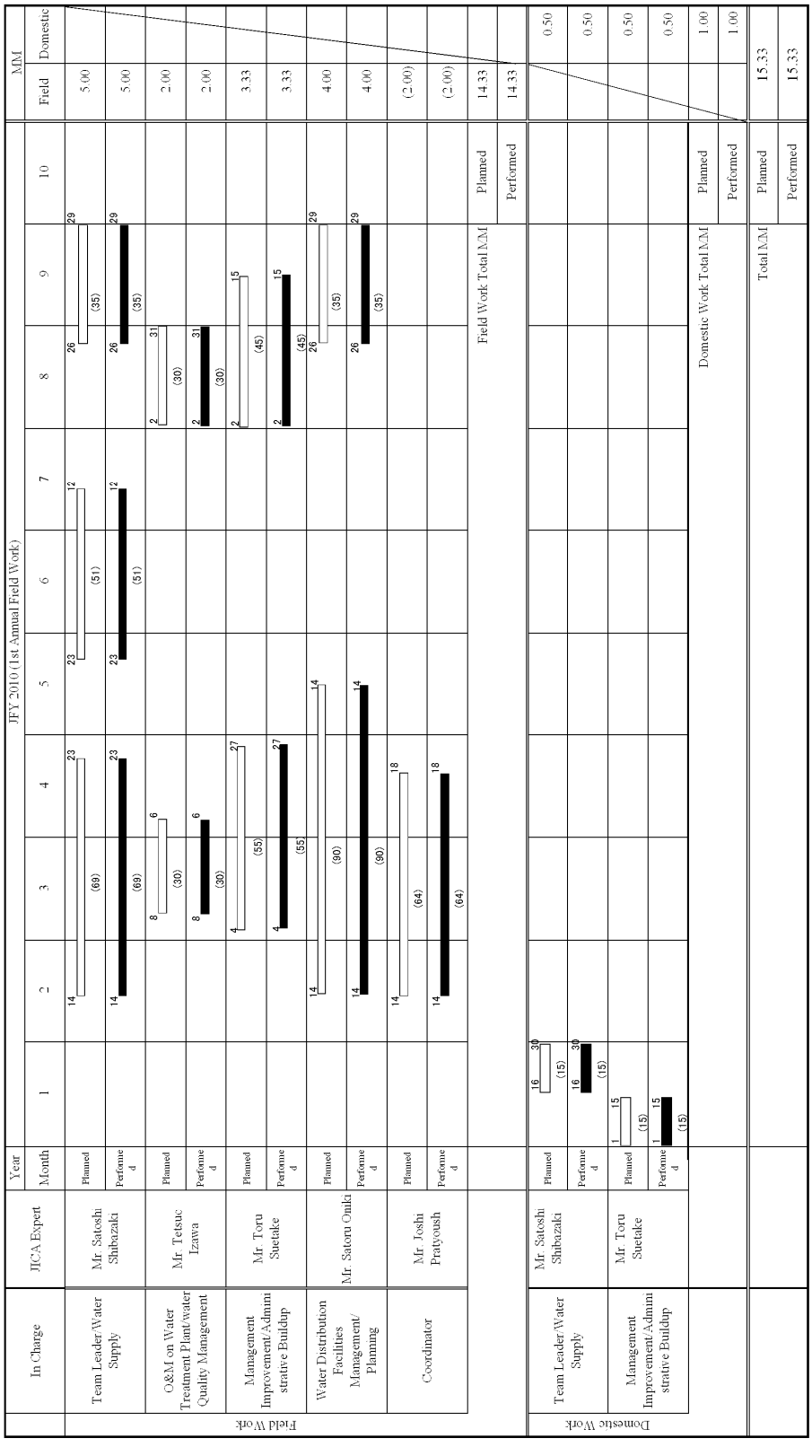


**Table 2.6 Input of Experts (The 2nd Year)**

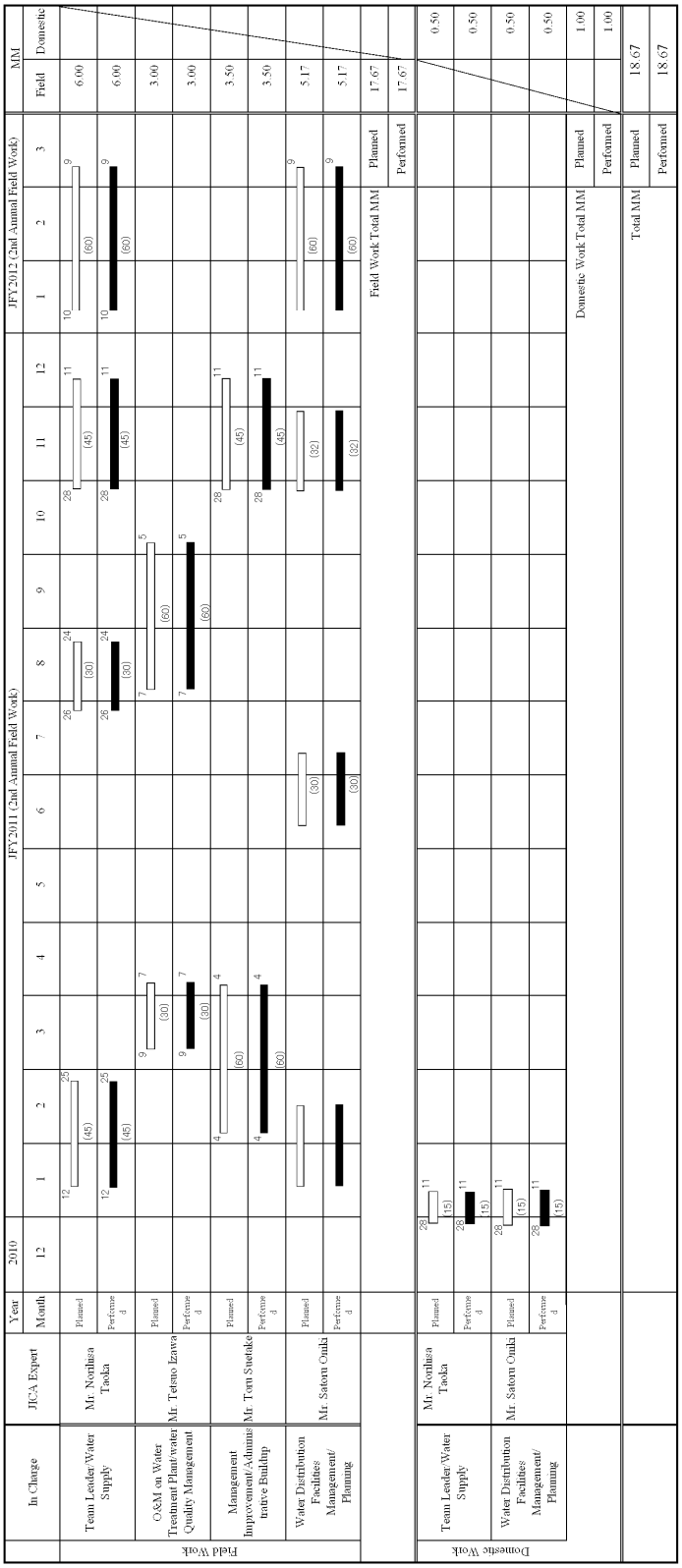
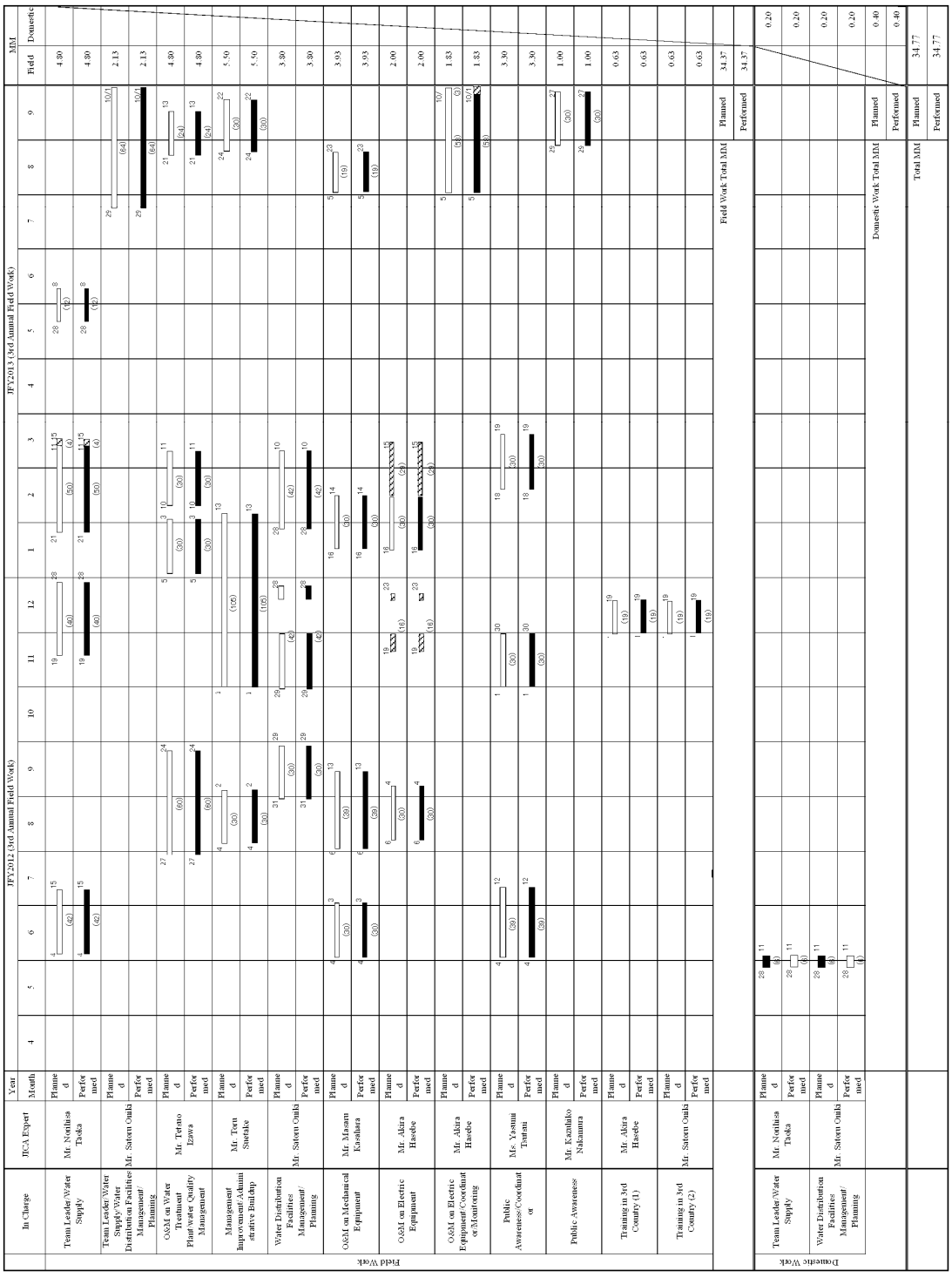


**Table 2.7 Input of Experts (The 3rd Year)**



## 2.4 Nepal Side Contribution

Contribution to the Project from Nepali sides is shown **Table 2.8**.

**Table 2.8 Nepal Side Contribution**

| 1.Counterpart | | | | | |
|---|---|---|---|---|---|
| **Organization** | | **Name** | **Position** | **Start Date of Involvement** | **Date of Transfer** |
| MoUD | | Mr. Abadh Kishore Mishra | Joint Secretary | Apr. 2013 | |
| | | Mr. Raj Kumar Malla | Joint Secretary | Jan. 2010 | |
| | | Mr. Teeka Ram Pandey | Under Secretary | Jan. 2010 | |
| MoPPW | | Mr. Suman Pd. Sharma | Joint Secretary | Jan. 2010 | Nov. 2012 |
| | | Mr. Rajendra Nepal | Legal Unit Chief | Jan. 2010 | |
| DWSS | | Mr. Ishwori Prasad Paudyal | Director General | Nov. 2012 | |
| | | Mr. Tej Raj Bhatt | Deputy Director General | Sep. 2012 | Jul. 2013 |
| | | Mr. Deepak Puri | Chief, Foreign Aid Coordination and Planning Section | Jan. 2010 | |
| | | Mr. Jyoti Kumar Shrestha | Section Chief, NGO and Community Mobilization Section | Dec. 2011 | |
| | | Mr. Ujjwal Prajapati | Chief, Project Design Appraisal, Progress M&E Section | Oct. 2012 | |
| | | Mr. Sudarshan Bhandari | Chief, Water Quality Improvement (WQI) and Monitoring Section | Sep. 2012 | |
| | | Mr. Hari Prasad Pandey | Senior Divisional Engineer | Jan. 2010 | |
| | | Ms. Binu Bajracharya | Senior Divisional Engineer | Jan. 2010 | |
| | | Mr. Krishna Pd. Acharya | Deputy Director General | Mar. 2011 | Nov. 2011 |
| | | Mr. Khom Bahadur Subedi | Deputy Director General | Jul. 2013 | |
| | | Mr. Kabindra Bikram Karki | Chief, Project Design Appraisal, Progress M&E Section | Jan. 2010. | Mar. 2012 |
| | | Mr. Lakshmi Nath Nepal | Senior Divisional Engineer | Jul. 2011 | |
| | | Mr. Shrawan Kumar Upadhayay | Senior Divisional Engineer | Mar. 2012 | |
| | | Ms. Jyoti Tamang | Engineer | Jul. 2012 | |
| | | Mr. Nawal Kishore Mishra | Chief, Human Resource Development, Training and Research Section | Nov. 2011 | May 2012 |
| CHRDU | | Mr. Rajeeb Ghimire | Chief | Jan. 2010 | |
| ERMSO | | Mr. Pratap Sharma | Regional Chief | Feb. 2013 | |
| | | Mr. Ram Lakhan Mandal | Regional Chief | Jan. 2010 | |
| | | Mr. Chok Prasad Dhital | Senior Divisional Engineer | Mar. 2011 | |
| | | Mr. Shambhu Prasad Rijal | Regional Chief | | Retired |
| WSSDO | Jhapa | Mr. Binod Kumar Agrawal | Division Chief | Sep. 2012 | |
| | | Mr. Pramod Kumar Dutta | Engineer | Jan. 2010 | |
| | | Mr. Babu Kaji Shrestha | Engineer | Jan. 2010 | |
| | | Mr. Jagannath Purbey | Division Chief | Jan. 2010 | Oct. 2012 |
| | Morang | Mr. Ganesh Bahadur Thapa | Division Chief | Mar. 2012 | |
| | | Mr. Anoj Upadhyaya | Engineer | Jan. 2010 | |
| | | Mr. Raj Kumar Chaudhary | Engineer | Mar. 2012 | |
| | | Mr. Shyam Prasad Upadhayaya | Division Chief | Jan. 2010 | Mar. 2012 |
| | | Mr. Dharmendra Keshari | Engineer | Jan. 2010 | Apr. 2012 |
| | | Mr. Surat Lal Chaudhary | Engineer | Jan. 2010 | Oct. 2012 |
| WUSC | Gauradaha | Mr.Govinda Bahadur Khadka | Chairperson | Apr. 2011 | |
| | | Mr. Babu Ram Bhandari | Secretary | Apr. 2011 | |
| | | Mr. Shree Prasad Tajpuriya | Manager | Jan. 2010 | |
| | Mangadh | Mr. Ram Bahadur Ghimire | Chairperson | Jan. 2010 | |
| | | Ms. Durga Chapagain | Secretary | Jan. 2010 | |

| | | | | | |
|---|---|---|---|---|---|
| | | Mr. Ganga Prasad Acharya | Manager | Jan. 2010 | |
| | Dhulabari | Mr. Indra Bahadur Budhathoki | Chairperson | Jan. 2010 | |
| | | Mr. Siddhi Bikram Nembang | Secretary | Dec. 2012 | |
| | | Mr. G.P Dhungana | Manager | Jan. 2012 | |
| 2.Materials and Equipment | | Office Facilities in DWSS and Jhapa/Morang WSSDO (Office Space, Electronic power source, Furniture, etc.) | | | |
| | | Necessary Budget (the Project related budget, Domestic transportation/ accommodation allowance for training/workshop, Electric charges, etc.) | | | |
| 3.Investivation /Activity | | Field Survey on WUSCs(MIT/MAT/MET) | | | |
| | | Publication of the Project Activities on the Web Site | | | |

## 2.5 Revisions of PDM

Original PDM and PO was formulated based on the R/D exchanged between MoPPW (currently MoUD) and JICA in February, 2009. At the 1st year JCC in September 2010, the revised PDM and PO (PDMver.3 and POver.3) were approved aiming at 44WUSCs (17%) as the Overall Goal of the project and 20WUSCs (100%) as the Project Goal. Thereafter, the revised PDM and PO (PDMver.4 and POver.4) were approved at the JCC held on 22nd November 2011 along with the mid-term evaluation team's suggestions which were received in November 2011. The approvals would help achieve the project goal efficiently and make the goal and output clearer. Then, the revised PDM and PO (PDMver.5 and POver.5) were approved at the JCC held on 27th September2013 to reflect the organizational change from the Ministry of Physical Planning and Works to the Ministry of Urban Development.

The revised PDMs are shown in the tables below respectively in parallel with the original one with reasons of revisions.

### (1) The 1st Revisions of PDM

Setting up the Overall Goal and Project Goal

| Items | Current Wording | Proposed Wording | Reason |
|---|---|---|---|
| **Objectively Verifiable Indicator** | | | |
| Overall Goal | 1. The number of WUSCs which are strengthened by the support of DWSS is increased XX % of all WUSC. | 1. The number of WUSCs which are strengthened by the support of DWSS is increased 44 WUSCs (17%) of all WUSC. | 1. Number of WUSCs was selected from Nepali districts.<br>2. The percentage is calculated as the following, % = selected No. of WUSCs/total No. of WUSCs (17% = 44 / 259 x 100) |
| Project Purpose | 1. Based on the technical support manual established by DWSS/RMSO/WSSDO, the support system to XX% of all WUSC in Jhapa/Morang is implemented. | 1. Based on the technical support manual established by DWSS/RMSO/WSSDO, the support system to 17 remaining WUSCs (100% of all WUSCs in Jhapa/Morang districts) is implemented. | 1. Number of remaining target WUSCs in Jhapa/Morang districts is 17 WUSCs excluding Dhulabari, Gauradaha and Morang WUSC.<br>2. clarification of the meaning |
| Output 3 | 3-1. XX% of all WUSCs in | 3-1. 17 WUSCs (100% of all | |

| | | | |
|---|---|---|---|
| | Jhapa/Morang districts made a plan to conduct "Small and Medium-sized Water Supply Management Model". | WUSCs in Jhapa/Morang districts) made a plan to conduct "Small and Medium-sized Water Supply Management Model". | |
| **Narrative Summary** | | | |
| Activities | 1-5. To approve the Project direction including a revised PDM and Project progress in JCC and StC.<br>1-6. To conduct monitoring of indicators regularly by StC. | 1-5. To approve the Project direction including a revised PDM and Project progress in JCC and PMC.<br>1-6. To conduct monitoring of indicators regularly by PMC. | 1. Change the title of "Steering Committee (StC)" to "Project Management Committee (PMC)". |

### (2) The 2nd Revisions of PDM

In order to make the contents of PDM clearer and correct some writing errors, the mid-term evaluation team and the project team discussed and prepared the revised PDM.

| Items | Current Wording | Proposed Wording | Reason |
|---|---|---|---|
| **Narrative Summary** | | | |
| Output 1 | Basic information for the Project and necessary information for indicators are collected, and water supply management of the Project is appropriately executed and implement periodically monitoring for appropriate water supply management. | Basic information for the Project and necessary information for indicators are collected, and ~~water supply~~ management of the Project is appropriately executed and ~~implement periodically~~ monitoring for appropriate water supply management is implemented periodically. | 1. typographical error<br>2. error in grammar |
| Output 2 | "Small and Medium-sized Water Supply Support Model" and "Small and Medium and Medium-sized Water Supply Support Management Model" are collected as models for WSSDO/ERMSO and WUSC. | "Small and Medium-sized Water Supply Support Model" and "Small ~~and Medium~~ and Medium-sized Water Supply ~~Support~~ Management Model" are ~~collected~~ developed as models for WSSDO/ERMSO and WUSC. | 1. typographical error<br>2. clarification of meaning |
| **Objectively Verifiable Indicator** | | | |
| Project Purpose | 1. Based on the technical support manual established by DWSS/RMSO/WSSDO, the support system to 17 remaining WUSCs (100% of all WUSCs in Jhapa/Morang districts) is implemented. | 1. Based on the technical support ~~manual~~ model established by DWSS/RMSO/WSSDO, workshop and training on "Small and Medium-sized Water Supply Management Model" are held at least one time and the support system to the other 17 ~~remaining~~ WUSCs (~~100% of all WUSCs~~ in Jhapa/Morang districts) is introduced. | 1. typographical error<br>2. clarification of the meaning<br>3. Number of WUSCs in Jhapa/Morang districts is gradually increasing and 17 WUSCs are no longer 100% of all WUSCs in Jhapa/Morang districts. |
| Output 2 | 2-1. "Small and Medium-sized Water Supply Support Model" manual and "Small and Medium | 2-1. "Small and Medium-sized Water Supply Support Model" ~~manual~~ and "Small ~~and Medium~~ | 1. typographical error |

| | | | |
|---|---|---|---|
| | and Medium-sized Water Supply Support Management Model" manual are completed. | and Medium-sized Water Supply ~~Support~~ Management Model" ~~manual~~ are completed. | |
| Output 3 | 3-1. 17 WUSCs (100% of all WUSCs in Jhapa/Morang districts) made a plan to conduct "Small and Medium-sized Water Supply Management Model". | 3-1. The other 17 WUSCs in Jhapa/Morang districts develop draft implementation plans to introduce ~~17 WUSCs (100% of all WUSCs in Jhapa/Morang districts) made a plan to conduct~~ "Small and Medium-sized Water Supply Management Model". | 1. Number of WUSCs in Jhapa/Morang districts is gradually increasing and 17 WUSCs are no longer 100% of all WUSCs in Jhapa/Morang districts.<br>2. clarification of the meaning |
| **Means of Verifications** | | | |
| Super Goal | 2. Statics of MDGs | 2. Statistics of MDGs | 1. omission |
| Project Purpose | 2-3 Support Activity Report of WSSDO | ~~2-3 Support Activity Report of WSSDO~~ | 1. Record of Support activities will be written in annual/periodical report which is Means of Verifications 2-2. |
| Output 2 | 2-2 "The support manual for WUSC" | 2-2 "~~The support manual for WUSC~~ Small and Medium-sized Water Supply Support Model " | 1. clarification of the meaning |
| **Important Assumption** | | | |
| Overall Goal | 1. The construction of appropriate water supply facilities is promoted. | 1. The construction of appropriate water supply facilities ~~are~~ is promoted. | 1. error in grammar |
| Project Purpose | 1. Necessary budget for expansion of WUSC support model in semi-area is allocated. | 1. Necessary budget and human resources for expansion of WUSC support model in semi-urban areas ~~is~~ are allocated. | 1. Not only budget but also human resources should be considered as important assumption for the Project. |

### (3) The 3rd Revisions of PDM

In accordance with the organizational change of Nepal government in May 2012, the name of the organization was revised from the Ministry of Physical Planning and Works to the Ministry of Urban Development in the PDM.

| Items | Current Wording | Proposed Wording | Reason |
|---|---|---|---|
| **Narrative Summary** | | | |
| Overall Goal | DWSS technical support model for WUSCs established by the Project will be disseminated to all over the country by MoPPW & DWSS. | DWSS technical support model for WUSCs established by the Project will be disseminated to all over the country by MoUD & DWSS. | 1. Change the organization name of "MoPPW" to "MoUD". |
| Activities | 3-3. MoPPW/DWSS holed a liaison M&E conference including related organization/local authorities. | 3-3. MoUD/DWSS holed a liaison M&E conference including related organization/local authorities. | |
| **Means of Verifications** | | | |
| Super Goal | 1. Statistics report of MoPPW (5-year Plan, etc.) | 1. Statistics report of MoUD (5-year Plan, etc.) | |

## 2.6 Public Awareness and Public Relations

Activities on public awareness are conducted in addition with dissemination of the WASMIP. The purposes of the activities are described as follows:

- Water tariff needs to be raised due to adequate operation and maintenance for water supply facilities.
- Understanding the importance of saving water and it needs to be understood and cooperated with residents.
- Educational materials are prepared for the activities and distributed to project involved persons and residents.

(1) Preparation of media and PR activities

Prepared media are described as follows:

WASMIP Poster

The purpose of the prepared poster is to make consumers understand that the WASMIP is on-going easily. Posters are put on the wall of tariff counter on every WUSC. The poster itself does not describe detailed contents of the project on its function, but it appeals the safety of water from WUSC. The purpose and contents of the project are complemented on leaflets, pamphlet and website.

WASMIP Sticker

Project logo sticker has been prepared. The stickers are distributed to targeted WUSCs during workshops and meetings several times. Experts request targeted WUSCs to utilize it on daily activities. The utilization method for the sticker is up to targeted WUSCs. Experts introduced case example for the sticker and suggested how to utilize it on daily activities in the workshop held on 28th November, 2012.

Pamphlet for WUSCs

The pamphlet is has been prepared for WUSCs and describes general outline of the project in Nepali. Preparation and finalization of the contents on pamphlet are revised several times and counterpart works with patience for it. The pamphlets are distributed to targeted WUSCs during workshops and meetings on several occasions.

Pamphlet for Management model and Support model (for WUSC)

The system of the Models and the organization figure was completed with the discussion between the terminal evaluation team and the JICA Expert Team (February to March, 2013). In the project areas, individual activities of the project were well known, such as technical trainings, but it was rarely recognized as that a series of activities are forming the models. In addition, the name of “Water Supply Support Model” and “Water Supply Management Model” were not well known among WUSC employees. Therefore, DWSS and the JICA Expert Team corroborate, and prepare the pamphlet of

these two models. The pamphlets have been distributed to targeted WUSCs during workshops and meetings on several occasions.

Leaflet for public awareness

Aims of prepared leaflet are to recognize the WASMIP and understand necessity of adequate operation and management for water supply facilities with cooperation of residents in targeted area. The leaflet describes the outline of the project, benefit of the project for the society, cooperation for raising water tariff and understandings for its necessity of saving water. The leaflet is written in Nepali.

Leaflet of Good/Bad practice for using the supplied water (for residents)

First time, awareness leaflet for residents were prepared on December 2012. The first leaflet explains the summary of the WASMIP, the reason of water tariff increase, and importance of saving water. According to the result of the awareness survey of March 2013, which mentioned at the next section, many of residents know about the JICA project, agree with the increase of water tariff, and try saving water in everyday life. Therefore, the topic of the next leaflet focuses on good and bad practice for using the supplied water for its sustainable use. For example, four of good practices (saving water, understanding of importance of Chlorine treated water, reporting water leakage, and reporting turbid water), and two of bad practices (damaging water meter, and not paying water bill). The second leaflet was prepared in August 2013. These two leaflets were used as educational material at the workshop for residents. Since the issues of the second leaflet are more general, WUSC can continue to use as educational materials for residents even after the completion of WASMIP.

Request for coverage and posting organizing the workshop on local new papers

PR activity utilizing local newspapers and internet are conducting in addition with preparation of leaflet and pamphlet etc. Due to recognition of the project activity to residents, local newspaper has an interview and posts to activities on the newspaper. The request for the interview from the local newspaper was conducted by WSSDO chief and workshop and OJT activities are covered on the paper.

Posting on website (DWSS website)

DWSS, counterpart, has its own website and the WASMIP is set on one of its site page (http://www.dwss.gov.np/content/62/WASMIP). The outline of the project, workshop report and the workshop covered by the local newspaper and its article are posted on the page. Articles on the website are the WASMIP activities and the article from the local newspapers.

Posting on the website (JICA website)

Project activities are posted on JICA website. Main activities such as technical workshop are posted on the site.

(2) Awareness survey for residents

A survey for the residents was carried out at Mangadh, Gauradaha, and Dhulabari in March 2013. The total number of interviewees was 283 persons (Male: 189 persons, Female: 94 persons). Though same questionnaire was applied, all interviews were carried out by employees of each WUSC. Major questions are below:

- Do you know a JICA project is going on your area?
- How did you know about the JICA Project?
- Do you feel the service of water supply is getting better for last 3 years?
- Do you agree with the water tariff increase?
- Do you try to save water in your daily life?

**Figure 2.2** shows the result of the survey. According to the result, 94% of respondents know that the JICA project is going on, 90% of respondents feel the quality of water supply service is getting better, 75% are positive for the tariff increase, 97% are trying to save water in everyday life. Regarding the result, the topic of the new leaflet (mentioned at the previous section) was decided for general information of usage of supplied water.

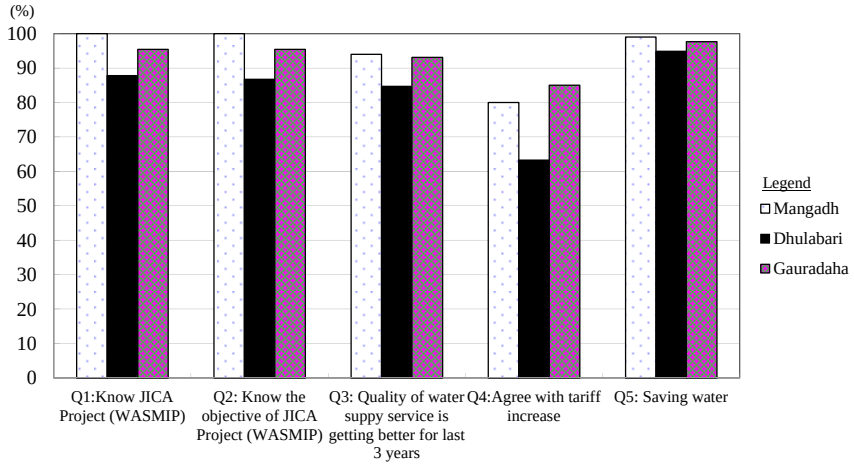



**Figure 2.2 Result of the Survey (March 2013)**

(3) Activity for Public Awareness

Workshops for public awareness are conducted for WSSDO, WUSC and residents in September 2013. The workshops are organized by participatory style and the contents of two types of leaflets are introduced to WSSDOs, WUSC and residents for aiming to deeply understand the contents of the leaflets.

a) CHRDU

Two types of pamphlet and leaflet are distributed in the seminar for water meter readers at CHRDU on 6th September, 2013, and Experts explained the contents of the WASMIP.

Achievement and comments from the participants

- Participants understand the contents of the project.
- Participants share the contents of the workshop with the residents in daily activities.
- Participants are all water meter readers. Therefore, the contents of the leaflets are easy for participants to understand.
- The workshop assists that the contents of public awareness recommended by the WASMIP project are continuously recognized by the residents.
- Pamphlets, leaflets and stickers are distributed not only participants but also PR office in CHRDU and the contents of the project are disseminated. Thus, other participants for other seminars have chance to access the information and recognize the project.

Seminar on Public Awareness



b) WSSDO, WUSCs

The meetings with Chandragadh, Birtamod, Dhulabari, Kakarbhitta, Lakhanpur, Gauradaha WUSCs, Morang WSSDO, Pathri, Sakalpur, Tanksinuwari, and Mangadh WUSCs are organized from 8th to 10th September, 2013. Posters, pamphlets, leaflets and stickers are distributed on the meetings.

Achievement and comments from the participants

- PR officer for public awareness in WSSDO introduces the contents of public awareness in the WASMIP in a seminar.
- The person in charge of public awareness is appointed by the chairperson and he/she conducts the workshop for water meter reader and residents.
- The content of public awareness recommended by the WASMIP is continuously conducted in the seminar for public awareness organized by WUSC.
- Water meter readers understand the importance of dissemination on the contents of public awareness recommended by the WASMIP and recognize it to residents.
- General assembly is held once a year on each WUSC and most of the assemblies are organized in January. WUSCs disseminate the contents of public awareness on the WASMIP.
- Each WUSC needs to arrange for organizing the general assembly for public awareness.
- Posters and stickers are already put on the office. However, Experts request each WUSC to put posters and stickers on the entrance and water tariff counter in the office for recognizing the WASMIP to residents more than ever.

- Experts request WSSDO to pass leaflets and pamphlet are distributed to some WUSCs where Expert cannot visit due to the general strike. The contents of materials were described by phone, if necessary.

Meeting on Public Awareness



c) Public awareness activities for residents and WUSC

The workshops for Chandragadh, Birtamod, Dhulabari, Birtamod, Lakhanpur, Gauradha WUSCs, Pathri, Damak, Tanksinuwari, and Mangadh WUSCs are organized for residents from 18th to 22nd September, 2013. Two types of leaflets are distributed on the workshops.

Achievement and comments from the participants (Residents)

- Participants understand the public awareness activities on the WASMIP.
- Participants understand Good practice/Bad practice on water use.
- Participants are enthusiastic to say their current situation and opinion during the session and it seems their commitment for the workshop is seen.
- All participants are interested in water supply. For instance, one of participants asks the Expert how WUSC monitors water quality on water in daily use.
- Some participants are teachers from elementary schools. They consider conducting some classes to their students for public awareness using the leaflets.
- All participants are representative from their communities in one of the workshops. They are going to disseminate the contents of the workshop continuously after attending the workshop.

Seminar on Public Awareness



# CHAPTER 3 PROJECT ACTIVITES AND OUTCOMES

## 3.1 Strategy for Technical Transfer

On the basis of the 1st and 2nd year's activities, technical transfer has been implemented according to strategies shown below.

**The 2nd Year's Strategy for Technical Transfer**

**(1) Implementation of OJT/Training with Active Participation of C/P including DWSS**

One of the project purposes is to enhance the capacity of WUSCs in implementing O&M for WTP and water distribution facilities, water quality management, and proper water supply management including formulation of the medium and long-term business plan, so as to develop fundamental management system for efficient supply of safe drinking water. For this purpose, the Project planned to implement OJT/Training with active participation of DWSS and WSSDO/ERMSO in order to enhance their capacity in practicing technical guidance and training to WUSCs. DWSS issued the letter of announcement to WSSDOs before OJT/Training, and confirmed the participants. The JICA Experts reported DWSS the results of OJT/Training and participants.

The JICA Experts conducted OJT/training in the first year. However, while the Experts conducted it continuously in the second year, the training ownership was gradually shifted to the C/P side, DWSS and WSSDOs.

**(2) Utilization of Central Human Resource Development Unit (CHRDU)**

CHRDU located in the suburb of Kathmandu has training programs such as water quality analysis, calibration for water meter, assembly/disassembly and repair of pumps, and electric system checking method. Therefore, the Project planned to use the CHRDU facilities to complement the activities at the sites where tools and materials for the training are insufficient. Through the discussion and agreement between DWSS and the JICA Experts, the training schedule and program were decided in advance. Further, it was agreed that CHRDU will take part in the OJT/Workshop and monitoring & evaluation activities as a C/P.

**(3) Utilization of Water Quality Analysis Center in DWSS**

DWSS has a water quality analysis center equipped with atomic absorption photometers and it executes iron removal, arsenic removal and bacteria elimination as a pilot project. Despite the possession of such analytical instruments, it has not been utilized effectively due to the lack of basic knowledge in the staff regarding chemical reagent and analytical equipment management, analytical principle and its range of data application, judgment of data reliability.

Making a training base of the DWSS analysis center, OJT/training on water quality analysis method, chemical reagent dealing method, water quality standards, etc. were provided to the DWSS staff at this center. The trained DWSS staff will be dispatched to WSSDOs and WUSCs and transfer the water analysis technology to the staff of WSSDOs/WUSCs. Thus, cooperating with DWSS and CHRDU, the

water quality analysts will be brought up.

**(4) Consideration of Timing of OJT/Training, Securing of Training Room**

For some of OJT/training programs, the electricity is necessary, especially for O&M on WTP and water quality analysis, and therefore, such training was implemented during the rainy season when occurrence of power failure is few. In case of power failure, implementation of OJT/training was facilitated by providing fuel for power generator or facilitating rental of transportable generator.

Appropriate training rooms for workshop and/or seminar with C/P and the means of transportation for participants (such as rental a car) was secured.

For effective OJT/training, qualified interpreters were secured in order to provide an accurate technical explanation.

**(5) Cooperation with ADB on Water Supply Management**

The information regarding buildup on water quality management system was exchanged with ADB as follows:

A TSC (Technical Support Center) was constructed at Itahari in Sunsari district under the control of ERMSO as the C/P. However, this institution has not started operation at full capacity due to delays in personnel and budget arrangements. It was examined whether this facility can be used periodically in the future as the WUSC's personnel training workshop (OJT of a water examination) and water testing laboratory of WUSC. In addition, the JICA Expert Team with DWSS discussed and exchanged opinions with ADB about strengthening WUSC's capacity on water quality control, if necessary.

**The 3rd Year's Strategy for Technical Transfer**

**(1) Input of Japanese Experts**

Originally, the input of the Japanese Experts in the Project was planned up to the end of May 2013, whereas project termination date stated in the R/D is September 2013. So, based on the R/D, the input of the Japanese Experts has been extended up to September 2013. The extension on the input of the Japanese Experts has also been necessary as the Mid-Term Review report recommended to provide additional technical assistance to the targeted WUSCs and C/Ps on the O&M of Mechanical Equipments, O&M of Electrical Equipments and Public Awareness and Project Coordination which were not included previously. The activity plans of these Experts are as follows:

- O&M of Mechanical Equipment: To conduct OJT on up skilling of C/P in O&M and repair work of mechanical equipment, and support holding workshop/seminar. To propose for WSSDO to build sustainable system in implementing inspection/monitoring of equipment for WUSCs.
- O&M of Electrical Equipment: To conduct OJT on up skilling of C/P in O&M and repair work of electrical equipment, and support holding workshop/seminar. To propose for WSSDOs to build sustainable system in implementing inspection/monitoring of equipment for WUSCs.
- Public Awareness/Project Coordination: To conduct activities on the public awareness and public relations. To post information, news and articles related to the project activities in the website of

JICA and DWSS. To develop and distribute Project Logo, pamphlet, leaflet, poster to the stakeholders in order to make them aware on the objectives of the Project and to familiarize Project activities among them, as well as on future increase of water tariff and saving water habit for proper operation of facilities.

**(2) Provision of Spare Parts/Tools**

Following the second year, some of the spare parts and tools are necessary for OJT on O&M of water supply facilities and water quality tests were procured and provided to respective WUSCs and WSSDOs. The provided spare parts and tools have been used for OJT. Keeping these tools properly, the WUSCs and WSSDOs use them for daily O&M work. If additional tools are needed, WUSCs and WSSDOs will procure them by their own budget.

**(3) Activity Plan**

1) Implementation of OJT/Training with Active Participation of C/P including DWSS

In the first year and the first half of second year, the JICA Experts alone conducted OJT/workshop. In the latter half of the second year, training ownership gradually shifted to the C/P side, DWSS/WSSDOs. In the third year, trainings of trainers were carried out for DWSS/WSSDOs staff and trained staff was able to conduct training to WUSCs. Thus, the C/P side is taking full ownership of organizing and conducting OJT/training/workshop on their own initiatives to enhance efficiency in the implementation of the Project and to achieve set objectives of the Project.

2) Dissemination of the Water Supply Management Model and Support Model to other 17 WUSCs

One of the major activities of the third year is to disseminate “Water Supply Management Model” and “Water Supply Support Model” to the other 17 WUSCs. To carry out this activity, the contents of draft Management Model and Support Model prepared in the second year have been examined continuously to make it more appropriate, practicable and implementable. In other words, goals of WUSCs in technical and administrative areas were indicated in the “Management Model”. SOP and example of business plan were also put in the Model as tools for realizing the goals. In the “Management Model”, Maintenance Inspection Team (MIT) and Management Advisory Team (MAT) were put in the Model so that DWSS/WSSDO provides technical support through activities of these Teams.

3) Utilization of Central Human Resource Development Unit (CHRDU)

CHRDU has good training facilities and conducts training programs such as water quality analysis, calibration of water meters, assembling, disassembling and repair of pumps, and electric system checking method. The Project is planning to use the facilities of CHRDU to complement project activities at the sites. The training menu and program are decided in coordination with CHRDU/DWSS and the JICA Experts. The staff of CHRDU participated in the training of trainers for water quality management and the chief participated in the Project as a member of

project monitoring/evaluation team.

4) Utilization of Water Quality Analysis Center in DWSS

DWSS has established a central water testing laboratory at its premises in Kathmandu to analyze of drinking water. The laboratory is equipped with atomic absorption photometers along with other testing equipment. Utilizing the water quality analysis center, in the second year, the Project organized OJT/training on water quality analysis method, chemical reagent dealing method, water quality standards, etc. to the staff of DWSS, CHRDU and TSC. Refresher training was conducted in the third year, and the trained DWSS staff shall be mobilized to conduct training at WSSDOs and WUSCs to transfer water analysis technology to the staff of WSSDOs/WUSCs. Thus, cooperating with DWSS and CHRDU, the water quality analysts will be brought up.

5) Consideration of Timing of OJT/Training, Securing of Training Room

The electricity must be available for OJT of O&M on WTP and water quality analysis. Therefore, such training was implemented during the rainy season when occurrence of power failure is less. In case of power failure, transportable power generator was rented.

Appropriate training rooms for workshop/seminar were secured consulting with DWSS in advance, and cost to be shared by DWSS and JICA were decided. The means of transportation for participants (such as renting a car or WSSDO's vehicle) were also secured.

6) Public Relations (PR)

Effective publication to support the PR activities was carried out so that Japanese and Nepalese people shall have an appropriate understanding of the meanings of the Cooperation Project, its activities contents and outcomes to be yielded.

Manuscripts were prepared cooperatively with C/Ps and prior permission from C/P regarding the contents of manuscript, photographs, portrait rights and copyrights.

The PR activities included posting information, news and articles related to the project activities in the website of JICA and DWSS, developing and distributing Project Logo, pamphlet, leaflet, poster to the stakeholders in order to make them aware on the objectives of the Project and to familiarize the Project activities among them, as well as on future increase of water tariff and saving water habit for proper operation of water supply facilities.

## 3.2 Major Outcomes of Technical Transfer

### 【Output 1】

Basic information for the Project and necessary information for indicators are collected, and management of the Project is appropriately executed and monitoring for appropriate water supply management is implemented periodically.

**(1) Preparation of Inception Report (Draft)**

The collection and analysis of the information and data of the water service organizations had been carried out in Japan from JICA preliminary survey report, October 2008, etc.

IC/R (proposal) was created at the end of January, 2010 based on the result of discussions on the basic policy of the Project implementation, the technique of technology transfer, etc. with JICA.

**(2) Presentation /Discussions on IC/R**

Explanation and deliberations on the inception report (draft) and on the implementation of the Project were carried out at local sites of Nepal as a domestic work.

The corrected IC/Rs were submitted to DWSS and JICA on March 4, 2010 as a result of deliberations with DWSS.

**(3) Baseline Study (B/S)**

1) Outline of the Study

In order to find out socio economic condition, survey was re-commissioned to the local consultant.

Area for investigation

Three WUSCs (Dhulabari, Gauradaha, Mangadh) and the residents receiving water services from the mentioned water supply utilities.

Method of investigation and number of samplings

The examination method was carried out by the questionnaire and by a random sampling.

Investigation number was a total of 260 households.

Consultation period

On-site investigation: April 16th to April 24th, 2010.

**Table 3.1 Allocation of Sampling by WUSC**

| No. of Questionnaires | Estimated Served No. of HH s | No of HH Survey |
|---|---|---|
| Dhulabari WUSC | 1,910 | 105 |
| Gauradaha WUSC | 787 | 45 |
| Mangadh WUSC | 1,994 | 110 |
| Total | 4,691 | 260 |

The item of the main investigations

The contents of the main investigations included collection of the following information as discussed and decided with PWT.

- Outline of service sites (the outline of a water supply area, number of household connections, average number of family members, served household percentage, water usage)
- Type of house of the residents (living level, economical level)
- Household income (type of household profession, area of housing, percentage of household possessing, average income of household)
- Access to potable water (location of taps/faucets/connection, water source, distance of tap/faucet)
- Water supply service (service time, frequency of water supply, users satisfaction, usage rate of water tanks, purchasing rate of bottled water, purchasing rate of water tanker, satisfaction of service pressure, water quality, frequency of water quality test, frequency of water tank cleaning)
- Toilet facilities (location of toilet, type of toilet facilities)
- Morbidity of diseases
- Expected benefit
- Maximum monthly water service charge willingness to pay
- Willingness to pay (rate of willingness to pay, monthly charges)
- Views on current water tariff (cheap, appropriate, expensive)
- Kind of requests to WUSC（improvement item）

2) The Result of Basic Investigation on Socio-Economic Conditions.

The result of investigation is shown in **Table 3.2**.

**Table 3.2 Result of Baseline Survey**

| | Survey Items | Dhulabari Area | Gauradaha Area | Mangadh Area |
|---|---|---|---|---|
| 1 | Outline of Service Sites | | | |
| | Service Areas | Wards1 to 6, Hainan 8 and 9 | Wards 2, 3, 4, 7, 8, 9 | Ward 1 to 5, Dhaijan 4 |
| | Number of Household connections | About 2.000 | About 720 | About 1,900 |
| | Average number of Family members | 5.4 | 6 | 5.4 |
| | Served Household Percentage | About 49% | About 25% | About 45% |
| | Water Consumption (Ratio) | Living：58%<br>Bathing/washing：29%<br>Animal use& Others：13% | Living：88%<br>Bathing/washing：12%<br>Animal use：0% | Living：47%<br>Bathing/washing：30%<br>Animal use& Others：23% |
| 2 | Type of main House of the residents | Middle level：50%<br>(Semi-pakka house) | Middle level：53%<br>(Semi-pakka house) | High level：87%<br>(Pakka house) |
| 3 | Household Income | | | |
| | Type of Household Profession | Services：42% | Agriculture：64% | Services：69% |
| | Area of Housing | Less than 253m$^2$：50% | 270 - 591m$^2$：62% | Less than 253m$^2$：65% |
| | Percentage of Household possessing | Both Electric Goods &Transportation：6.7% | Both Electric Goods &Transportation：4.4% | Both Electric Goods &Transportation：48% |

| | | | | |
|---|---|---|---|---|
| | (Vehicles, Electric goods) | | | |
| | Average Income of Household (year/NRs) | NRs. 92,580 | NRs. 118,333 | Data Unavailable |
| 4 | Access to Potable Water | | | |
| | Location of Taps/Faucets/connection | Indoor Only：19%<br>outdoor Only：78%<br>Both indoor & outdoor: 3% | Indoor Only：20%<br>outdoor Only：80% | Indoor Only：14%<br>outdoor Only：25%<br>Both indoor & outdoor：61% |
| | Water Source | Private Connection Only：91%<br>Both Private Connection &Well/Hand Pump：9% | Private Connection Only：100%<br>Both Private Connection &Well/Hand Pump：0% | Private Connection Only：59%<br>Both Private Connection &Well/Hand Pump：41% |
| | Distance of Tap/faucet | <50m：91% | <50m：100% | <50m：70% |
| 5 | Water Supply Service | | | |
| | Service Time（Dry Season, Weekday） | 1-3 hours/day：50%<br>4-6 hours/day：50% | 1-3 hours/day：38%<br>4-6 hours/day：62% | 1-3 hours/day：51%<br>4-6 hours/day：49% |
| | Frequency of Water Supply（Weekday） | 2 Times/day（Dry Season）<br>All day long（Rainy Season） | 3Times/day（Dry Season）<br>3Times/day（Rainy Season） | 3Times/day（Dry Season）<br>3Times/day（Rainy Season） |
| | Users Satisfaction (Service Time) | Satisfaction：50% | Satisfaction：38% | Satisfaction：51% |
| | Mitigation of Supply Interruption (Using Alternatives) | Combined usage of Well/Hand pump/Pond：91% | Combined usage of Well/Hand pump/Pond：91% | Combined usage of Well/Hand pump/Pond：53% |
| | Usage rate of Water Tanks | 89% | 40% | 58% |
| | Purchasing rate of Bottled Water | 6% | 0% | 9% |
| | Purchasing rate of Water Tanker | 3% | 2% | 11% |
| | Satisfaction of Service Pressure | Full Satisfaction：39% | Full Satisfaction：44% | Full Satisfaction：30% |
| | Water Quality | Taste(Satisfaction)：97%<br>Odor(Satisfaction)：98%<br>Color(Satisfaction)：96% | Taste(Satisfaction：98%<br>Odor(Satisfaction)：100%<br>Color(Satisfaction)：53% | Taste(Satisfaction)：100%<br>Odor(Satisfaction)：100%<br>Color(Satisfaction)：93% |
| | Frequency of Water Quality Test | 1-3 Time/year：50%<br>Data Unavailable：50% | 1-3Time/year：7%<br>Data Unavailable：93% | Data Unavailable：100% |
| | Frequency of Water Tank Cleaning | 1-2Time/year：11%<br>>2Times/year：1%<br>Data Unavailable：88% | 1-2Time/year：5%<br>>2Times/year：7%<br>Data Unavailable：88% | 1-2Time/year：69%<br>>2Times/year：31% |
| 6 | Toilet Facilities | | | |
| | Location of Toilet | Indoor Only：19%<br>Outdoor Only：78%<br>Both Indoor/outdoor：3% | Indoor Only：18%<br>Outdoor Only：82%<br>Both Indoor/outdoor：0% | Indoor Only：52%<br>Outdoor Only：18%<br>Both Indoor/outdoor：30% |
| | Type of Toilet Facilities | Tank Flush：18%<br>Pour Flush：39%<br>Septic Tank：28%<br>Pit Latrine, etc.：15% | Tank Flush：0%<br>Pour Flush：58%<br>Septic Tank：36%<br>Pit Latrine, etc.：6% | Tank Flush：5%<br>Pour Flush：1%<br>Septic Tank：82%<br>Pit Latrine, etc.：12% |
| 7 | Morbidity of Diseases | There is a few data（Diarrhea and the illness of an eye have mainly broken out） | | |
| 8 | Expected Benefit | Mitigation of Water carriage burden<br>Less Morbidity<br>Improvement in a level of life | | |
| 9 | Maximum Monthly Charge willing to pay (Affordability) | 50 NRs/Month：33%<br>50-100 NRs/Month：36%<br>100-150 NRs/Month：15%Over150 NRs/Month:16% | 50 NRs/Month：44%<br>50-100 NRs/Month：9%<br>100-150 NRs/Month：33%<br>Over150 NRs/Month：14% | 50 NRs/Month：20%<br>50-100 NRs/Month：72%<br>100-150 NRs/Month：6%<br>Over150 NRs/Month：2% |
| 10 | Willingness to Pay | | | |

| | | | | |
|---|---|---|---|---|
| | Rate of Willing to Pay | 100% | 100% | 100% |
| | Monthly Charges | 50 NRs/Month：52%<br>50-100 NRs/Month：32%<br>100-150 NRs/Month：0%<br>Over 150 NRs/Month：16% | 50 NRs/Month：51%<br>50-100 NRs/Month：40%<br>100-150 NRs/Month：1%<br>Over 150 NRs/Month：8% | 50 NRs/Month：37%<br>50-100 NRs/Month：58%<br>100-150 NRs/Month：1%<br>Over 150 NRs/Month：4% |
| 11 | Views on Current Water Tariff (Evaluation) | Cheap：11%<br>Appropriate：57%<br>Expensive：32% | Cheap：7%<br>Appropriate：38%<br>Expensive：57% | Cheap：4%<br>Appropriate：69%<br>Expensive：27% |
| 12 | Kind of Requests to WUSC（Improvement Item） | Solve for Water pollution：18%<br>Water Supply Dropout：19%<br>Air Foaming Mixture：10%<br>Meter Error of Water volume Measured：6%<br>Payment Procedure：12%<br>Water Supply Condition：18%<br>Improve Sewerage System：4%<br>Improve Infrastructure, etc.：17% | Solve for Water pollution：17%<br>Water Supply Dropout：23%<br>Air Foaming Mixture：0%<br>Meter Error of Water volume Measured：2%<br>Payment Procedure：2%<br>Water Supply Condition：27%<br>Improve Sewerage System：4%<br>Improve Infrastructure, etc.：25% | Solve for Water pollution：15%<br>Water Supply Dropout：32%<br>Air Foaming Mixture：1%<br>Meter Error of Water volume Measured：1%<br>Payment Procedure：1%<br>Water Supply Condition：10%<br>Improve Sewerage System：14%<br>Improve Infrastructure, etc.：26% |

*Source：Baseline Study Report, August 2010*
*Note: There are some discrepancies in data; therefore in-depth study is required to confirm the actual conditions.*

The feature as a result of baseline investigation is shown below.

3) Economic conditions

Mangadh WUSC has many business districts and the living environment is rich compared to Dhulabari and Gauradaha WUSCs. Therefore, average water consumption is high.

a) Supply of safe drinking water

- In the 3 WUSCs, 95% of reply does not have dissatisfaction in water quality.
- In the 3WUSCs, the reply of the frequency of a water examination needs to re-investigate because of non-respondent by large number.
- Cleaning of the water tank installed in Mangadh area is carried out well. However, the remedy of cleaning frequency is required for other WUSCs.

b) Supply of the stable amount of water

- In the 3WUSCs, 50% of reply is satisfied with the present water supply time in general.
- Furthermore, it is necessary to carry out the expansion plan of an improvement and a diffusion rate for water service.
- Since quantity of raw water available from existing sources has a limitation, measures such as augmentation of new water sources (construction of tube wells) and construction of new water supply tank are to be considered.

c) Improvement of water rates

Comparison of the present basic charge of the 3WUSCs is shown in **Table 3.3**.

**Table 3.3 Basic Water Rates**

| Parameters | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Minimum Basic Volume Range ($m^3$/Month) | 1-8 | 1-8 | 0-10 |
| Minimum Basic Charge (NRs/Month) | 50 | 75 | 90 |
| Average Water Consumption ($m^3$/Month/Household) | 7-10 | 5-11 | 10-12 |
| Average Water-rate (NRs/Month/Household) | 70-80 | 85-100 | 90-120 |
| Additional Charge (NRs/$m^3$) | 11 | 10 | 14 |

*Source：Information from JICA Expert Study, June-July 2010*

- The payment of water rates is high.
- The customer is satisfied with the water-rates system in general.
- Cooperation consciousness is high for extension of water supply facilities.
- The improvement of water rates
  - Affordability is possible till a maximum of 150 NRs/month.
  - Raising the minimum amount of water rates is possible.
  - The reduction in basic amount of water is possible.
  - A large quantity consumer's additional charge can be raised.

d) Self-defense measure (correspondence at the time of suspension of water supply)

- 90% of the water service users in Dhulabari and Gauradah areas are using the hand pump together. However, the possession rate of a private water tank is only 2 to 3%.
- 53% of the water service users in a Mangadh area is using together with the hand pump.
- Most of private tank capacity is 0.1-0.5 $m^3$.
- The rich home has purchased it by tanker.
- Since the demand of pet water bottle is high, it has seldom dissemination. (The unit price of PET bottle water is about ten to 20 NRs/liter and tap water is about 4 to 10 NR/$m^3$)

e) Degree of comprehension of the benefit effect

The customer has received convenience about the following items.

- Reduction in fetching/collecting water labor and time
- The effect on the occurrence and prevention of a disease is high
- Improvement in a living environment condition

### (4) Capacity Assessment on C/P Agencies Organization

#### (4-1) Outline of investigation

In order to find out human capability and organizational ability of the organization for their strengthening, investigation was re-commissioned to the local consultant.

Period of investigation

- On-site investigation: May 1st to May 31st, 2010

Targeted organization to be investigated

- DWSS (Department of Water Supply and Sewerage)
- ERMSO (Eastern Regional Monitoring and Supervision Office: Dhankuta WSSDO)
- 2WSSDOs (Morang District and Jhapa District)
- the 3WUSCs (Dhulabari, Gauradaha, Mangadh)

Method of investigation and number of samplings

An examination method is shown below.

- Analyze with a questionnaire by interview
- Background and knowledge
- Collection and analysis of related regulation

The number of interviewee is 123 as a total, 44 from DWSS, 10 from ERMSO, 20 from Jhapa WSSDO, 18 from Morang WSSDO, 17 from Dhulabari WUSC, 5 from Gauradaha WUSC and 9 from Mangadh WUSC.

**(4-2) Result of evaluation of personnel ability**

The result of the personnel ability rating (a training candidate is included) of a government organization is shown in **Table 3.4**.

**Table 3.4 Summary of Evaluation of Personnel Capacity (Government agency)**

| Parameters | | DWSS (Interviewee staffs : 2) | ERMSO (Interviewee staff : 10) | WSSDO Jhapa (Interviewee staff : 20) | WSSDO Morang (Interviewee staff : 18) |
|---|---|---|---|---|---|
| Category of Staffs | Qualification (Degree) | Master / Bachelor：100% | Bachelor：70%<br>Middle Level：30% | Bachelor ：10%<br>Middle Level：40%<br>Compulsory education：50% | Bachelor ：22%<br>Middle Level：28%<br>Compulsory education：50% |
| | Total year of Experience | Less than 20 years：19%<br>21-30 years：27%<br>Over 31 years：9%<br>Data unavailable：45% | Less than 10 years：20%<br>11-20Years：50%<br>Over 21years：0%<br>Data unavailable：30% | Less than 15 years：70%<br>16-20Years：10%<br>Over 21years：20%<br>Data unavailable：0% | 10-15Years：33%<br>16-20Years：12%<br>Over 21Years：11%<br>Data unavailable：44% |
| | Age | 20-40：13%<br>41-50：47%<br>Over 51：40% | 26-45：60%<br>46-60：30%<br>Data unavailable：10% | 26-45：45%<br>46-60：55% | 31-45：61%<br>Over 46：39% |
| | Retirement age | 58 | | | |
| | Special Subject | Water/Sanitation/Quality Eng.：80%<br>Administrative Staff, etc.：20% | Technical Eng.：60%<br>Administrative Staff, etc.：30%<br>Data unavailable：10% | Technical Eng.：65%<br>Administrative Staff, etc.：35% | Technical Eng.：72%<br>Administrative Staff, etc.：28% |
| | Oversea Training （2005-09：166 Staffs; Japan:21%, India:17%） | Water supply, management Plan, Project implementation management, Disaster management, personnel management, etc. | Water supply：30%<br>Management/Accountant：20%<br>Health：20%<br>Others：1%<br>Data unavailable：29% | Water supply：45%<br>Management/Accountant：15%<br>Others：10%<br>Data unavailable：30% | Water supply：56%<br>Management/Accountant：6%<br>Others：16%<br>Data unavailable：22% |
| Capacity of Expertise | Language（English） | Knowledgeable：100% | Knowledgeable：80% | Knowledgeable：50% | Knowledgeable：60% |
| | Technical department | High technical knowledge (Waterworks Engineering, Pipeline, Environment, Physical chemistry, Groundwater, others) | High technical knowledge （Waterworks Engineering, construction supervision , Pipeline, Basic operation of Computer, others) | | |
| | | Capacity of technical assistance is satisfying. (However teaching materials for training are insufficient | | | |
| | Management department | High technical knowledge （For example, Financial affairs / management / accounts / personnel management / racial improvement, others） | High technical knowledge （For Example, financial affairs / personnel management / accounts, others） | | |
| | | Capacity of technical assistance is satisfying. (However teaching materials for training are insufficient | | | |

| | | |
|---|---|---|
| Practice Capacity / Knowledge | Management capability of an organization | High level |
| | Knowledge about organization's objectives | Understanding |
| | capability of execution of role | About satisfactory |
| | Ability to adjustment | High level |
| | Knowledge required for general service | The knowledge of wide range on waterworks technology is insufficient.<br>The capability of personal computer basic operation is insufficient. |
| | Knowledge on management staff | About satisfactory |
| | Understanding job definition | Understanding |
| | Communications skills with a boss and a coworker | About satisfactory |
| | Negotiation capability to an external organization | High level |
| | Emphasis nature / teamwork | About satisfactory |
| | Financial-planning development and management | High level |
| | Report generation | Capability of a senior member of the staffs high ((For Example, a fiscal year plan, an policy, a report)<br>Other Staffs can prepare only the report on routine work. |
| | Leader ship | A senior member of the staff is high |
| | Information gathering capability from an external office | A senior member of the staff is high |
| | Decision-making | A senior member of the staff is high |
| | Knowledge of management | ・ Management-by-objective knowledge is insufficient,<br>・ Construction management knowledge is insufficient.<br>・ Performance inspection knowledge of facilities is insufficient. |
| Qualification of Government Employee | Government official's principle and pride | High level (For Example, service to citizens, fairness) |
| | Spirit of good service to citizens | High level |
| | Consciousness of self-study | High level |
| | Independence of self-study | Insufficient (Reliance-upon-others-like) |
| | Independence of execution of business | A senior member of the staffs is high, however, others are low. |

*Source: Capacity Assessment Report, August 2010*

The result of the personnel's ability rating (a training candidate is included) is shown in **Table 3.5.**

**Table 3.5 Summary of Evaluation of Personnel Capacity (the 3WUSCs)**

| Parameters | | Dhulabari WUSC (Interviewed staffs：17) | Gauradaha WUSC (Interviewed staffs：5) | Mangadh WUSC (Interviewed staffs：9) |
|---|---|---|---|---|
| Category of staffs | Qualification (Degree) | Middle Level：18%<br>Compulsory education：76%<br>Illiteracy：6% | Bachelor：20%<br>Middle Level：60%<br>Compulsory education/ Illiteracy：20% | Bachelor：11%<br>Middle Level：33%<br>Compulsory Education/Illiteracy：46%<br>Data unavailable：10% |
| | Total year of Experience | Less than 10Years：71%<br>11-15 Years：29%<br>Over 16 Years：0% | Less than 10 Years：80%<br>Over 20Years：20%<br>Data unavailable：0% | Less than10 Years：56%<br>11-20 Years：22%<br>Over 21 Years：11%<br>Data unavailable：11% |
| | Age | 16-35：65%<br>36-50：23%<br>Over 51：12% | 40-50：100% | 20-30 ：22%<br>31-60：56%<br>Over 60 s：11%<br>Data unavailable：11% |
| | Retirement age | 60 | | 62 |
| | Special Subject | Technical staffs：41%<br>Administrative Staff, etc.：59% | Technical staffs：60%<br>Administrative Staff, etc.：40% | Technical staffs：67%<br>Administrative Staff, etc.：33% |
| | Oversea Training | No track record | | |
| | 2006-2007:JIC's Training (Soft Component) | Water supply and O&M：78 %<br>Management：17%<br>Data unavailable：5% | Water supply and O&M：80%<br>Management：20%<br>Data unavailable：0% | Water supply and O&M：67%<br>Management：22%<br>Data unavailable：11% |
| Capacity of Expertise | Language（English） | Average：10%<br>Difficult / local language ：90% | Average：40%<br>Poor/only local：60% | Good：25%<br>Average：75% |
| | Technical department | Knowledge of water service technology is insufficient.<br>The knowledge of O&M is high.<br>The knowledge of water quality is insufficient. | Knowledge of water service technology is high.<br>The knowledge of O&M is insufficient.<br>The knowledge of water quality is insufficient. | Knowledge of water service technology is high.<br>The knowledge of O&M is sufficient.<br>The knowledge of water quality is average. |
| | | O&M Manual is un-fixing. (O&M ledger is fixed in general but Disunity) | | |
| | Management department | ・ High management knowledge<br>・ Capability of ledger management is high. | | |
| Practice Capacity / Knowledge Qualification of Government Employee | Management capability of an organization | High level | | |
| | Knowledge about organization's objectives | Understanding | | |
| | Implementation capability of role | About satisfactory | | |
| | Ability to adjustment | High level | | |
| | Knowledge required for general service | The knowledge of wide range on waterworks technology is insufficient.<br>The capability of personal computer basic operation is insufficient. | | |
| | Knowledge on management staff | About satisfactory | | |
| | Understanding job definition | Understanding | | |
| | Communications skills with a boss and a coworker | About satisfactory | | |
| | Negotiation capability to an external organization | High level | | |
| | Emphasis nature / teamwork | About satisfactory | | |

| | | | |
|---|---|---|---|
| | Financial-planning development and management | High level (However, a written item is insufficient) | |
| | Report generation | ・ Capability of a senior member of the staffs high ((For Example, annual report, Financial report, a report)<br>・ Other Staffs can prepare only the report on routine work. | |
| | Leader ship | A senior member of the staff is high. | |
| | Information gathering capability from an external office | A senior member of the staff is high. | |
| | Decision-making | A senior member of the staff is high | |
| | Knowledge of O&M management mind | Insufficient (Item of management log is insufficient) | |
| | Knowledge of Water-rates revision | Knowledge of water-rates revision is insufficient. | |
| Qualification of Employee | Spirit of good service to citizens | High level | |
| | Consciousness of self-study | Insufficient | High level |
| | Independence of self-study | Insufficient (Reliance-upon-others-like) | About sufficient |
| | Independence of execution of business | A senior member of the staff is high, however, others staffs are low. | High level |
| | Government official's principle and pride | High level (For Example, service to citizens, fairness) | |

*Source: Capacity Assessment Report, August 2010*

### (4-3) Implementation of organizational ability evaluation

The result of the analysis of collected data is shown in **Table 3.6**.

**Table 3.6 Summary of Evaluation of Institution Capacity (Government agency)**

| Parameters | | DWSS (Interviewed staffs：2) | ERMSO (Interviewed staffs：5) | Jhapa WSSDO (Interviewed staffs：3) | Morang WSSDO (Interviewed staffs：5) |
|---|---|---|---|---|---|
| Organization | Work responsibility | Well-defined (A comprehensive plan, budget allotment, management instruction organization) | Well-defined (Monitoring and supervision of the east area in 16 counties business, Operating management of an ADB technical assistance center) | Well-defined (Budget supervision concerning WUSC, the supervisor of construction work, the technical assistance of O&M) | |
| | Function of an organization | Sufficient | | | |
| | Exchange of the information between organizations | Slightly insufficient | | | |
| | Planning of a measure and enforcement of policy | Functioning | Functioning as an organization which assists DWSS. | | |
| Business Administration | Development of a business plan document | Functioning | Functioning as an organization which assists DWSS. | | |
| | Flexibility of measure and a rule | There is a limit.（Since it is prescribed by the law/rule） | | | |
| | Jurisdiction of responsibility | Well-defined | | | |
| | Development of a budget plan | Established | Functioning as an organization which assists DWSS. | | |
| | Enforcement procedures of a budget | Established | - | | |
| | Recognition procedure of a report | Functioning | | | |
| | Management of operating data | Prepared | | | |
| | Management of facilities data | Not established yet | | | |

| | | | |
|---|---|---|---|
| | Management of documents and books | Not established yet | |
| Personnel Management | Staff regulations | Specified | |
| | Employment regulation | Specified | |
| | Regulation of a grade and a salary | Specified | |
| | Regulation of labor union activity | Specified | |
| | Regulation of a personnel evaluation | Specified | |
| | Regulation of the system of commendation | Not specified | |
| Decision Making | Routine work | Functioning according to office regulations | |
| | When deliberations with their other sectors are required | Functioning by the liaison conference. | |
| | Speed | Determination of routine work is quick. | |
| Water Rate | Authority to revise the system of water rate | There is regulation (WUSC carries out) | |
| | Authority to arbitrate revision of water rate | There is no regulation（Mediation is carried out in the internal organization of MoUD） | |
| Monitoring | Execution of a budget | Functioning | Functioning as an organization which assists DWSS. |
| | Progress of a project | Functioning | |
| | Management index of WUSC / Surveillance of a benchmark | Insufficient / unfinished | |
| | Value of a water quality standard | Established | |
| | Surveillance of water quality management | Insufficient / unfinished | |
| Personnel Training | Training system (domestic) | Utilizing a CHRDU organization is established. | |
| | Training system (overseas) | Established | |
| | Technical guidance system to WUSC | Established | |
| | Teaching materials | Insufficient / unfinished. | |

*Source: Capacity Assessment Report, August 2010*

1) The result of the analysis of collected data is shown in **Table 3.7**

**Table 3.7 Summary of Evaluation of Institution Capacity (the 3WUSCs)**

| Parameters | | Dhulabari WUSC（Interviewed Staffs：2） | Gauradaha WUSC（Interviewed Staffs：2） | Mangadh WUSC（Interviewed Staffs：3） |
|---|---|---|---|---|
| Organization | Work responsibility | Well-defined (Management of a water utility) | | |
| | Function of an organization | Sufficient | | |
| | Exchange of information between other WUSC(s) | Insufficient | | |
| | Development of Annual report and financial audit report | Functioning | | |
| Business Administration | Development of a business plan document | Insufficient | | |
| | Flexibility of measure and a rule | There is a limit.（Since it is prescribed by the law/rule） | | |
| | Jurisdiction of responsibility | Well-defined | | |
| | Development of a budget plan | Established | | |
| | Enforcement procedures of a budget | Established | | |
| | Recognition procedure of a report | Functioning | | |
| | Management of operating data | Established | | |
| | Management of facilities data | Not established yet | | |

| | | | |
|---|---|---|---|
| | Management of documents and books | Not established yet | |
| Personnel Management | Staff regulations | Specified | |
| | Employment regulation | Specified | |
| | Regulation of a grade and a salary | Specified | |
| | Regulation of labor union activity | Not specified | |
| | Regulation of a personnel evaluation | Not specified | |
| | Regulation of the system of commendation | Specified | Not specified |
| Decision Making | Routine work | Functioning according to office regulations | |
| | Speed | Determination of routine work is quick. | |
| Water Rate | Authority to revise the system of water rate | There is no regulation (WUSC carries out) | |
| | Authority to arbitrate revision of water rate | There is no regulation（Mediation is carried out in the internal organization of MoUD） | |
| Monitoring | Management index of WUSC / Surveillance of a benchmark | Insufficient / unfinished | |
| | Value of a water quality standard | Established | |
| | Implementation of water analysis | Seldom inspected(There are simple water analysis equipment supplied by JICA ) | |
| | Surveillance of water quality management | Insufficient / unfinished | |
| Personnel Training | Training system (domestic) | There is no opportunity except JICA training. | |
| | Training system (overseas) | No system | |
| | Teaching materials | Insufficient / unfinished. | |

*Source: Capacity Assessment Report, August 2010*

### (4-4) Generalization

As a summary, features, capability/volition to be improved and others to be checked of the government organization and WUSCs are shown in the **Table 3.8**.

**Table 3.8 Features, Capability/Volition to be Improved and Others to be Checked (Government organization, WUSCs)**

| | | Government organization | WUSC |
|---|---|---|---|
| The feature of personnel capability | Feature | ・ Educational qualification of the Personnel's is high (Especially of the DWSS personnel) are high<br>・ The working experience at a place is high, and the knowledge of special learning is high (15 to 30 years)<br>・ There are many engineers (60 to 80%)<br>・ There are many persons experienced in overseas training<br>・ The DWSS/ERMSO personnel have high English capability but the WSSDO personnel are slightly low<br>・ Operating competency is high<br>・ The nature as a government official is high | ・ The personnel's education level is low<br>・ The working experience is high, and the knowledge of special learning is high (15 to 30 years)<br>・ The personnel's age group is comparatively balanced (However, in Dhulabari WUSC, 65% are aged 35 and below)<br>・ There are many of technical background (40-70%)<br>・ There is almost no person experienced in an overseas training<br>・ The person experienced in domestic training is only a training program of JICA's soft component (2006-2007)<br>・ English capability in general is low (An interpreter is necessary excepting Mangadh WUSC)<br>・ Management ability is high |
| | Capability/volition to be improved | ・ Although there is self-study volition, it is a reliance-upon-others principle (There are many middle/lower grade staff)<br>・ "Motivation" volition (There are many middle/lower grade staffs which have dissatisfaction in a boss, an organization, promotion, etc.)<br>・ The initiative of a performing a task (There are many middle/lower grade staff)<br>・ Self-valuation capability<br>・ WSSDO has little experience on the operation and maintenance of a plant<br>・ The capability to create the management index of WUSCs by Administration<br>・ Construction supervision skill of field Engineers | ・ Although there is self-study volition, it is a reliance-upon-others principle (There are many middle/lower grade staff), (Mangadh WUSC has high)<br>・ "Motivation" volition (Mangadh WUSC has high)<br>・ The initiative for performing a task is high (Dhulabari WUSC has low)<br>・ Self-valuation capability is high.(Dhulabari WUSC has low)<br>・ The capability to create the management index<br>・ Business management index (benchmarks)<br>・ Management ability of O&M<br>・ Basic knowledge and application capability of O&M (however, Mangadh WUSC has high)<br>・ Compatibility of the ledger of O&M<br>・ Knowledge of a water-rates system |
| | In addition to this | ・ The number of staff in DWSS is about 88<br>・ However, 50% of the DWSS staff has no job to do in their place of work<br>・ (Reason: The balance of an operating scale and the number of the personnel has collapsed)<br>・ These personnel could be dispatched as the supervisor of construction work, and for technical guidance or as adviser to WUSCs, if needed<br>・ The training item for which the personnel wish is shown below | ・ The training item for which the personnel wish is shown below.<br>・ Introduction of water service technology<br>・ Future technology<br>・ Basic operation of a personal computer<br>・ The repair method of a water meter<br>・ Introduction of water rates<br>・ Plant O&M know-how |

| | | | |
|---|---|---|---|
| | | ➢ Introduction of water service technology<br>➢ Basic operation of a personal computer<br>➢ Introduction of management / accounts | |
| The feature of the capability of an organization and Institution | Feature | ・ The organization, the system, and the role are prescribed by law and regulation<br>・ The assignment of an organization and a job is clear<br>・ The business management system is functioning clearly<br>・ Personal rating system is functioning clearly<br>・ The system of planning of a policy and law and planning of a business plan is functioning<br>・ The system of decision making is functioning clearly<br>・ The monitoring operating system is improved.（such as Budget implementation, project management)<br>・ The technical assistance system to WUSCs is improved | ・ The organization and its role are established by Committee's Constitution<br>・ Management of the water supply enterprise is established<br>・ Personal rating system is prescribed by the personnel rule<br>・ The meter reading and a charge collection system are established and functioning<br>・ Business management ledger is fixed<br>・ Operating form is fixed<br>・ Water meter regulation is indicated on the costumer's water tariff card (leaflet) etc.<br>・ Annual report and/or Audit report is reported to General Assembly once a year<br>・ The decision-making organization is functioning clearly |
| | System/mechanism to be improved | ・ The enhancement program of self-study consciousness<br>・ Information exchange between organizations<br>・ Increase efficiency in monitoring system of WUSC<br>・ Management index of management system of WUSC<br>・ Water quality control system of WUSC<br>・ Data management system of O&M of WUSC<br>・ Support teaching materials to WUSC<br>・ Support capable people to WUSC<br>・ Maintenance of O&M manual and related document | ・ Personnel training system<br>・ The enhancement program of self-study consciousness<br>・ Information exchange between organizations<br>・ Monitoring system of WUSC<br>・ Management index system of WUSC<br>・ Water quality control system of WUSC<br>・ O&M data management system<br>・ Maintenance of O&M manual and related document |
| | In addition to this | ・ DWSS does not participate in deliberations of water tariff revision<br>・ There are few opportunities given to the training on technical know-how of O&M<br>・ There are fewer people who desire transfer to rural areas | ・ There are few opportunities given to training on the practical know-how of O&M<br>・ Personnel dismissal is difficult<br>・ The personnel period of employment is guaranteed<br>・ Activation of an organization is difficult |

### (5) Setup and Review of PDM Indicators

1) Improvement target (strengthening target)

The target (%) value for an improvement of the water service enterprise was shown from DWSS as it was shown in **Table 3.9**, **Figure 3.1** and **Figure 3.2**.

- The target of Overall Goal is about 17%.
- The target value of Project Goal is about 100% (For two districts)

**Table 3.9 Number of WUSCs Target Improved**

| Description | Through out the country | In Jhapa and Morang Districts |
|---|---|---|
| Total Number of WUSC (Existing) | 259 | 20 |
| Number of WUSCs to be strengthened by DWSS | 44 | 20 (17 by DWSS+3 JICA Expert) |
| Number of WUSCs Target Improved | 17% | 100% |

*Source: DWSS, PWT, 5 July 2010*

2) Determination of area for monitoring improved management

- The monitoring for the situation of improved management will be set up about in about ten areas after a survey of existing circumstance
- As for the indicators of improved management, monitoring investigation is conducted periodically
- The result of monitoring investigation is evaluated periodically and training of improved management is carried out if needed

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**Number of Users Committees providing Private Connection Service in Districts**

| S.No. | District | No. of UC |
|---|---|---|
| **Eastern Region (Dhankuta)** | | |
| 1 | Taplejung | 1 |
| 2 | Panchthar | 1 |
| 3 | Ilam | 2 |
| 4 | Jhapa | 11 |
| 5 | Morang | 9 |
| 6 | Sunsari | 5 |
| 7 | Dhankuta | 1 |
| 8 | Terhathum | 1 |
| 9 | Sankhuwasabha | 1 |
| 10 | Bhojpur | 1 |
| 11 | Solukhumbu | 1 |
| 12 | Okhaldhunga | 1 |
| 13 | Khotang | 2 |
| 14 | Udayapur | 3 |
| 15 | Saptari | 1 |
| 16 | Siraha | 3 |
| | Sub-Total | 44 |
| **Western Region (Pokhara, Kaski)** | | |
| 1 | Tanahu | 3 |
| 2 | Syangja | 2 |
| 3 | Kaski | 1 |
| 4 | Lamjung | 5 |
| 5 | Gorkha | 1 |
| 6 | Manang | 1 |
| 8 | Myagdi | 1 |
| 9 | Parbat | 3 |
| 10 | Baglung | 1 |
| 11 | Gulmi | 1 |
| 12 | Arghakhanchi | 1 |
| 13 | Palpa | 3 |
| 14 | Nawalparasi | 5 |
| 15 | Rupandehi | 4 |
| 16 | Kapilbastu | 1 |
| | Sub-Total | 33 |
| **Far Western Region (Dipayal, Dotl)** | | |
| 1 | Bajura | 2 |
| 2 | Bajhang | 1 |
| 3 | Achham | 1 |
| 4 | Doti | 3 |
| 5 | Kailali | 5 |
| 6 | Kanchanpur | 1 |
| 7 | Dadeldhura | 1 |
| 8 | Baitadi | 3 |
| 9 | Darchula | 1 |
| | Sub-Total | 18 |

| S.No. | District | No. of UC |
|---|---|---|
| **Central Region (Kathmandu)** | | |
| 1 | Dhanusha | 10 |
| 2 | Mahottari | 1 |
| 3 | Sarlahi | 8 |
| 4 | Sindhuli | 2 |
| 5 | Ramechhap | 1 |
| 6 | Dolakha | 2 |
| 7 | Sindhupalchowk | 3 |
| 8 | Kavrepalanchowk | 15 |
| 9 | Lalitpur | 9 |
| 10 | Bhaktapur | 7 |
| 11 | Kathmandu | 19 |
| 12 | Nuwakot | 1 |
| 13 | Rasuwa | 1 |
| 14 | Dhading | 2 |
| 15 | Makawanpur | 14 |
| 16 | Rautahat | 2 |
| 17 | Bara | 3 |
| 18 | Parsa | 10 |
| 19 | Chitwan | 10 |
| | Sub-Total | 120 |
| **Mid Western Region (Birendranagar, Surkhet)** | | |
| 1 | Dang | 15 |
| 2 | Pyuthan | 3 |
| 3 | Rolpa | 2 |
| 4 | Rukum | 2 |
| 5 | Salyan | 2 |
| 6 | Banke | 3 |
| 7 | Bardiya | 3 |
| 8 | Surkhet | 3 |
| 9 | Jajarkot | 1 |
| 10 | Dailekh | 3 |
| 11 | Kalikot | 1 |
| 12 | Jumla | 2 |
| 13 | Dolpa | 1 |
| 14 | Mugu | 2 |
| 15 | Humla | 1 |
| | Sub-Total | 44 |

| | | |
|---|---|---|
| 1 | Eastern Region | 44 |
| 2 | Central Region | 120 |
| 3 | Western Region | 33 |
| 4 | Mid Western Region | 44 |
| 5 | Far Western Region | 18 |
| | Total | 259 |

| Overall Goal | Total No. of WUSC | No. of WUSCs to be strengthened by DWSS | % of WUSCs Targeted |
|---|---|---|---|
| | 259 | 44 | 17 |

| Project Target (Jhapa + Morang) | Total No. of WUSC | No. of WUSCs to be strengthened by DWSS | % of WUSCs Targeted |
|---|---|---|---|
| | 20 | 17 + 3 | 85 |

(D/A/M)

Source: DWSS, PWT, 5 July 2010

**Figure 3.1 Numbers of WUSCs by Districts**

Department of Water Supply and Sewerage
The Project for Capacity Development on Water Supply in Semi-Urban Areas

1. WUSCs selected for technical support by DWSS for strengthening water services (IC/R 2.2 (2))

| S.No. | District | Development Region | WUSC | Project |
|---|---|---|---|---|
| 1 | Ilam | Eastern | Fikkal WUSC | Fikkal Small Town WSS Project |
| 2 | Sankhuwasabha | Eastern | Khandbari WUSC | Khandbari Water Supply Project |
| 3 | Sunsari | Eastern | Inaruwa WUSC | Inurawa Water Supply Project |
| 4 | Sunsari | Eastern | Itahari WUSC | Itahari Small Town WSS Project |
| 5 | Dhankuta | Eastern | Dhankuta WUSC | Dhankuta Water Supply Project |
| 6 | Udayapur | Eastern | Triyuga WUSC | Triyuga Small Town WSS Project |
| 7 | Dhanusha | Central | Dhalkebar WUSC | Dhalkebar Water Supply Project |
| 8 | Mahottari | Central | Bardibas WUSC | Bardibas Water Supply Project |
| 9 | Sarlahi | Central | Lalbandi WUSC | Lalbandi Water Supply Project |
| 10 | Sindhuli | Central | Kamalamai WUSC | Kamalamai Small Town WSS Project |
| 11 | Ramechhap | Central | Manthali WUSC | Manthali Water Supply Project |
| 12 | Sindhupalchowk | Central | Chautara WUSC | Chautara Water Supply Project |
| 13 | Nuwakot | Central | Bidur WUSC | Bidur Water Supply Project |
| 14 | Chitwan | Central | Ratnanagr WUSC | Ratnanagar Small Town WSS Project |
| 15 | Chitwan | Central | Parsa WUSC | Parsa Small Town WSS Project |
| 16 | Tanahu | Western | Tanahubazaar WUSC | Tanahubazaar Water Supply Project |
| 17 | Tanahu | Western | Bandipur WUSC | Bandipur Small Town WSS Project |
| 18 | Syangja | Western | Waling WUSC | Waling Small Town WSS Project |
| 19 | Kaski | Western | Lekhnath WUSC | Lekhnath Small Town WSS Project |
| 20 | Lamjung | Western | Besisahar WUSC | Besisahar Water Supply Project |
| 21 | Gorkha | Western | Prithvinarayan WUSC | Prithvinarayan Small Town WSS Project |
| 22 | Myagdi | Western | Beni WUSC | Beni Small Town WSS Project |
| 23 | Parbat | Western | Kushma WUSC | Kushma Small Town WSS Project |
| 24 | Nawalparasi | Western | Amarapuri WUSC | Amarapuri Water Supply Project |
| 25 | Nawalparasi | Western | Pragatinagar WUSC | Pragatinagar Water Supply Project |
| 26 | Nawalparasi | Western | Gaidakot WUSC | Gaidakot Water Supply Project |
| 27 | Nawalparasi | Western | Bardaghat WUSC | Bardaghat Water Supply Project |
| 28 | Rupandehi | Western | Shankarnagar WUSC | Shankarnagar Water Supply Project |
| 29 | Dang | Mid Western | Ghorahi WUSC | Ghorahi Small Town WSS Project |
| 30 | Dang | Mid Western | Tulsipur WUSC | Tulsipur Small Town WSS Project |
| 31 | Dang | Mid Western | Bhalubang WUSC | Bhalubang Water Supply Project |
| 32 | Rukum | Mid Western | Musikot WUSC | Musikot Water Supply Project |
| 33 | Banke | Mid Western | Kohalpur WUSC | Kohalpur Small Town WSS Project |
| 34 | Banke | Mid Western | Khajura WUSC | Khajura Water Supply Project |
| 35 | Bardiya | Mid Western | Gulariya WUSC | Gulariya Water Supply Project |
| 36 | Bardiya | Mid Western | Bansgadhi WUSC | Bansgadhi Water Supply Project |
| 37 | Surkhet | Mid Western | Chhinchu WUSC | Chhinchu Water Supply Project |
| 38 | Surkhet | Mid Western | Birendranagar WUSC | Birendranagar Small Town WSS Project |
| 39 | Doti | Far Western | Rajpur WUSC | Rajpur Water Supply Project |
| 40 | Doti | Far Western | Silgadhi WUSC | Silgadhi Water Supply Project |
| 41 | Kailali | Far Western | Bhajani WUSC | Bhajani Water Supply Project |
| 42 | Kailali | Far Western | Attariya WUSC | Attariya Small Town WSS Project |
| 43 | Dadeldhura | Far Western | Amargadhi WUSC | Amargadhi Water Supply Project |
| 44 | Darchula | Far Western | Khalanga WUSC | Khalanga Water Supply Project |

2. WUSCs selected for technical support by DWSS for strengthening water services in Jhapa and Morang districts (IC/R 2.3 (2))

| S.No. | District | Development Region | WUSC | Project |
|---|---|---|---|---|
| 1 | Jhapa | Eastern | Kakarvitta WUSC | Kakarvitta Water Supply Project |
| 2 | Jhapa | Eastern | Birtamod WUSC | Birtamod Small Town WSS Project |
| 3 | Jhapa | Eastern | Budhabare WUSC | Budhabare Small Town WSS Project |
| 4 | Jhapa | Eastern | Saniachare WUSC | Saniachare Water Supply Project |
| 5 | Jhapa | Eastern | Chandragadhi WUSC | Chandragadhi Water Supply Project |
| 6 | Jhapa | Eastern | Topgachhi WUSC | Topgachhi Water Supply Project |
| 7 | Jhapa | Eastern | Lakhanpur WUSC | Lakhanpur Water Supply Project |
| 8 | Jhapa | Eastern | Damak WUSC | Damak Water Supply Project |
| 9 | Jhapa | Eastern | Surunga WUSC | Surunga Small Town WSS Project |
| 10 | Morang | Eastern | Urlabari WUSC | Urlabari Water Supply Project |
| 11 | Morang | Eastern | Pathari WUSC | Pathari Water Supply Project |
| 12 | Morang | Eastern | Salakpur WUSC | Salakpur Water Supply Project |
| 13 | Morang | Eastern | Rangeli WUSC | Rangeli Water Supply Project |
| 14 | Morang | Eastern | Ibenahat WUSC | Ibenahat Water Supply Project |
| 15 | Morang | Eastern | Baraicha WUSC | Baraicha Water Supply Project |
| 16 | Morang | Eastern | Tankisiuwari WUSC | Tankisiuwari Water Supply Project |
| 17 | Morang | Eastern | Letang WUSC | Letang Water Supply Project |

*Source: DWSS, PWT, 5 July 2010*

**Figure 3.2 Detail of Number of WUSCs by Districts**

**(6) Holding JCC/PMC Meeting (the 1st year)**

Held the PMC/JCC meetings were held to review the progress of the Project and to make smoothen implementation further, and to make decisions on the Project, if needed.

**1) The 1st JCC**

On 23rd February 2010, the 1st JCC meeting was held at DWSS conference room. The major topics of discussion are shown below and approved in this JCC.

- Confirmation of the duration of the Project (from January 2010 to September 2013)
- Changing the title of "Steering Committee" to "Project Management Committee (PMC)"
- Offices for the Project in DWSS, Jhapa WSSDO and Morang WSSDO
- Formulation of PWT(Project Work Team)
- Revisions of PDM (Project Design Matrix), project goals to be in the next JCC.
- Approval of the Draft Inception Report

**2) The 1st PMC**

On 20th April 2010, the 1st PMC meeting was held at DWSS conference room. The major topics of discussion are as shown below.

- To decide places for public awareness activity of conflict management and training of stakeholder meeting. It was confirmed the activities would be held in Dhulabari, Gauradaha, Mangadh and Dhankuta
- PWT requested DWSS and WSSDO to set up and verification of personal list from related organization
- PWT requested DWSS to set the overall goal and the project goal. The overall goal and project goal would be set in the next JCC

**3) The 2nd JCC**

On 20th September 2010, the 2nd JCC meeting was held at DWSS conference room. The major topics of discussion are as shown below and approved in this JCC.

- Reporting the result of the 1st year activities
- Approval of PDM revisions
  - Overall goal: 44WUSCs (17% of all WUSCs) are strengthened by the support of DWSS.
  - Project Purpose: Support system to 20WUSCs (100% of all WUSCs in Jhapa/Morang districts) is implemented.
- Approval of PO

**(7) Training on Monitoring System and Operation Method**

In order to monitor and evaluate OJT's effects on the improvement of WUSC's capacity, training on the monitoring system and operating procedure was carried out.

Training theme is mentioned here under

1) Objective of establishment of committee
   - Establishment of monitoring organization
   - Selection/Election of the member
2) Frequency of monitoring investigation

Frequency of monitoring shall be more than once in a year.

3) Scope of investigation object

WUSCs (Human resource capability and organization/ operation capacity)

4) Monitoring Investigation Chart

a) Human Resource /personnel capability investigation chart

Prepare investigation chart for every target trainees.

b) System/ Operation capacity investigation chart

Prepare investigation chart in all 3 target WUSCs.

In addition, the monitoring investigation tables were created in collaboration with PWT.

5) Implementation of Monitoring

Monitoring will be implemented by PWT.

Investigation method is shown below.

a) Human /Personnel Resource capacity

Evaluate from the personal interview based on investigation chart

b) System/ Operation capacity

- Evaluate from the interview with responsible person based on evaluation chart
- Evaluation will be done based on the improvement of technical capacity and business work, from the record items of reports. Record items will be evaluated confirming related documents.

6) Evaluation item of the achievement of goal

Achievement of evaluation will be judged considering following points.

a) Technical contents moved practically

b) Activities towards the business

c) Evaluation of achievement of the OJT/ training related to members

7) Result of evaluation of achievement

Evaluation was carried out on 3 levels adopting following method.

a) Self-evaluation

b) Evaluation by PWT responsible person

c) Evaluation by evaluation committee considering a) and b)

Grades and points allocated for rating the evaluation are shown below.

**Table 3.10 Score of Grade**

| Grade | Descriptions | Point |
|---|---|---|
| A | Excellent | 4 |
| B | Good | 3 |
| C | Average | 2 |
| D | Poor | 1 |

8) Report of evaluation result

- Result of the evaluation will be reported to the JCC and PMC.
- Indicate the suggestions and comments on implementation for improvement, if any.

### (8) The 1st Monitoring Study and Summarizing of Outcome

The result of the 1st OJT enforcement and monitoring was carried out by the method described above (7), and summarized the evaluation result to **Table 3.11**.

Monitoring investigation evaluated the training result of OJT/seminar, improvement in the capability regarding personnel, organization and management, which the JICA Expert had carried out. For investigation, Team Leader Mr. D. Puri of PWT from DWSS and the JCC/PWT member Ms.B.Bajracharya from MoPPW visited Gauradaha, Dhulabari, and Mangadh WUSCs on 12th to 14th, September, 2010.

Interviews to 4 to 6 out of 15 trainers from each technical area were conducted for monitoring.

**Table 3.11 Summary of Study Result**

| Target of Capacity Development Program | | Dhulabari WUSC | | | | Gauradh WUSC | | | | Mangadh WUSC | | | | Comprehensive Evaluation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of Interviewee | Objective Assessment | Subjective Assessment | | No. of Interviewee | Objective Assessment | Subjective Assessment | | No. of Interviewee | Objective Assessment | Subjective Assessment | | No. of Interviewee | Objective Assessment | Subjective Assessment | |
| | | | WUSC | PWT, Team Leader | JCC/PWT Member | | WUSC | PWT, Team Leader | JCC/PWT Member | | WUSC | PWT, Team Leader | JCC/PWT Member | | WUSC | PWT, Team Leader | JCC/PWT Member |
| 1) Individual (Technical) capacity | | 4~6 | 2.4 | 2.7 | 2.7 | 2-4 | 2.3 | 2.5 | 2.7 | 3-6 | 2.9 | 2.9 | 3.0 | 14.6 | 2.5 | 2.7 | 2.8 |
| | | | 100% | 115% | 113% | | 100% | 111% | 119% | | 100% | 100% | 104% | | 100% | 108% | 111% |
| 2) Organization & Management Capacity | Technical capacity | 2.0 | 1.9 | 2.4 | 2.4 | 2.0 | 2.5 | 2.6 | 2.7 | 3.0 | 3.3 | 3.1 | 3.2 | 7.0 | 2.7 | 2.7 | 2.8 |
| | | | 100% | 128% | 127% | | 100% | 102% | 108% | | 100% | 94% | 99% | | 100% | 103% | 107% |
| | Business Management Capacity | 2.0 | 2.8 | 3.1 | 3.3 | 2.0 | 3.1 | 2.0 | 2.1 | 3.0 | 3.3 | 3.3 | 3.6 | 7.0 | 3.1 | 2.9 | 3.1 |
| | | | 100% | 111% | 119% | | 100% | 64% | 68% | | 100% | 108% | 108% | | 100% | 92% | 99% |
| | Institution (Written Item to report ) Capacity | 2.0 | **2.9** | 2.4 | 2.5 | 2.0 | 2.9 | 1.9 | 2.0 | 3.0 | 1.9 | 1.0 | 1.7 | 7.0 | 2.5 | 1.6 | 2.0 |
| | | | **100%** | **84%** | **89%** | | 100% | **64%** | **69%** | | 100% | **52%** | **88%** | | 100% | **66%** | **81%** |
| **Total (Ave)** | | **2.9** | **2.5** | **2.7** | **2.7** | **2.4** | **2.7** | **2.2** | **2.4** | **3.6** | **2.8** | **2.5** | **2.9** | **8.9** | **2.7** | **2.5** | **2.7** |
| | | | **100%** | **108%** | **110%** | | **100%** | **83%** | **88%** | | **100%** | **90%** | **101%** | | **100%** | **93%** | **100%** |
| | **Evaluation Point** | **A (Excellent): 4 points, B (Good): 3 points, C (Average): 2 points, D (Poor): 1 point** | | | | | | | | | | | | | | | |

Result of evaluation is shown in **Table 3.12**

**Table 3.12 Result of Evaluation**

| WUSC | Evaluation of individual capacity | Evaluation of the management capability of organization |
|---|---|---|
| Dhulabari | Interview investigation was conducted on selected trainees (4-6 persons) of each field, present at the time of investigation, among 22 trained persons<br><br>・ Objective rating is higher than self-evaluation about 15%<br>・ Evaluating point of the degree of achievement is Good- Average (2.4 to 2.7 points)<br>・ All members are inclined to utilize the knowledge and experience which were obtained by this training | Technical Capacity<br>・ Objective rating is higher than self-evaluation about 30%<br>・ Evaluating point of the degree of achievement is Average (1.9 to 2.4 points) in general<br>・ Capacity development which contributes to management of an organization can be estimated "To attain in general"<br>Business Management Capacity<br>・ Objective rating is higher than self-evaluation about 2-10%<br>・ Evaluating point of the degree of achievement is Good-Average (2.8 to 3.3 points) in general<br>・ Capacity development which contributes to management of an organization can be estimated "To attain in general"<br>Institution (Mentioned items of report) Capacity<br>・ Objective rating is lower than self-evaluation about 10-15%<br>・ Evaluating point of the degree of achievement is Good-Average (2.4 to 2.9 points)<br>・ Capacity development which contributes to management of an organization can be estimated "To attain in general" |
| Gauradaha | Interview investigation was conducted on selected trainees (2-4 persons) of each field, present at the time of investigation, among 12 trained persons.<br><br>・ Objective rating is higher than self-evaluation about 15%<br>・ Evaluating point of the degree of achievement is Good- Average (2.3 to 2.7 points)<br>・ All members are inclined to utilize the knowledge and experience which were obtained by this training | Technical Capacity<br>・ Objective rating is equivalent to self-evaluation<br>・ Evaluating point of the degree of achievement is Good-Average (2.5 to 2.7 points)<br>・ Capacity development which contributes to management of an organization can be estimated "To attain in general"<br>Business Management Capacity<br>・ Objective rating is lower than self-evaluation about 30-35%<br>・ Evaluating point of the degree of achievement is Average (2.0 to 3.1 points)<br>・ Capacity development which contributes to management of an organization can be estimated "Strengthening is required"<br>Institution (Mentioned items of report) Capacity<br>・ Objective rating is lower than self-evaluation about 30-35%<br>・ Evaluating point of the degree of achievement is Average (1.9 to 2.9 points)<br>・ Capacity development which contributes to management of an organization can be estimated “Strengthening is required" |
| Mangadh | Interview investigation was conducted on selected trainees (2-4 persons) of each field, present at the time of investigation, among 10 trained persons.<br><br>・ Objective rating is equivalent to self-evaluation in general<br>・ Evaluating point of the degree of achievement is Excellent-Good (2.9 to 3.0 points)<br>・ All members are inclined to utilize the knowledge and experience which were obtained by this training | Technical Capacity<br>・ Objective rating is lower than self-evaluation about 1-5%<br>・ Evaluating point of the degree of achievement is Excellent-Good (3.1 to 3.3 points)<br>・ Capacity development which contributes to management of an organization can be estimated "To attain in general"<br>Business Management Capacity<br>・ Objective rating is higher than self-evaluation about 8%.<br>・ Evaluating point of the degree of achievement is Excellent-Good (3.3 to 3.6 points). |

| | | |
|---|---|---|
| | | ・Capacity development which contributes to management of an organization can be estimated "To attain in general".<br>Institution (Mentioned items of report) Capacity<br>・Objective rating is lower than self-evaluation about 12-48%.<br>・Evaluating point of the degree of achievement is Average (1.0 to 1.9 points).<br>・Capacity development which contributes to management of an organization can be estimated "Strengthening is required." |
| Evaluation of a comprehensive result | ・The goal attainment level of the individual capacity development according to each level is estimated in general as a success | Technical Capacity<br>・The contribution of technical capacity to management of a water utility is at Good level<br>Business Management Capacity<br>・The contribution of Business Management Capacity to management of a water utility is at Good level<br>Institution (Mentioned items of report) Capacity<br>・The contribution of institution Capacity to management of a water utility is at Average level<br>・Improvement efforts are indispensable.<br><br>There is still room for improvement in the capability to sound management.<br>The manager needs to offer a training opportunity in order to promote the personnel's self-study volition, and he needs to aim at improvement in a level of the knowledge of each specialty. |

**(9) Resident Enhancement Activities on Conflict Management Considerations and Stakeholder Consensus-Building Training**

To prepare for the training on Conflict Management Considerations related to the resident enlighten activities and stakeholders, an agreement was done with Local NGO (Human Rights Network and Peace Action Group: PAG).

Issues for the training were decided in consultation with JICA Nepal considering past cases on disputes and after baseline study for holding of conflict management at target area (Interview investigation).

1) Objective of the Training

・To raise the dispute management self-restrain and management capability in local committee level.

・Improvement in dispute/discussion concept of the resident and reinforcement of the problem solving capacity

2) Period of training

3 days course at each place.

3) Selection/Election of implementation place and trainees

Implementation place and the invitees for the training were examined from the method mentioned here under.

a) Interview investigation at local area.

・Preliminary survey of local area (Consciousness of the problems on the activity contents of the stakeholders including residents and solution of dispute)

・Baseline study (Selection of target area and preparation of list of invitees)

b) Selection/Election of target area

In order to select target areas, base line study was considered and it was made pass through by the consultation at DWSS. Selected 4 target areas and mentioned here under.

1) Jhapa District: Dhulabari WUSC
2) Jhapa District: Gauradaha WUSC
3) Morang District: Mangadh WUSC, Dhankuta District

4) Implementation Period

Training was completed on mid July 2010 as mentioned in **Table 3.13**

**Table 3.13 Enforcing Date**

| | Project Areas | Workshop Date | Venue |
|---|---|---|---|
| 1 | Gauradaha water residential area, Jhapa district | 13 – 15 June, 2010 | Gauradaha |
| 2 | Dhulabari water residential area, Jhapa district | 16 – 18 June, 2010 | Dhulabari |
| 3 | Mangadh water residential area, Morang district | 23 – 25 June, 2010 | Biratnagar |
| 4 | Dhankuta water residential area, Dhankuta district | 27 – 29 June, 2010 | Dhankuta |

5) Number of Trainees

Participating number of trainees exceeded planned number of 100 trainees. Total number of trainees included in the training was 118 persons.

6) Method of training

Method for the training was decided considering past disputes occurred between the personnel's of water supply utilities and residents. It included the capability on dispute prevention, improvement on the problem solving capability and improvement on the knowledge of residents.

Main training procedures are mentioned here under.

- Lecture (Concept of dispute prevention, acquire knowledge on techniques of solving measures)
- Group Consultation (Plan communalization of information)
- Selection/Election of organizer at the area (construction of dispute prevention system)
- Grasp on degree of understanding about the solution of the dispute
- An obstacle factor (Analysis of training effect of display of obstacle factor)

7) Result of the training

a) Evaluation of degree of achievement

According to the comprehensive judgment of the trainers, degree of achievement has been confirmed as per following methods.

- Same questionnaires (with 10 questions) had been distributed on the first day of the training and the 3rd day of the training and the contents has been evaluated. Evaluation method was ranked in 4 levels; Poor, Reasonable, Good, and Excellent.
- Evaluation of the contents of the comments of expectation of the trainees from the training and the result after the training.
- Participation manner of the trainees (group consultation, status of selection of dispute solution organizer)

Evaluation of achievement at each site is shown in **Table 3.14**

**Table 3.14 Evaluation of Achievement at each site**

| Area | Evaluation related to the level of understanding questionnaire before and after seminar (questionnaire evaluation) | Evaluation related to the level of understanding of trainees according to the lecturers. | Selected facilitator |
|---|---|---|---|
| Dhulabari | ・Improvement in large scale has been found before and after seminar.<br>・People lacking knowledge has decreased to 3% from 68% | Before seminar<br>・They lack concept of the Mediation and Arbitration session.<br>・They had been thought disputes in negative aspect.<br>・They could not been able to write the expected items on dispute consultation management.<br>・WUSC feels that the dispute among people residing near intake area and people among near of supply area has been increased.<br>After Training<br>・Analysis method of dispute has been understood.<br>・They were able to think positively that people need the disputes.<br>➢ Concept of the mediation/arbitration session has been understood.<br>➢ Improved the understanding method upon dispute solution method<br>・Understood the necessity of drinking water.<br>・Understood the potential dispute issues related to the water.<br>・Stakeholders understood the roles and management of dispute prevention. | Mr. Murari Dhungel (Social worker), consumer residing at Dhulabari Water Supply Area, Mechinagar Municipality Ward#5 |
| Gauradaha | ・There is an improvement of big scale in before and after training.<br>・Personnel's insufficient of awareness were reduced from 71% to 6% | Before Training<br>・Concept of Mediation/Arbitration has not been recognized.<br>・Dispute/conflict had been thought negatively<br>・Expected matter related to the dispute/consultation was not written<br>After Training<br>・Understood the analysis method of discussion/dispute<br>・Were able to think positively that human beings need discussion/disputes<br>・Understood the concept of Mediation/Arbitration<br>・Method of dispute solution has been improved<br>・Understood the importance of drinking water<br>・Understood the potential dispute subject in connection with water<br>・Stakeholder understood the role of the prevention from dispute and management | Mr. Devendra Kumar Khadka A consumer of water supply (social service person), resident of Gauradaha VDC ward 9, Gauradaha area. |
| Mangadh | ・Improvement in large scale has been found before and after seminar<br>・People lacking knowledge has decreased to 7% from 69% | Before Seminar<br>・They lack concept of the Mediation and Arbitration session<br>・They had been thought disputes in negative aspect<br>・They could not been able to write the expected items on dispute consultation management<br><br>After Seminar<br>・Analysis method of dispute has been understood.<br>・They were able to think positively that people need the disputes<br>・Concept of the mediation/arbitration session has been understood<br>・Improved the understanding method upon dispute solution method<br>・Understood the necessity of drinking water.<br>・Understood the potential dispute issues related to the | Mr. Sanat Baral (WUSC, Vice-Chairperson, Social Worker), consumer residing at supply area, Biratnagar Sub-Metropolitan City-1 |

| | | | |
|---|---|---|---|
| | | water<br>・ Stakeholders understood the roles and management of dispute prevention. | |
| Dhankuta | ・ Improvement in large scale has been found before and after seminar.<br>・ People lacking knowledge has decreased to 6% from 73%. | Before Seminar<br>・ They lack concept of the Mediation and Arbitration session.<br>・ They had been thought disputes in negative aspect.<br>・ They could not been able to write the expected items on dispute consultation management<br>After Seminar<br>・ Analysis method of dispute has been understood.<br>・ They were able to think positively that people need the disputes.<br>・ Concept of the mediation/arbitration session has been understood.<br>・ Improved the understanding method upon dispute solution method.<br>・ Understood the necessity of drinking water.<br>・ Understood the potential dispute issues related to the water<br>・ Stakeholders understood the roles and management of dispute prevention. | Mrs. Kusum Kumari Shrestha (WUSC member, NGO Vice-Chairperson, Board of Member of Municipality Development Committee, Social Worker), Consumer of Dhankuta water supply, residing at Dhankuta Municipality Ward no.2. |

### (23) Holding JCC/PMC Meeting (The 2nd Year)

#### 1) The 3rd JCC

At the beginning of the 2nd year activities, the contents of Draft Work Plan Report were explained to C/P such as DWSS, Jhapa and Morang WSSDOs and the 3WUSCs. The contents were accepted basically without any particular comment.

On 11th February 2011, the 3rd JCC meeting was held. The major topics were to summarize the 1st year activities and to get consent to the contents of 2nd year's Work Plan Report. Though the Work Plan Report was approved by JCC, the following issues were pointed out in terms of the 1st year activities.

・ Computerized billing system is requested
・ Leakage detection equipment is requested
・ Fulfillment of water quality analysis kit
・ Acquisition of spare parts

The Expert Team consulted with JICA Nepal Office on how to tackle with these requests. As a result, the following conclusions were extracted.

・ As to the computerized billing system, it is difficult to deal with this issue in the Project primarily due to the time constraints. It should be designed apart from the Project
・ The leakage detection equipment should be coupled with a non-revenue water reduction program, which should be designed apart from the Project
・ Regarding water quality analysis kit, the Project will provide necessary reagents which are required in implementing training
・ In terms of the spare parts, the Expert Team will arrange an access to the Nepali agent of Japanese manufacturer. In addition, the Project will provide tools which are necessary in implementing OJT

Such measures were explained to C/P and accepted.

**2) The 4th JCC**

On 22nd November 2011, the 4th JCC meeting was held. The major topics are to report and explain the results of the Mid-term Review. The review results and recommendation from the Review Team were accepted by JCC and the draft modification of PDM (Ver. 4) was accepted as well.

**3) The 2nd PMC**

On 28th February 2012, the 2nd PMC meeting was held. The main topics are to share the project progress and outcome of the 2nd year activities. The draft Project Completion Report was presented and its contents were approved by the PMC.

**(24) The 2nd Monitoring and Summarization of its Outcome, Manners of Utilization Methods, such as Plan Decision and Budget Allotment etc. and Initiating Monitoring/Evaluation Liaison Conference for Business Operation**

On the 12th and the 13th August 2011, the Expert visited the 3WUSCs with the project member of MoPPW (present MoUD), DWSS, RMSO and WSSDO to monitor and evaluate how the capacity of WUSC and its staff was improved as an outcome of project implementation. Questionnaire surveys to the staff were conducted, and the evaluation team assessed based on their answers and hearing from them. The PWT member had a role of evaluator.

After this assessment, the 1st Monitoring/Evaluation Liaison Conference was held on 14th August 2011. In the conference, 40 members participated in total including the 3 WUSCs as well as other 6 WUSCs in Jhapa and Morang districts and the conference was chaired by the PWT Leader. The managerial persons of the WUSCs gave comments that the training provided by the Expert Team is very beneficial on capacity development of staff and management. On the other hand, the evaluator side pointed out a lesson regarding evaluation method that some questionnaire items were not clear and they confused the respondents.

**(33) Hold Seminar on Reporting of Activity Outcome by the 3WUSCs through Water Supply Utilities Liaison Conference in Each District**

The 3rd Water Supply Utilities Liaison Conference was held on 9th February 2012. Apart from the 3 WUSCs, other 10 WUSCs in Jhapa and Morang District participated in this conference. The reports from the 3 WUSCs were outlined as below:

Dhulabari

- Through the OJT and workshop provided by the JICA Experts/WSSDO, their employees have become more skilled.
- Sand washer pumps which were out of operation for almost three years are now in work with the help of the Project.
- To extend such type of program is requested to JICA, DWSS and GoN.
- In the upcoming days, they would share all the experience with other WUSCs for the betterment and progress.

Gauradaha

- The OJT/workshop provided by the Project is very useful.
- The training encouraged them to prepare the business plan and they could prepare it, which will

become a guideline of their future management.

- If Gauradaha WUSC is able to give training and share their experience and achievements with other WUSCs, then it will be more effective.

Mangadh

- Many knowledge and skills were taught by the JICA Expert/WSSDO, which as a result has become very fruitful.
- Before the Project started, users did not trust the quality of the supplied water. But after the Project, water quality is tested and proved to be good.
- Now, the number of connections has increased quickly and become doubled. The water supply services are very improved by the capacity development Project.

After these presentations, the participants were divided into three groups, and each group discussed on the technical and managerial issues which they are facing. A lot of issues were extracted including those of facility functions, water pressure, water quality, public awareness, staff skills, etc. Also, an idea of employing engineers by the group of WUSCs was presented in order to solve common problems of each WUSC which does not have staff with technical knowledge.

**(36) Hold Workshop on Practical Use Methods, such as Results from Implementation of the 3rd Monitoring, Plan Decision and Budget Allotment**

During 6 to 8 February 2012, the evaluation team consisting of 5 members from DWSS and WSSDO visited the 3 WUSCs to conduct the 3rd monitoring/evaluation. The evaluation was done according to the following four categories:

1. Knowledge

(Methodology)

The evaluation is based on the predetermined questionnaires. Two different sets of questionnaire for WUSC members and technical staffs of the Project were used. The main objectives of the questionnaires were to capture the level of knowledge confidence of the participants.

2. Skill

(Methodology)

The evaluators observed the use of skill in the recently completed maintenance work.

3. Attitude

(Methodology)

The separate meetings with WUSC members and technical staffs were conducted. The separate unstructured interviews were also conducted with users who at that time came to WUSC office to pay tariff.

4. Overall management

The result of the monitoring/evaluation was presented at the Liaison Conference held on 9 February 2012.

**(37) Hold Monitoring/Evaluation Liaison Conference for Business Operation**

The Monitoring/Evaluation Liaison Conference was held on 9 February 2012 along with the Water Supply Utilities Liaison Conference. At the Conference the result of monitoring/evaluation was reported by the chief of CHRDU. The evaluation is based on five degree of evaluation (Excellent, Very good,

Good, Satisfactory, Poor). The results are outlined as below:

1) Knowledge (Very good)

Knowledge of treatment system, water quality, tariff structure, tools, fittings, meter, and valves is adequately transferred. On the other hand, knowledge in the areas of new technology (e.g. UV, RO), high level drinking water standard, financial management and public awareness needs to be improved.

2) Skill (Good)

The level of skill in technical staff is satisfactory. Record keeping is also good. The following areas are the challenges from now on.

- Mechanical-electrical skill
- Leakage detection
- Computer billing and accounting
- Fund generation and investment
- Network establishment
- Business promotion

3) Attitude (Good)

The attitude of staff and management is satisfactory such as:

- Eager to learn new things
- Good behavior towards customers
- Willingness to improve and to do well
- Applying the way of participatory problem solution

4) Overall Management

The levels of tariff collection, attention given to the drinking water quality, water service coverage, and financial management are very good to satisfactory. The following matter is a new challenge:

- Coping with sanitation component

### (40) Holding JCC/PMC Meeting (The 3rd Year)

#### 1) The 3rd PMC

The 3rd PMC meeting was held on 29th June 2012. The major agenda of the meeting was to summarize the activities of the second year and to get consent on the contents of 3rd year's Work Plan Report. In addition, the Expert Team proposed to set up a Patrol Team in order to support WUSCs in O&M of Electro-Mechanical Equipments. Following achievement is recognized;

- The 3rd year's Work Plan Report was approved by PMC and shared by C/Ps
- Regarding the Patrol Team of Electro-Mechanical Equipment, the Nepal side showed a positive attitude and several ideas were discussed on the formation of the Team. DWSS agreed to carry out organizational improvement for setting up the Patrol Team
- It was confirmed that the Nepal side is in the process of procurement of spare parts/tools that were to be procured by the C/P side
- It was confirmed that the 3 WUSCs are proceeding preparation of their business plan based on the method which the Expert Team instructed to the WUSCs in the 2nd year

#### 2) The 4th PMC

The 4th PMC meeting was held on 8th February 2013. The major agenda of the meeting was to report

project activities and outcomes from June to December 2012 and make agreement about the 3rd year progress report (2) to be approved. The expert discussed with PMC necessity of more than 2 persons assignment from WSSDO as the project C/P, how to approach the non-participating WUSCs and modification of the Support Model. Following achievement is recognized;

- It is agreed to instruct WSSDOs from DWSS to involve at least 2 persons in the Project as C/P and establish proper record system of documents and training materials etc. to ensure smooth implementation of project activities
- It is further agreed to instruct WSSDOs to communicate with the chairpersons of the non-participating WUSCs and try to motivate them to send their staff in the training/workshop/OJT for their own benefits
- The field test of the current draft of the Support Model will be conducted in Jhapa & Morang districts to get feedback from the field. The Model shall be finalized through discussions among stakeholders and disseminated accordingly to other areas
- The 3rd year progress report (2) has been discussed and agreed to be approved by PMC

**3) The 5th JCC**

A joint terminal evaluation of the Project was conducted from 11th February to 3rd March 2013 by the Terminal Evaluation Team dispatched by JICA. The terminal evaluation was conducted based on 5 evaluation criteria: relevance, effectiveness, efficiency, impact and sustainability. The result of evaluation was reported in the 5th JCC meeting on 3rd March. The JCC accepted it and both the Nepalese and Japanese side agree to the contents to sign on the Minutes of Meeting. The contents in detail are shown in the section 5.

**4) The 6th JCC**

The 6th JCC meeting was held on 27th September 2013. The major agenda of the meeting was to approve the Management Model and the Support Model and to make consensus about dissemination of the two models in other districts and regions of the country after completion of the Project. In the meeting, it was accepted that DWSS shall approve and formalize the 2 models and continue to take activities like MIT, MAT, MET and OJTs as its annual program. In addition, it was also accepted that DWSS shall develop a plan for the dissemination utilizing human resources trained through the Project.

### (49) The 4th Monitoring and Summarization of its Outcome and Develop Future Directional Movement

From the 18th to the 22nd of July 2013, DWSS, ERMSO and Jhapa/Morang WSSDO cooperatively implemented the 4th Monitoring and Evaluation for 8 WUSCs in Jhapa and 6 WUSCs in Morang districts. This activity was conducted on their own initiatives while the experts were away.

They scored the WUSC's performance from 6 points of views; organizational management, financial management, customer complaint, business planning, water quality management and operational record keeping (maximum 60 points as a total) and summarized the result as shown in **Table 3.15**.

The result was presented at the liaison conference held on 23rd July 2013 for monitoring and evaluation. The monitoring and evaluation was conducted based on the perspectives listed below.

- Organization management: regular meeting, general meeting, work division, office management
- Financial management: water tariff rate, status of arrears, status of fixed deposit in bank/loan clearance,

status of billing record

- Complaint management: status of complaint record, method of solving complaint
- Business plan: made or not, implementing aspect
- Water quality: daily/monthly/semi-yearly/yearly, water quality record, importance of water quality
- Record keeping

**Table 3.15 Result of the 4th Monitoring and Evaluation**

| | WUSC | A | B | C | D | E | F | Total |
|---|---|---|---|---|---|---|---|---|
| Jhapa | Damak | - | - | - | - | - | - | - |
| | Lakhanpur | 7 | 6 | 6 | 7 | 6 | 6 | 38 |
| | Gauradaha | 8 | 7 | 7 | 7 | 8 | 7 | 44 |
| | Topgachhi | 6 | 5 | 5 | 5 | 5 | 5 | 31 |
| | Surunga | 8 | 7 | 8 | 7 | 7 | 6 | 43 |
| | Birtamod | 7 | 6 | 6 | 5 | 6 | 5 | 35 |
| | Sanischare | - | - | - | - | - | - | - |
| | Budhabare | 6 | 7 | 7 | 7 | 6 | 7 | 40 |
| | Dhulabari | 8 | 7 | 7 | 6 | 7 | 8 | 43 |
| | Kakarbhitta | - | - | - | - | - | - | - |
| | Chandragadhi | 6 | 6 | 6 | 5 | 6 | 7 | 36 |
| Morang | Letang | - | - | - | - | - | - | - |
| | Sakalpur | 7 | 7 | 7 | 6 | 6 | 7 | 40 |
| | Pathari | 6 | 7 | 5 | 7 | 5 | 5 | 35 |
| | Urlabari | 8 | 8 | 7 | 7 | 7 | 7 | 44 |
| | Haraicha | - | - | - | - | - | - | - |
| | Tankisinuwari | 7 | 6 | 6 | 6 | 5 | 6 | 36 |
| | Jhorahaat | 5 | 5 | 5 | 6 | 6 | 5 | 32 |
| | Mangadh | 7 | 7 | 8 | 8 | 8 | 8 | 46 |
| | Rangeli | - | - | - | - | - | - | - |

A: Organization Management, B: Financial Management
C: Complain Management, D: Business Plan
E: Water Quality, F: Record Keeping

### (50) Holding Liaison Conference on Monitoring/Evaluation for Business Operation on Water Supply Utilities

The liaison conference was held on 23rd July, 2013, for monitoring and evaluation. Similar to the monitoring and evaluation activity (shown in (49)), this conference was also held by the members concerned while the experts were away. DWSS, SEIU, ERMSO, Jhapa/Morang WSSDO and WUSCs took part in the conference and actively discussed the countermeasures for more future improvement based on the presentation of the monitoring and evaluation results.

At the conference, DWSS presented some proposals as follows.

- Provide training regarding accounting and computerized the billing system
- Provide technical training as per necessity
- Provide training regarding water quality management; water quality test kit should be managed.
- Itahari lab (TSC) must be improved
- Public awareness program is necessary
- Manage regular monitoring of different projects and forming joint team with DWSS, RMSO and WSSDO

In addition to the monitoring and evaluation, the drafts of the Management Model and the Support Model

were explained and the attendees discussed the procedure of supporting WUSCs, dissemination of the models, administrative improvement, and securing the budget for those.

As for securing the budget to support the improvement of WUSCs based on the guideline titled "Directive 2069", which is in process of formulation, it has been already secured for the fiscal year from July 2012 to June 2013. The budget for the following fiscal year is also going to be planned to be secured considering the requests given in this conference.

In the discussion of the Support Model, it was proposed to give priority to strengthening the water quality management and operational record keeping since WUSCs generally received fewer score in this part. The other recommendation was to formulate and implement a business plan along with the Model.

The attendees shared common perceptions that the WASMIP Model, composed of the Management Model and the Support Model, were effective in WUSCs' facility O&M and running their services efficiently and that it should be utilized as much as possible.

After the completion of the project, subcommittees will be organized for purposes such as holding liaison conferences successively, regularly implementing the monitoring, and setting up conferences to discuss and share their knowledge.

**(51) The 3rd Year Resident Awareness Raising Activities on Conflict Management Considerations and Stakeholder Consensus-Building Training**

A local NGO (Human Rights Network and Peace Action Group: PAG) was hired to carry out training on the Conflict Management Considerations related to the resident enlightenment activities and stakeholders.

1) Objectives of the Training

The objectives of the training are as follows:

- To initiate local communities to establish self-help mechanism in conflict sensitive program/project management
- To raise awareness on conflict/disputes and to strengthen problem-solving capability among residents.

2) Target Area

The service areas of the 3 WUSCs were selected as the target area for the Training. As Urlabari WUSC of Morang district also show interest on the subject, it was also added in consultation with DWSS. Thus, the training was conducted in Jhapa for 2 WUSCs, Dhulabari and Gauradaha, and in Morang for 2WUSCs, Mangadh and Urlabari.

3) Coordination with relevant stakeholders

Before conducting the training, a visit program was carried out in the service area of all 4 WUSCs service area from 13$^{th}$ to 17$^{th}$ July 2012. The purpose of the visit was to organize meeting with stakeholders such as intake area community group, media people, ward consumers group, local government bodies etc. for coordination and sharing information with the stakeholders and to collect the names of interested candidates in the training.

4) Conduct of 3-days Workshop

During September to October 2012, the 3-days workshop was conducted separately in each target area. A total of 117 people participated in the workshop.

i) Objectives of Workshop

- To discuss about the importance of water

- To discuss the natural resources and its impact
- To provide knowledge about local dispute resolution
- To inform about the procedures of dispute resolution
- To inform about the analysis method of dispute resolution
- To provide knowledge about formal and informal mechanism of dispute resolution
- To discuss about the role and responsibilities of stakeholders, community and consumers committee for the use of drinking water
- To inform about Nepalese law and its provision for the consumption of water resources
- To aware participants about referral mechanism
- To discuss the role of action group on dispute mitigation process in water residential area

ii) Date and Participants of Workshops

Date and Participants of Workshop is shown in **Table 3.16**.

**Table 3.16 Date and Participants of Workshops**

| Project Area | Workshop Organized Date | Venue | Participants |
|---|---|---|---|
| Gauradaha Water Residential Area | 12-14 September 2012 | Gauradaha | 30 |
| Mangadh Water Residential Area | 15-17 September 2012 | Biratnagar | 28 |
| Dhulabari Water Residential Area | 3-5 October 2012 | Dhulabari | 29 |
| Urlabari Water Residential Area | 6-8 October 2012 | Urlabari | 30 |

iii) Achievements of Workshop

- 117 participants participated in the conflict management training.
- Participants became aware on the legal provision of dispute resolution system and Nepalese law provision.
- Participants realized the importance of the drinking water and their role on the preservation of the drinking water.
- Participants get acquainted with the meaning, kinds, cause and effect of conflict and regular steps of conflict/dispute and dispute management.
- Participants became able to overview the local issues and conflict situation on water residential areas.
- Participants enhanced their capacity and skills on the procedure of dispute resolution and documentation.
- Participants became aware of dispute/conflict analysis methods.
- Stakeholders became aware of their role and responsibilities how to on the protection of the drinking water.
- Participants became aware of dispute resolution and referral mechanism.
- Four action groups have been formed among the participants for dispute mitigation, to support respective WUSCs and to become aware consumers on water supply and sanitation.
- Participants get aware on the role of action group.
- Participants get committed for the betterment of the drinking water and overall environment development.

**【Output 2】**

"Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" are developed as models for WSSDO/ERMSO and WUSC.

**(10) Formulation of OJT Program on the 3WUSCs Based on Results by Capacity Assessment Study**

Since the function of an organization system and the improvement effect of a role are influenced by the improvement in capability of the personnel, capability is strengthened by the following methods.

1) Examination of the OJT execution plan

Considering the investigation result, OJT/Training execution plan for one year later was examined. Furthermore, OJT executive plan for the 2nd fiscal year will be repeated after practically examining the effectiveness of the training.

a) JICA feasibility study report
b) Investigation results under the present condition according to the JICA Expert Team.
c) Evaluation result of re-consignment report.

2) Extraction of problem

Based on the result of consideration 1), trainings for capability strengthening are shown in **Table 3.17**.

**Table 3.17 Trainings for Capability Strengthening**

| | | Capability Strengthening for Governmental Organizations and WUSCs |
|---|---|---|
| Strengthening schedule of personnel capability | Item to be strengthened | ・First fiscal year (Targeted organization: WUSC, WSSDO, DWSS)<br>・Technical transfer of the fundamental knowledge adapted to the business solution of the present condition<br>・The content of OJT is shown in **Table 3.18**.<br>・Following fiscal year or later<br>・The OJT enforcement plan of the following fiscal year is reexamined at any time reflecting the training effect in the first fiscal year. |
| | Method of strengthening | ・OJT/training is carried out by the 3WUSCs respectively (Preparation of Nepali version).<br>・Person in charge of a government organization learns know-how from training of WUSC.<br>・Each trainee person evaluates / criticizes a training result, and raises the consciousness of self-study. |
| Strengthening plan of an organization/system | Item of strengthening | ・The major items that require strengthening and to be written in a report are shown below.<br>・Degree of achievement of business management<br>・Result of the measure against leakage of water<br>・Result of improvement activities of self-study volition<br>・Result of the information exchange with other water utilities |
| | Method of strengthening | ・The central government strengthens the supervisory powers of WUSCs.<br>・Strengthening items will be written in the annual-report of WUSCs, and improvement of a system will be promoted to a practical level. |
| | Action plan | a) WUSC<br>WUSC should consider the items indicated on the annual report, and should p reports on the result/subject at a given fiscal year.<br>b) Government organization (DWSS, ERMSO, WSSDO)<br>・Support the action plan which WUSC carries out<br>・Monitoring the contents of a report |

The content of OJT based on the items of capability strengthening is shown in **Table 3.18.**

## Table 3.18 Training Items of OJT

| 1. OJT on Purification Facilities O / M<br>***a) Preparation of SOP on Facilities O&M*** | 2. OJT on Water Distribution Facilities O & M and Planning of a new plan<br>***b) Preparation of SOP on Water distribution facilities O&M)*** | 3. OJT on Water quality Management (by simple Water management)<br>***c) Preparation of SOP on Water quality inspection & Monitoring*** | 4.OJT on Water Meters Reading /Meter Calibration Control Management<br>***d) Preparation of SOP on Meters inspection & Meters accuracy Management*** | 5. Educational Campaign on Waterworks as Civil Education |
|---|---|---|---|---|
| · Purification flow (system)<br>· Management on Purification facilities<br>· Wash up/control of filter sand of slow sand filter<br>· O&M on manganese<br>· Water quality control<br>· Flow rate control (Inlet /Outlet)<br>· Calculation method on chlorination<br>· Various Checklist on O&M (voltage/consumed power/pump operation record, etc.)<br>· Troubleshooting | · Management on underground Pipes (raw water transmission, transmission<br>· Management of distributed water (mass balance)<br>· Maintenance on elevated tanks<br>· Management on air valves/valves<br>· Installation method on pipes<br>· Selection on pipe materials/valves<br>· Connecting skills on plumbing (HDPE)<br>· Leakage detection technology<br>· Calculation on in-pipe velocity (gravity/pressure)<br>· Various Checklist on O&M<br>· Plan documents on new distribution main (planning/design/ construction supervision) | · Purpose of water quality management<br>· Water quality standard value.<br>· Sampling<br>· Water analysis technique<br>· Data management.<br>· Information disclosure<br>· Other | · Outline of Water meter reading<br>· Purpose of a water meter installation<br>· Scope of meter facilities installation and maintenance by WUSC<br>· Connection standard (expense burden)<br>· Cause of poor meter<br>· Repair method of meters<br>· Accuracy management of meter a water<br>· International standard<br>· Life of metes<br>· Purchase specification of metes<br>· Amount of unusual used and measure against a claim | · Purpose<br>· Target to be educated<br>· Method<br>· Activity plan |
| 6. Operational guidance on Efficient Water-rate Claim Business | | 7. Checking &Instructing Existing Customer File Management for Implement | 8. Checking &Instructing Existing Complaint Handwriting Processing System for Implement | 9. Confirmation & Instructing Existing Waterworks Annual Report & its Contents for Improvement |
| · Outline of water-rate collection<br>· Water-rates setup / amendment<br>· Poor-and-needy consideration<br>· Inspection-of-a-meter schedule<br>· Computerization examination of a water-rates claim and collection practices<br>· Examination of the water-rate payment method | | · Purpose of ledger management<br>· Written item of a ledger<br>· Renewal of data, and data management<br>· Computerization examination of the practice of the customer data management in the relation. | · Purpose of carrying out Complaint activity<br>· Review of the method and a system on complaint handling processing<br>· Other | · Principle of water-supply corporation<br>· Organization<br>· Committee<br>· Track record in a fiscal year operation<br>· Business plan of next fiscal year<br>· Financial reporting |

**(11) OJT on O&M for Water Treatment Plants**

During a period of 12 days investigation from 8th - 25thAugust 2010, present status of each 3 WUSCs was studied and OJT was implemented in an effective and efficient manner at each WUSCs discussing O & M of Water Treatment Plant.

In addition, the JICA Expert on O&M of Water Treatment Plant and Water Quality management carried out OJT.

Period and Place of the training is mentioned in the **Table 3.19.**

**Table 3.19 Training Schedule and Number of Attendants**

| Descriptions | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC | Total |
|---|---|---|---|---|
| Training Period | August 17-20, 2010 | August 22-25, 2010 | August 10-15, 2010 | - |
| Training days | 4 days (Banda 1day) | 4 days | 5 days | 13 days |
| Time | 4 - 5hour/day | 4 - 5hour/day | 4 - 5hour/day | - |
| Place | WUSC room<br>WTP site /meeting room | WTP site | WTP Site/WUSC room | - |
| No. of average participants/day | 23<br>(including WSSDO 0) | 12<br>(including WSSDO 0) | 20<br>（including WSSDO 6） | 55<br>(including WSSDO 6） |

a) Objective of the training

The purpose of training included

- Acquisition of the basic knowledge of plant technology
- Acquisition of the basic knowledge of water-purifying O&M management

b) Achievement set up at the beginning

The maintenance situation and its subject of the water-purifying facilities in the 3WUSCs are shown in **Table 3.20.**

**Table 3.20 Operation Situation of Water-purifying Facilities**

| Descriptions | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Water-purifying system | Slow sand filter System | Iron removal equipment | Iron removal equipment |
| Source of water | Spring water + groundwater | Groundwater | Groundwater |
| Capability of a plan institution | 4,300 $m^3$/day | 1,000 $m^3$/day | 2,200 $m^3$/day |
| Main composition of Civil Structure | Receiving well, Settling basins, Rough filter basins, Slow sand filter basins, Distributing reservoir, Backwash elevated reservoir, Chlorine facility building, Back wash water lagoon pond, Administration building | Tube wells, Distributing reservoir, Elevated water tank, Chlorine equipment, Back wash water lagoon pond, Administration building | |
| Main machine and electric equipment | Water flow meter, valves, pumps, chlorine dosing equipment, power generator, incoming panel, main control panel, local panel, a water level gauge | Iron removal tanks, aeration equipment, compressor,Stabilizer,same as on the left | Iron removal tanks, aeration equipment, compressor, same as on the left |
| Organization of facilities operation | 24-hour organization<br>(Date time working: 10:00-17:00) | 24-hour organization | 24-hour organization |
| Main O&M works (routine work) | - Abnormal surveillance and O&M management of plant | - Stabilizer(except Mangadh WUSC)<br>- Same as on the left- Stabilizer | |

| | | |
|---|---|---|
| | ・ Record of the amount of inflow<br>・ Cleaning of chlorine equipment, and chlorine solution management<br>・ Washing operation of rough filtration<br>・ Cleaning of slow sand filtration facility<br>・ Pump Operation<br>・ Valve operation<br>・ Check of an incoming power condition<br>・ Operation of power generator<br>・ Creation of control-of-maintenance record<br>・ Maintenance of O&M manual and a catalogs<br>・ Implementation of water test and Maintenance of water analysis equipment | |
| Subject on operation | ・ Strengthening of the O&M management ability corresponding to quality of raw water and inflow amount of water<br>・ Strengthening of the custom of cleaning and control of maintenance<br>・ Strengthening of the control-of-maintenance capability of chlorine equipment<br>・ Strengthening of the O&M skill of mechanical equipment<br>・ Strengthening of the operation know-how of a plant<br>・ O&M Strengthening of the capability to create record | ・ Strengthening of the O&M management ability corresponding to quality of raw water and inflow amount of water<br>・ O&M Strengthening of the capability to create record |

The evaluation results of the site activities are as follows;

- ・ Treated water largely meets the water quality standard.
- ・ It is required to obtain the knowledge of facility O&M for the best performance of the plant and energy saving
- ・ It is required to monitor the quality of raw water and treated water in the facility O&M.
- ・ Cleanliness and Maintenance of the facility are not enough.

c) OJT and Workshops

OJT and workshops are held according to the contents as shown in **Table 3.21**.

**Table 3.21 Contents of OJT and Workshops for Water Treatment Plant**

| Enforcement of OJT | Discussion |
|---|---|
| ・ Method of examination of the operating condition of a plant<br>・ Check of the operation situation of a water-purifying process<br>・ Method of control-of-maintenance for chlorine dosing equipment<br>・ How to deal with dangerous chlorine powder<br>・ Case study of Amount of feeding air for Aeration tank, chlorine dosing and Back-wash time for Iron removal tanks was calculated to make suitable for water quality （for Gauradaha/Mangadh）<br>・ Case calculation of Velocity in settling basins, rough filters and slow sand filters was carried out. (Dhulabari）<br>・ Method of a checking the operation of an equipment (routine works / unusual operation)<br>・ Review of an O&M record form<br>・ Creation of O&M record<br>・ Conduct repair work of the main facility under fault, and implementation of cleaning work (aeration tank for Iron removal) | ・ Understanding of the purpose of a water-purifying facility<br>・ Understanding of a water-purifying processing flow<br>・ Understanding of the role of each institution<br>・ Cleaning of equipment and maintenance of institutions needs to be improved.<br>・ Check the purpose of maintenance works<br>・ Understanding of meaning of maintenance for slow sand filter and backwash for iron removal tank<br>・ Understanding of the evaluation method of O&M plant<br>・ Understanding of the calculation method of the operating condition of plant operation<br>・ Understanding of O&M manual<br>・ Understanding of the purpose of the O&M management form, others |

d) Result of activities

i) Enforcement of a small test

The important trainees who planned and did also participated.

- The whole rate of average results has been improved from 57% to 70 %

ii) Comments of lecture attendees

The opinions of the trainees got during the training period are shown below.

- It is judged that the persons have learned in general the basic knowledge for which they wished.
- They have requested to provide training continuously, and to increase training items.
- Training was significant.
- The basic knowledge of how to decide the numerical value which determines an operating condition was understood.
- The repair method of the aeration tank was learned.
- It would be thankful if the trainings are continuously provided gradually increasing the types of trainings
- The attendees were largely satisfied with the contents of OJT.

iii) Evaluation by the JICA Expert instructor

- Although the whole degree of comprehension is 70%, it still needs to be strengthened.
- The result of OJT is judged "To be goal achieved in general" from the following improvement items.
  - The ability to create operation management record of O&M improved.
  - Operation ability suitable for quality of raw water improved.
  - In addition, OJT of the original purpose was understood.

However, it is required to strengthen the technical knowledge about maintenance of filtering medium for iron removal and chlorine.

- Implementation of repeated OJT / lecture and monitoring are required.
- All WUSCs helped co-operatively for the arrangement of training place, dispatching trainees and operating generator for providing electricity during implementation.

The interpreter of local employment lacked sufficient technical knowledge, and was not able to communicate effectively.

e) Pictures of OJT







**OJT in Terms of O&M at WUSCs**

### (12) Preparation of Draft SOP on O&M for Water Treatment Plants

"Operation Control-of-Maintenance Manual of a Water Purification Plant" was prepared as general purpose SOP (Draft) and used as teaching-materials for item (11) during OJT.

A. SOP for Water Purification Process Management
- A-1 Water treatment process and equipment/facilities which consist of process
  1. Coagulation-sedimentation-rapid filtration
     (1) Alum dosing rate
     (2) Rapid Mixing Basin and Flocculation Basin with gentle mixing
     (3) Sedimentation Basin
     (4) Rapid Filter
  2. Iron Removal Plant with Manganese Sand
  3. Slow Sand Filtration System
- A-2 Maintenance of the equipment/facilities
- A-3 Flow management
- A-4 Record Formats for Water Quality Management
- A-5 Trouble shooting: Refer to manual of each equipment

B. SOP for Water Quality Analysis
- B-1 Purpose of water quality analysis
- B-2 Water quality criteria
- B-3 Sampling
- B-4 Frequency of water quality analysis
- B-5 Water quality analysis methods
- B-6 Data management
- B-7 Disclosure of information
- B-8 Closing

### (13) OJT on O&M and New Planning Formation for Water Distribution Facilities

During a period of 6 days local area investigation from 5$^{th}$ - 15$^{th}$September 2010, present status of each 3 WUSCs was investigated and OJT was implemented in an effective and efficient manner at each WUSCs discussing on New Planning Formation for Water Distribution Facilities.

Period and Place of the training are mentioned in the **Table 3.22.**

**Table 3.22 Periods and Places of the Training**

| Descriptions | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC | Total |
|---|---|---|---|---|
| Training Period | September 6-7, 2010 | September 9-10, 2010 | September 13-14, 2010 | - |
| Training days | 2 days | 2 days | 2 days | 6 days |
| Time | 4 - 5 hour/day | 4 - 5 hour/day | 4 - 5 hour/day | - |

| Place | WUSC room<br>WTP site/meeting room | WTP site<br>WUSC room | WTP site<br>WUSC room | - |
|---|---|---|---|---|
| No. of average participants/day | 14<br>(including WSSDO 2) | 9<br>(including WSSDO 0) | 16<br>(including WSSDO 3) | 39<br>(including WSSDO 5) |

a) Objective of the training

The purposes of training were,

- Acquisition of the basic knowledge of O & M management on distribution facility
- Acquisition of the basic knowledge of distribution plan

b) Current Conditions

The maintenance situation and its subject of the distribution facilities in the 3WUSCs are shown in **Table 3.23.**

**Table 3.23 Situation of Maintenance of a Piping line Facilities**

| Items | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Facility Capacity (at planning) | 4,300 m³/day | 1,000 m³/day | 2,200 m³/day |
| Number of piped water supplied Household | About 2,000 (as of May 2010) | About720(as of May 2010) | About1,900 (as of May 2010) |
| Name of a pipeline | Aqueduct, distribution pipe, Service pipe | Distribution pipe, Service pipe | |
| Extended distance | About 50km (new 20 km) | Amount 31km (new 14 km) | About 60km |
| Type of pipe material | Cast iron pipe/PE pipe | PE pipe | Cast iron pipe/ PE pipe |
| Main piping equipment | Air valve: about 30 pieces<br>Valve: about 60 pieces<br>Drain valve: about 20 pieces<br>Fire hydrant : about 10 pieces | Air valve: about 15 pieces<br>Valve: about 40 pieces<br>Drain valve: about 10 pieces<br>Fire hydrant: about 2 pieces | Air valve: about 5 pieces<br>Valve: about 42 pieces<br>Drain valve: about 16 pieces<br>Fire hydrant: about 1 piece |
| Organization of plant operation | Day time: 10:00am~17:00pm (24 hrs. operation) | | |
| Main O&M works (routine work) | · Leakage-of-water management and repair<br>· Operation of valves<br>· Management of Cleaning works<br>· Management of a valve boxes, a hand holes, and a manholes<br>· Management of a hydrants | | |
| Subject on management | · The patrol organization which manages a pipeline periodically needs to be strengthened.<br>· The repair organization of a manhole cover needs to be strengthened.<br>· Check positions, such as a piping line sign and a manholes.<br>· Maintenance of an O&M management ledger needs to be strengthened. | | |

c) OJT and workshops

OJT and workshops are held according to the contents as shown in **Table 3.24**.

**Table 3.24 Contents of OJT and Workshops for Water Distribution Facilities**

| Enforcement of OJT | Discussion |
|---|---|
| · Grasp of an O&M management status<br>· Implementation of exploration of a piping route<br>· Check location of piping locators and valve pits<br>· Check valves performance<br>· Cleaning of a valve pit<br>· Theft preventive measures of the manhole covers<br>· Review of an O&M record form | · Understanding of a piping drawing/legend symbols<br>· Understanding of the role of piping network equipment<br>· Analysis/evaluation of the operation situation<br>➢ O&M of a water supply system is easy because of the gravity system using the vertical interval of geographical feature.<br>➢ Also in the time of a power failure, supply water is possible from an elevated reservoir |

| | |
|---|---|
| | ➢ Water examination of an end water tap is required<br>➢ Management of a piping route needs to be strengthened<br>・ Acquisition of the basic knowledge of the water quality management method in piping water<br>・ Acquisition of the basic knowledge of the measure against water leakage<br>・ Understanding of the O&M manual<br>・ O&M management form, other ledgers |

d) Result of activities

i) Enforcement of a small test

The important trainees who planned and did also participated.

The whole rate of average results has been improved from 92% to 98% (refer to **Table 3.46**).

ii) Trainee's Comment

The opinions of the trainees got during the training period are shown below.

- It is judged that the persons have learned in general the basic knowledge for which they wished.
- Training was significant.
- They have requested to provide training continuously and to increase training items.
- Trainees are judged to be "satisfied" in general by the contents of OJT.

iii) Evaluation by the JICA Expert

- The degree of achievement from the test result has improved 6%.
- Although the whole degree of comprehension is 90%, it still needs to be strengthened.

However, on-site exploration investigation of pipe line is insufficient, and repair/ maintenance of pipeline equipment is behind.

- Since enough map information is not given, the improvement of effective water supply service is difficult.
- The training as OJT is judged "To be goal achievement in general" from the following improvement items.
  - ➢ The purpose of an on-site exploration was understood.
  - ➢ The importance of the periodic check of a piping network was verified.
  - ➢ This OJT's aim was attained.
- Implementation of repeated OJT / lecture and monitoring are required.
- All WUSCs helped co-operatively for the arrangement of training place, dispatching trainees and running generator for electricity during implementation.

e) Photograph of OJT




Exploratory investigation of Pipeline Rout

**(14) Preparation of Draft SOP on O&M and New Planning Formulation of Water Distribution Facilities**

"Operation Control of Maintenance Manual of an O&M & New Planning Formulation of Water Distribution Facilities" used as teaching-materials for item (13) during OJT was prepared as general purpose the draft SOP. The content of the draft SOP is as below,

**1. Standard Operation Procedure (SOP) on O&M of Water Distribution Facilities**
- 1.1 Water Distribution Facilities
- 1.2 Provision of Survey
- 1.3 Consideration of Facility Survey
- 1.4 Out of Order and Measures of Valve
- 1.5 Procedures of investigation and report to WUSC
- 1.6 Water Distribution Network Map

**2. New Planning Formulation of Water Distribution Facilities**
- 2.1 Water Distribution Facilities Plan
- 2.2 Issues in the Planning Process
- 2.3 Type, Size and Location of Facilities
- 2.4 Planning and Conceptual Design of Distribution Facilities
- 2.5 Required Quantities
- 2.6 Maximum daily design water flow, Hourly maximum design water flow
- 2.7 Distribution Network System
- 2.8 Distribution System
- 2.9 Piping System Sizing
- 2.10 Design Criteria in Hydraulic Analysis
- 2.11 Consideration of Planning of Distribution Network
- 2.12 Accessory Equipment
- 2.13 Service Reservoirs and Elevated Tanks
- 2.14 Operation and Maintenance (O&M) of Distribution Facilities

**(15) OJT on Water Quality Management (By Simple Water Quality Control) in ERMSO**

During a period of 12 days of local area investigation from 10th - 25thAugust 2010, present status of each 3 WUSCs was investigated and OJTs was implemented in an effective and efficient manner at each WUSCs discussing about Water quality management.

1) Shift of a Location for conducting OJT

Although OJT by simple water analysis was scheduled to be carried out at the beginning using the analysis center of ERMSO, but as a result of discussion with C/P on the need of evaluation in advance, the enforcement place of OJT was changed due to difficulty of maintenance control of

existing analysis equipment. OJT was carried out at the site of each WUSC. OJT was carried out from 10th to 25th August 2010 at Dhulabari, Gauradaha, Mangadh WUSC.

a) The Objective of the Training

The following effects were acquired as a result of training to each WUSC.

In addition, the JICA Expert on O&M of Water Treatment Plant and Water Quality management carried out this OJT.

- Training to trainees has been carried out.
- Practical OJT training suitable for an operation management situation has been carried out.
- The existing simple analytical instrument has been evaluated.
- Evaluation of the present water quality has judged easily.
- The item of water quality measurement was nine items required for the present water analysis, they are pH, Turbidity, Color, Iran, Coli form, Residual chlorine, Ammonium nitrogen; $NH_4$-N, Nitrate nitrogen; $NO_3$-N and Electrical conductivity.

b) Current Conditions

Water quality management of the 3WUSCs is carried out on an irregular base.

The situation of water quality management is shown in **Table 3.25.**

**Table 3.25 Status of Water Quality Management**

| Descriptions | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Water-purifying system | Slow sand filter System | Iron-removal plant | Iron-removal plant |
| water source | Spring water Groundwater | Groundwater | Groundwater |
| Material to be removed | Turbidity | Iron | Iron |
| Feature of quality of raw water | ph.: 7-7.5<br>Turbidity(rainy): 1-2 NTU | ph.: 6.4-7<br>Turbidity: Less than 1 NTU<br>Iron; 0.1~5 mg/L | ph.: 7-7.5<br>Turbidity: Less than 1 NTU<br>Iron:0.3~3 mg/L |
| Water quality value of treated water | ph.: 7-7.5<br>Turbidity:1NTU<br>Residual chlorine: 0.1-0.5 mg/liter | ph.: 6.4-7<br>Iron: 0.1mg/L<br>Residual chlorine：0.1-0.5 mg/L | ph.: 7-7.5<br>Iron: 0.3 mg/L<br>（measurement limit）<br>Residual chlorine: 0.1-0.05 mg/L |
| Conformity to a Nepal water-purifying standard | Meet water quality standard | Almost meet water quality standard | Meet water quality standard |
| | Turbidity: less than 5 NTU, ph: 6.5 - 8.5, Iron：less than 0.3 mg/L | | |
| Water analysis equipment | Donated by JICA, simple water analytical equipment（Turbidity，residual chlorine，pH meter） | | |
| | - | donated by ENPHO(Iron kit) | - |
| | Bacteria test：outsourcing/purchase of examination paper | | |
| Frequency of measurement(Inside of a water purification plant) | Turbidity：Raw water in rainy season (once /day)<br>Residual chlorine：Treated water (once /day)<br>pH：not measured (breakdown) | Turbidity：(once /1-2 days)<br>Residual chlorine：treated water (once/ 1-2days)<br>pH：not measured (breakdown)<br>Iron：once/1-2days<br>Bacteria test：Self-supply | Turbidity：(once /week)<br>Residual chlorine：treated water (once/day)<br>pH：not measured (breakdown)<br>Iron：once/week |
| Main O&M works (Routine work) | · Implementation of a periodical water examination (a sampling and measurement)<br>· Implementation of accuracy proofreading of water quality test equipment<br>· Implementation of maintenance of equipment (cleaning / storage / checking battery)<br>· Creation of the report of the water quality result to a plant O&M operator | | |

| | |
|---|---|
| | ･ Creation of record |
| Issue of water quality control | ･ An understanding and strengthening of the purpose of water chemistry control are needed<br>･ Strengthening of the knowledge of a definition of an analysis item is needed<br>･ Strengthening of the management ability of a water analysis record ledger is needed<br>･ Strengthening of the knowledge of accuracy management of analysis equipment is needed<br>･ Strengthening of the cross-check of a simple water examination result is needed<br>･ Strengthening of the water examination of a water tap is needed |

c) OJT and workshops

OJT and workshops are held according to the contents asshown in **Table 3.26**

**Table 3.26 Contents of OJT and Workshop for Water Quality Management**

| OJT | Workshop/ Discussion |
|---|---|
| ･ How to deal with water analysis equipment<br>･ About the measurement error of a water analysis instrument<br>･ Sampling method<br>･ Implementation of a water quality test inspection, and evaluation of an analytical value<br>･ Creation of record | ･ Grasp of the concept of water quality management<br>･ Grasp of the basic knowledge of the water analysis method<br>･ Evaluation of water quality management<br>➢ Analysis is carried out with the existing water analysis equipment.<br>➢ The performance of water analysis equipment needs to be checked.<br>➢ It is necessary to reflect the result of water analysis data in operation of a plant.<br>･ Grasp of the meaning of a water quality standard value / water quality item<br>･ Grasp of the basic knowledge of the mechanism of the analysis equipment<br>･ Method of water sampling and its storage<br>･ Creation and storage of a report<br>･ Understanding of the meaning of the necessity of feeding back an analysis result to O&M administrator |

d) Result of activities

i) Enforcement of a small test

The important trainees who planned and did also participated.

･ The whole rate of average results has been improved from 45% to 55%.

ii) Implementation of comment investigation

Most trainees' comment is shown below.

･ In general, the basic knowledge for which it wished at the beginning has been learned.

･ OJT of simple water analysis was positive experience.

･ Since treated water quality conformed to meet the regulation value, they felt reassurance.

･ They have requested to be continuously given training, increasing a training item.

iii) Evaluation by the JICA Expert

･ The whole degree of comprehension is 50%, and it is necessary to strengthen it.

･ Especially the degree-of-comprehension level of the basic knowledge of water quality is low.

･ The training as OJT is judged "To be goal achieved in general" from the following improvement items.

➢ Ability to create record of a water quality daily report improved.

➢ Basic knowledge which evaluates a water analysis value improved.

- In addition, OJT of the original purpose has been carried out.
- Implementation of repeated OJT / lecture and monitoring are required.
- All WUSCs helped co-operatively for the arrangement of training place, dispatching trainees and running generator for electricity during implementation.

The interpreter of local employment lacked sufficient water-quality-technical knowledge, and was not able to communicate effectively.

e) Photographs of OJT




**Water-quality's OJT/Training at WUSCs**

**(16) OJT on Water Meter Reading /Meter Calibration Control and Prepare Draft SOP**

OJT and lectures for capability strengthening were carried out from 5th to 15th September 2010

a) Objective of the training

- Acquisition of the basic knowledge of how to read water meters, water meter reading method.
- Acquisition of the basic knowledge of a water meter and piping a house-connection.
- The method of accuracy management of a water meter
- Information control of a water meter

b) Achievement set up at the beginning

- The situation of the operation is shown in **Table 3.27**.
- An inspector reads a meter value, and writes down the value in a meter reading slip and billing slip at meter checking.
- Calculation of the amount billed computes water rates from a water-rates simplified chart, and is immediately entered in a column on the slip.

**Table 3.27 Sates of Water Meter Reading**

| Descriptions | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Frequency of water meter reading | Monthly (The scheduled day was decided in general) | | |
| Number of meter staff(As of May 2010) | Two persons.<br>(About 2,000 meters ) | Two persons.<br>(About 720 meters ) | Two persons.<br>(About 1,900 meters ) |
| Other responsibilities | The following information is immediately reported to WUSC.<br>・Registration of a complaint<br>・Report of unusual amount of water<br>・Report of an illegal act<br>・Report of damage/ loss / leakage-of-water(water supply equipment/meter boxes)<br>・Build up confidential relation with a customer (Data collection from customer and public-relations activities of WUSC | | |

| | | | |
|---|---|---|---|
| Management of an meter reading form | ・Reading the water meter of the spot.<br>・Fill out a water-meter-reading and billing slip blank in "handwriting"<br>・Posted the information on the water meter reading slip to the customer ledger at WUSC office | | |
| Main written items | ・Name of the consumer / ID number /slip number / Date of meter reading<br>・Last month's digit<br>・Current digit<br>・Consumed amount<br>・Amount<br>・Additional cost<br>・Sum total of water rates for this month<br>・Reader's signature | ・Name of the consumer / ID number /slip number / Date of meter reading<br>・Last month's digit<br>・Current digit<br>・Consumed amount<br>・Amount<br>・Additional cost<br>・Sum total of water rates for this month<br>・Reader's signature | ・Name of the consumer / ID number /slip number /Date of meter reading<br>・Last month's digit<br>・Current digit<br>・Consumed amount<br>・Amount<br>・Maintenance cost<br>・Amount in arrears and surcharge<br>・Filtration / dynamo usage fee<br>・Repair charge<br>・Sum total of water rates for this month<br>・Reader's signature |
| Subject of operating enforcement | ・Meter reading in every two months is predicted that delinquent bill-payers will be increased in the number.<br>・Main meter reading obstacles are absence of residences.<br>・It is difficult to check the work attitude of meter readers.<br>・When a ledger indicates from a meter reading, a mistake may occur.<br>・Complaint has occurred at the measurement value of a water meter.<br>・In order to correspond to a complaint, strengthening of equipment which can check the performance of water service meter simply is needed. | | |

1) Water meter performance examination equipment of ERMSO

Accuracy examination of ADB supported water meter performance equipment under jurisdiction of ERMSO is still under adjustment (the guideline of the fiducial point of a performance error is undecided).

Therefore, it was judged that the OJT training using this equipment was "difficult".

2) Judgment of WUSC about use of accuracy management equipment of a water meter

WUSC is scrapping replaced /failure meters for the following reasons.

・A customer can be asked for the expense of a water meter.

・Frequency of failure is low.

・No merit in commission repair.

・Since a purchase water meter is an acceptable product of shop inspection, performance has reliability.

・It is thought that proof reading of repair meter is unnecessary for the time being.

3) Imported universal water service meters

The typical water meter is 1/2 inch size and Dry Type made in China.

c) Implementation of training

OJT /Training were held according to the contents as shown in **Table 3.28**

**Table 3.28 Contents of OJT and Workshops**

| OJT | Discussion |
|---|---|
| ・ How to Read a water meter<br>・ Grasp of the mechanism of a water meter<br>・ Confirmation of the contents of water meter reading work | ・ Outline of water meters<br>・ Analysis/evaluation of meter reading operation<br>➢ It is a rational meter reading slip<br>➢ Conversation with a customer is important<br>・ Grasp of the basic knowledge of the connection range of a water meter (the responsibility of service range of WUSC)<br>・ Grasp of the basic knowledge of method of how to connect service pipe from distribution line.<br>・ Acquisition of the basic knowledge of the water meter.<br>・ Understand the meaning of the dial on the water meter<br>・ Understand installation and maintenance expense<br>・ Introduction (ERMSO's) of proofreading equipment of a water meter<br>・ Grasp of the measure against failure<br>・ Understand information management of a water meter, and required items |

d) Result of activities

1) Enforcement of a small Test

The important trainees who planned and did also participated.

・ The whole rate of average results has been improved from 50% to 66%.

2) Trainees' comment

The opinions of the trainees during the training period are shown below.

・ In general, the basic knowledge for which it wished at the beginning has been learned.

・ OJT of how to read a water meter was positive experience.

・ They have requested to be continuously given training, increasing a training item.

3) Evaluation by the JICA Expert instructor

・ The whole degree of comprehension is 60%, and it is necessary to strengthen it.

・ The training by OJT is judged "To be goal achieved in general" from the following improvement items.

- ➢ Importance of the water meter was understood.
- ➢ Mechanism of the water meter was understood.
- ➢ In the future, the necessity for the information control of repair and performance record of the meter was understood.

・ Implementation of repetition OJT / lecture and monitoring are required

・ All WUSCs helped co-operatively for the arrangement of training place, dispatching trainees and running generator for the implementation.

4) Preparation of the Draft SOP

The SOP proposal on the methods of water meter reading and water meter accuracy management was prepared. The content of the draft SOP is as below,

1. Installation of Service pipe and Water Meter
   1.1 Service Pipe
   1.2 Location of Water Meter
   1.3 Pipe Working
   1.4 Water Meter

1.5 Water Meter Type
1.6 Proper treatment of a water meter and suggestion of water meter installation
2. Outline of Meter Reading
3. Responsibility of installation fee and maintenance of water meter
4. Water Meter Calibration Control
4.1 Water Meter accuracy management equipment
4.2 Examination of Instrumental Error with Master (Standard) Water Meter
5. Out of Order and Measures of Water Meter
6. Management of Water Meter

**(17) Educational Campaign on Waterworks as Civil Education**

During a period of 9 days of local area investigation from 18th August 2010 to 27th August 2010, present status of each 3 WUSCs was investigated and educational campaign was implemented in an effective and efficient manner for about 1 day at each WUSC conducting discussions on the meaning of Civil Education.

- Number of average attendants were about 7 - 13 person per day.
- 97% of them were employee of WUSC.

Period and Place of the training conducted is mentioned in the **Table 3.29.**

**Table 3.29 Periods and Places of the Training**

| Descriptions | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC | Total |
|---|---|---|---|---|
| Date of Training | August 22-24, 2010 | August 26-27, 2010 | August 18-20, 2010 | - |
| Duration | 3 days | 2 days | 3 days | 8 days |
| Time | 3 hours/day | 3 hours/day | 3 hours/day | - |
| Place | WUSC's Meeting Hall | Classroom of elementary School | WUSC's Meeting Hall | - |
| No. of average participants/day | 20 (including WSSDO 0) | 8 (including WSSDO 0) | 10 (including WSSDO 1) | 38 (including WSSDO 1) |

a) Objective of the training

- Support to the C/P organization about publicity work.
- Sharing fundamental knowledge on civil education.

b) Current Conditions

Understanding the necessity of WUSCs, civil education activities were implemented at the 2 WUSCs excluding Gauradaha.

In addition, since residents already recognize the importance of water, the educational campaign for water saving is not carried out in particular.

A resident education situation including the resident education of the 3WUSCs is shown in **Table 3.30**.

**Table 3.30 Current Condition of Civil Education**

| Items of activity | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Information disclosure | Water Quality Standard Value | | ・ Water Quality Standard Value<br>・ Place water supply time table<br>・ Name of the exclusive committee |
| Publicity Work (Enlightenment) | ・ Send out signals of cautions information on a waterborne (infectious) disease through town meeting and media<br>・ Implementation of Garbage cleaning Campaign<br>・ Activities of public announcement of the Hygiene education posters offered from DWSS | ・ Not doing anything special | ・ Celebrating Water Day (March, 22), Activities done that day are mentioned below<br>・ Target were elementary students<br>・ Enlightenment activities of drinking water and hygiene. Proper observation on hand washing (distribution of towel and soaps). Implementation of plantation<br>・ Specially, they are not implementing any enlightenment activities targeted to the public |

Picture of publicized information

Name of Working Committee(9)

Time Schedule of Water Supply

Water Quality Standard Table

Picture of Public Relation Activities

Hygiene education Campaign

a) Implementation of Training

Training was implemented under the instruction of the JICA Expert in the form of discussion with participation of all members.

・Meaning of public enlightenment

・Analysis and Evaluation of the present activities.

(The activity which obtains an understanding of a water utility is still insufficient)

・Means of Enlightenment activity

(Priority order of Enlightenment items, an object generation/Group/Place, Preparation of PR document, PR order/frequency etc.)

・Valuation method of the degree of result achievement of an educational campaign
・Bearing Expenses, etc.

b) Results

・According to self-evaluation results of questionnaire, 25 out of the 38 participants were "satisfactory".

i) Comments of lecture attendees

・Training was beneficial.
・They want the continuation on the implementation of the training adding more training items.

ii) Evaluation of JICA Expert's instructor

・Most of the trainees understood the contents of the consultation.
・Implementation of enlightenment activity, since securing the budget is difficult; there is a limitation in scaling up of the activity.
・All WUSCs helped co-operatively for the arrangement of place for training, dispatching trainees and arrangement of generators for providing electricity during the implementation of the training.

**(18) Efficient Water-Rates Claim Business**

During 9 days period of local area investigation from 18th to 27th August 2010, present status of each 3 WUSCs was investigated and the training on the subject implemented in an effective and efficient manner for about 1 day at each WUSCs conducting discussions about the computerization system.

・Number of average attendants were about 7-13 person per day
・97% of them were employees of WUSC.

a) Objective of the training

・Support on improving Management works of C/P organizations
・Analysis of present activity status
・Grasp of the concept of the efficiency by the computerized operating billing service
・Sharing of basic knowledge of water rate claim business

b) Current Conditions

Billing Management procedure is mentioned below.

・All the record entries are in hand written.
・Payment amount from customers is checked by the ledger book confirming the amount to be received.
・Water bills (in cash) is paid every month at the counter of the WUSC
・Issuance of bill of water charge (request payment slip) is issued every month by water meter readers.
・Paid amount of water rates by the customer can be checked from issue of a receipt and a water book (a members-booklet).
・Collected amount are to be deposited in the bank account of the WUSC in the same day.

The creation procedure of a water-rates bill is shown below:

- Almost all the water-rate amount billed is calculated from the water consumption of a water meter.
- A water meter reader integrates water rates from the amount of water consumed by a quick checklist.
- The number of water meters installed is only one in each household.
- Water rates are calculated with a basic charge plus addition amount for extra consumed water
- Number of the water-bills of each WUSC is shown in **Table 3.31**.

**Table 3.31 Number of the water-bills to be issued Monthly**

| Items | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Number of bills issued (piped water supplied household) | About: 2,000 | About: 720 | About: 1,900 |
| Number of new water meter connection | 15 connections /month | 6-7 connections /month | 20 connections /month |
| Frequency of bills to be issued | Monthly | | |

*Source：WUSC/DWSS, April, 2010*

**Table 3.32** shows the example of the written items in the bill.

**Table 3.32 Written item of a bill（Dhulabari WUSC）**

| | | |
|---|---|---|
| Customer's name. address | Meter reading of last month | Amount of water bill this month |
| Customer number | Meter reading of this month | Sign of meter reader |
| Date of water meter reading and Bill issuance date | Amount of water used this month | others |

In order to keep consumer well aware of water tariff and to keep track on the regular payment, WUSC issues a water booklet as membership card to each costumer at the time of water service connection (Each one keeps it).

The example of a written item in the water-booklet is shown in **Table 3.33.**

**Table 3.33 Written items in the water-booklet (Dhulabari WUSC）**

| |
|---|
| On the cover page of the Membership booklet: Customer's Name, Address, Date, Ward No, Customer #, Tel no. of customer |
| On the back page of the Membership booklet: Tel no. of WUSC |
| Date, Payment month, Carried forward condition |
| Meter reading of last month, meter reading of this month, used amount of this month |
| Total Charge, Payment amount, Receipt number, Sign of personal in charge of WUSC, Remarks |
| Terms and conditions are stated on the back of the membership booklet. |

Duty of Cash Counter of WUSC

- Cash Counter of WUSC is in one place (Person in charge are 1-2 person)
- Business Hours: Sunday – Thursday (10:00 – 17:00, however, the payment receipt of a charge is

up to 14:00), Friday (10:00 – 12:00)

- Duty of the Contents
- Issuance of Receipt and record in water-booklet (works in handwritten)
- Issuance of Receipt (Check work of a Customer's bill and WUSC-customer filed record)
- Pictures of WUSC's counter

c) Implementation of training

Training was carried out in discussion form under JICA Expert's instruction.

- Significance of billing services
- An understanding of the basic knowledge of the system of billing collection
- Grasp of the subject of handwriting works
- Deliberations of the effect of computerization of works
- Acquisition of the input skill of a personal computer
- Deliberations of maintenance expenses
- The billing system of water supply is appropriate for the local and the management system is working properly
- For handwriting, it is necessary to consider the efficiency of administrative processing

d) Result of activities

According to self-evaluation results of questionnaire, 25 out of the 38 participants were "satisfactory."

i) Comments of lecture attendees

- The training was beneficial
- They want the continuation on the implementation of the training adding more training items.

ii) Evaluation of JICA Expert's instructor

- Most of the trainees understood the contents of the training
- Objective of the training was achieved sufficiently
- All WUSCs helped co-operatively for the arrangement of place for training, dispatching trainees and arrangement of generators for the implementation of the training.
-

**(19) Checking and Instructing Existing Customer File Management for Improvement**

During a period 9 days for local area investigation from 18th August 2010 to 27th August 2010, present status of each 3 WUSCs was investigated and training on the subject was carried out in an effective and efficient manner for about 1 day at each WUSC conducting discussions on the computerization system for the customer ledger file.

- Number of average attendants were about 7-13 person per day.
- 97% of them were WUSC employees.

a) Objective of the training

- Support to the C/P organization about the improvement of the Customer File.

- Grasp on outline of effectiveness related to the computerization
- Sharing basic knowledge on customer file.

b) Current conditions

- Customer file is used for management of new connection information, water meter information, and water rates.
- Ledger has indicated information by the note system and the "handwriting system."
- The amount of water rates for this month received at the window of WUSC is used in order to check the payment situation of the amount of money of a bill, and the past.
- It is used in order to check the registration number and contractor name of a water meter.
- This information is being interlocked with the accounting control ledger.
- All records are handwritten
- Example of a written item of a customer ledger is shown in **Table 3.34.**

**Table 3.34 Written Item of a Customer Ledger（Dhulabari WUSC）**

| | |
|---|---|
| No. of water Supply Meter | Monthly charge and payment record:<br>・Date, Previous amount of meter reading, Current amount of meter reading, amount of water used<br>・Due amount bill, other costs<br>・Discount amount（3% of Bill amount）<br>・Total amount of payment this month<br>・No. of receipt / sign of the receiver from WUSC |
| Customer's name, address, telephone no. | |
| Record of payment charge and payment amount. | |

Renewal time of customer ledger

- When the receipt of water rates is published (Check of water rates, a contractor name, etc.)
- When installation of a water meter and meter replacement.
- When a connection application and change (contract name, a place, the time of a water supply stop, piping size, etc.)
- When the payment of water rates is overdue (fine) and etc.

c) Implementation of training

Training was carried out in discussion form under JICA Expert's instruction.

- Meaning of customer file
- Understanding of mentioned information
- Grasp on issue on hand written office works
- Consultation upon computerization of office works
- Acquire skills in computer input
- Consultation on maintenance expenses of equipment

d) Result

i) Comments of lecture attendees

- They want the continuation on the implementation of the training adding more training items
- According to questionnaire, within the 38 participants, self-evaluation results of 25

participants were satisfactory.

ii) Evaluation of JICA Expert's instructor

- It is necessary to consider the increase in efficiency of office work for handwriting
- Management information is being interlocked with accounting control and is functioning.
- Objective of the training was achieved sufficiently
- Most of the trainees understood the contents of the training
- All WUSCs helped co-operatively for the arrangement of place for training, dispatching trainees and arrangement of generators for the implementation of the training.

**(20) Checking and Instructing Existing Complaint Handling Processing System for Improvement**

During a period of 9 days of local investigation from 18th to 27th August 2010, present status of each 3 WUSCs was investigated and the training on the subject was conducted in an effective and efficient manner for about 1 day at each WUSCs discussing about the computerization system of complaint register.

- Number of average attendants were about 7-13 person per day
- 97% of them were WUSC employees.

a) Objective of the training

- Support on improving complaint ledger of c/p organizations
- Analysis of present activity status
- Sharing of Basic knowledge of complaint ledger

b) Current conditions

- A customer's complaint has two kinds, water rates and water supply.
- Complaint management procedure is presented here under.
- Registration of a complaint is reported by the WUSC's window or water meter reader or telephone.
- Information about complaint in recorded in the register.
- Complaints are correspondent by the related personnel according to the contents of the complaints
- Time of the usual measure against a complaint, investigation/reply repair is carried out immediately.
- A person in charge indicates the circumstances of a measure, and a result in a ledger.
- The statement of a complaint is indicated by a "handwritten system" in a note ledger.
- The repair charge which a customer should pay is added to water rates next month.

A complaint situation is shown in **Table 3.35**.

**Table 3.35 Situation of Complaint Ledger**

| Items | Dhulabari WUSC | Gauradaha WUSC | Mangadh WUSC |
|---|---|---|---|
| Total of Generated number of cases (an affair/a month) | About 60-70 | About 50 | About 20 |
| Example of contents of a complaint | ・Leakage of water from water conduit and distribution pipe line<br>・Overcharge of water meter amount<br>・Failure of a water meter<br>・Improvement of water supply time<br>・Improvement of water supply time<br>・Dry out and low water supply pressure | ・Leakage of water from water pipe<br>・Overcharge of water meter amount<br>・Failure of a water meter<br>・Dry out and low water supply pressure | ・Leakage of water from water pipe (Pipe line; 2-3/month, Valve; 10/month)<br>・Overcharge of water meter amount (2-5/Month) |

c) Implementation of training

Training was carried out in discussion form under the JICA Expert's instruction.

・Meaning of a complaint ledger

・An understanding of the information (written item) indicated

・Grasp of the subject of handwritten office works

・Deliberations of the effect of computerization of office works

・Acquisition of the input skill of a personnel

・Deliberations of maintenance expense

d) Result of activities

i) Comments of lecture attendees

・According to questionnaire self-evaluation results, 25 participants out of the 38 participants were satisfactory.

・The training was beneficial

・They want the continuation on the implementation of the training adding more training items.

ii) Evaluation by the JICA Expert

・Most of the trainees understood the contents of the training

・Recording of complaints is well managed on a ledger.

・It takes time to analyze the data of complaint due to paper-based management.

・Computerization for the increase in efficiency of the operation needs to be budget-sized

・Objective of the training was achieved sufficiently

・All WUSCs helped co-operatively for the arrangement of place for training, dispatching trainees and arrangement of generators for the implementation of the training.

**(21) Confirmation and Insuring Existing Waterworks Annual Report and its Contents for Improvement**

Within the period of 9 days of local investigation from 18th to 27th August 2010, present status of each 3 WUSCs was investigated and the program was implemented in an effective and efficient manner for

about 1 day at each WUSC conducting discussions about the Annual Report & its Contents for improvement.

- Number of average attendants were about 7-13 person per day
- 97% of them were WUSC employees.

a) Objective of the training

- Support on improving publication of Annual report to C/P organizations
- Analysis of present activity status
- Sharing of Basic knowledge of Annual report

b) Current Conditions

- In order to report the business track record of each fiscal year in WUSC's general meeting (WUSC of Dhulabari/Mangadh are publishing an annual report every year.)
- However, Gauradaha is publishing a report as their business track record once in 3 years; only an internal audit report is being presented in the annual general meeting.
  Contents of the internal audit report are shown in **Table 3.36**.

**Table 3.36 Contents of the Internal Audit Report**

| Items of the annual report (Dhulabari WUSC) | Items of an internal audit report (Gauradaha WUSC) |
|---|---|
| ・ Statement of an important business plan<br>・ Generalization of management and an annual budget (this year and the following fiscal year)<br>・ Third party official-recognition accounting report<br>・ Financial statements<br>・ Statement of executive board regulation<br>・ List of steering committees<br>・ In addition to this (message) | ・ Generalization of management and an annual budget<br>・ Independent Auditor's Report<br>・ Financial statements<br>・ In addition, financial datum |

c) Implementation of training

Training was carried out in discussion form under JICA Expert's instruction.

- Meaning of annual-report issue
- Understanding of the information (written item) indicated
- Instruction of the improvement proposal of the annual report (setup of the included business management index)

d) Result

i) Comments of lecture attendees

- According to questionnaire, within the 38 participants, self-evaluation results of 25 participants were satisfactory
- The training was beneficial
- They want the continuation on the implementation of the training adding more training items.

ii) Evaluation of JICA Expert's instructor

- The contents of the annual report and issue are fixed in general.
- Computerization for the increase in efficiency of the operation needs to be budget-sized

- Objective of the training was achieved sufficiently
- Most of the trainees understood the contents of the training
- In order to improve a financial condition further, it is necessary to enrich a management index.
- All WUSCs helped co-operatively for the arrangement of place for training, dispatching trainees and arrangement of generators for the implementation of the training

**(22) Initiation on Water Supply Utilities Liaison Conference in Each District**

The meeting was held at Morang WSSDO on September 14th, 2010.

1) The contents of activity are shown below.

The purpose is as follows,

- To facilitate improvement in O&M skill and management level among Water facilities
- To build the system of information sharing and mutual support relationship among WUSCs to solve problems which the 3 WUSCs have
- As a result, promotion of the following effects is expectable

a) To promote sound management

b) To manage proper operation and maintenance work on water supply facilities

c) To secure stable drinking water in terms of quality and quantity

d) To secure suitable water pressure

2) Items discussed in the Conference

a) Formation of Committee (Tentative structure)

A management organization is shown in **Figure 3.3**.

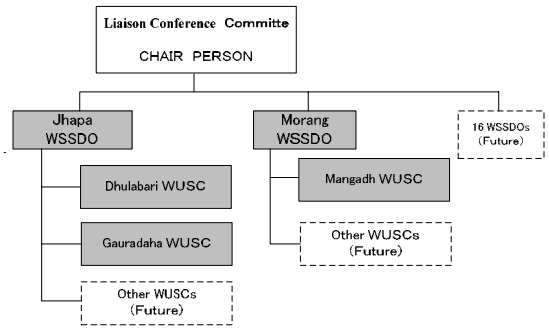



**Figure 3.3 Management Organization**

b) Formation of an 11 member committee.

- Chairperson and Secretary from each 3 WUSCs (6)
- Regional Chef of ERMSO (1)
- Division Chiefs of WSSDOs Morang and Jhapa (2)
- Team Leader/Representative from PWT (1)
- Representative from JICA/JICA Expert Team (1)

c) Selected as Chairperson: Mr. Ram Bahadur Ghimire (Chairperson, Mangadh WUSC)

d) Selected as Vice-Chairperson: Mr. R.K. Basnet (Chairperson, Gauradaha WUSC)
e) Selected as Secretary: Mr. I.B.Budathoki (Secretary, Dhulabari WUSC)
f) Meeting holding frequency: 2 times or more per year
g) Next Conference: Venue and session: December, 2010 (at Biratnagar)
h) Participant: All WUSCs from Jhapa, Morang and Sunsari districts selected for capacity development including relevant stakeholders as invitees

As the 1st meeting, there were following reports from C/P
a) Exchange of the information with the 3WUSCs
- Situation of plant O&M
- Information on a complaint

b) Comment on OJT/training
- Insufficiency of interpreter's capability
- Review of the contents of a lecture
- Request of continuation of training, others

c) In addition to this
- Request for the equipment and tools from JICA
  (O&M maintenance equipment, a water quality control set and a dynamo)

**(25) OJT to the 3WUSCs Based on the draft SOP**

The 2nd year OJT included the review of the training items of the 1st year and implementation of higher-level training. The draft SOP prepared in the 1st year was used for the training.

(1) OJT Implementation on Maintenance of Water Distribution Facilities and formulation of New Plan, and Water Meter Reading/Meter Calibration Control

1) Contents of OJT/Workshop

With the draft SOP created in the 1st year as an instruction material, OJT/workshop were provided to the 3WUSCs regarding maintenance of water distribution facilities and formulation of new plan, and water meter reading/meter calibration control. The contents of the OJT/workshop are as follows:

a) Confirmation of current facilities which consist of raw water transmission pipelines, transmission pipelines, distribution pipelines and elevated tanks
b) Implementation of regular inspection and creation of check/repair sheets, and filling up
c) Creation of water distribution facility map including the pipeline routes, locations (valves, washout and fire hydrant), pipe diameter and pipe material for maintenance and repair
d) Instruction of water distribution plan including items for consideration, procedure, pipe diameter determination, measure of distribution dead ends and so on
e) Comprehension of proper water meter management such as storage and delivery records and treatment

f) Comprehension of meter calibration control

2) Participant in OJT/Workshop

OJT/Workshops were conducted by the JICA Expert with WSSDO staff at the 3WUSCs in February and June 2011. Most of members of plumber, operator and meter reader attended the OJT/Workshop. A WSSDO engineer declared his own view of OJT/workshop, and participants had discussion and exchange of opinions. The number of participants on OJT/Workshop is shown in **Table 3.37**.

**Table 3.37 Attendance of OJT/Workshop on O&M of Water Distribution Facility and Water Meter**

| | | Workshop | OJT | Total |
|---|---|---|---|---|
| Dhulabari WUSC Office | Days | 3 days | 4 days | 7 days |
| | WUSC | 26 | 28 | 54 |
| | Jhapa WSSDO | 0 | 3 | 3 |
| | Total | 26 | 31 | 57 |
| Gauradaha WUSC Office | Days | 3 days | 3 days | 6 days |
| | WUSC | 16 | 15 | 31 |
| | Jhapa WSSDO | 1 | 0 | 1 |
| | Total | 17 | 15 | 32 |
| Mangadh WUSC Office | Days | 3 days | 3 days | 6 days |
| | WUSC | 23 | 23 | 46 |
| | Morang WSSDO | 3 | 2 | 5 |
| | Total | 26 | 25 | 51 |

Note: Total number of participants on OJT/Workshop

3) Achievements of OJT/Workshop

a) Water distribution facilities inspection

- At the beginning of the project, WUSC has not conducted facility inspection and facility malfunctioning such as manhole cover missing, differential settlement of valve chamber and unconfirmed valve location were found at the sites. Facility malfunctioning was gradually reduced because of introduction of inspection activity into daily work and implementation of regular inspection according to the draft SOP.
- Regular inspection of the facilities is conducted every month, and the results are reported to the manager and/or committee member. When facility malfunction was found by a staff, the result is informed to the manager and/or committee member, measures for it are taken. (Gauradaha WUSC, Mangadh WUSC)
- Distribution pipe repairs are maintained and recorded in other ledgers (location, malfunction content and countermeasure).
- The facility information maps which show locations of pipeline routes, valves and planed pipes are prepared by the 3WUSCs, and are available for the maintenance checkup. The maps are expanded in order to correspond to the planned distribution pipes.

b) Water meter management and calibration

- At the beginning of the project, WUSC did not have proper knowledge to install a water meter and to correspond to failure and of calibration, management of water meter. WUSC corresponded only to customer complaints. However, WUSC can handle customer complaints by the implementation of appropriate meter installation, management and calibration according to the draft SOP.
- The 3WUSCs conducted the examination of instrumental error with reference water meter for existing water meters about which customers have complaints. Since the results of examinations (calibrations) were within the range of the allowable error of measurement, customers' complaints were solved and WUSCs gained the understanding of customers. WUSC staffs have solved such complaints and cope with them by meter calibration with their reference water meters since OJT/Workshop.

The WSSDO staffs were also involved in such OJT/Workshop. As a result, WSSDO staffs have guided to WUSC staffs by themselves gradually shifting from the JICA Expert. Two tests to WUSC staff were conducted to measure the improvement of their ability and understanding before and after OJT/Workshop. It can be judged that trainees' comprehension and understanding progressed after OJT/Workshop since their test scores were improved. Results of tests are shown below.

It is noted that the contents and degree of difficulty of the test were different depending on the contents of OJT/Workshop. The test scores of the 3WUSCs staff are shown in **Table 3.38**.

**Table 3.38 Comparison of Test Score in the 3WUSCs**

| WUSC | 2011 | Test Score (Average) | | Variation |
|---|---|---|---|---|
| | | Before | After | |
| Dhulabari | February | 61.3 | 80.0 | +18.7 |
| | June | 54.2 | 65.0 | +10.8 |
| Gauradaha | February | 47.0 | 63.0 | +16.0 |
| | June | 43.8 | 53.8 | +10.0 |
| Mangadh | February | 40.7 | 58.4 | +17.7 |
| | June | 47.1 | 75.0 | +27.9 |

Note: On the basis of a possible maximum of 100

4) Problems and Countermeasures

Main problems and measures/instructions of each WUSC in July 2011 were shown below. Subsequently, since the follow-up OJT for the 3WUSCs was conducted in November 2011 and January 2012, the problems were dissolved. Problems and countermeasures in July 2011 are shown in **Table 3.39**.

**Table 3.39 Problems and Countermeasures in July 2011**

| WUSC | Problems (In July, 2011) | Countermeasures/Guidance | After the follow-up OJT (In January, 2012) |
|---|---|---|---|
| Dhulabari | Regular inspection of facilities is not accomplished. There are not inspection and repair records of | Introduction into daily works<br>Creating and filling up of check sheets | Water facility inspection and records were conducted. Regular inspection and repair of |

| | | | |
|---|---|---|---|
| | facilities. | | malfunctioning facilities should be implemented. |
| | Information map of water distribution facilities is not drawn up yet. | It was suggested that a pipe network map is made up including main water facilities which consist of valves, air valves, washout and fire hydrants. | The information map was made, and linked with the facility ledger. |
| Gauradaha | Information map of water distribution facilities is insufficient. | Water facility information which is pipe materials, pipe diameter and valve location should be drawn on the map. | The facility information was drawn on the map, and it linked with the facility ledger. |
| Mangadh | Since water facility information on the map and the ledger are isolated, facilities such as valves, air valves and washout are not able to be found on the map. | Information map and facility ledger should be confirmed to ledger number. It makes the map easy to find the water facility. | The facility information was drawn on the map, and it linked with the facility ledger. |

Since the water distribution maps were linked together with the facility information/ledgers in the 3WUSCs, the information can be shared and be centralized for other staffs. Therefore, the facility information which technicians and plumbers have relied on their experience and memories till now can be visualized and be also shared to a third person. Furthermore, places where consumers complaint such as low water pressure and water quality deterioration occur can be confirmed with the information map, and the causes can be supposed. WUSCs are able to study countermeasures such as elimination of dead ends, pipe looping and valve control, and they take measures.

5) Other Activities Achieved

a) Introduction of Technical Support Center (TSC) to the 3WUSCs staffs

The 3WUSCs staffs, plumber and meter reader attended the guidance of the water meter calibration equipment at TSC in Itahari, and leaned the calibration method. New water meters which the 3WUSCs staffs brought were tested by the calibration equipment in small flow range. The results were within the range of the allowable error of measurement. These tested meters can be used as reference meter for calibrating.

b) Workshop of a handmade socket type conjugation tube of HDPE by Mangadh WUSC

Dhulabari WUSC and Gauradaha WUSC adopt a manual butt welding joint method for HDPE (high density polyethylene) joining. There is, however, a high possibility of leakage of water from joint part on the method when a section of junction is rough or fusion welding is insufficient. Mangadh WUSC uses a handmade socket type conjugation tube method, and instructed Dhulabari and Gauradaha WUSC staffs the method.

c) Instruction for examination of instrumental error to an existing water meter at CHRDU

CHRDU staff was guided in examination of instrumental error to an existing water meter as well as the 3WUSCs staffs. Former method which measures water quantity with a bucket is less-accurate. The examination method with reference water meter is highly precise to check an existing water meter, and it is available for settlement of customer complaints by

introducing trainees this method. Instruction items at CHRDU were as follows:

- Meter reading up to 0.1liter (In general way, meter reading up to integral number, 1 $m^3$)
- Examination of instrumental error with reference (standard) water meter
- Connecting the water meter
- Calculation of instrumental error

d) Joint Workshop for WUSCs in Jhapa/Morang districts

Joint workshop was held at Dhulabari WUSC office on November 30th, 2011. Number of participant was 63 persons, and engineers of Jhapa/Morang WSSDO as a lecturer conducted workshop on water distribution facility maintenance and water meter installation/calibration according to the draft SOPs.

e) Joint Workshop by Jhapa WSSDO in Dhulabari

The follow-up OJT was conducted at Dhulabari WUSC on January 31, 2012. Total 21 participates, mainly plumbers and meter readers from other WUSCs in Jhapa district joined OJT/workshop. Jhapa WSSDO engineer instructed them meter calibration method and water distribution facility inspection and recordings. Dhulabari WUSC staff also introduced their pipeline information map and explained them how to make the map.

The joint OJT/workshop was held for only 1 day, but other WUSCs requested to extend OJT/workshop period. It will be carried out to WUSCs grouped in the 3rd year of the project as refer to section (34).

f) OJT on Mechanical/Electrical Equipment for the 3WUSCs

Mechanical and electrical OJT for the 3WUSCs was conducted by the JICA experts with local staffs as technical interpreter for 4 days from January 23, 2012. At Dhulabari WTP, the sand washing machine had not worked ever due to malfunction of sand washing pumps. The pumps were inspected and repaired in OJT, and Dhulabari staffs learned how to check pumps and to use the sand washing machine.

**(26) Training on Water Quality Inspection/Monitoring and Formulate Draft SOP**

Following the first year, the following activities were carried out during March to October 2011, by two times site visits.

First Site Visit, the Second Year, March-April, 2011

1) Repeating the training implemented in the first year

Explained the same training contents conducted last year again by Power Point at the 3WUSCs. Before and after the explanation, same questioners were used to confirm how much they could understand the training contents. The scores were almost the same as last year. The result showed the similar tendency and there was no significant progress in understanding for some parts (for example, the importance of confirmation of free residual chlorine in the tap was not yet recognized.)

However, Gauradaha WUSC gradually started measuring free residual chlorine and coli forms at the tap by simple analysis kits. Mangadh WUSC started water quality test once a day, while it was implemented every 5 days last year. Actual operation management seemed to have been progressing little by little, which was different from the test results.

2) Training for DWSS Staff

Very few staff from Morang and Jhapa WSSDO attended the training last year, although the target was the staff of WSSDOs and WUSCs. To improve the situation, detailed table with the schedule, activities, target/ discussion staff, what to be prepared by Nepali side were prepared in advance of the site visit in March-April. It was informed through DWSS and sent to the man in charge of WSSDOs and WUSCs in question by fax and directly by telephoning by the JICA Expert side. For this reason, the visit of the JICA Expert in March-April was known to all, which resulted in increase of participants from the 2 WSSDOs.

However, the originally main objective of the Project is that DWSS with the assistance by the JICA expert shall train WSSDOs and trained WSSDOs shall train WUSCs.

The JICA Experts discussed the restructure of the Project with DWSS, back to the original objective of the Project; the target of the training shall be DWSS at first. Through the discussion between the two parties, both party reached the agreement of strengthening the capacities of DWSS Central laboratory and DWSS staff and the flow of capacity development from DWSS to WSSDOs and WUSCs.

It is clear that DWSS laboratory has the major role and strengthening its capacity is the urgent issue for confirmation of the accuracy of the measurement results by simple analysis kits at site and by district laboratories, and for implementation of water quality management.

Stable power supply with stable voltage is the first priority for proper operation of the laboratory. In addition, new reagents and standard solutions are also required. For these reasons, the both parties reached an agreement as M/M that DWSS shall procure generator to assure the operation during blackout, stabilizer, new reagents and standard solutions till the time of next visit of the JICA Expert on August 2011.

The same training contents and quantitative approach as having used for the staff of WUSCs and WSSDOs were presented to DWSS staff. It was well received; however, the attendances were limited because of the sudden offer from DWSS. The JICA Expert promised that similar and more detailed presentations with some practical exercises shall be added to strengthen the training next time for more DWSS staff.

3) Discussion with ADB on cooperation with ADB

The JICA Expert discussed the cooperation with ADB which provided analysis equipment, etc. to 6 district laboratories. ADB replied that they proposed the solution of lack of human resources and definition of the meanings of the laboratories to the Minister. However, they have no intention to dispatch the expert to operate the laboratories properly until the Nepali Government reacts to the proposal.

Itahari laboratory had never replied whether they want to participate in this Project or not. However, DWSS proposed that 6 district laboratories shall participate in the training for DWSS Central laboratory to be implemented from August 12th, 2011. Through the training, they will be able to understand basics of water quality analysis.

The Second Site Visit in the Second Year August - October, 2011

1) Training for DWSS and DWSS Central Laboratory

Training for DWSS and DWSS laboratory was implemented from August 12th to September 12th, 2011. The training consists of water quality management and process control.

The main objectives of the water quality management (August 12th - 25th, 2011) are how to secure analysis accuracy in water quality analysis calibration procedures of analyzers by using standard solution. Confirmation of reliability of simple analysis kits to be used at site how to use the analysis results

Regarding Process Control, the main objective of process control is to secure understanding and evaluation of water purification process by conducting jar-test and simple iron removal experiment.

Prior to the implementation of training to the DWSS central laboratory, whether what had been agreed in April, 2001, was practiced or not was confirmed by e-mail to the DWSS from Japan.

As the result, it was confirmed that DWSS could not yet purchase generator, stabilizer and new standard solutions by political turmoil in Nepal, though DWSS had finished budget request to the upper organization. On the other hand, it was also confirmed that electricity supply has been greatly improved in 2011 compared to 2010. The JICA Expert decided to implement the training as the schedule, with purchase of new standard solutions necessary for the training by JICA side.

The JICA Expert confirmed again the situation through discussion with DWSS, along with explanation of training content. But the situation was the same as the mail. In addition, DWSS explained Atomic Absorption Spectrometer (AAS) was out of order and requested the supplier to repair and it was uncertain that AAS can be used during scheduled training period. For this reason, changing the part of training contents might be avoidable. However, during the schedule, DWSS purchased, by own, Japan-made stabilizer to secure AAS operation and negotiated the supplier to manage to change the parts. By their great efforts, AAS could be used for the training.

Training contents for DWSS Central Laboratory was as the followings.

i. Seminar

- Meanings of the parameters to be analyzed
- Basic to secure accuracy in water quality analysis and preparation of analysis flow sheet
- Introduction of Certified Environmental Analyst system in Japan, etc.

ii. Analysis Training

1) pH

- Calibration of pH meter by new pH standard solutions
- Difference pH values between old and new standard solution
- Calibration of potable pH meter brought from Japan
- Measurement of pH of tap water
- What to be paid attention to in pH measurement
- Formulation of SOP of pH measurement

2) Turbidity

- Calibration of turbidity meter by the standard solution brought from Japan
- Preparation of calibration curve of spectrophotometer by the standard solution brought from Japan
- The naked eye colorimetric method for site measurement by the turbidity standard solution brought from Japan
- Confirmation of accuracy of transparency meter by the standard solution brought from Japan
- Turbidity measurement of tap water by the 4 methods above
- Relation between kaolin turbidity and NTU
- What to be paid attention to in turbidity measurement: to adjust 0 by using the membrane-filtered distilled water, to take standard solution quickly and equally, etc.
- Formulation of SOP of turbidity measurement

3) Color

- Preparation of calibration curve of spectrophotometer by the color standard solution brought from Japan
- The naked eye colorimetric method for site measurement by the color standard solution brought from Japan
- Color measurement of tap water by the 4 methods above
- What to be paid attention to in color measurement: to adjust 0 by using the membrane-filtered distilled water, influence by iron and manganese, etc.
- Formulation of SOP of color measurement

4) M-alkalinity

- Preparation of hydrochloric acid standard solution for titration and orientation by pH meter and indicator which DWSS uses
- M-alkalinity measurement of tap water by pH meter, simple analysis kit brought from Japan, sulfuric acid method DWSS has been adopting
- What to be paid attention to: to use appropriate volume of burette and/or pipette

5) Residual chlorine

- Concentration confirmation of chlorine standard solution brought from Japan
- Accuracy confirmation of residual chlorine test kit by diluted chlorine standard solution

- What to be paid attention to in chlorine measurement

6) Total iron
   - Preparation of calibration curve of photo spectrophotometer and AAS by iron standard solution brought from Japan
   - Accuracy confirmation of total iron analysis test kit brought from Japan with iron standard solution brought from Japan
   - Iron analysis of tap water by 3 methods above
   - Total iron measurement of artificial sample which includes copper and zinc by spectrophotometer absolute calibration curve, internal standard method, and AAS

7) Arsenic
   - Accuracy of arsenic digital meter by arsenic standard solution brought from Japan
   - Preparation of calibration curve of AAS and measurement of arsenic in tap water

Training for DWSS is as the followings.

i. Seminar
   - Water purification flow and key points of unit operation
   - Quantitative evaluation procedures of unit operation

ii. Training

1) Jar test including measurement of filtration velocity of supernatant, sludge generation volume, etc.
   - Measurement of parameters such as pH, M-alkalinity, Turbidity, Color, total iron, SS
   - How to decide optimum chemical feeding rate
   - How to use the results against design and evaluation of actual plant

2) Iron removal
   - Oxidation of ferrous iron: air and chlorine
   - Iron removal by sand filtration or Manganese sand
   - Measurement of parameters such as ferrous iron, total iron, pH, $NH_4$-N, residual chlorine, color
   - Confirmation of function of manganese sand

iii. Presentation by DWSS side
   - Day, objectives of the day, objectives of parameter measurement, procedure, results, discussion, etc.
   - What to do from now on?

iv. Preparation of exercises for purification process understanding and example of solution

2) Training for the 3WUSCs in September 13$^{th}$ - 24$^{th}$, 2011
   - Presentation of training contents for DWSS and DWSS Central Laboratory
   - Practice of measuring test kits brought from Japan
   - Discussion on draft of SOP: Discussion of what to add and modify draft SOP

- Confirmation of current operation and daily inspection of equipment, discussion for further improvement
- Discussion on necessary tools, etc.: confirmation of necessary tools and equipment WUSC side submitted and additional ones necessary for O&M of WTP
- Preparation of main equipment, instruments, etc.: Name of equipment and instruments, manufactures, type, specifications
- Discussion of others concerned

3) Results and discussions, etc.

i. Training for DWSS and DWSS Central Laboratory

- 8 to 10 staffs from DWSS, DWSS Central Laboratory, CHRDUP, DWSS Q/C section and Itahari laboratory attended the training every day. During the schedule, DWSS purchased, by own, Japan-made stabilizer to secure AAS operation and negotiated the supplier to manage to change the parts. These were the result of enthusiasm of DWSS against the training.
- Seeing the presentation from DWSS side, most of the presentations were only of easurement procedures. The JICA Expert felt that they were yet lacking of fundamental recognitions to secure analysis accuracy such as management of distilled water, standard solutions, reagents, etc., data management and why the parameters to be measured in experiment, etc.
- It was confirmed that simple analysis kits (pH, total iron, M-alkalinity, residual chlorine) can be available to use for normal tap water without so differences from official methods.
- The difference of pH value by new standard solutions and by the old ones DWSS Central Laboratory had been used, even though their effective date was till 2008.
- With respect to iron measurement, the measurement results of the artificial sample which was intentionally prepared by adding copper and zinc showed 10, 19, 15 mg/L by AAS, the spectrophotometer absolute standard calibration curve method, spectrophotometer standard addition method, respectively. The differences were rather big, further trials shall be necessary.
- For arsenic, the sensitivity of digital arsenic meter was poor and could only detect more than 100 ppb (0.1 mg/L) arsenic because of old reagents, but DWSS had used them. To confirm the accuracy of the meter, purchasing new reagents shall be necessary.
- More than 0.03 mg/L of arsenic could be measured with enough accuracy by AAS with reduction vaporization method. Other methods like JIS require to measure around up to 0.0001 mg/L which is equivalent to 5 times of Japanese Standard for drinking water. Current arsenic standard of drinking water in Nepal is 0.01 mg/L, therefore 0.03 mg/L of arsenic lower determination level seems to be no problem. However, considering WHO arsenic guideline of drinking water is 0.01 mg/L and the world tendency is to regulate lower level, replacement of arsenic lamp and use of hydrogen gas regulated in other methods, instead of acetylene gas currently being used at the Central Laboratory are required.
- There was another request from DWSS to know updated technology such as membrane and

UV system. Prepared another material for the request.

- Guided DWSS the outline of how to conduct the experiment like arsenic absorption procedures (Quantitative experiment procedure).
- Handed over all the files of the materials used during the training to DWSS. DWSS shall copy them to distribute to WSSDOs and WUSCs.

Suggested DWSS DG and DDG and the manager of Q/C section the followings.

- To become trainers for DWSS Central Laboratory needs continuous training by themselves, how to improve measurement accuracy, lower determination limit, detection limit, etc.
- To establish the system to measure all parameters required in the standard of drinking water
- To execute above, budget procurement is necessary

ii. Training for the 3WUSCs

1) Current situations of O&M

- Ensured that turbidity/color measurement kit which is being used at the 3WUSCs can be available with satisfactory accuracy by confirming the measurement accuracy with standard solutions brought from Japan at Mangadh WUSC.
- WUSCs pointed out what to be added and modified in draft SOP. The revised English and Nepali versions, reflected to the discussion, were sent to WSSDOs and WUSCs
- Mangadh WUSC and Gauradaha WUSC has started measuring least parameters to be measured with simple analysis kits at site and timely asking official measurement to the Laboratory having ISO 17025.
- Residual chlorine level of the day is shown on the board at customer window for the fee payers to recognize.
- In addition, Mangadh WUSC has started the satisfaction survey to the customers regarding water supply quantity and quality and asking regularly external organization to check the status of the equipment
- Although the concept of water quality management is recognized and implemented both at Mangadh WUSC and Gauradaha WUSC, process control seems not be established, seeing such facts as no records of inflow, backwash flow, etc..
- Water quality measurement seemed not enough implemented at Dhulabari WUSC, seeing the fact that newly purchased reagent bags to measure chlorine were not opened. On the other hand, some improvement was observed such as recording chlorine chemical consumption and piping water line to avoid chlorine exposure when staff contacted chlorine.

2) There were some requests from the 3WUSCs regarding mechanical and electrical training.

Regarding machinery and equipment;

- Knowledge of repair works, necessary tools and instruments for repair works
- Motor coil repair procedure
- How to maintain motors, compressor, etc.

Regarding electrical works;

- The role of panel components
- Understanding wiring drawings
- Trouble shootings

Explained these requests to DWSS E/M section manager who is expected as the trainer and requested and requested him to visit the 3 WUSCs for further discussion to prepare training program to meet their requests.

iii. Discussion with DWSS

- DWSS DG expressed acknowledgements against the training this time.
- There was acknowledgment from this training DWSS expressed agreement to our proposal.
- DWSS shall be trainer to lower organizations.
- The JICA Expert will monitor the activities by DWSS from Japan through interpreters in Nepali office till the next visit in 2012.

The JICA Expert will evaluate the training activities to have been executed from DWSS to lower organizations upon next arrival and modify the training contents, if necessary.

**(27) Educational Campaign on Waterworks as Civil Education (Continued)**

In August 2010 of the first year, the JICA Expert Team conducted introductory workshop of awareness program including importance of good hygiene practice and roles of water supply to 3 target WUSCs.

In March 2011 of second year, the JICA Expert Team continued workshop on this subject and developed two materials, training for school kids and training for young mothers, and guided to awareness program using these developed training materials. The number of participants was 25, 18 and 5 from Mangadha, Dhulabari and Gauradaha WUSC, respectively.

Examples in developing countries experienced by the Expert (e.g. educational activities and materials for school kids and young mothers for understanding of water supply and sanitation) were introduced, and discussions were made as to how WUSCs can develop the activities and what kind of educational materials are needed. As a result, they concluded to conduct awareness activities on the role of water supply and sanitation at schools and/or public meetings. The Expert instructed how to prepare “Story Board” which is a visual booklet with about 10 pages as a presentation material.

Such activities result was presented at the joint workshop held on 30$^{th}$ November, 2011 (Regarding participants, refer to item (32)). The 3 WUSCs presented their public awareness campaign plan and the materials to be used. It is planned that the awareness campaign is implemented twice a year using school facilities. The target of the campaign is focused on children and women and education on water-borne diseases and preventive measures against infection will be disseminated. Preparation of the materials was done by the WUSC staff and the effect of technical transfer is recognized.

**(28) Efficient Water-Rates Claim Processing**

In the first year, the Team conducted assessment survey of existing manual based billing and collection

system as well as knowledge and skill of customer service staffs. The current billing work process is as follows:

1) When meter reading takes place, reading record and bill are prepared and handed to the customer.
2) The reading record is transferred to the reading ledger at the office.
   When a customer comes to pay, comparison with the ledger record is done and arrears situation is checked by referring to the customer ledger and the payment ledger.
3) The payment record is put down on the reading, customer, and payment ledgers, followed by the issuance of receipt.
4) After such billing and collection work, the payment ledger is handed to the accountant for accounting work.

As such, billing and collection system closely links with accounting system in cash handling, and therefore, these procedures cannot be easily cut down so as to ensure the accuracy of accounting. The Expert has a view that the existing system is not always inefficient as long as it is done by manual work.

On the other hand, the number of connection exceeds 2,000 in Mangadh and Dhulabari WUSC, and it almost comes to a limit for manual handling. It is considered that computerizing is necessary to deal with such a large number of data efficiency and accurately. However, since the computerized billing system entails a lot of cost and time (for procurement of hardware and software, customization, data entry, operation training, etc.), it was judged that computerized billing system will not be included in the TOR of the Project.

Based on such background, the Team guided and recommended to improve cashier windows and cashier's job flow for reducing miss recording and miss transaction at the 2nd year workshop in February 2011. In addition, since request of computerized billing and collection system from WUSCs are still strong, the Team introduced card based customer ledger. The trainees understood that the base work such as billing and collection is common to both the computerized and the existing manual billing systems.

**(29) Checking and Instructing Improvement of Existing Customer Ledger Management**

In the first year, the Team conducted assessment of existing customer ledger system to find opportunity of improvement. Present customer ledger is so called ledger system (They have three kind of ledgers depending specific information, i.e. reading record, customers, payment), and not completely same with card system (each customer information is individually managed) widely adapted in computerized system. But the existing system is not always inefficient as long as it is done by manual work. All necessary information for billing is recorded sufficiently on present ledger. It is possible to increase customer information in the customer ledger in case of computerized system. In case of manual system, however, it forces more work load to customer service staff and will spoils work efficiency. Therefore, it is not necessary to change the present customer ledger management

system as long as the computerized billing and collection system is not introduced.

**(30) Improvement of Existing Complaint Handling Processing System**

In April 2010 of the first year, the Team conducted assessment survey and then introduced concept of user complaints management system in a workshop conducted in the same month. In August 2010 of the first year, the Team developed draft user complaints management system manual and suggested them to implement based on this draft manual.

In the second year, the Team monitored their implementation status. Although Mangadh WUSC showed good practice, the other two WUSC have not been implementing from a reason of insufficient manpower.

**(31) Improvement of Existing Waterworks Annual Report and its Contents**

The Team conducted assessment survey regarding issue of annual report by WUSC in March to April 2010 in the first year. Presently, Mangadh WUSC and Dhulabari WUSC issue annual report focusing on financial information while Gauradaha WUSC issues only financial report.

The objective of annual report is to achieve accountability to stakeholders such as users and DWSS. From this definition, the existing annual reports, which are delivered to members, explained and approved in their annual assembly, are in a satisfied level as annual report in terms of clearly mentioned activities, revenue and expenditure to activities, and guaranteed it's accuracy and sufficiency by external auditor. Also, their annual reports mentioned budget based on actual performance. Thus, it can be said that these annual reports achieve accountability on accounting and financial management in minimum level.

However, it would be better for the annual report to include non-financial information and data as well. In the first year, therefore, the Team introduced structure and contents of annual report widely adapted in western business society including Japan in the workshop.

In the second year, the Team developed draft guideline for annual reporting, and recommend improving their annual report into standard structure and contents by introducing this draft guideline in a workshop conducted in February 2011. The number of participants is 16 from Mangadh WUSC, 9 from Dhulabari WUSC and 7 from Gauradaha WUSC.

The Expert also recommended preparing monthly management report before jumping to preparation of annual report. The Team introduced preparing monthly management report in the workshop in the second year. The 3 WUSCs issue monthly based simple accounting report but do not issue monthly management report that include non-financial data, and agreed to add important financial information to the existing report.

**(32) Medium and Long-Term Waterworks Business Plan**

In general, the 3 WUSCs were reluctant to prepare a medium and long term business plan because when a new chairman of the committee, whose assignment period is 3 years, is elected, he has to

decide the plan of business activities for coming 3 years. This plan of business activities is announced in their annual assembly and approved, and also briefly mentioned on their annual report. Thus, the management committee cannot guarantee business activities beyond their assignment period and is also afraid that their successor denies and criticizes their plan.

Apart from such a situation, the JICA Expert Team assessed reality and introduced concept and method for prepare business plan in the workshop of the first year.

In the second year, the Team conducted joint workshop with corporation of engineering expert and management expert and invited all WUSCs in Jhapa and Morang Districts in February 2011. 48 participants attended in this joint workshop. In this workshop, the Team requested to prepare business plan up to 2020 to the 3 WUSCs and make presentation on the next joint workshop scheduled in November 2011. In this joint workshop, the Team suggested to starts to prepare their business plan as soon as possible and also feel free to ask any question regarding preparation of business plan and will reply on coming follow up meeting. Then the Team conducted follow-up meeting on March 2011 but any WUSC did not touch anything at that point.

Again, the Team explained process to prepare financial plan in business planning at the follow up meeting in November 2011. According to this instruction, the 3 WUSCs prepared the business plan. The prepared plan was presented at the joint workshop held in Dhulabari on 30 November 2011. The participants of the workshop included 2 from DWSS, 5 from WSSDO, 21 from the 3 WUSCs, and 35 from other WUSCs, which totaled 63.

The business plan has a target year of 2025, and includes investment plan, operation and maintenance plan, water tariff setting, financial (cash flow) plan. The presenters prepared the materials by themselves and presented in Nepali. By having such an opportunity, the WUSC staff has deepened their understanding of contents of the business plan, methods of preparation.

**(34) Training on Planning/Design/Construction Management on the 2 WSSDOs Targeted**

(1) Training/Workshop for Jhapa/Morang WSSDOs

Training/Workshops on water distribution planning, design and construction management were carried with the draft SOP at Jhapa/Morang WSSDOs. The training purpose is not only instruction of these but also technical information and opinions exchange between 2 WSSDOs. Therefore, the invited engineer of Morang WSSDO as a lecturer conducted Training/Workshop at Jhapa WSSDO in November 2011. Meanwhile, Jhapa WSSDO engineer lectured at Morang WSSDO in January 2012.

1) Contents of Training/Workshop

In consideration of WSSDO's roles and instruction to WUSCs with the draft SOP, the contents of Training/Workshop are 1) water distribution facility planning/design/construction management, 2) water meter maintenance and calibration, 3) water distribution facility maintenance, 4) introduction of OJT by WSSDO.

2) Achievements of Training/Workshop

OJT/Workshops had been conducted by the JICA Experts to the 3 WUSCs and 2 WSSDOs since commencement of the Project. Since WSSDO engineers, however, served as a lecturer to other WSSDO staffs, the following results are achieved, a) technical information and opinions exchange, b) revision of the draft SOP on new planning formulation of water distribution facilities, c) technology exchange between WSSDO and WUSC in OJT.

a) Jhapa/Morang WSSDOs shared information of WUSCs' problems and technical improvement such as elimination of dead ends in pipe network and proper pipe connection.
b) WSSDOs advised Nepali design criteria for water distribution facilities and pipe diameters & specifications adopted in the site. The draft SOP was able to be revised according to them.
c) WSSDOs were able to activate the exchange of technology to WUSCs through OJT conducted by WSSDOs.

(2) OJT/Workshop to other WUSCs in Morang District

The project purpose is that DWSS technical support system to WUSCs is improved in Morang and Jhapa districts. OJT/Workshop for other 3 WUSCs, Urlabari, Pathari and Letang WUSC was conducted for 3 days by Morang WSSDO with the JICA Expert at Urlabari in February 2012. Average 17 persons per day participated in the OJT/Workshop.

1) Contents of OJT/Workshop
   - Workshop on water distribution facility management & water meter reading/meter calibration control
   - OJT on existing water meter calibration control with master meter
   - OJT on water distribution facilities inspection, facility ledger and distribution network map

2) Achievements of Training/Workshop

OJT/workshop was conducted by WSSDO engineer, and trainees learned basic knowledge of distribution facility and water meter management. According to survey after the training, since participants have not given ever such OJT/workshop, they would like to introduce the draft SOP in routine work due to lecture of practical use.

Two tests to participants were conducted to measure the improvement of their ability and understanding before and after OJT/Workshop. It can be judged that trainees' comprehension and understanding progressed after OJT/Workshop since their test scores were improved. Results of tests are shown below.

**Table 3.40 Result of a small test**

| WUSC | Test Score (Average) | | Variation |
|---|---|---|---|
| | Before | After | |
| Urlabari | 69.5 | 76.5 | +7 |
| Pathari | 41.0 | 79.5 | +38.5 |
| Letang | 62.5 | 79.0 | +16.5 |

Note: On the basis of a possible maximum of 100

There are 8 target WUSCs except Mangadh WUSC in Morang district. After consultation with Morang WSSDO, these WUSCs are divided into 3 groups in consideration for location, region and accessible. Relatively priority group was selected this time.

In the meanwhile, there are 9 target WUSCs except Dhulabari and Gauradaha WUSC in Jhapa district, and WUSCs are divided into 4 groups. OJT/workshop will be conducted to all target groups in 3rd year activities of the Project.

**(35) Development of "Small and Medium-Sized Water Supply and Management Model (Draft)"**

The JICA Expert Team prepared a draft of the Management Model. The draft model enumerated the required items which an ideal water supply utility should furnish in each of the following aspects.

- Institutional
- Functional
- Mental
- Computerization

At the joint workshop held on 30th November 2012, the draft model was presented to the WSSDO staff in Jhapa and Morang district, and the participants from DWSS. In December 2011, discussions were made between 6 members at the DWSS Office on the concept of draft model. The discussions concluded as follows:

- It is important to disseminate this model to all over the country to enhance the capacity of WUSCs.
- It is necessary to give an orientation at the regional level, and let them know the concept of the model.

From December 2011 to January 2012, DWSS gave an orientation to the regional staff at 3 regions on the concept of the model.

**(38) Hold Workshop on "Small and Medium-Sized Water Supply Management Model (Draft)" for Introduction**

A workshop for introduction of "Small and Medium-sized Water Supply Management Model (Draft)" was held on 10th February, 2012. Apart from the 3 WUSCs, other 10 WUSCs in Jhapa and Morang District participated in this workshop.

An engineer of DWSS presented the concept of the Management Model that an ideal water supply utility should furnish the required items in institutional, functional, mental and computerization aspect. It was confirmed that by the discussion on the Management Model, it helps WUSCs for efficient managerial process in future, and the Model will help WUSCs to be self-sustainable.

The JICA Expert suggested that WUSCs participated here should pursue a realistic model rather than ideal one. The 3 WUSCs, Dhulabari, Gauradaha, Mangadh are a good benchmark for other WUSCs, and could be a realistic model. The purpose to introduce this model to other WUSCs is to make them catch up with the 3 WUSCs. Another workshop will need to be held to formulate the implementation

plan of model introduction.

**(39) Development of "Small and Medium-Sized Water Supply Support Model (Draft)"**

The JICA Expert Team prepared a draft of the Support Model. The draft model indicates the following 6 areas which DWSS needs to support for WUSCs.

- Guide to construct institutional system
- Provide training to strengthen the knowledge of staff
- Provide OJT to ensure skills of staff
- Provide an opportunity for information exchange between WUSCs
- Provide financial resource
- Provide physical facilities and materials

Together with the Management Model, discussions were made between 6 members at the DWSS Office on the concept of draft Support Model in December 2011. The discussions concluded that to give an orientation on the concept of the Support Model is necessary at the regional level, and their feedback on the draft model should be expected.

From December 2011 to January 2012, DWSS gave an orientation to the regional staff at 3 regions on the concept of the draft model.

On 27th February 2012, a brainstorming workshop was conducted at the DWSS Office to extract ideas of detailed support system in the above 6 areas from the DWSS staff members. The participants totaled 24 including member of DWSS, RMSO, WSSDO.

The discussion points through the brain storming for each of above areas were as follows:

1. What kind of support is already implemented to WUSCs by DWSS.
2. What kind of support should DWSS/RMSO/ WSSDO provide to WUSCs to improve their capacity
3. How frequently and by what organization should the support activities be done.

As a result of the brainstorming, the following ideas of necessary support were extracted from the participants. Contents of the necessary support are shown in **Table 3.41**.

**Table 3.41 Contents of Necessary Support**

| Area | Necessary Support | When | By Whom |
|---|---|---|---|
| Guide to construct institutional system | · Facilitate to form WUSC, prepare regulations and act, register WUSC | · Beginning | · DWSS |
| | · Registration of WUSC mandatory | · Beginning | · DWSS |
| | · Tie up with Local Bodies (VDC/Municipality/DDC) | · From Beginning | · DWSS/Local Bodies |
| | · Institutional development training | · As required | · DWSS |
| Provide training to strengthen the knowledge of staff | · VMC (Vicious Management Circle) Training | · Beginning | · DWSS/CHRDU |
| | · WSP (Water Safety Plan), disinfection Training | · Beginning | · DWSS/WSSDO |
| | · Management Training (billing, accounting, administration, etc) | · Beginning | · DWSS/CHRDU |
| | · Technical Training (water quality, meter calibration, leakage control, etc) | · After recruitment, refreshment | · WSSDO |
| Provide OJT to | · Pre construction training | · Start of project | · WSSDO |

| | | | |
|---|---|---|---|
| ensure skills of staff | · Training for plumber, electro mechanical, meter reader, leak detection<br>· Training for WTP operator, water quality test<br>· Post construction training<br>· Accounting training<br>· Business plan training<br>· Basic computer training<br>· Water shed management training<br>· Wastewater/sludge management training | · During construction /periodic refresher<br>· Completion of project<br>· Completion of project<br>· Completion of project<br>· Completion of project<br>· Completion of project<br>· Completion of project<br>· Completion of project | · WSSDO/CHRDU<br>· WSSDO/CHRDU<br>· WSSDO<br>· WSSDO/CHRDU<br>· WSSDO/CHRDU<br>· WSSDO/RMSO<br>· WSSDO<br>· WSSDO |
| Provide an opportunity for information exchange between WUSCs | · Exchange visit for management committee and staffs<br>· Publication and distribution of booklets, brochure, newsletter<br>· Establishment of websites<br>· Liaison Conference | · Annually<br>· Periodically<br>· Regularly<br>· Annually | · WSSDO/RMSO<br>· WUSC/WSSDO<br>· WSSDO/DWSS<br>· RMSO |
| Provide financial resource | · Provision of O&M fund with an amount equal to 5% of total project cost (2.5% in cash from WUSC out of their 20% contribution and 2.5% from DWSS).<br>· Separation of certain percentage of revenue & certain percentage for future improvement and extension.<br>· Cost sharing for extension and improvement<br>· Facilitate for arrangement of soft loan, bank loan, share floating mechanism, equity bond<br>· Guidance for tariff fixation | · Prior to project implementation<br>· Every month<br>· As required<br>· As required<br>· As required | · DWSS<br>· WUSC<br>· WUSC/DWSS<br>· WUSC/DWSS<br>· DWSS |
| Provide physical facilities and materials | · Logistic support for Office Establishment<br>· Support for Lab facilities, chemicals, advanced test kit<br>· Regular monitoring and evaluation mechanism | · Completion of project<br>· Completion of project<br>· Completion of project | · DWSS/WSSDO<br>· DWSS/WSSDO<br>· DWSS/WSSDO/RMSO |

**(41) Refresher Training Concentrating on O&M, Business Operation Improvement and Plan Formation for New Water Treatment Plant, etc.**

1. O&M on Water Treatment Plant and Water Quality Management Refresher Training in August 2013

In the first and second year, the JICA Expert organized OJT mainly to DWSS, DWSS Central Laboratory, CHRDU, 2 WSSDOs and the 3 WUSCs. The main objective of the activity in the 3rd year is to initiate DWSS and its Central Laboratory to conduct training to Morang and Jhapa WSSDOs, and these both WSSDOs to take initiation on the training to all 20 WUSCs in their respective district.

The objectives of the training were;

a) To assist DWSS as the trainer for WSSDO
b) To review and instruct how to confirm the accuracy of the main parameters such as pH, turbidity, color, M-alkalinity, total iron and free residual chlorine by using standard solutions, simple analysis kits, visible spectrometer and atomic absorption spectrometer.
c) To review and instruct the basic knowledge of purification process: theory and simple experiments
d) To assist DWSS to make presentation on what has been learned.
e) Selection of trainer to WSSDO

Since the training to DWSS Q/C section on the theory of water purification seemed insufficient, the

Expert prepared an additional training on the matter.
However, as all of the staff from Central Laboratory gets transferred to other organizations, the Expert required repeating the training again to the staffs from local laboratories, CHRDU and WSSDOs, who were assigned by DWSS. The contents of the training were as the followings.

Analysis on August 1-14

i. Seminar：

Meanings of Drinking Water Quality Standard

- Basics to keep analysis accuracy and preparation of analysis flow-sheet
- Introduction of Certified Environmental Analyst System in Japan

ii. Analysis training

1) pH
   - Calibration of potable pH meter
   - Analysis of tap water
   - Key points in measuring pH
   - SOP preparation of pH measurement

2) Turbidity
   - Calibration of turbidity meter by formalin and polystyrene turbidity standard solutions
   - Eye-comparison method for site analysis by turbidity standard solutions
   - Analysis of tap water by the two methods above
   - Key points on preparation of turbidity dilute standard solution and analysis of sample with turbidity: Use distilled water filtered with membrane filter again to adjust 0 value, take the sample quickly and eventually, etc.,
   - SOP preparation of turbidity measurement

3) Color
   - Preparation of color calibration curve by spectrophotometer
   - Eye-comparison method for site analysis by color standard solutions
   - Tap water analysis by the two methods above
   - Key points on color measurement: Use distilled water filtered with membrane filter again to adjust 0 value, effects by iron, manganese, etc.
   - SOP preparation of color measurement

4) M-alkalinity
   - Preparation of hydrochloric acid standard solution for titration and factor standardization by indicator and pH meter
   - Tap water analysis with indicator and pH meter
   - Key points on M-alkalinity measurement: Use appropriate volume of burette, pipette, etc.
   - SOP preparation of M-alkalinity measurement

5) Free residual chlorine
   - Decision of concentration of chlorine standard solution by titration
   - Confirmation of accuracy of free residual chlorine analysis kit by using diluted chlorine standard solution
   - Key points on color measurement:

6) Total iron
   - Preparation of iron calibration curve by spectrophotometer with iron standard solution
   - Direct analysis of the sample including humic acid and analysis after digestion by sulfuric acid-nitric acid by spectrophotometer

7) Arsenic
   - Confirmation of accuracy of arsenic digital meter with arsenic standard solution
   - Confirmation of accuracy of HACH arsenic simple analysis kit

Purification Process on August 15- 24

i. Seminar
   - Purification flow-sheet and key points of unit operation
   - Quantitative evaluation procedures of unit operation

ii. Training

1) Jar tests including filtration velocity measurement of supernatant, sludge volume measurement, etc.
   - Analysis of parameters (pH, turbidity)
   - Decision of comprehensively optimum chemical dosing rate
   - How to use the results in design and evaluation of actual plant

2) Iron removal
   - Oxidation of ferrous iron
   - Iron removal by sand filter and manganese sand
   - Analysis of parameters: total iron, pH, free residual chlorine, color
   - Confirmation of effect of manganese sand on iron removal

3) Presentation by trainees
   - Instruction of how to use computer by project interpreters
   - Objectives of training
   - Objectives of analysis of parameters, procedures, results, remarks, etc., at the day
   - How to do from now on
   - Comments on the training
   - Request against DWSS

4) Practical exercises: Practical exercises to understand purification process and examples of solutions, least knowledge for design and evaluation of purification process, procedures, etc.

5) General remarks of training

The training was started with eight participants, without leaving a single person, and the presentation by trainees got more to the point than last year's presentation.

The certificate of participation was awarded to all participants. Mr. Santosh Koirala from DWSS Regional laboratory, Itahari and Mr. Prakash Mishra from CHRDU who attended the same training in the last year also (Mr. Prakash Mishra) are selected as the trainer for Morang and Jhapa WSSDOs, respectively.

2. Refresher Training in January – February 2013

DWSS Central Laboratory

1) Purpose of the training
   - To instruct the basic knowledge of purification process by seminar and exercises
   - To confirm the current conditions to re-establish the central laboratory
   - Analysis capacity assessment of the central laboratory staff by simple experiments and by analysis of the samples
2) Purpose of the training
   - Exercises of basic calculations for water purification plant
   - Confirmation of analysis accuracy of arsenic by digital arsenic meter and atomic absorption spectrometer
   - Jar test, analysis and discussion
3) Results and Outcomes

   There were 18 participants not only from DWSS but CHRDU, WSSDOs, Regional Lab, RMSOs. Training for arsenic analysis, jar test and iron removal test was conducted by the 4 selected trainers who had attended the more detailed training held last year at the Central Laboratory. Preparation for the experiments and analysis were completed by the 4 selected trainers themselves.

   The biggest achievement of this training was that DWSS/Central Laboratory itself could confirm the accuracy of arsenic (0.01- 0.05 mg/L) by AAS with pre-treatment equipment and iron analysis (0.3 - 5 mg/L) by finding the best burner position through trial and error even though some advice from the expert were still needed.

   The participants deeply understood water purification process through the exercises of it, simple experiments, and discussion of the problems and solutions at actual water purification plants.

   However, some participants seemed to need to learn fundamentals and have practice more. It is required that DWSS central lab shall regularly hold more internal training for technical transfer under the initiative of the 4 selected trainers.

Trainers of water quality management in Morang and Jhapa WSSDO

1) Purpose of the training

   The capacity improvement of the trainers of water quality management in Morang and Jhapa

2) Contents and Outcomes

   The JICA Expert explained how to estimate free chlorine and iron level without simple analysis kit, how to calculate necessary chlorine dosing rate and the features of slow and rapid sand filtration process. Even though they still remembered and understood well the meaning and procedure of analysis owing to the trainings given to them before, they seemed to need more understanding about the method of the related calculations in concrete so the expert explained those again.

   In the training, the expert emphasized that it is significant for WSSDO to successively promote the awareness of water quality management to WUSCs. The expert proposed WSSDO to make a necessary budget plan according to the MIT inspection activities in order to explain and submit it to the chief of WSSDO. Besides, it is also proposed that members of MIT should set opportunities to have more internal trainings for technical transfer to each other without dividing their roles excessively.

Mangadh, Gauradaha, Dhulabari WUSCs

1) Purpose of the training

   To confirm the improvement of water quality management at the 3WUSCs especially about what the JICA Expert had instructed in concrete

2) Contents and Outcomes

   The expert conducted the same refresher training to the 3WUSCs as same as the trainers in Morang and Jhapa. The 3WUSCs had become familiar with how to use simple analysis kits and implement analysis regularly and it was confirmed that the water quality of plant outlet still kept in good condition.

   Mangadh WUSC outsources the analysis of the samples at the plant inlet, outlet and taps of users to accredited laboratory. Dhulabari WUSC daily conducts water analysis with the simple analysis kits by themselves due to their remarkable improvement of the awareness about water quality management.

   At Mangadha and Dhulabari WUSCs, the expert gave instruction of how to get the necessary figures for process evaluation with the excel formats the expert provided. To utilize the format, the WUSCs revised their paper-based daily record format by themselves.

   As for Gauradaha WUSC, which had no computer at the site, the expert showed the same procedure of calculation with the paper-based format due to positive attitude of the staff to process evaluation.

   The Expert requested the 3 WUSCs to arrange opportunities for technical transfer to each other in order to sustainably improve their skills by themselves. Besides, the JICA Expert also

recommended that opportunities for internal technical transfer shall be more organized even in a WUSC since the more staffs share knowledge and skills of facility O&M, the more sustainable service of the WUSC would be.

3. Refresher Training in August – September 2013

DWSS Central Laboratory

1) Purpose of the training

Final evaluation was carried out to confirm whether the trainers could give proper instruction and demonstration of water analysis to other staffs.

2) Contents of the training

- To confirm the reliability of analysis results by absolute calibration and standard addition method for the sample with hindering materials
- To know the result difference in metal analysis with and without acid digestion
- To know the result difference in metal analysis by spectrophotometry and atomic absorption method
- To learn how to confirm the reliability of simple analysis set
- To learn the difference in nature of coagulation and particle sinking velocity when using calcium hydroxide and sodium carbonate for compensation of decreased alkalinity by ammonium sulfate hydrate. .

3) Results and Outcomes

There were 8 participants including the 4 trainers selected by the Expert last year. Preparation and demonstration of experiments to check water quality items and its analysis were completed by the 4 selected trainers themselves. Especially, the trainers showed improvement in awareness about accuracy of water quality experiments so they retried the experiments by themselves when the results did not seem to be accurate enough.

However, with the present equipment and skills, it is still not possible to cover all the parameters established by water quality standard in Nepal. It is quite necessary to gradually develop the capacity of the central laboratory to be able to measure more parameters by official methods under the initiative of trainers who attended this training. The Expert recommended DWSS to plan the budget allocation for it in cooperation with the trainers.

Trainers of water quality management in Morang and Jhapa WSSDO

The Expert conducted monitoring and refresher training to the trainers of water quality management in Morang and Jhapa WSSDO. The results of the activities are shown in later part 4) of “MIT Activities”.

Mangadh, Gauradaha, Dhulabari WUSCs

1) Purpose of the training

To confirm the improvement of water quality management along with the SOP at the 3WUSCs especially about what the Expert had instructed in concrete

2) Contents of the training

The Expert confirmed the improvement of water quality management at the 3WUSCs especially about what the JICA Expert had instructed in OJT and pointed out.

Mangadh WUSC utilized the MS-Excel record format and the chlorine dosing rate calculated with it and the actual measured value were almost equal. Considering current status of the record format, water production, distribution amount, chlorine feeding rate and unit power consumption are well managed on it. On the other hand, recording of the important parameters for process evaluation such as filtration velocity and backwash velocity were not enough managed; therefore the Expert gave the instruction.

At the Gauradaha WUSC, procedure of calculation with paper-based format and countermeasures against complaint from residents were confirmed with MIT members. Considering elapsed years of the facilities and worse quality of raw water, the Expert gave additional instruction, 5 to10 minutes drain of treated water just after back washing process, in order to prevent foreign matter from getting into.

As same as Mangadh WUSC, Dhulabari WUSC also utilized the MS-Excel record format and the chlorine dosing rate calculated with it and the actual measured value were almost equal. Considering current status of the record format, Water production and distribution volume, FRC concentration and water quality results are well managed on it. On the other hand, recording of backwashing flow was not properly recorded so the Expert gave intense instruction to always fill out the record format with the actual measured value. Besides, it was also suggested to immediately wash the filter sand and clean basins to deal with high water level due to increase of filtration resistance.

**<O&M on Water Distribution Facilities>**

The refresher training on O&M of water distribution facilities to the 3 WUSCs was implemented to confirm understanding and sustainability.

In Dhulabari and Gauradaha WUSCs, regular inspection and maintenance and revision of the distribution map had not been implemented. Henceforward, Jhapa WSSDO shall monitor their activities.

a) Mangadh WUSC

Proper understanding on the draft SOP and their activities based on it were confirmed.

- Regular inspection of distribution facilities has been carried out every month and data are recorded on check sheets.
- The distribution map is revised showing extension of new pipeline.
- WUSC has properly carried out water meter management. The staffs use the self-made meter calibration equipment which has helped them to cope with customers' complaints.

b) Gauradaha WUSC

Regular inspection, maintenance of the distribution facilities and revision of the distribution map had

not been done for more than 6 months. There was also lack in their understanding regarding an existing water meter calibration.

→WSSDO/CHRDU Engineers and the JICA Expert explained the necessity and importance of periodical maintenance, and instructed how to conduct inspection and an existing water meter calibration. Inspection of distribution facilities has been implemented appropriately then after.

c) Dhulabari WUSC

Regular inspection, maintenance of the distribution facilities and revision of the distribution map had not been carried out for more than 6 months. The reason behind was the recruitment of a new manager who could not grasp fully the project activities and contents of the draft SOPs in this period. The technicians and plumbers did not take any initiative on their own and remained passive.

Jhapa WSSDO Engineer gave new manager draft SOPs both in English and Nepali language and asked him to attend the OJT/Workshop at Birtamode WUSC. Accordingly, he took part in the workshop/OJT. Then after, Jhapa WSSDO monitored their activities and confirmed the implementation of regular inspection and revision of the map. Some facilities such as valve box covers were repaired.

**<Business Operation Improvement>**

The Expert Team conducted management training on 4 subjects, awareness program, user complaint management, annual report and monthly report in first and second year. The Expert Team received request for coaching on other two subjects also, i.e., improvement on the efficient billing and collection, and improvement of the customer ledger.

Regarding the improvement of billing and collection, and customer ledger, the Expert judged that there is no room to improve in the current routine as long as the manual processing is continued. Therefore, the refresher training on these subjects could not be conducted.

In terms of annual reporting, the WUSCs do not agree on the necessity of changing the contents of the annual reporting as the style and form of their annual report meet the standard of Nepal government, which fulfills the accountability to the committee members.

Regarding monthly reporting, although only financial parameters were reported in the past, some non-financial information such as number of connection has been added after project implementation.

### (42) Training on Water Quality Inspection/Monitoring Based on SOP

The main part of the Draft SOP includes purification process and water quality management. Activities on the training were described in Item (41).

A. Draft SOP for O&M of Water Treatment Plant (WTP)
   - A-1 Water treatment process and equipment/facilities which consist of process
   - A-2 Maintenance of the equipment/facilities which consist of process
   - A-3 Maintenance of sand for slow sand filtration
   - A-4 Maintenance of manganese green sand

A-5 Flow management: Raw, treated water and backwash velocity,
A-6 Calculation of chlorine dosing flow
A-7 O&M checklist: Record of receiving voltage, power consumption, operation hours of pump, etc.
A-8 Trouble shooting

B. Draft SOP for Water Quality Management
B-1 Purpose of water quality management
B-2 Water quality criteria and meanings: Level in environment, background of the regulation
B-3 Sampling: 5 (five) times of replacement with the sample
B-4 Water quality analysis methods by simple analysis kit
B-5 Data management
B-6 Disclosure of information
B-7 Others

**(43) Development of "Small and Medium-sized Water Supply Management Model (Draft)" (Continued)**

The Team developed a draft of the Management Model and presented in the second joint workshop at Dhulabari WUSC in November 2011. On August 2012, the Team updated the model and made a presentation at a workshop on 28th November 2012. The updated draft described the following points.

- The ideal status of WUSC is attained when they will be able to achieve their mission of "provide safe water in an affordable and stable way with reasonable cost to maximum people in their jurisdiction".
- For realization of this ideal situation, WUSC may need to strengthen the capacity of facility to provide water more than the demand, as well as to maintain financial capability in a sustainable and stable manner to carry on their activities, and to enhance operational capability including capability of operating and maintaining of facility as well as managing capability of water supply business.
- Business plan is a tool for the realization of ideal status of WUSC. Business plan is also a method for strengthening capacity of facility and enhancing financial capability for realizing the ideal status step by step. Setting target and act (e.g. facility improvement project) to realize these targets, and carry on financial activity including improvement of water rate and ensure to realize capital investment (e.g. the facility improvement project).
- For strengthening operational capability, carry on job flow standardization based on SOP, and training based on manual to enhance skill of the staff.

**(45) Holding Workshop on "Small and Medium-Sized Water Supply Management Model (Draft)" for Dissemination**

The 1st Workshop on 9th July 2012

In disseminating the Management Model to the other 17 WUSCs in Jhapa and Morang, a workshop was held on 9th July 2012 in order to make them understand the contents of the draft Management

Model as well as SOP and Business plan. The training plan to be conducted from August 2012 for these WUSCs was also explained at the same workshop.

The achievements of the workshop are as follows:

- About 40 participants from 19 WUSCs had participated in the workshop in spite of their busiest period at the end of fiscal year which confirmed their eagerness to join in the Project.
- DWSS took initiative in the workshop, where a planning engineer explained the Management Model and the Morang division chief explained SOP. The chairperson of Mangadh explained that they still are on the process of preparing financial report for their general assembly based on their business plan. The technical transfer of the training could be observed in the workshop.
- C/Ps conducted the workshop extracting problems and degree of understanding on facility operation from each WUSC. These results can be utilized as a feedback for the training in future.

The 2nd Workshop on 28th November 2012

The JICA Expert Team conducted the 2nd workshop on 28th November 2012 and presented the draft Management Model to the participants. All together 78 participants from 20 WUSCs of Jhapa and Morang districts and participants from 2 WSSDOs, ERSMO and DWSS attended in the workshop.

The JICA Expert Team conducted a survey through questionnaire, and 86% of the attendants replied that they can understand presentation on the Management Model. The same percentage of the participants replied that they can understand the concept of the Model, and 99% replied that the model is useful and applicable in their WUSC.

However, there were some problems in time management in the workshop. The discussion time could not be secured as long time had been consumed in the presentations.

### (47) Development of "Small and Medium-Sized Water Supply Support Model (Draft)" (Continued)

In August 2012, the JICA Expert Team updated the Model and presented on a workshop on 28th November, 2012. The updated draft recommended to provide advisory services such as management advisory, technical advisory and financial advisory to WUSCs and to provide coaching to enhance their management, technical and financial skills. Since WUSCs do not have sufficient capability on preparing and updating business plan, the draft recommends for supporting on the preparation of facility improvement plan, cost estimation (capital investment planning) and financial planning of WUSCs.

- To conduct joint annual monitoring and evaluation based on business plan, and provide advises on facility improvement or management improvement.
- To establish financial assisting scheme including grant, zero interest loan and low interest loan and to provide financial assistance based on the WUSC's financial capability. It also recommends establishing fund for these financial schemes: (1) To conduct training including training at CHRDU, OJT and workshop for enhancing skill of the staff, and (2) To provide space and opportunity for

socialization between WUSCs for exchanging experiences and information.

**(48) Holding Workshop on of "Small and Medium-Sized Water Supply Management Model (Draft)" for Monitoring for the Practical Use**

On 28th November 2012, the workshop was held in Biratnagar to explain to the contents updated of the draft Management Model the Expert developed last year. The updated contents are as shown in the item (43) in this report.

In the workshop, 3 target WUSCs, Mangadh, Gauradaha and Dhularari WUSC, made presentation to all the attendees about their updated business plan which they had developed with the Expert.

Gauradaha WUSC explaining their business plan

Mangadh WUSC explaining their business plan

**(52) Conducting Refresher Training Concentrating on Annual Operational Plan and Medium/Long-Term Business Plan Formation by the 3WUSCs**

As of August 2012, the 3 WUSCs could not yet prepare financial report of 2011/2012 fiscal year, and they are still on the process of preparing financial report for their general assembly. The JICA Expert Team confirmed this status but could not conduct the follow up training.

In November 2012, it was confirmed that Mangadh WUSC updated their business plan based on actual performance from July 2011 to June 2012, and Gauradaha WUSC was discussing on the draft business plan approved by their General Assembly on November, 2012.

For the purpose of supporting WUSCs to establish the Management Model, the expert conducted related trainings at the sites in August 2012 and from November 2012 to February 2013. This helped WUSCs prepare their business plans as part of the MAT activities

This time, refreshing trainings mainly focused on annual and business plans. The experts prepared a draft guideline for monitoring and evaluating the business plan implementation as part of the WUSC Management Model.

The workshop was held on August 27th to introduce the M&E activity based on the draft guideline. The experts recommended that WUSCs joint M&E of the business plans with DWSS/WSSDO. At the workshop, the expert presented the example of Dhulabari WUSC as a concrete case study based on the information collected with DWSS.

The M&E of business plan is a mandatory activity in implementing the WUSC Management Model. It is recommended that WUSCs and DWSS/WSSDO implement the joint M&E on an annual basis in the Support Model. Regarding such recommendation, the experts conducted training for WSSDO in February 2013 and transferred the M&E knowledge and techniques (MET activity) as well as management consultation (MAT activity).

**(53) Reviewing and Developing SOP**

1) SOP on O&M of Water Treatment Plant and Water Quality Management

The Draft SOP on O&M of Water Treatment Plant and Water Quality Management was reviewed and improved discussing with the 3WUSCs last year and was ratified. The seminar and OJT were conducted using the approved SOP. This SOP has been finalized and considered as the final version.

2) SOP on O&M on Water Distribution Facilities and Meter Calibration

The draft SOP on Water Distribution Facilities and Meter Calibration was developed discussing with the engineers of WSSDOs and it was modified based on the results of the trainings carried out in the first and second year. The modification was made on the following subject matters.

a) O&M on Water Distribution Facilities

- Well has been added in the inspection list of intake facilities.
- Regarding the facility planning, items such as service area, population, etc. have been added in the main planning fundamentals as the items to be considered.
- Design standards adopted in Nepal have been verified.
- Specifications of pipe materials (mainly, HDPE) in use in Nepal have been confirmed.
- Correction has been made on Nepali translation.

b) Meter Calibration

- Detail calculation method has been added for calibrating existing meters.
- Correction has been made on Nepali translation

3) Description of Electro-Mechanical Equipment in SOP

The O&M manual of electro-mechanical equipments was provided to the 3 WUSCs by the contractor of the grant aid project. The common equipments which significantly affect the operation of water facilities shall be selected from the manual and SOP shall include description on such common equipments. The descriptions shall be simple so that staff of WUSCs could understand it easily. SOP shall include following electro-mechanical equipments and description on them.

- Pump, Chlorine dosing equipment, generator, power receiving equipment
- Preparation for starting, method of daily operation, inspection flowchart

4) SOP for Emergency Response

Apart from the SOP under normal situation as shown on the flowchart of inspection and O&M, SOP on emergency response includes following topics in addition:

・Objectives of Emergency Response
・Definition of Emergency
・Liaison System in Emergency from WUSC to Residents
・Information of Emergency from Residents and Liaison System in WUSC

The establishment of liaison system has been described in the SOP in emergency, as the priority is given to protect life of residents and to secure safety. In order to forward information rapidly, WUSC staff need to identify emergent incidence properly and inform it to the manager/board members as fast as possible. The manager/board members must decide to inform to residents, collecting proper information and grasping the proper situation of the incident. The liaison system needs to establish in WUSC as the residents themselves may provide information to the WUSC.

【Contents Described in SOP】

Emergency will be classified into

i. Stop of water supply function (large scale power failure, damage of facilities, water contamination)
ii. Natural disaster (earthquake, floods, fire, abnormal weather, infectious diseases)
iii. Terrorism (threat, destructive activities)

The emergency in this context is defined as i. Stop of water supply function. SOP describes that when an emergency situation takes place, response will be carried out to protect life of residents and to secure safety, to protect water supply facilities, to secure continuance and safety of facility operation.

**(54) (55) Finalizing "Small and Medium-Sized Water Supply Management Model" and "Small and Medium-Sized Water Supply Support Model" and Obtain DWSS's Approval**

Drafts of the Management Model and the Support Model were prepared and workshops had been conducted for the introduction of these models. A brainstorming workshop was conducted in February 2012 in order to make the models more applicable. In August 2012, a part of contents of “the Management Model” and “the Support Model” were reviewed. A Nepali consultant was hired in April and May 2013, and the Management Model and the Support Model are revised to Nepali version with DWSS cooperation.

The project output sharing workshop was conducted for 14 WSSDOs in Eastern area and 27 WUSCs in Jhapa and Morang in order to introduce the Models and outcomes. The project output sharing workshop was also conducted with DWSS and other donors (UNICEF, ADB, and SWISS Embassy) in September 2013.

Finally, two models were accepted in the 6th JCC.

**【Output 3】**

| |
|---|
| Model of Output 2 is disseminated in Jhapa/Morang districts. |

**(44) Formulate Training Program to WUSCs Targeted in Jhapa/Morang Districts**

The Expert Team prepared a draft training plan for the targeted 20 WUSCs in Jhapa and Morang districts. Two WUSC's service area, one for Jhapa and the other for Morang, were selected as training sites to conduct training so that participants from other targeted WUSCs could select and join in the training at their nearest training site. It was planned to provide 4-days training at each site including both class room lecture and OJT. The training subjects were divided into 1) O&M of WTP, 2) O&M of electro-mechanical equipment, 3) O&M of Distribution Facilities, 4) Meter Control, 5) Water Quality Management, and 6) Business Management.

1) Training Plan for WTP O&M (including M&E)

1. Training site：Jhapa District; Dhulabari WUSC, Gauradaha WUSC
   Morang District; Mangadh WUSC, Pathari WUSC
2. Training period：From 14th to 31st August, 2012, Four days training at each site
3. Contents of training：

a) Daily inspection and maintenance

Necessity of daily inspection, Item and method of inspection (Lecture and OJT)

b) Periodic maintenance

Necessity of periodic maintenance, keeping inspection record, dismantling and assembling mechanical equipments (Lecture and OJT)

c) Trouble shooting

Finding and specifying problems and method of solution

4. Time schedule：

Training schedule for WTP O&M is shown in **Table 3.42**.

**Table 3.42 Training schedule for WTP O&M**

| | AM | PM |
|---|---|---|
| Day 1 | Orientation of Training, Distribution of training material (Room) | Inspection and Maintenance of electric equipment (Room) |
| Day 2 | Inspection and Maintenance of mechanical equipment (Room) | Trouble shooting (Room) |
| Day 3 | Inspection and Maintenance of electric equipment (Site) | Trouble shooting (Site) |
| Day 4 | Inspection and Maintenance of mechanical equipment (Site) | Trouble shooting (Site) |

2) Training Plan for O&M of Distribution Facilities, Meter Control

a) Training Site

Group 1: **Birtamode**, Surunga, Chandragadi, Shanischare (Jhapa)

Group2: **Salakpur**, Rangeli (Morang)

Group3: Topgachhi-1, Topgachhi-2, Topgachhi-3 (Jhapa)

(Note) Grouping may be changed on the request of WSSDO.

b) Training Period

From the 2nd week to the 4th week of September, 2012, Four days training at each site

c) Contents of Training

Workshop on the O&M of water distribution facilities and meter calibration/management based on the SOP

1. Calibration/ Management of water meter
   - Maintenance of customer meter（meter storage, keeping delivery note, etc.）and understanding on appropriate handling
   - Understanding and exercise on meter calibration method
2. Inspection, preparation of inspection ledger and mapping of water distribution facilities
   - Confirmation of facilities condition, preparation of inspection ledger and maintaining inspection and repair records of conveyance, transmission, distribution pipes, elevated tank
   - Creation of information map of distribution facilities (route, location, diameter, material of pipes, valves, washout, hydrant) for use on maintenance work
   - Planning of distribution network (required items and procedures)
   - Learning of pipe connection method including socket type connection practiced by Mangadh.

d) Time Schedule

Training schedule for O&M of Distribution Facilities and Meter Control is shown in **Table 3.43**.

**Table 3.43 Training schedule for O&M of Distribution Facilities and Meter Control**

| | AM | PM |
|---|---|---|
| Day 1 | Management of water meter (Room) | Meter reading (Site) |
| Day 2 | Management of water distribution facilities (Room) | Inspection of facilities (Site) |
| Day 3 | Pipe connection (Room) | Preparation of distribution network map (Room) |
| Day 4 | Observation of existing facilities, maintenance work situation (Site) | |

Note: The staff of WSSDOs will be the trainers.

3) Training Plan for Water Quality Management

a) Training Site：

1. DWSS: DWSS Central Laboratory
2. Itahari: TSC
3. Jhapa: Jhapa WSSDO, Dhulaban WUSC, Gauradaha WUSC
4. Morang: Morang WSSDO and Mangadh WUSC

Note:

- WUSC shall receive training either at the base WSSDO (Jhapa and Morang) or WUSC (Dhulabari, Gauradaha, and Mangadh).
- The schedule and contents of the training are tentative. They may change according to the conditions such as request from C/Ps, availability of the electricity, convenience of Central Laboratory, acquisition of reagents, etc.

b) Training Period：From 8 September to 21 September, 2012

c) Training Policy：DWSS and DWSS Central Laboratory shall assist the training at Itahari TSC and Jhapa and Morang WSSDOs. Similarly, each WSSDO shall assist the training at the base WUSC for other 17 WUSCs.

4) Training Plan for Business Management

a) Selection of WUSCs

Selection of WUSCs for training on Business Management shall be done on merit basis taking into account the size of WUSC, situation of annual report preparation, attendance record on previous workshops, etc. Selection of WUSCs is done.

b) Instruction/OJT on Business Administration Improvement and Preparation of Business Plan

Instruction on Business Administration Improvement and Preparation of Business Plan shall be provided to the selected WUSCs.

c) Hold Workshop on Outcome of Instruction/OJT

The outcome of the training shall be presented in a workshop by the trained WUSCs.

### (46) Training to Other WUSCs by C/P Based on Training Program

1. Water Quality Management

Training was held from August 26 to September 13 at Morang and Jhapa WSSDOs and WUSCs in each district.

1) Contents of Training

a) Presentation by the trainer who had been trained at DWSS central laboratory

- Objectives of the Project: The Expert to assist DWSS to become a trainer for sustainability of the Project
- How to secure analysis accuracy
- Confirmation of accuracy of simple analysis kits
- Key points of design and evaluation of water purification process by simple experiments: Jar test and iron removal experiment

b) Review of meanings of water parameters, background of regulations, etc.

c) Review of water purification process

d) Practice exercises of measurement of pH, M-alkalinity, turbidity, color, total iron and free residual chlorine by simple analysis kits, and simple treatment experiment of turbidity, iron

e) Discussion on the results of exercise

f) Process evaluation of actual unit process by water quality analysis of total iron, chlorine feeding rate, etc. at the inlet and outlet of the unit facility and filtration velocity

2) Number of Attendees:

Number of attendees is shown in **Table 3.44**.

**Table 3.44 Number of Attendees**

| Training location | Duration | Numbers of attendees |
|---|---|---|
| Morang WSSDO | 26-28August | 20 |
| Mangadh WUSC | 29August-2 September | 18 |
| Jhapa WSSDO | 3-5 September | 16 |
| Gauradaha WUSC | 6-9 September | 15 |
| Dhulabari WUSC | 10-13 September | 13 |

(Note)

- Rangeli and Letang WUSCs in Morang District and Sanischare WUSC in Jhapa WUSC did not attend.
- Birtamode WUSC in Jhapa District attended only one day.

3) Selection of the trainers and training by selected trainers

Among the training attendants at DWSS laboratory from August 1 to 24, Mr. Santoshi Koirala from WSSDO Sunsari and Mr. Jay Prakash Mishra from CHRDU were selected as the trainer for Morang and Jhapa WSSDO respectively. They conducted training at each WSSDO as the trainer.

Then the trainers who were selected from each WSSDO instructed the meanings of the parameters to be measured and instructed how to use simple analysis kits with attentions in analysis.

Among the training attendants at Morang and Jhapa WSSDO, Mr. Ghanshyam Koirala, who voluntarily wanted to become a trainer and Mr. Ramanand Das, who also had attended the training at DWSS laboratory, were selected as the trainer for the WUSCs in Morang and Jhapa district, respectively. They trained WUSCs.

4) Achievements and Issues of the Training

a) Achievements

- The training ended successfully. All attendants actively practiced using simple analysis kits and showed enthusiasm to understand process control by analysis results.
- Among 4 trainers, 3 trainers except one from CHRDU, demonstrated their good ability to become a trainer, although continuous study is necessary.
- All attendants from WUSCs, other than the 3WUSCs which have been trained for 2 years, showed their enthusiasm on the training as this was their first training
- The Expert awarded Certificate of Attendance to all participants according to the attendance days and also awarded certificates to the trainers Mr. Santosh Koirala of Sunsari WSSDO, Mr. Ghanshyam Koirala of Morang WSSDO and Mr. Ramanand Das of Jhapa WSSDO.

b) Present Status of the 3WUSCs

- The 3WUSCs, Mangadh, Gauradaha and Dhulabari have maintained good quality of water. Even though Iron concentration at Mangadh and Gauradaha is less than 0.1 mg/L, oxidation in

the aeration tank seems not sufficient.

- Iron concentration of existing well was within the limit set by regulation and that had been confirmed while the post-evaluation mission pointed out high iron in the well.

c) Issues

Trainees' understanding on the process control and evaluation by using data and analyzing results is not still sufficient. Continuous training is necessary on the analysis and evaluation of the water treatment process to increase their skills and knowledge. Some of the examples observed during the training are as follows:

- They practiced annual chlorine dosing without understanding calculation method of necessary and actual dosing rate. As a result, actual dosing rate was too low compared to theoretical one.
- They did not understand how to calculate filtration velocity by using daily record of the volume of the treated water.
- Simple experiments and exercises were prepared for DWSS to understand for design and evaluate water purification process, but the staff from DWSS did not attend the training.
- For measuring cadmium, cyanide, lead, mercury, aluminum, which should be regulated as per Nepal Standard, proper pre-treatment process and enough knowledge on analysis methods have not been established sufficiently.

2. O&M of Water Distribution Facilities and Meter Control

The trainings on O&M of Water Distribution Facilities and Meter Control have been implemented for 20 WUSCs altogether in Jhapa and Morang districts in collaboration with Jhapa and Morang WSSDOs, DWSS, CHRDU and the JICA Expert. Juropani WUSC of Jhapa and Belbari WUSC of Morang, which were not included in the list of target WUSCs also participated in the workshop/OJT conducted in November on the request of WSSDO.

1) Training Schedule for WUSCs

a) Jhapa district

**Table 3.45 Target WUSCs in Jhapa District**

| Priority | WUSC | No. of participant | Place | Schedule |
|---|---|---|---|---|
| Group 1 | Birtamode, Surunga, Chandragadi, Shanischare, Budhabare, Dhulabari<br>Total 6 WUSCs[1)] | 14 trainees (mainly plumber and meter reader) | Birtamode WUSC | September 17th - September 20th, 2012 (4 days) |
| Group 2 | Lakhanpur, Damak, Guradaha, Kakarvitta, Topgachhi[2)]-1, Topgachhi-2, Topgachhi-3, Juropani<br>Total 8 WUSCs[1)] | 14 trainees (mainly plumber and meter reader) | Damak WUSC | November 2nd - November 6th, 2012 (4 days) |

1) Nonparticipation from Shanischare, Kakarvitta and Topogachhi-3 WUSC
2) There are 3 WUSCs in Topogachhi.

b) Morang district

**Table 3.46 Target WUSCs in Morang District**

| Priority | WUSC | No. of participator | Place | Schedule |
|---|---|---|---|---|
| Group 1 | Urlabari, Pathari, Letang<br>Total 3 WUSCs | 17 trainees (mainly plumber and meter reader) | Urlabari WUSC | February 14th – February 17th, 2012 (4 days) |
| Group 2 | Haraicha, Jhorahat, Tanksinuwari<br>Total 3 WUSCs | 11 trainees (mainly plumber and meter reader) | Haraicha WUSC | September 11th – September 14th, 2012 (4 days) |
| Group 3 | Salakpur, Rangeli, Belbari<br>Total 3 WUSCs[1)] | 9 trainees (mainly plumber and meter reader) | Salakpur WUSC | November 7th – November 11th, 2012 (4 days) |

1) Nonparticipation from Rangeli WUSC

2) Training Contents

a) Inspection of water distribution facilities, preparation of record sheets and preparation of map of distribution pipelines.

- Function of water distribution facilities and valves, countermeasures of mechanical failures and the importance and creation of the map of distribution facility were instructed by WSSDO engineers.
- Present conditions of water distribution facilities were confirmed with WUSC staffs. The method of maintenance and repair records of distribution pipelines, elevated tanks and valves were also instructed by WSSDO engineers.
- Creation of the map of distribution facility including pipeline routes with pipe materials and diameter and locations of facilities such as valves, washout and fire hydrants was instructed by WSSDO engineers. The engineers explained the importance of the information for the maintenance and repair.

b) Water meter management and calibration

- WSSDO engineers explained about the proper installation of water service pipes and water meters.
- WSSDO engineers also explained about the proper handling of water meter, meter storage and record to WUSC staffs.
- WSSDO engineers also instructed to WUSC staffs methods of calibration of an existing water meter and reading below 0.1 $m^3$ (in the order of 0.1 L - 100 L) for calculating instrumental error.
- Trainees together with WSSDO engineers visited customers who have complaints regarding water meter (getting higher records) and explained them the results of meter calibration.

c) Explanation/Handling of Procured Equipment

WSSDO, DWSS and CHRDU engineers instructed on the appropriate handling of equipments such as pipe cutter, electronic heating plate for HDPE pipe and pipe drill which were provided to WSSDOs. Instruction was given to WSSDOs and WUSCs together even though the equipments were provided only to the WSSDOs, not to the WUSCs. Any WUSC

may have access on these equipments and can borrow from concerned WSSDO whenever needed. The damaged water level indicator and flow cell in the WTP of Mangadh were replaced and restored to the original condition.

3) Training Policy

a) Jhapa/Morang WSSDOs, DWSS and CHRDU engineers provided lectures and instructions to WUSC staffs in Nepali. The JICA Expert supported and advised trainers when required. The contents of the lecture and the methods of instruction were confirmed before the training.

b) Materials presented in the workshop were based on the draft SOPs and prepared in Nepali on power point slides

c) Jhapa/Morang WSSDOs, DWSS and CHRDU engineers also instructed trainees on OJT. The engineers demonstrated the use of equipment, and then trainees followed to practice.

d) Pre-test and post-test were conducted in the workshop/OJT to assess the degree of understandings/achievements of the trainees.

4) Achievement of Training

a) Supplementary description of the technical terms was explained in Nepali language during the OJT/Workshop. The misunderstanding and inconsistency of the technical words were made clear to the trainees.

b) WSSDO, DWSS and CHRDU engineer's proper answers to the questions raised by the trainees, especially related to the field problems, helped trainees to understand in detail.

c) Nepalese engineers taught trainees meticulously to use the equipments meticulously, especially during the OJT.

d) Two tests were conducted to measure the improvement of ability and understanding of the trainees before and after the OJT/Workshop. The knowledge and understanding of the trainees had been found improved after the OJT/Workshop in comparison to the beginning as their average test scores were improved. It should be noted that the contents and degree of difficulty of the tests were different in the beginning and in the end of the OJT/Workshop.

e) Since WSSDO, DWSS and CHRDU engineers served as lecturer of OJT/Workshop several times, their explanations and teaching skills to WUSCs was improved. According to the survey conducted through questionnaire after the training, most of the trainees answered that the contents were appropriate and easy to understand.

f) Through the training, WSSDOs and WUSCs had found good opportunity to exchange opinions and information. It can be expected that both of them can develop cooperative relation forward from now.

g) Since WSSDO, DWSS and CHRDU participated in the OJT/Workshop, they could exchange opinions among them and DWSS/CHRDU may directly instruct to WUSC staffs. Hereafter, it can be expected that DWSS/CHRDU and WSSDO conduct the training cooperatively.

**Table 3.47 Test Results of Trainees**

| Workshop/OJT | District | Average | | Variation |
|---|---|---|---|---|
| | | Pre | Post | |
| In September | Morang | 54.8 | 68.8 | +14 |
| | Jhapa | 62.3 | 71.8 | +9.5 |
| In November | Morang | 52.5 | 82.5 | +30.0 |
| | Jhapa | 78.5 | 89.1 | +10.6 |

Note: On the basis of a possible maximum of 100 WSSDO Engineers explained trainees test answers after post test. WSSDOs gave marks.

5) Issues in OJT/Workshop

a) The OJT/Workshop on distribution facility management and water meter accuracy management were held after mechanical/electrical management and water quality management. Although many of the staffs attended from different WUSCs, some WUSCs didn't send their staff to take part in any of the OJT/Workshop.

b) The draft SOPs were revised in the second year. In the third year, Nepalese engineers have suggested minor revisions on the technical words in Nepali. Therefore, the JICA Expert has asked WSSDOs, DWSS and CHRDU for more concrete comments/suggestions to make SOPs more practical and useful to WUSCs.

c) Since most of the WUSCs do not have equipment such as pipe cutting machine, electric heating plate and mechanical jack which the JICA Expert Team procured and handed over to WSSDOs, the general opinion was that they, WUSC staffs may not have opportunity to use it when they needed despite understanding on mutual use.

6) Improvement of Issues

a) Regarding issues described in Item No.5 a) WSSDO, DWSS, WUSC and the JICA Expert discussed on the causes, factor and improvement of nonparticipation on OJT/Workshop, factor and improvement. The reasons behind nonparticipation were busy work schedule, lack of manpower, lack of transportation allowance (incentive), unexpected dealing with customer complaints and malfunction of facilities which needs to be attended immediately and lack of understanding among WUSC board members about the benefit of workshop. In addition, it seems that manager and technicians are not able to get permission from WUSC board members easily.

WSSDOs have sent request letters to WUSCs before the OJT/Workshop for the participation. WSSDOs even called WUSC board members directly and/or visited them to explain the importance of the OJT/Workshop in order to persuade them to send participants in the OJT/Workshop's. WSSDO Engineers visited non-participating WUSCs and discussed with board members explaining importance and benefit of the OJT/Workshop.

b) Regarding Issue 5. b) WSSDOs and the JICA Expert made revisions on the draft SOPs based on the outcome of the workshop/OJT to finalize them. They corrected and/or complemented technical words and other descriptions prepared in Nepali.

c) Regarding Issue 5. c) WSSDOs explained WUSCs that they will lend equipment to WUSCs if necessary. WSSDO might send the equipment on their vehicle or someone from WUSC has to come to pick up the equipment.

7) Others

・ Aeration Tank in Gauradaha WUSC

Net provided inside the tank could not support the load of materials on it as the materials on it became heavier. The JICA Expert in consultation with the operator has advised WUSC for:

・Replacement of the net ( plan to supply it as spare parts)

・Reduction of the volume of the materials to half and to replace them every month. The other half is required to be washed with water to remove stocked substances as much as possible during the storage of materials outside.

・Proper back washing of the tank 2 times a day, in the morning and in the evening.

3. O&M on Water Treatment Plant (including Electro-Mechanical Equipment)

Training on the O&M of mechanical and electrical equipment has been implemented for WUSCs of Jhapa and Morang districts including the 3WUSCs. The assessment of the actual condition of the electro-mechanical equipment had not been conducted in target WUSCs before. Training on the O&M of mechanical and electrical equipment was added in the project activities only in the third year to comply strong request of C/Ps. Therefore, the training was implemented simultaneously conducting an assessment of the level of understanding on the purpose of the facilities and their management in each WUSC.

Considering the difference among the 3WUSCs, where facilities were improved under the Japanese ODA, and other target WUSCs, the training venues were not limited to the 3 WUSC. The training venues were selected at other WUSCs as well for the convenience of the trainees: Mangadh, Pathari, Dhulabari and Damak WUSCs were chosen as suitable places for the training.

The training was implemented for 4 days in each place. The contents and outcome of the training are described below.

Implemented Training Schedule

An implemented training schedule including the training places, name of participating committees and so on is shown below.

**Table 3.48 Participants of Individual Trainings**

| Date | Place | No. of Trainees | Participating corporation |
|---|---|---|---|
| Morang District Session 1 | | | |
| 14th(Tue) | Mangadh | 18 | Morang WSSDO |
| 15th(Wed) | | 17 | Mangadh, Tanksinuwari, |
| 16th(Thu) | | 17 | Jhorahat, Rangeli, Katahari, Jamungachhi, Jatuwa |
| 17th(Fri) | Tanksinuwari, Jhorahat | 15, 9 | |
| Morang District Session 2 | | | |
| 19th(Sun) | Pathari | 18 | Morang WSSDO |

| | | | |
|---|---|---|---|
| 20th(Mon) | | 17 | Pathari, Urlabari, Salakpur, Haraicha, Letang |
| 21st(Tue) | | 17 | |
| 22nd(Wed) | Salakpur, Urlabari | 15, 9 | |
| Jhapa District Session 1 | | | |
| 23rd(Thu) | Dhurabari | 20 | Jhapa WSSDO Dhulabari, Kakarbhitta, Budhabare, Chandragadhi, Sanischare, Birtamod |
| 24th(Fri) | | 18 | |
| 26th(Sun) | | 19 | |
| 27th(Mon) | Kakarbhitta, Budhabare | 11, 12 | |
| Jhapa District Session 2 | | | |
| 28th(Tue) | Damak | 21 | Damak, Lakhanpur, Gauradaha, Topgachhi, Surunga, Juropani |
| 29th(Wed) | | 19 | |
| 30th(Thu) | | 19 | |
| 31st(Fri) | Gauradaha, Lakhanpur | 18, 20 | |

Contents of the training

- Understanding on water treatment process and the fundamental equipment
- Understanding on the importance of preventive maintenance
- Procedure of making a list of equipments
- Procedure of making a maintenance check-list
- How to implement daily and regular inspection
- Trouble shooting at the site

Task to be done by the trainees

- Preparation of a list of equipments of their own facility
- Preparation of a maintenance check-list for their own facility
- Setting of daily and regular inspection schedule
- Sort out actions for improving condition of the equipment pointed out by the JICA Expert during trouble shooting session.

It was necessary to clear out all of the contents shown to perform initiative and continuous maintenance by WUSCs themselves. The trainees prepared the list of equipments of their facility, performed maintenance, kept the record and took out some actions to improve the conditions of equipment pointed out, based on the training.

Response from the trainees

At the end of each training session, questionnaire survey about the training has been conducted. In general, there were a quite number of positive answers such as “It was very useful to learn maintenance methods of pumps, instruments, and other equipment.”, “I learned how important preventive maintenance is for the first time”. On the other hand, there were requests also to focus on more practical training at the site than learning theory at the classroom.

Originally, the training schedule had been planned to give some time for lectures in classroom for the purpose of promoting their understanding on basic water treatment process as the expert thought that would help every WUSC to improve impromptu measures taken so far while some practical trainings could be useful only to the limited WUSCs which did have tools appropriate to implement the

maintenance work.

The training session to be planned in future will focus more on the practical training such as assembling and disassembling of pumps to comply with the trainee's requests.

Some of the positive initiation created by the training is outlined below. If a maintenance patrol team is set up, the trainees from WSSDOs or WUSCs who demonstrated their positive attitude and initiative could be recommended as the team member.

Observations about the training

- Inside of an electrical panel was cleaned one day in the classroom after a lecture on the importance of the cleanliness.
- Some managers of WUSCs asked to get a sample of maintenance check list during the trouble shooting session at the site.
- Some operators gave a trial of actual operation and maintenance with their own equipment by themselves spending their time at intervals just after the lecture on the subject in the classroom.
- Some managers asked a general cost of insulation resistance tester after implementing trouble shooting with it at the site.
- Some trainees involved themselves so actively in the site training that they handled most of the actual hand work listening to the guidance from the JICA Experts.
- In and even after the lectures, some trainees sorted out troubles they were facing in their facility and derived solutions to overcome them from the notes they took in the lectures.
- Some operators requested the JICA Expert to review their original maintenance check list.
- Trainees took an initiative to take an individual note on a sheet of paper what they have learned from the training and shared it among themselves.
- Some trainees asked about the objective measures such as water pressure and electrical current showing the specification of their own facility.
- Some managers took an immediate action on site to achieve the requirement pointed out by the expert such as cleanliness of equipment and applying grease.
- Some members from WSSDO took an initiative attitude not only attending the lectures and discussion but also provided lectures to other trainees from WUSCs by themselves on the objectives of the training and O&M hereafter.
- On the mechanical OJT, the trainees were instructed to prepare equipment list at first. When confirming the completion status of the list, it has been found that some WUSCs were still preparing the list and some had not prepared at all. The WSSDOs verified the reasons of their unpreparedness and their understanding on the subject, and instructed them the objectives and method to prepare the list.
- After indicating that the stabilizer at Dhulabari WUSC has been placed at inappropriate place, they build a small storage room to place the stabilizer. They also arranged the cables in appropriate place as instructed. At Gauradaha WUSC also, the stabilizer cable from the electric

panel boards were hung downwards. After instruction they also arranged it appropriately.

4. WUSCs Support for Installation of the Management Model

1) Business planning workshop (Activity to support installation of the Management Model)

The JICA Expert conducted some workshops of business planning for the 6 WUSCs (Lakhanpur, Chandragadhi, Salakpur, Pathari, Urlabari, and Tankisinuwari) in August 2012, and from November 2012 to middle of February 2013 as part of the MAT activities.

The purpose of the workshops was to make a business plan in concrete for the next 15 years phase for each WUSC. First, necessary tables of the plan were prepared based on the actual data, and then were presented as in a report and presentation format. Considering that only a few WUSCs have own PC, the presentation materials of the business plan were explained to the stakeholders with a flipchart.

Through the workshops, the WUSCs gained the necessary management knowledge and skills such as revising the business plan, proper raise of water tariff, proper arrangement of personnel and a healthy financial management.

Not only in the 3 target WUSCs but also in Urlabari, Salakpur and Lakhanpur WUSCs, the business plans had been officially approved by a general assembly and they now operate their services based on the plan. The other WUSCs also intend to approve their business plans in the coming assembly which will be held next November through December.

In future, each WUSC will revise its own business plan with advice given by MAT.

Since ADB's Small Town Project had already assisted preparation of a business plan, the JICA Expert did not hold the related workshop for the 6 WUSCs of Damak, Surunga, Birtamod, Kakarbhitta, Budhabare and Rangeli. The JICA Expert did not hold the workshop in Topgachhi WUSCs either. The reason was that Topgachhi-1 just started its service in May 2012 and therefore the size of business is still too small to prepare a business plan. Topgachhi-2 cannot operate its service due to the facility trouble. Topgachhi-3 has problems with iron removal and water tariff collection. Even though it might be possible for the 3 WUSCs in Topgachhi to operate independently from technical point of view, it is recommended that they merge to secure an operational efficiency from managerial point of view. As for Sanishare WUSC, it was impossible to prepare a business plan due to its lack of management and financial baseline data before August 2012. The submission status of business plan is shown in **Table 3.49**.

**Table 3.49 Submission Status of Business Plan**

| | Business planning workshop | | | | | | |
|---|---|---|---|---|---|---|---|
| | WUSC | DATE | Table | Report | Powerpoint | Flip Chart | Notes |
| Jhapa | | | | | | | |
| J01 | Damak | | na | na | na | na | ADB's small Town Project prepares business plan |
| J02 | Lakhanpur | NOV 2012 | YES | YES | YES | YES | |
| J03 | Gauradaha | NOV 2011 | YES | YES | YES | YES | Target 3 WUSCs |
| J04-1 | Topagachhi-1 | | | | | | first they must merge. Business plan is too early for such small size water supply system |
| J04-2 | Topagachhi-2 | | | | | | not operate |
| J04-3 | Topagachhi-3 | | | | | | not operate properly |
| J05 | Surunga | | na | na | na | na | ADB's small Town Project prepared business plan |
| J06 | Birtamod | | na | na | na | na | ADB's small Town Project prepared business plan |
| J07 | Sanischare | | | | | | they have corruption problem and not have enough financial data |
| J08 | Budhabare | | na | na | na | na | ADB's small Town Project prepares business plan |
| J09 | Dhulabari | NOV 2011 | YES | YES | YES | YES | Target 3 WUSCs |
| J10 | Kakarhbitta | | na | na | na | na | ADB's small Town Project prepares business plan |
| J11 | Chandragadhi | JAN 2013 | YES | YES | YES | YES | |
| J12 | Juropani | | | | | | |
| J13 | Khajurgachhi | | | | | | |
| Morang | | | | | | | |
| M01 | Letang | | na | na | na | na | ADB's small Town Project prepares business plan |
| M02 | Salakpur | DEC 2012 | YES | YES | YES | YES | |
| M03 | Pathari | DEC 2012 | YES | YES | YES | YES | |
| M04 | Ulabari | JAN 2013 | YES | YES | YES | YES | |
| M05 | Haralcha | APR 2013 | YES | YES | YES | YES | Counter part conducts workshop in activity of MAT |
| M06 | Tankshnuwari | FEB 2013 | YES | YES | YES | YES | |
| M07 | Jhorahaat | APR 2013 | YES | YES | YES | YES | Counter part conducts workshop in activity of MAT |
| M08 | Mangadh | NOV 2011 | YES | YES | YES | YES | Target 3 WUSCs |
| M09 | Rangeli | APR 2013 | YES | YES | YES | YES | Counter part conducts workshop in activity of MAT |

2) Workshop of awareness program for good hygiene practice and roles of water supply

The workshop was held for the 5 WUSCs of Mangadh, Gauradaha, Dhulabari, Salakpur and Pathari. The purpose was to gain support from residents and enhance their understanding of the WUSCs activities. The workshop was also helpful in dissemination of good hygiene and water usage practices. This activity took indirect, mouth to mouth/bottom up approach. It started with explaining the necessity of good hygiene practices, and resulted in promoting the residents to understand the roles of water supply system. The workshop would eventually help to improve the water supply system coverage.

At the workshop, the JICA Experts explained with a flipchart that how people can take preventive measures against oral infection with good hygiene practices and use of safe water from the water supply system. In addition, as their tools for dissemination of the activity, educational materials for school kids and women's groups were also developed. Implementation record of awareness program workshop is shown in **Table 3.50**.

**Table 3.50 Implementation Record of Awareness Program Workshop**

| District | WUSC | Date | Flip Chart |
|---|---|---|---|
| Jhapa | Gauradaha | Nov. 2011 | Yes |
| Jhapa | Dhulabari | Nov. 2011 | Yes |
| Morang | Salakpur | Jan. 2013 | Yes |
| Morang | Pathari | Feb. 2013 | Yes |
| Morang | Mangadh | Nov. 2011 | Yes |

The Mangadh WUSC initiated several awareness program activities for pupils of primary schools and women's group meetings with the educational materials since the workshop. Furthermore, it

prepared pamphlets to introduce its business plan with the awareness program. The WUSC also presented its activity on the annual assembly and distributed pamphlets among the assembly attendees. Salakpur WUSC invited a local women's group to the workshop and developed the presentation materials jointly. The WUSC took a part in the awareness program for good hygiene practices implemented by the women's group for the local elementary school kids.

MIT Activities

1) MIT (Maintenance Inspection Team) Establishment: December 2012 - January 2013

MIT (Maintenance Inspection Team) was established in December 2012 to give instructions on conducting a proper O&M to WUSCs. This would not only strengthen the cooperation between DWSS/WSSDOs and WUSCs but also covers the lack of technical knowledge of WUSCs.

Persons in charge from DWSS, WSSDOs and some representatives of WUSCs agreed the main contents of MIT activities shown below.

- 2 teams would be established in each district (Morang, Jhapa)
- Each team would be composed of 2 WSSDOs staffs (Team Leader, Sub Leader) and 2 operators from each WUSC
- MIT Inspection shall be conducted every 3rd month, 4 times a year.
- After each inspection, MIT shall provide a report on the facility O&M condition and score for each WUSC in a standard format to DWSS.

In January 2013, the Experts conducted the 1st MIT inspection with the WSSDO staffs as MIT Team Leaders and Sub Leaders and DWSS staff as a supervisor of MIT activity. It was also on the job training for the MITs to learn the procedure of site inspection and how to give instruction on O&M to WUSC staffs. In response to the result of this activity, DWSS and the WSSDOs agreed that MIT can do the inspection for 2 WUSCs in a day in order to assure enough time to hear and share the problems of each WUSC at the site. They also agreed to hold an O&M Monitoring workshop to inform all target WUSCs in their district about the MIT activity and confirmed the schedule, agenda, and presenters of the workshop.

2) Refresher Training for MIT Members (WSSDO staff): February – March, 2013

The Experts conducted site training on WTP O&M, water quality management, distribution facility management and water meter management based on the SOPs for WSSDO staffs (MIT members) to follow up the 1st and the 2nd year trainings. The WSSDO staffs reviewed the significance of facility O&M, items to be checked and procedure of how to give instruction about trouble shooting at the site.

At the end of training, WSSDO staffs from both Jhapa and Morang and DWSS staff in charge of MIT activities discussed the difference of scores and share the check points of each inspection item.

As a result of this training, WSSDO staffs acquired enough knowledge and skills to conduct MIT

activity by themselves such as planning, implementation of the inspection and reporting from their next inspection scheduled in coming April.

3) O&M Monitoring Workshop: February 2013

On 10th February 2013, O&M Monitoring Workshop was held to inform the MIT activity to WUSCs and promote their cooperation to the activity. In addition to DWSS and the WSSDOs, staffs from 18 WUSCs participated and there were more than a hundred attendees as total.

The contents of the presentations given in the workshop are listed below.

＜DWSS＞

- Introduction of WASMIP, background of O&M monitoring workshop, O&M policy for this year and next year

＜WSSDO Chief＞

- Concept of Maintenance Inspection Team to be set up,
- Roles to play for each section (DWSS, WSSDO, MIT, WUSC)
- Sharing the annual plan for this year, Goal to achieve and Favors to ask WUSC for the activity
- Introduction of MIT Team Leaders and Sub Leaders

＜WSSDO Engineer (MIT Team Leader)＞

- Introduction of Actual Activity of the MIT, How to make the Preventive Maintenance Record

＜WUSC Operator＞

- On-site O&M Knowledge from WASMIP

At the workshop, the attendees actively asked questions and the workshop was a good opportunity for DWSS and WUSCs to directly discuss.

All the attendees made the preventive maintenance record for their own facility as a mission given through the questionnaire sheet to promote them to actively take part in the workshop. The WSSDO staffs, MIT Team Leaders and Sub Leaders, directly taught the procedure of making it to the attendees. The WSSDO staffs promised they would follow up and give more instruction to each WUSC at the site about the procedure which the attendees could not understand well when they do the next MIT inspection.

It was significant that the WSSDO staffs who are the main players of the MIT activity explained personally to WUSCs not only the purpose and policy of the activity but introduced the persons in charge and also the concrete schedule for the future inspection.

One of the remarkable achievements of the workshop was that the WSSDO staffs themselves had stronger awareness as the persons in charge of the activity. As soon as the workshop closed, WSSDO staff committed to implement the site inspections by themselves and make a report to DWSS and the Expert team.

Introduction of MIT Members

Attendees learning how to make O&M record with the support of MIT leaders

DWSS staff explaining the project

WUSC operator introducing how to check and maintain the equipment at the site

4) Monitoring and Follow-up of MIT Activities: August 2013

The Expert joined the 3rd site inspection conducted by the WSSDO staffs to monitor and follow up their MIT activity and check the publicity of the activity to the WUSCs.

The WSSDO staffs assured enough time to discuss problems of the WUSC with the chairman and manager at the each site. They made suggestions to the WUSCs after the discussion and wrote down some recommendations and countermeasures to be taken on the WUSCs' notebook of O&M record. The awareness that they shall take a roll of advisors and supervisor to lead the WUSCs in their district was more improved than the time when this activity had started.

Besides, it was seen that many WUSCs had already gathered in their conference room to welcome WSSDO staff when they visited so it seems that the communication between WSSDO and WUSCs was also improved compared to the previous situation.

The other outcomes in concrete found through the monitoring of MIT activity this time are introduced below.

Water Quality Management

- WSSDO staff monitored quality of water such as residual chlorine, pH, iron and M-alkalinity by means of utilizing the simple water quality analysis kit at the sites (Morang).
- As a result of the awareness improvement for water quality affected by the MIT activity, some

WUSCs started to implement or consider securing the budget for outsourcing water quality test.

Water Distribution Facility Management/Water Meter Management

- Intake and distribution flow meter had been newly installed at many WUSCs.
- Although these new flow meters were not granted by WSSDO but by DWSS, they were provided based on the request from WSSDO according to their MIT inspection result. It means DWSS was succeeded to respond the actual demand from the sites and the MIT activity functioned well as intermediary.
- Regular maintenance, record keeping and revising the existing distribution route map were properly implemented.

Maintenance of Mechanical /Electrical Equipment

- WSSDO staffs inspected the electrical leakage condition of equipment by means of insulation resistance tester.
- Because of this, the countermeasures are taken by searching the parts in trouble even though previously the equipment in trouble were ignored or was just replaced with a new one without any checking.
- Some WUSCs started to do some easy maintenance by themselves regularly such as cleaning an air filter and inside of electrical panels utilizing the preventive maintenance record.

The number of the WUSCs that recognized the importance of taking O&M records has increased. Their records included not only their water production but the water quality data, operational records of well pumps and generators, repair and regular maintenance records of water meters, water distribution facilities and the other equipment. What is better, they also improved their records keeping system and some WUSCs even customized the record format to fit their facility and management style more for ease and sustainability.

At the end of the activity, the expert made some suggestions to make MIT activity more sustainable and effective as is mentioned below.

- The MIT members shall share knowledge and skills within the team more so they will be able to cover each other when needed.
- Regular meetings should be arranged for MIT of Morang District and Jhapa District to share the information between the two districts.
- Cooperating with the WUSCs where the skilled and experienced operators work, setting up the site training or workshop would be effective in sharing their knowledge and skills widely in the districts.

MIT Team Leader giving instruction to make proper O&M records

MIT members testing the water quality using a simple analysis kit

**(56) Holding Liaison Conference for WUSCs**

Liaison conference for WUSCs has been held three times as a total in both Morang and Jhapa districts under the initiative of DWSS and the 2 WSSDOs where the outcomes of the Project were introduced.

On the 27th of August 2013, the final liaison conference was held as a part of Sharing Workshop for the project achievement in Eastern region. There were 90 attendees as a total from 27 WUSCs in Jhapa and Morang districts including the 3 target WUSCS and 14 WSSDOs in Eastern region.

In November 2011, as the 1st liaison conference, the workshop was held to introduce the business plan and the draft SOPs which had been developed as the outcomes of the Project by that time.

In November 2012, as the 2nd liaison conference, the workshop was held to introduce the drafts of the Management Model and the Support Model and the SOPs. At that time, these models were still in the process of formulation and were not completed thoroughly as the outcomes of the Project.

At the 3rd liaison conference held in August 2013 as mentioned above, the two Models, the SOPs, and the MET, MIT and MET activities composing the Support Model were introduced as the final outcomes of the Project and the discussions on its future utilization were made with the attendees.

At these liaison conferences, the 3 target WUSCs introduced their knowledge and outcomes developed through the Project. The summaries are shown below.

Dhulabari WUSC

- The facility O&M record keeping has been installed as a daily routing work after understanding the importance of it through the training given by the JICA Experts.
- Necessity of raising the water tariff can be logically discussed based on the business plan.
- The staff awareness not only on the production of water but its quality also has been highly improved.
- As for the facility O&M and management of WUSC, cooperation with WSSDO and DWSS will be also required in the future phase.
- The trainings and workshops implemented through the Project contribute to a sustainable development of WUSCs in a long-term.

- As a result of implementation of water quality management, the number of new connections has increased every year based on the service reliability improvement from the customers.

Gauradaha WUSC

- The business plan has been made with the guidance of the JICA Expert. Their service management is now operated based on the variable data and a 24 hours service plan. Further effort is required to respond the demand of about 150 new connections every year.
- As a result of the trainings and workshops implemented through the Project, more reliable and consecutive services are now available.

Mangadh WUSC

- Record keeping is the most significant factor of the facility O&M management.
- Since record keeping contributes to finding facility problems in the early stage, the record shall be tidily filed and stored at the site.
- It is necessary to secure proper human resources and regular monitorings for an efficient management and operation of WUSCs.
- They would take initiative to share the knowledge and technical skills given by WASMIP with other staffs and WUSCs.

**(57) Sharing Workshop on the Project Outcomes for ERMSO, WSSDOs and Other WUSCs**

On 27th August 2013, a workshop for introduction of the Management Model and the Support Model was held in Biratnagar. There were 90 attendees from 14 WSSDOs in Eastern region and 30 WUSCs in Jhapa and Morang Districts.

At the workshop, staffs from DWSS, ERMSO and 2WSSDOs introduced the WASMIP Model which consists of the Management Model and the Support Model. The Management Model is composed of Business Plan, the SOP for Water Treatment Plan O&M, the SOP for Water Quality Management, the SOP for Water Distribution Facilities and the SOP for Water Meter Management. They explained about the contents of those respectively and shared what had been achieved with this model.

The presentations given by the counterpart of the Project, DWSS, ERMSO and 2 WSSDOs, are listed below.

- Introduction of the Management Model
- The SOP on Water Quality Management
- The SOP on Water Distribution and Water Meter Management
- Introduction of Business Plan
- Introduction of the Support Model
- MIT/MAT/MET Activities

The presenters reported the activities based on the Model developed with DWSS, 2 WSSDOs and the targeted 20 WUSCs and introduced the operational procedures and outcomes. Especially for the MIT activity, which is one of the Support Model tools, it had installed a scoring system for WUSCs' facility

O&M performance by regular site inspection and the staff showed the scoring results in the presentation.

The staff explained the reasons for the difference of scores among WUSCs from three points of views. The highly scored WUSCs were the 3 WUSCs whose board members, managers, and staff had intentional trainings through the Project so it resulted in a good evaluation. As for the WUSCs which had got a remarkable improvement in the facility O&M score for the past half year, the reason was that they applied the Management Model. On the other hand, there are some WUSCs which could not get much improvement in this period due to the factors such as lack of personnel and budgetary resources, lack of knowledge and technical skills. It is expected that they would get a better improvement by following the instructions continuously given by WSSDO staffs through their regular MIT activities onwards.

Usability of the business plan was also introduced by the chief of CHRDU. The business plan is a component of the Management Model. CHRDU intends to give trainings for WUSCs to formulate their own business plan and the training opportunity could contribute to the Model dissemination.

In this workshop, there were attendees from other 9 WUSCs and 12 WSSDOs in Eastern region in addition to the project counterparts. Some of them showed their willingness to apply and utilize the Model. DWSS indicated they would support it and cooperate in the dissemination of the Model.

At the end of the workshop, DWSS gave a prize to the WUSCs with a high score in the last monitoring evaluation. Providing incentives to WUSCs is highly effective and significant for promoting them to take the initiative in improvement of their water supply services.

Introduction of the WASMIP Model by DWSS staff

Awarding Ceremony for the competent WUSCs

**(58) Sharing Workshop on the Project Outcomes for MoUD, DWSS and Other Donors**

The sharing workshop was held on 13th September 2013 at the DWSS conference room to introduce the draft Management Model and Support Model under the initiative of DWSS.

There were a total of 39 attendees including attendees from other organizations such as ADB, UNICEF, SWISS Embassy, MWSDB (Melamchi Water Supply Development Board), TDF (Town Development Fund) and DOLIDAR (Department of Local Infrastructure Development and Agriculture Roads).

At the workshop, the Management Model and the Support Model were introduced as 2 major contents of the WASMIP Model. As components of the Management Model, the contents of Business Plan, the SOP for Water Treatment Plan O&M, the SOP for Water Quality Management, the SOP for Water Distribution Facilities and the SOP for Water Meter were explained and what had been achieved with this model were also shared with all of the attendees..

The contents listed below are the topics presented at the workshop by the DWSS and WSSDO staffs.

- Introduction of the Management Model and Support Model
- The SOP on Water Quality Management
- The SOP on Water Distribution and Water Meter Management
- Introduction of Business Plan
- MIT, MAT, MET and practical training and Achievements

【Questions/Comments from other donors】

At the discussions session of the workshop, there were several questions and comments from other donors which could contribute to the further revision and implementation of the WASMIP Model in future. Below are the questions/comments:

UNICEF：

- What is required in advance to implement the Model?

  →DWSS Answer：

  WUSCs are required to prepare their business plan complying with the demand of the guideline in process of formulation.
- What is the input for implementation of the Model? How much would it cost and how does DWSS secure the budget to implement the Model?

  →DWSS Answer：In order to implement the Support Model, it is considered to establish the JICA Expert unit to deal with it. Even though how to put the Model into effect is more important than its cost, implementing the Support model itself does not cost much since it cost only some administration fee like not construction but a staff cost.
- What is the difference between Small Town Project and WASMIP?

  →DWSS Answer：Small Town Project mainly focuses on the renovation and expansion of the water supply facilities. On the other hand, WASMIP is giving opportunities for capacity development of water supply services from the management and technical point of view. Small

Town Project also can apply the WASMIP Model to the newly constructed or renovated sites.

- How can DWSS support all target WUSCs whose number might be more or less 300 all over the country?

→DWSS Answer：To apply the Management Model and Support Model to WUSCs, it is required to set criteria for screening and establish support system in all regions.

DWSS：

- The central lab in DWSS and the regional lab could apply for ISO by means of summarizing water quality management SOP and conducting quality control after preparing required analysis equipment.

ADB：

- Business plan could also deal with the contents of risk management.

SEIU：

- It is recommended that DWSS collect the water quality analysis data from each WUSC to make a statistic data store.

DWSS officially committed that it is going to approve the WASMIP Model and disseminate it to all of the other regions as their tools. DWSS stated that at first it is significant to promote all WUSCs to prepare their business plans and SOPs based on their own visions in order for DWSS to support them easier with the limited government budget. They will enhance the functionality of WUSCs by means of setting up screening criteria for WUSCs to apply for the Model and implementing water quality test at the sites.

DWSS also clearly mentioned that they are going to take the ownership of the Model and check the effectiveness of it by conducting M&E while they are disseminating it.

Picture of Sharing Workshop

Picture of Sharing Workshop

# CHAPTER 4 OUTCOME OF THE THIRD COUNTRY TRAINING IN THE KINGDOM OF CAMBODIA

## 4.1 Outline of the Training

### (1) Objectives of Training

The objectives of the third country training were Training of Trainers (ToT) for the counterpart personnel from MUD, DWSS and WSSDOs to enhance their understandings on the good management and O&M of facilities in water supply utilities. The training is expected to contribute on the enhancement of technical capacity of DWSS and WSSDOs.

### (2) Training Organization and Name of Training Course

The third country training was organized in Phnom Penh Water Supply Authority (PPWSA) and Siem Reap Water Supply Authority (SRWSA) in Cambodia from 1st December to 14th December 2012.
The PPWSA is one of the water supply authorities where human resource development in both technical and management fields has been successfully achieved relatively in a short duration of time through technical cooperation programs of the JICA. PPWSA now is providing training to Cambodian as well as overseas water supply utilities. With this background of the PPWSA, it had been selected as the training organization for the third country training to learn from its efforts and experiences on the improvement of the water supply management.
The SRWSA relies on groundwater for its water source and it has iron and manganese removal system. The WUSCs in the project area also have iron removal system as their source of water is also groundwater which contains high concentration of iron. The SRWSA was selected as another training organization in Cambodia to enhance the knowledge of trainees on the management of O&M of treatment facilities provided for the removal of high iron concentration in the groundwater.

a) Name of Training Course

i. Water Supply Management for Improvement of Technical Skill and Knowledge of Local Water Supply Utilities in Nepal
   Training Organization: Phnom Penh Water Supply Authority, Cambodia
ii. Water Treatment Plant Operation for Improvement of Technical Skill and Knowledge of Local Water Supply Utilities in Nepal
   Implementation institution: Siem Reap Water Supply Authority, Cambodia

b) Training Period

From 1st December to 14th December 2012 (including date for transfer)

c) Participants of Training

The selection of the participants from the list of C/Ps was done by MoUD which comprised of

counterpart officials from the ministry itself and from DWSS and 2 WSSDOs. The number of participants in the training from the aforesaid institutions was twelve persons in total (**Table 4.1**).

**Table 4.1 Number of Participants**

| Institution | MoUD | DWSS | WSSDOs | Total |
|---|---|---|---|---|
| No. of participants | 2 | 5 | 5 | 12 |

d) Subjects included in the Training

The main subjects included in the training were human resources management, water supply business management, O&M of WTP (including rapid sand filtration and iron removal process), water quality management, O&M of water distribution facilities and water meter control. The training curriculum was shown in **Table 4.2**.

**Table 4.2 Training Curriculum**

| Date | | Trainer | Training Menu | | Lecturer | |
|---|---|---|---|---|---|---|
| | | | Item | Content | Name | Position |
| 2012/12/3 | Mon | PPWSA | Lecture | Orientation & Human Resource Management | Mr. Khut Vuthiarith | Deputy General Director |
| | | PPWSA | Lecture | Business Management 1 | Mr. Long Naro | Deputy General Director |
| 2012/12/4 | Tues | PPWSA | Lecture | Water Treatment Plant (1) | Mr. Tan Bounneth | Chief of Phum Prek Water Treatment Plant |
| | | PPWSA | Site visiting | Site visiting in Phum Prek WTP | Mr. Tan Bounneth | Chief of Phum Prek Water Treatment Plant |
| | | PPWSA | Lecture | Water Treatment Plant (2) | Mr. Kem Kanvicheth | Vice-Chief of Electrical Section |
| | | PPWSA | Site visiting | Site visiting in Chroy Chanvar WTP | Mr. Kem Kanvicheth | Vice-Chief of Electrical Section |
| | | PPWSA | Discussion | Discussion | MoUD, DWSS | |
| 2012/12/5 | Wed. | PPWSA | Lecture | Water Quality Management | Mr. Keo Heng | Chief of Laboratory |
| | | PPWSA | Lecture | Water Distribution Facilities Maintenance | Mr. Pheng Ty | Deputy Director of Production and Distribution Department |
| | | PPWSA | Discussion | Discussion | MoUD, DWSS | |
| 2012/12/6 | Thur | PPWSA | Site visiting | Site visiting for distribution facilities | Mr. Pheng Ty | Deputy Director of Production and Distribution Department |
| | | PPWSA | Lecture | Water Meter | Dr. Chea Visoth | Deputy General Director |
| | | PPWSA | Lecture | Business Management 2 | Dr. Chea Visoth | Deputy General Director |
| | | PPWSA | Discussion | Discussion | MoUD, DWSS | |
| 2012/12/7 | Fri | PPWSA | Site visiting | WTP Construction Site | Mr. Pheng Ty | Deputy Director of Production and Distribution Department |
| | | PPWSA | Discussion | Discussion | MoUD, DWSS,PPWSA | |
| 2012/12/11 | Tues | SRWSA | Lecture | Present on overview of Siem Reap water supply system and future development plant | Mr. Cheav Chamny | Deputy General Director |
| | | SRWSA | Lecture | Iron and manganese removal of Siem Reap WTP operation process | Mr. Kong Sovan | Director of Production and Commercial |
| | | SRWSA | Site visiting | WTP site | MoUD, DWSS, SRWSA | |
| 2012/12/12 | Wed | SRWSA | Site visiting | Monitoring wells and household connections | MoUD, DWSS, SRWSA | |
| | | SRWSA | Discussion | Questions and discussion | MoUD, DWSS, SRWSA | |

### (3) Training Proceedings

The training included classroom lectures, site observation and discussions. A daily discussion meeting was set after the training to share the learning and to exchange opinions among participants which also helped to promote active participation of each and every participant in the training. The participants prepared reports on each lecture on the formats developed by the Experts which included notes on the lecture or site visits and participants personal judgment on the applicability of learning in the water supply utilities of Nepal and in their own job.

A discussion program with the officials and lecturers had been organized on the final day of the training at each of the training institutions, PPWSA and SRWSA, to exchange views and experiences

between Nepalese participants and Cambodian officials and lecturers. Some of the Japanese experts working in Cambodia were also presented in the discussion as the representatives from JICA Cambodia Office. The Nepalese participants demonstrated themselves as a well organized team and actively conversed with all of the participants in the discussion program.

Discussion with PPWSA

Discussion with SRWSA

**4.2 Training Outcome**

**(1) Training Outcome**

1) Learning and Knowledge Acquired from the Training

The learning and knowledge acquired from the training in the view of the participants were as follows:

- The water users' willingness to pay plays vital role in promoting legal connections thus reducing the illegal ones. Building good relationship and maintaining it through mutual communications with water users is important.
- Monitoring/Inspection team should be mobilized to prevent illegal connections.
- It is necessary to give responsibility and opportunity of promotion to the younger staff for human resources development.
- Incentive system such as increase in salary, bonus, and penal regulation are necessary.
- C-class water meter is the best in comparison to others recommended instead of A-class for ensuring accuracy and to reduce non-revenue water.
- Setup of leakage control team is also necessary to decrease non-revenue ratio.
- Preparation of checklist and keeping record is necessary to ensure proper O&M of facilities and for water quality control.
- Proper equipment and qualified staff are required for water quality analysis.

2) Utilization of Learning and Knowledge

The utilization of the learning and knowledge obtained from the training as mentioned by the participants in their own job are as follows:

- The performance evaluation of the staff shall be introduced unofficially to promote their motivation.

- An attempt shall be initiated to encourage each staff to set up their own target and make efforts for achieving it.
- The checklists for O&M of electro-mechanical equipment shall be prepared and water quality data shall be recorded.
- Information and results of water quality analysis will be disclosed to consumers.
- As-built drawings of water distribution facilities will be compiled and those shall be utilized for O&M activities.
- Standard Operation Procedure (SOP) will be prepared and action based on SOP shall be promoted.
- Technical improvement of the staff will be carried out continuously.
- The indicators adopted by PPWSA to demonstrate its success can also be used by WUSCs and DWSS to demonstrate their achievement.
- Issues regarding the operation as well as marketing for the operation of DWSS central and Regional laboratories shall be considered seriously
- The level of the groundwater shall be monitored
- DWSS shall provide guidance to WUSCs for reducing non-revenue water ratio.
- Workshop for consumers enlightenment should be held.

**(2) Seminar at DWSS**

After returning back to Nepal, participants of the training organized a seminar at DWSS building to disseminate the learning and knowledge gained in the training and to share experiences of Cambodia. They had summarized whole contents of the training thematically into three groups: 1) Human Resource & Business Management, 2) Water Treatment Plant & Water Quality Management, and 3) Distribution facilities & Water Meter Maintenance. Each group made presentation on Microsoft Power Point describing the training contents, learning from the training and their relevancy and applicability in water supply utilities of Nepal and in their own job.

Presentation by Trainees

Participants in the seminar

# CHAPTER 5 SUMMARY OF MID-TERM REVIEW AND TERMINAL EVALUATION

## 5.1 Summary of Mid-Term Review

The JICA Mid-term Review Team was dispatched to Nepal from 7th to 23rd November 2011 in order to conduct the mid-term review of the Project. The mid-term review was done according to the five evaluation criteria; Relevance, Effectiveness, Efficiency, Impact and Sustainability. In addition, revisions of the PDM were recommended by the Mid-term Review Team. These evaluation results were reported to the JCC held on 22nd November 2011. The results were accepted by the JCC and the Minutes of Meeting (M/M) on the evaluation results was signed between the Nepali side and the Japanese side.

An outline of the evaluation is presented below.

### 5.1.1 Conclusion of Mid-Term Review

**(1) Relevancy: High**

- The Project is aligned with national policies in Nepal, such as the National Water Plan 2005 and the National Rural Water Supply and Sanitation Policy 2004, which aims at strengthening of the safe drinking water supply and management system. The Project is also consistent with the needs of DWSS, WSSDOs and WUSCs, which need to be strengthened for sustainable water supply management.
- Project contents are coherent with Japanese Country Assistance Strategy to Nepal.
- The Project is appropriate to achieve improvement of water facility operation and management because a cycle of “Baseline survey- OJT/Workshop- Monitoring- OJT” is utilized.

**(2) Effectiveness: Moderate**

- Due to the low ownership of WSSDOs and limited understanding of DWSS to the Project management, the prospect of achieving project purpose related to technical support to 17 remaining WUSCs is low.
- On the other hand, the prospect of project purpose to improve water service in 3 WUSCs is high, as technical-knowhow transfer to them is making progress.

**(3) Efficiency: Relatively Low**

- Japanese inputs (experts, their expertise, equipment and others) are appropriate to make progress of project activities. However, both Japanese and Nepali side have not implemented the necessary inputs as planned in PDM.
- Communications among stakeholders should be improved to make the Project more effective.

**(4) Impact**

- Rating of Impact is not made because it is too early to review impact of the Project.

**(5) Sustainability: Relatively Low**

- At the 3 WUSCs, it is expected that they would manage and maintain water facilities by them as they establish fundamentals to keep outputs of the Project.
- Due to low participations of WSSDOs in OJT/workshop, WSSDOs have not gained enough technical and knowledge to develop 2 Models and to provide technical support to the 17 WUSCs by themselves. Further, DWSS is required to prepare for the budgetary arrangements to disseminate outcomes of the Project.

### 5.1.2 Recommendations by Mid-Term Review

**(1) Counterpart Personnel**

- In the half of the Project, sufficient counterpart personnel from WSSDOs were not involved in activities of the Project. Sufficient counterpart personnel for the Project should be allocated by DWSS and WSSDOs in the latter half of the Project.

**(2) Securing Budget**

- MoPPW (present MoUD) and DWSS are strongly requested to secure budget to carry on the activities to promote outcomes of the Project, especially to achieve project goals and overall goals.

**(3) Communications among Stakeholders**

- Involvement of DWSS and WSSDO in OJT/workshop is highly required not only to make it more effective, but also to play a role as an interface for language barrier between WUSC staff and Japanese Experts.
- It is strongly requested that MoPPW and DWSS make strong commitment to achieve overall goal and project purpose of the Project.
- Close communication and information sharing between JICA Expert and JICA Nepal Office is essential for appropriate project management based on actual situation.

**(4) The Support Model and the Management Model**

- Since development of the Support Model and the Management Model is scheduled in the latter half of the Project, the Project Team including DWSS, WSSDOs and Japanese Experts is requested to discuss contents of the Model immediately.

**(5) Intensive OJT Activity**

- The 3 WUSCs requested to extend OJT period, but it might not be feasible. Therefore, OJT should be conducted more intensively and practically within the designated period.

**(6) Training for Electric Mechanical Equipment**

- Training on repair, operation and maintenance for electric mechanical equipment is requested by the WUSCs. Basic training on this matter should be conducted and SOP should include how to cope electric mechanical equipment.

**(7) Provision of Spare Parts**

- Provision of spare parts for water supply facilities is recommendable for smooth implementation of the Project if necessary. Meanwhile, procurement flow of spare parts should be established and disseminated to WUSCs for sustainable management by DWSS and WSSDOs.

**(8) Overseas Training as One of the Project Activities**

- Overseas training should be conducted to match project implementation.

**(9) Networking of Resource Person**

- Since human resource of one organization is limited, not only resource of WSSDOs but also resource of DWSS, CHRDU, RMSO, WSSDO and WUSCs should be utilized for the training based on training subject. Thus, networking of resource persons, training on trainers (TOT) and certification of skilled staff in WUSCs should be considered.

**(10) SOP for Emergency Response**

- SOP for emergency response is requested to be developed to cope emergency cases such as stop of water supply and to recover as soon as possible. Practical training should be also conducted based on the SOP.

**(11) Public Relations**

- Activities which make the Project visible such as utilization of signboard, issue of News Letters and Brochure on the Project activity are highly recommendable.

**(12) Transportation**

- Since dissemination of the Management Model will be implemented during project period mainly by WSSDOs, provision of transportation should be considered as described in PDM to encourage this activity. At the same time, WSSDO has to cover fuel cost, travel allowance and daily allowance for extension activity.

**(13) Modification of PDM**

- Clarification of PDM has been done and the Team proposed draft PDM version 4. Based on the modified PDM, the Project Team is requested to clarify the framework of the Project.

### 5.1.3 Implementation on the Recommendations by Mid-term Review

**(1) Counterpart Personnel**

Jhapa and Morang WSSDO have committed that they assign 5 persons as Counterpart Personnel. Presently, the assigned persons are actively playing the role as a trainer for WUSCs staff under the assistance of the JICA Experts. In addition, CHRDU has been involved in the Project. It mainly takes care of non-engineering areas such as business planning.

**(2) Securing Budget**

When a workshop/conference is to be held, DWSS and the Expert Team always discuss about the allocation of its expenses. Budget allocation for procuring necessary spare parts/tools for the 2 WSSDOs and 3 WUSCs has been discussed and decided between DWSS/WSSDO and the Expert Team. The both sides secured the budget according to this decision.

**(3) Communications among Stakeholders**

Due to the high commitment of the DWSS top management to the project implementation, involvement of DWSS and WSSDO in OJT/workshop was much improved, and language barrier between WUSC staff and Japanese Experts is not found anymore.

Communication and information sharing between JICA Expert and JICA Nepal Office is being done day-by-day basis.

**(4) The Support Model and the Management Model**

At various opportunities such as meeting, conference, workshop/brainstorming, the Project Team including DWSS, WSSDOs and Japanese Experts had discussed contents of the both Model and disseminated its concept to WUSCs.

**(5) Intensive OJT Activity**

Regarding the OJT on maintenance of water distribution facilities and meter calibration control, a follow-up training was conducted for the 3 WUSCs in January 2012.

**(6) Training for Electric Mechanical Equipment**

Employing local experts, training on repair, operation and maintenance for electric mechanical equipment was conducted for the 3 WUSCs in January 2012. By this activity, the damaged sand washing pumps in Dhulabari STP were repaired and the sand washing facilities became able to be in operation.

**(7) Provision of Spare Parts**

Provision of necessary spare parts/tools for water supply facilities was planned. Some of them were delivered to the WSSDOs and 3 WUSCs in early March 2012.

**(8) Overseas Training as One of the Project Activities**

Overseas training in Cambodia was conducted in December 2012. (Refer to Chapter 4, Overseas Training)

**(9) Networking of Resource Person**

Presently, Committee Members of the 3 WUSCs are playing as a leading runner for other WUSCs in the opportunity of various workshop/conference. In the 3rd year, with the cooperation of CHRDU and JICA Experts, new trainers joined and conducted OJT from the trained staff of the 3 WUSCs.

**(10) SOP for Emergency Response**

It was developed in the 3rd year.

**(11) Public Relations**

The Public Relation such as producing leaflet was prepared and distributed to the citizens at the public awareness meeting. The nickname of the Project has been decided as "WASMIP" (Water Supply Management Improvement Project). The PR activities are extended in the 3rd year.

**(12) Transportation**

Four-wheel drive (4WD) vehicles one each to Jhapa and Morang Division Office were provided.

### 5.2 Summary of Terminal Evaluation

The JICA Terminal Evaluation Team was dispatched to Nepal from 11th February to 3rd March 2013 in order to conduct the terminal evaluation of the Project. The terminal evaluation was done according to the five evaluation criteria: Relevance, Effectiveness, Efficiency, Impact and Sustainability. These evaluation results were reported to the JCC held on 3rd March 2013. The results were accepted by the JCC and the Minutes of Meeting (M/M) on the evaluation results was signed between the Nepali side and the Japanese side.

An outline of the evaluation is presented below.

#### 5.2.1 Conclusion of Terminal Evaluation

**(1) Relevance: High**

- The overall relevance of the Project is high.
- While the 3 WUSCs of the Project were renovated or partially constructed by Japan's Grant Aid and received training on management and O&M of facilities in 2007, the needs of WUSCs for improving operational and management capacity of executive committee members and technical staff are high.
- A technical support system or structure from DWSS and WSSDO to WUSCs has been established, which created a strong need for building a support model for WSSDO and WUSCs. In order to realize an effective capacity development of WUSCs in the Morang and Jhapa districts, operation and management of each WUSC need to be improved with the proper support by DWSS and WSSDO/ERMSO.

**(2) Effectiveness: Relatively High**

- The overall effectiveness of the Project is relatively high.
- The prospect of achieving the Project Purpose based on the levels of achievement of the defined OVIs on the PDM is evaluated to be relatively high. Relating to the Output 2, the management model and the support model have been developed in cooperation with DWSS, RMSOs, WSSDOs and Experts, and they are currently in the initial implementation phase. DWSS and WSSDOs actively involved in the process of formulating the two models, for example, by assisting WUSCs in applying draft SOPs to their operation and revising the draft to cater for their needs.
- The development of the support model also contributed to enhancing communication and

collaboration among DWSS, ERMSO, WSSDOs and WUSCs in capacity development of WUSCs' operation and management.

- Until the end of the Project period, it is expected that WSSDOs provide the rest of the scheduled training for the other 17 WUSCs and assist them in applying SOP into their O&M and formulating a business plan. Considering the current levels and prospects of achievement on the defined three Outputs as well as the achievement level of indicators, it is evaluated that the Project has a good prospect of achieving the Project Purpose.
- It is the common understanding between the Nepalese and Japanese sides that the technical support system has been just established and it requires time to be incorporated into the annual plan as well as day-to-day practices of DWSS, WSSDOs and WUSCs. In the view of disseminating the two models in the future, it is important that the two models become well-established in the Jhapa and Morang districts until the end of the Project period.

**(3) Efficiency: Moderate**

- The overall efficiency is evaluated to be moderate.
- Until the Mid-Term Review, the inputs of Experts and C/Ps were not as effective as it was expected due to low involvement of C/Ps and a lack of close and frequent communications among C/Ps, Experts and JICA Nepal Office. After the Mid-Term Review, the involvement of C/Ps and communications among stakeholders were improved, which resulted in the conversion of appropriate inputs by the both sides to generate expected Outputs.
- Until the time of the Mid-Term Review, the roles and responsibilities of DWSS, ERMSO and WSSDOs in the Project as well as in the technical support system for WUSCs were not clearly defined and agreed by the Nepalese and Japanese sides, which made participation and cooperation among C/Ps rather difficult at the beginning of the Project. However, in the second half of the Project period, C/Ps demonstrated a good level of participation and commitment to the Project activities by involving in the formulating process of the two models and, in case of WSSDOs, willingly assuming responsibility of following up on O&M status of WUSCs.

**(4) Impact: Good potentials to generate a large scale of impacts**

- The Project has good potentials to generate a large scale of impacts
- While the prospect of achieving the Project Purpose by the end of the Project period is evaluated to be relatively high, the achievement of the Overall Goal is mainly dependent upon how effectively and efficiently the technical support model for WUSCs are established and implemented in other districts and regions on DWSS' initiative.
- While the support model and management model are presented to the 17 WUSCs and basic technical trainings have been offered, it is still unclear to what extent each WSSDO is capable of assisting WUSCs in applying SOP in their O&M and providing OJT when necessary. In 2012, the Government of Nepal approved the Directives on Operation of Water Supply Services, which stipulates the regular monitoring and inspection of WUSCs by DWSS through WSSDOs.

- Through the Project activities, WUSCs have started to achieve tangible progress toward institutionalizing the management model. The three target WUSCs have presented their business plans developed under the Project to the Users Committees' General Assembly and gained the approval, which formalized the long-term, medium-term and short-term vision and goals of the WUSCs.
- In addition, three (3) WUSCs voluntarily presented the Project achievements and good practices to other WUSCs in the eastern region at the WUSC Regional Federation. These initiatives of WUSCs are the signs of their belief in the Project's effectiveness and will contribute to the dissemination of the two models.

**(5) Sustainability: Moderate**

- At the time of the Terminal Evaluation, the Project is evaluated to have a moderate level of sustainability.
- The Project has laid down a foundation of DWSS' continuous monitoring and technical support system for WUSCs. However, ensuring and increasing the sustainability is largely dependent on continuous commitment and concrete actions by the Nepalese side, particularly with a strong leadership and coordination by DWSS.

The support model is considered as one of the tools to implement the Directives and expected to be reflected in the operational guideline of the Directives which is currently under preparation by DWSS. Based on the Directives, it was decided that additional budget was allocated to all the 75 WSSDOs for monitoring and inspection of WUSCs for improvement of their operation and maintenance. If DWSS reflects the support model in the operational guideline of the Directives, the impact and sustainability of the Project will be further increased. According to the Directives on Operation of Water Supply Services, DWSS approved the allocation of budget (50,000 rupees per district, 2012/13) for WSSDO's technical assistance to O&M of WUSCs. WSSDOs are expected to continue and maintain the implementation of the support model using the budget. While C/Ps are anxious about the limited technical capacity in O&M of electrical mechanical equipment, DWSS and WSSDOs have acquired skills to select the best available option (e.g., hiring local electrical mechanical technician) and plan the technical support for WUSCs accordingly. It is expected that application of the two models into WUSCs' daily practices continues to improve efficiency of WUSCs' operation and management. With the assistance of WSSDOs and 3 WUSCs, 17 WUSCs are expected to sustain the newly established practices of O&M based on the management model. Using the network strengthened by the Project, the management model and support model should be further spread among other districts and regions in the country with the lead of DWSS. Lastly, while the overall sustainability is evaluated to be moderate considering the current situation and prospects of institutional, organizational, financial and technical aspects, it is necessary for all the relevant organizations to demonstrate continuous efforts and commitment to the maintenance and implementation of the two models. In order to surely achieve the Project Purpose by the end of the Project, much effort to carry out the Project activities are

essential with collaboration among C/Ps, Experts and relevant organizations. In particular, leadership, commitment and effective coordination by DWSS is essential in order to increase the impact and sustainability of the Project.

### 5.2.2 Recommendations by Terminal Evaluation

**(1) Ensuring the Implementation of the two Models**

It is the common understanding among C/Ps and Experts that the management model and support model have just been established and started to be implemented. In order to revise and improve the models for dissemination to other districts and regions, it is recommended that DWSS, WSSDOs and WUSCs ensure the implementation of the two models in the Morang and Jhapa districts by the end of the Project period.

**(2) Strengthening Communication among C/Ps, Experts and JICA Nepal Office**

Reflecting the recommendation of the Mid-Term Review, communication among stakeholders has been improved comparing with the outset of the Project; however, much effort needs to be put forth for sharing the Project achievement and good practices with C/Ps, JICA Nepal Office as well as relevant development partners.

**(3) Obtaining Feedback on the two Models from Relevant Stakeholders including JICA Nepal office**

DWSS is expected to take a lead role to formalize the two models. Therefore, it is recommended that feedback and constructive criticism on the two models be obtained from relevant stakeholders such as World Bank, ADB, UNICEF and JICA Nepal office for refinement, improvement and finalization of the two models.

**(4) Reflecting the Support Model into the Operational Guideline of the Directives**

After the finalization of the two models, it is strongly recommended that the function of the support model be reflected in the operational guideline, which is under preparation, in order to generate synergetic effects and increase sustainability of the support model as well as the achievement of the Project.

**(5) Formulating a Specific Dissemination Plan of the two Models**

In order to disseminate the management model and the support model to WSSDOs and WUSCs outside of the 2 districts, it is necessary for DWSS to formulate a dissemination plan of the two models specifying districts and regions to be trained in the first phase of the dissemination, the procedures of technical training for WSSDOs, roles and responsibilities of RMSOs, CHRDU and DWSS central and regional laboratories, and budget allocation for the dissemination activities.

**(6) Presenting the Management Model and Support Model at the DWSS National and Regional Conferences**

In order to make the management model and support model known to other WSSDOs in the country, it is recommended that DWSS organize National Conference as well as Regional Conference with case presentation by Jhapa and Morang WSSDOs on two models, implementation process, and good practices. IT is recommended to establish WUSC conference committee at regional level.

**(7) Estimating Budget for the Implementation of the Support Model**

Based on the Project activities so far, it is recommended that Experts present the budget required for OJT, training workshop, conference, and activities relating to MIT, MAT and MET. Presenting the estimate amounts to DWSS and WSSDOs will promote the appropriate budget allocation for the implementation of the two models in the coming fiscal year.

Implementation and proposal to C/P on the Recommendation points of terminal evaluation are described in **Chapter 1**.

# CHAPTER 6 ISSUES AND PROBLEMS ENCOUNTERED, AND RECOMMENDATIONS

The WASMIP which commenced from January 2010 had encountered various problems. C/P's cooperation and participation are essential factors on technical transfer to C/Ps. Issues and problems encountered and recommendations are described below.

## 6.1 Issues and Problems Encountered and Recommendations

### (1) Unexpected Transfer of Counterparts

There have been unexpected transfers of C/Ps when it was less expected during implementation of the Project. This time, the transfer included most prominent C/Ps such as DG, DDG, Section Chief of Water Quality Improvement Section of DWSS, and both Division Chiefs including Engineers of Jhapa and Morang WSSDOs, who played core role as the project members. Such frequent personnel transfer can impose serious impacts on the sustainability of the project.

**[Countermeasures against Personnel Transfer]**

To ensure the sustainability of the Project, it is desirable to take into account the transfer of the C/Ps. However, personnel transfer is beyond the jurisdiction of DWSS, multiple participations from WSSDO and CHRDU as much as possible were proposed as the measures against this issue. Since there are 2 engineers from Jhapa WSSDO, it is very helpful for backup and complementary. While there is only one participant from Morang WSSDO as the other engineer transferred to elsewhere, the Division Chief of Morang himself participated in the workshop/OJT. It was requested to assign another engineer to take part in the Project. If the transfer of personnel is inevitable, the person who has been trained by the Project and is going to be transferred should train the person replacing him as his/her unavoidable duties provide necessary information.

Since the Maintenance and Inspection Team (MIT) which consists of 4 members in one team was established in the project, influence of unexpected transfer of counterparts can be minimized.

### (2) No Attendants from DWSS Counterparts to Training of Water Quality Management

On the training of Water Quality Management at DWSS Central laboratory, no one has been found assigned to the laboratory and there were no participants from W/Q section of DWSS on the training. There were participants only from regional laboratories, WSSDOs and CHRDU. The main objective of the Project was to assist DWSS to become the trainer to WSSDOs. Project sustainability was seriously under threat on such circumstances.

In addition, some parts of the training were forced to give up, because of non-operational condition of some equipment and instruments, lack of reagents and standard solutions. The Expert Team has requested DWSS to improve this situation.

**[Recommendations on Conducting Training of Water Quality Management]**

Re-establishment of DWSS central laboratory was suggested for the smooth implementation of training. The contents of re-establishments were prepared by the Expert and discussed with DWSS.

Further, the following points were recommended on assignment and mindset of C/Ps

- To assign the staff to DWSS central laboratory.
- To develop trainers from DWSS Central Laboratory, its staff need continuous training and their personal efforts as well, seeking for how to improve measurement accuracy, lower determination limit, detection limit, etc. The same approach should be followed at the regional laboratories also.
- To keep analyzers/instruments/equipment always in clean condition, even if there is no sample to analyze in both central and regional laboratories.
- To execute above mentioned activities, proper management and budget to procurement is a must.

Since a personnel transfer is unavoidable issue, it was suggested that a trainer who has been trained in OJT/workshop conduct the OJT to trainees.

**(3) Difference in Consciousness of WUSCs on Participation in Project Activities**

Out of the target WUSCs in Jhapa and Morang, some WUSCs did not permit their staff to participate in the OJT/Workshop conducted by the Project, which might be due to their insufficient understandings on the benefit of the OJT/Workshop. Such negative responses from WUSCs have affected on the expansion of project activities in the target WUSCs.

**[Conduct of Training for WUSC Management]**

Unless the WUSC management fully understands the benefit of the Project, their active involvement in the Project cannot be expected. In order to increase their understanding on the Project, it is recommended to conduct seminars and joint workshops on the project activities for the management of WUSCs were conducted. In addition, The WSSDO Engineers approached such WUSCs and tried to make them clear on the objectives of the project activities and persuaded them for the participation. The WUSC management fully understood the benefit of the Project due to seminar/workshop and WSSDO's persuasion.

**(4) Operation and Maintenance System of WUSC Water Supply Facilities**

It had been observed that DWSS/WSSDOs very seldom visit WUSCs to monitor their activities and to supervise them before commencing the project. There was nearly no communication among these organizations except sometimes in emergencies. The purpose of the Project is to enhance technical capacity of DWSS/WSSDOs for supervising WUSCs. However, until the actual situation of WUSCs could not be grasped correctly, effective supervision/instruction was difficult. Furthermore, taking into account the unexpected personnel transfer of the persons in charge, providing training only to

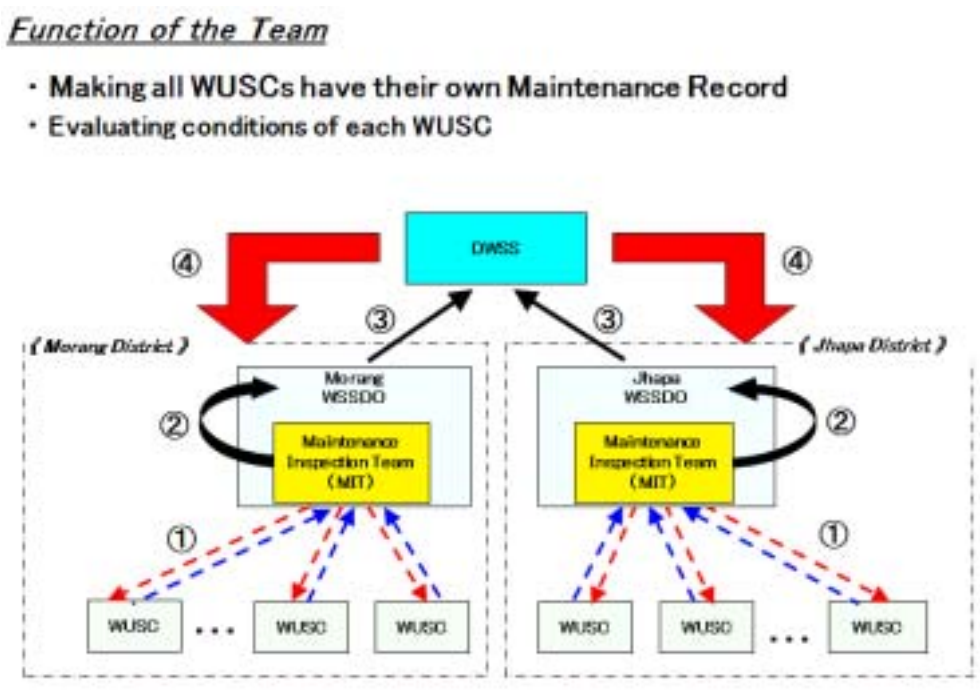
particular staff of WSSDO seemed to be not effective enough to achieve sustainable capacity building of WSSDOs.

**[Recommendation on Organizational Setup for Maintenance of Water Supply Facilities]**

As mentioned earlier, providing the training only to particular staff of WSSDOs is not effective enough to enhance sustainable capacity building. To cope with this, setting up of a Maintenance Inspection Team (MIT) was proposed as part of establishing "Water Supply Support Model". The team consists of persons in charge from WSSDO which helps WSSDO to directly and regularly understand the situation at the site and provides technical guidance to the WUSCs.

Settings up some routine work for the operation and maintenance activities were established in order to make handoff easier even in case if unexpected personnel transfer occurs again. This includes adoption of some rules such as frequency of inspection, filling up operation and maintenance activities properly and regularly on the specified formats, submission of reports etc., which were shared among the organizations.

The system of the Maintenance Inspection Team (MIT) is shown in **Figure 6.1**.




①Maintenance Inspection & Coaching ②Submission of Evaluation Report

③Submission of On-site Report ④Annual Workshop/Budget Allowance for O&M

**Figure 6.1 System of Maintenance Inspection Team (MIT)**

**(5) Development of Functional Water Supply Management Model and its Dissemination**

As the initial draft Management Model mainly referred to the concept of the Model, it was not always usable to WUSCs. It should include necessary elements for practical use such as goals of WUSCs to be attained and SOPs and the OJT/Workshop materials developed by the Project, so that WUSCs could

utilize it in their business operation as guidelines. The revised draft Management Model had been explained to the WUSCs several times in the workshops. However, utilizing the elements of the Model in the training conducted by WSSDOs, it needed to be disseminated to the target WUSCs in Jhapa and Morang in a practical manner.

**[Setup of Business Management Advisory Team]**

As part of establishing "Water Supply Support Model" similar to the Maintenance Inspection Team (MIT) mentioned in (4), setup of Business Management Advisory Team (MAT) was also recommended. Then the organized team (MAT) has executed the following tasks:

1) Business Management Advisory
   - To provide advice to WUSCs on business management affairs
   - To conduct performance review annually in collaboration with WUSCs. The review will be conducted using indicators and targets projected in the business plan.
   - The team will supervise overall business management of WUSCs.

2) Technical Advisory
   - To provide advice to WUSCs on technical affairs
   - To review technical plan, provide advice and data on water demand projection, cost estimate for rehabilitation/construction of facilities, design review.
   - To conduct annual review of achievement in technical plan in collaboration with WUSCs.

3) Financial Advisory
   - To provide advice to WUSCs on financial affairs
   - To review financial plan, provide advice and data on tariff setting
   - To conduct annual review of achievement in financial plan in collaboration with WUSCs.

It is recommended to assign a senior DWSS staff or former WUSC manager as the business management advisor for each of the WUSC. The advisors check the monthly report prepared by WUSCs, and if necessary/requested, they visit the WUSCs and give advice on business management.
The Management Advisory Team (MAT) is organized under DWSS as part of establishing "the Supply Support Model".

(6) Usability and Familiar for C/P on Management and Support Model

JICA Experts had prepared the draft Management model and Support model. These models needed to be more usability and familiar form for C/P

**[Revisions of Models]**

JICA Experts hired a Nepali local consultant to adjust the two models in the local context of Nepal in cooperation with DWSS. As a result of the revisions by the consultant and DWSS, the two models got more usability and familiar for C/P to utilize.

## 6.2 Other Matters that Affected Project Implementation

1) Political Disturbance (Bandha)

Restriction of domestic travel due to the political disturbances (such as Bandha) may hinder smooth implementation of the Project. It was necessary to watch the movement of the political situation.

2) Power Failure for Many Hours

Power failure occurs frequently; especially it is a long time a day during the dry season. The electricity must be available for OJT of O&M on WTP and water quality analysis. Therefore, such training was implemented during the rainy season when occurrence of power failure was few. In case of power failure, transportable power generator was rented.

# *Appendix*

- Minutes of Meeting of JCC, PMC -

**MINUTES OF MEETING**
**FOR THE FIRST JOINT COORDINATING COMMITTEE**
**ON THE PROJECT**
**FOR CAPACITY DEVELOPMENT ON WATER SUPPLY**
**IN SEMI-URBAN AREAS IN NEPAL**

The First Joint Coordinating Committee Meeting (hereinafter referred to as "JCC") on "The Project for Capacity Development on Water Supply in Semi-Urban Areas in Nepal" (hereinafter referred to as "the Project") was held on the 23rd February, 2010 with both the Nepalese and Japanese sides in attendance as in Annex 1.

As a result of the discussions in the JCC, both the Nepalese and Japanese sides agreed to the matters referred in the documents attached hereto, and that the Project shall be conducted accordingly.

Kathmandu, 23rd February, 2010

Toru Take
Senior Representative,
JICA Nepal Office
Japan International Cooperation Agency

Suman Prasad Sharma
Joint Secretary,
Ministry of Physical Planning and Works
The Government of Nepal

Satoshi Shibazaki
Team Leader,
Project for Capacity Development on Water Supply in Semi-Urban Areas in Nepal

NJS Consultants Co. Ltd. JICA Kanbara Team

Raj Kumar Malla
Director General
Department of Water Supply and Sewerage
Ministry of Physical Planning and Works

ATTACHED DOCUMENTS

1. Acceptance and Approval on the concept of the Draft Inception Report

The concept of the Draft Inception Report attached as ANNEX 2 is approved by the JCC members. The Inception Report will be finalized and submitted to both Nepalese and Japanese sides by the end of February, with revisions made according to comments from both sides.

2. Amendment on the Record of Discussions

(1) Change In Duration of the Project

The JCC agreed to amend the "IX. TERM OF COOPERATION" in the Attached Document of the Record of Discussions, as follows;

"The duration of the technical cooperation for the Project under this Attached Document will be 3 years and 9 months from **January, 2010**"

(2) Changing the title of "Steering Committee"

The JCC agreed to change the title of "Steering Committee (StC)" to "**Project Management Committee (PMC)**" and amend the Record of Discussions accordingly, including the title of "II of ANNEX V."

3. Provision by the Government of Nepal

The followings will be provided/organized by the Government of Nepal to the Project;

(1) Offices

3 Offices for the Project team, in DWSS, Jhapa WSSDO and Morang WSSDO

(2) Project Work Team

The Project Work Team (PWT) serves as the main implementing body under the consultation by JCC/PMC, headed by the **Section Chief, Foreign Aid Coordination and Planning Section, DWSS** as the Team Leader.

4. Revisions of Project Design Matrix(PDM)

The Project Design Matrix (PDM) which has been prepared formerly and signed as ANNEX VI-I of the Record of Discussions will be reviewed and revised in the next JCC, with the numerous goals set for all the indicators.

ANNEX:

1. List of Participants
2. Draft Inception Report

PARTICIPANTS ATTENDANCE JCC Date: 28 FEB, 2016

| | NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|---|
| 1 | Masanobu YUKI | JICA expert in MoPPW | engineer | |
| 2. | Yasuaki Momita | JICA, Nepal | Representative | |
| 3. | Noboru OZAKI | JICA | ex. Jica Expert | |
| 4. | Keiko Yamamoto | JICA | Senior Advisor | |
| 5. | SATOSHI SHIBAZAKI | JICA | PM | |
| 6 | Satoru Ebiki | JICA | JICA Expert | |
| 7. | PRATYOUSH JOSHI | 〃 | 〃 | |
| 8. | Jagannath pandey | WSSDO, Jhapa | Division chief | |
| 9. | Shyam Prasad Upadhyay | WSSDO, Morang | Division Chief | |
| 10. | Binu Bajracharya | MoPPW | Divisional Engineer | |
| 11 | Binod chandra Jha | DWSS | DDG | |
| 12. | Suman P Sharma | MoPPW | JS | |
| 13. | Raj Kumar Malla | DWSS | DG | |
| 14. | Ram chandra Sah | ERMSD | Reg. Chief | |
| 15. | Deepak Puri | DWSS | SDE | |
| 6 | Nawal kishor Mishra | CHRDU/DWSS | SE | |
| 17 | Birendra Man Shakya | WQIM/DWSS | SE | |
| 18. | Jyoti Kumar Shrestha | NGO&CMS/DWSS | SDE | |
| 19 | | | | |

## MINUTES OF THE MEETING (PCM No1)

I. Date and Time: Wednesday, April 20, 2010, 11:00 to 12:00

II. Place: Department of Water Supply and Sewerage Office (DWSS) 2F Meeting Room Kathmandu, Nepal

III. Present:

Mr. Krishna P Acharya
Joint Secretary, MoPPW
Mr. Raj Kumar Malla
DG, DWSS
Mr. Binod Chandra Jha
DDG, DWSS
Mr. Ram Chandra Sha
Regional Chief, ERMSO
Mr. Jagannath Purbey
Division Chief, Morang
Mr. Shyam Prasad Upadhyay
Division Chief, Jhapa
Mr. Deepak Puri
SDE, DWSS
Mr. Dan Ratna Shakya
SDE, DWSS
Mr. Kabindra B. Karki
SDE, DWSS
Mr. Jyoti Kumar Sharma
SDE, DWSS
Mr. Rajeeb Ghimire
SDE, MoPPW
Mrs Binu Bajracharya
DE, MoPPW
Mr. Prem Nidhi K.C
Sociologist

Mr. Deepak Poudyal
Chairperson, PAG
Mr. Prakash Adhikar
Program Coordinator,PAG i
Mr. Yasuaki Momita
Representative, JICA Nepal Office
Mr. Masanobu Yuki
JICA Expert on Water Supply Management
Mr. Krishna C Manandhhar
Sr. Loan Advisor, JICA
Mr. Satoshi Shibazaki
Team Leader, JICA Expert Team
Ms. Meriya Khadgi
Secretary, JICA Expert Team

IV. Discussion

1. Mr. Jha started meeting by welcoming all.
2. Mr. Shibazaki briefly explained about the agenda of the meeting.
   i. Briefly explained and commented on Joint site survey in 3 WUSC by JICA Expert Team.
   ii. Briefly explained about the Site office preparation which is almost completed.
   iii. Informed that SILT is contracted for Base line and C/A Survey and they started work from 3 days ago.
   iv. Introduced PAG, which is NGO contracted for Conflict management.
   v. PWT requested to set up and verification of personal list from related organization.
   vi. PWT requested % of rate of improvement of overall goal in Nepal, % of rate of improvement of project purpose in target area.
   vii. PWT also requested for information of total number of WUSCs in target area and/or in Nepal.
3. Regarding Conflict Management
   i. Mr. Prakash Adhikari, Program Coordinator, "PAG" briefly explained about their program approach for conflict management which included followings:-
   - ✧ Explained about common conflicts in community based water management and Stage of Facility construction.
   - ✧ The project objective is to gain overall goal in long term peace process through the conflict management.
   - ✧ For one of the target area, they proposed Ilam, but PMC rejected the proposal for water supply facility there is operated by Municipality which is out of the target area. Mr. Jha suggested in consent with DG Mr. Malla to select Dhankuta WSP as fourth target area. And Mr. Shibazaki told them to review contract paper once again for they have to accept the proposal where ever PMC decides.

   ii. Joint Secretary suggested that categorizing conflict issues is more important.
   iii. Mr.DG suggested that objectives should be simple, practical and tangible so that previous experience would not repeat again in any other areas.
   iv. Mr. Shibazaki explained that this project is only of 3 days seminar for 4 locations to organize dialogue and start establishing the mediation for peaceful solution among stakeholders.
   v. Lastly Mr. Shibazaki asked PAG to submit inception report as soon as possible including selection of 4 locations as baseline survey.



Sat

4. Mr DDG informed that PMC has been decided following information -
   i. Total number of WUSC in target area or in Nepal will be decided soon
   ii. Set up PWT organization and person responsible will be provided soon
   iii. XX% will be determined after receiving numbers of total WUSC's
   iv. Tentative Management-Effect indicators will be reviewed
   v. Personnel list and position for JCC, PMC as well as PWT will be provided

5. All information about (4) will be brought to the JCC to change R/D

| | |
|---|---|
| Mr. Binod Chandra Jha | Satoshi Shibazaki |
| Deputy Director General, DWSS | JICA Expert Team Leader |

PARTICIPANTS ATTENDANCE PMC Meeting (KTM) 2010/4/20

| NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|
| YUKI Masanobu | JICA in MoPPW expert | JICA expert | |
| Binu Bajracharya | MPPW | D.E. | |
| Prem Nidhi K.C. | DWSS/ERDD | Sociologist | |
| Jagannath pubey | WSSDO, Jhapa | Division chief | |
| Dan Ratna Shakya | DWSS/WQIMS | S.D.E. | |
| Kabindra R. Karki | DWSS/M&E unit | SDE | |
| Deepak pradhan | PAC. Mechi | chairperson | |
| Prakash Adhikari | " | Program coordinator | |
| Shyam Prasad Upadhyay | WSSDO Morang | Division Chief | |
| Deepak Puri | DWSS | SDE | |
| Binod chandra Jha | " | DDG | |
| Krishna P. Acharya | MoPPW | Jt. Secretary | |
| Raj Kumar Malla | DG | DWSS | |
| Ram chandra Sah | E. Reg. Chief ERMSO | E. Reg. chief | |
| Rajeeb Ghimire | MoPPW | SDE | |
| Yasuaki Horita | JICA | Rep. | |
| Krishna C. Manandhar | JICA | Snr. Loan Adv. | |
| Jyoti Kumar Shrestha | DWSS | SDE | |
| SATOSHI SHIBAZAKI | JICA EXPERT | | |
| Meriya Khadgi | NTS | adm. secretary | |
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Government of Nepal
Ministry of Physical Planning and Works
Department of Water Supply and Sewerage
Maharajgung, Kathmandu, Nepal

Phone No. 4-413744, 4-414539, 4-418253, 4-444433, 4-413670
Fax No. 4-419802

Ref. No. PWT-011/2010

Date: September 29, 2010

To,
Water Supply Division, MoPPW
Mr. Binod Chandra Jha, DDG/Project Manager, DWSS
Regional Monitoring and Supervision Office, Dhankuta
JICA Nepal Office, Pulchowk, Lalitpur
WSSDO, Biratnagar, Morang
WSSDO, Chandragadhi, Jhapa
Mangadh WUSC, Biratnagar, Morang
Dhulabari WUSC, Dhulabari, Jhapa
Gauradaha WUSC, Gauradaha, Jhapa
Water Quality Improvement and Monitoring Section, DWSS
Human Resource Development and Research Section, DWSS
Progress Monitoring and Evaluation Section, DWSS
NGO and Community Mobilization Section, DWSS

**Subject: Minutes of Second JCC Meeting**

Dear Madam/Sir,

Minutes of Second Joint Coordination Committee (JCC) meeting of the Project for Capacity Development in Semi-Urban Areas in Nepal held on 20th September 2010 at DWSS is attached herewith for your perusal.

Let me express my sincere thanks and appreciation for your active participation in the meeting.

Sincerely yours,

**(Deepak Puri)**
Section Chief /PWT Team Leader
Foreign Aid Coordination and Planning Section

CC: Mr. Satoshi Shibazaki, Team Leader,
JICA Expert Team/ NJS Consultants Co.,Ltd.

**MINUTES OF MEETINGS**
**FOR THE JOINT COORDINATING COMMITTEE (II)**
**ON THE PROJECT**
**FOR CAPACITY DEVELOPMENT ON WATER SUPPLY**
**IN SEMI-URBAN AREAS IN NEPAL**

The second Joint Coordinating Committee Meeting (hereinafter referred to as "JCC") on "The Project for Capacity Development on Water Supply in Semi- Urban Areas in Nepal" (hereinafter referred to as "the project") was held on the 20th September, 2010 with both the Nepalese and Japanese sides in attendance as in Annex 1.

As a result of the discussions in the JCC, both the Nepalese and Japanese sides agreed to the matters referred in the documents attached hereto, and the project shall be conducted accordingly.

Katmandu, 20th September, 2010

Toru Take
Senior Representative
JICA Nepal Office
Japan International Cooperation Agency

Gajendra Kumar Thakur
Director General (JCC Chairman(CO))
Department of Water Supply and Sewerage
Ministry of Physical planning and Works

Satoshi Shibazaki
JICA Expert, Team Leader
Project for Capacity Development on Water Supply in Semi-Urban Areas in Nepal

Binod Chandra Jha
Deputy Director General (PMC Chairman)
Department of Water Supply and Sewerage
Ministry of Physical Planning and Works

**Discussions:-**

Meeting was started with the opening speech of DDG Mr. Binod Chandra Jha and it was followed by the explanation of Mr. Shibazaki of Appendix 1-1 Implementation of the Project.

A. Main Points from Mr. Shibazaki:-

1. Mr. Shibazaki explained about the working schedule and summary of Baseline survey done by SILT co. During the explanation he focused little bit more on water tariff rates and expressed that Dhulabari WUSC seems to be charging little more comparatively than other two WUSCs.
2. Mr. Shibazaki explained about the C/A and informed that the data mentioned there shall be used in future study.
3. About the evaluation of Institutions, Mr. Shibazaki expressed that management of all 3 WUSC seems good and they only need to improve in the operational matter as they lack staff for O/M.
4. About Business Management and Operation focused on the matter of lacking water production rate of 2 WUSCs (Dhulabari and Gauradaha) and expressed the improvement needed as they are producing water below than their capacity level.
5. About the Improvement Scheme Mr. Shibazaki remarked the necessity of cooperation of DWSS towards WUSCs and also expressed the points in which some kind of report is needed to be prepared by the WUSCs for improvement in future.
6. About the OJT, Mr.Shibazaki told that OJT will be implemented as per TOR in the coming years as well.
7. Mr. Shibazaki suggested WUSC to improve O/M manual themselves as existing O/M manual is only a guideline for them.

B. Explanation from Mr. Puri about comments of WUSCs during Liaison Conference.

1. WUSCs want the training to be continued in coming years as well.
2. WUSCs want good interpreter during training session.
3. WUSCs preferred practical classes rather than theoretical classes.

C. Comments from WUSCs

(i) Gauradaha WUSC, Chairperson Mr. R.B Basnet.

1. Training was beneficial.
2. Practical classes are needed.
3. Provision for tools.
4. They want to have knowledge about the panel board as they are facing problem during the breakdown.
5. Due to the training they started doing backwash daily and that improved water quality a lot.

(ii) Dhulabari WUSC, Chairperson Mr. B.Nembang

1. Overall training was beneficial but it would be better if included practical classes.

(iii) Mangadh WUSC, Chairperson Mr. R.B. Ghimire

1. Overall training was beneficial but wants to have electro mechanical training.

D. Comments from JICA

(i) Mr. Take Toru

1. Mr. Take Toru took the JCC meeting as good opportunity for reviewing major issues and knowing present condition of the project.
2. Mr. Take Toru wished to take actions based upon the meeting and appreciated the work of MoPPW and DWSS.

(ii) Mr. Momita Yasuaki

1. Mr. Momita reminded to change the StC to PMC and the Project Period to January 2010 to September 2013 in PDM as it was approved by 1st JCC meeting.
2. Mr. Momita wishes for the similar achievement in following years as well from the project.

E. Comments from Regional Chief (ERMSO), Mr. R.C.Sah

(i) Mr. Sah requested to address the issues raised by WUSCs, especially training regarding the maintenance of electro mechanical equipments and management for good interpreter.

F. Comments from DDG, Mr. B.C. Jha

(i) DDG expressed his gratitude to JICA and NJS for achievements.
(ii) DDG assured continuous support from DWSS in the implementation of the project)
(iii) DDG also told that DWSS will replicate the experience of this project in other projects in future.

G. Closing speech and Comments from DG, Mr. G.K. Thakur

(i) DG appreciated the report prepared by NJS as it contained each and every single data in detail.
(ii) DG accepted that the meeting this time has not been well managed and expected that will be better managed from next time.
(iii) DG expressed gratitude to JICA for conducting such project.
(iv) DG also assured JICA that every single yen invested in this project will be worthwhile.
(v) DG also informed JICA that they are preparing the proposal regarding to water quality improvement project and will soon submit that to JICA.

**Issues approved by the JCC:-**

1. The following indicators of the PDM are set and approved by JCC;

   Indicator 1 of "Overall goal"

   "44 WUSCs (17% of all WUSCs) are strengthened by the support of DWSS."

   Indicator 1 of "Project Purpose"
   "Based on the technical support manual established by DWSS/RMSO/WSSDO, the support system to 17 remaining WUSCs (100% of all WUSCs in Jhapa/Morang districts) is implemented."

   Indicator 3-1 of "Output 3"
   "17 WUSCs (100% of all WUSCs in Jhapa/Morang districts) made a plan to conduct "Small and Medium-sized Water Supply Management Model"."

2. Approval of Formation of Liaison Conference Committee.
   During the Liaison conference held on 14th Sep 2010 at Biratnagar, Liaison Conference committee has been formed of 11 members and among them Chairman, Vice chairman and Secretary were selected for the coordination between DWSS, ERMSO, WSSDO and WUSCs and further more to share the experience gained from this project to rest 44 WUSCs which will be implemented in future under DWSS. From now onward detail operational schedule will be decided by the committee so formed.

3. There is no change in PO and JCC approved that.

Annex:
i) List of Attendance
ii) PDM Ver.No. 3
iii) PO Ver.No. 3

Annex 2

# Project Design Matrix (PDM) 20100920

Project Name: The Project for Capacity Development on Water Supply in Semi-urban Areas in Nepal
Period: January 2010 - September 2013
Target Area: Morang District & Jhapa District
Ver. No. : 3
Target Group: DWSS, WUSCs & Water Users (Approximately 21,000)
Date: 20 September 2010

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumption |
|---|---|---|---|
| **Super Goal**<br>Safe drinking water will be supplied stably in Semi-urban areas in Nepal. | Numerous households of which the safe drinking water can be supplied. | 1. Statistics reports of MoPPW (5 year Plan, etc.)<br>2. Statics of MDGs | |
| **Overall Goal**<br>DWSS technical support model for WUSCs established by the Project will be disseminated to all over the country by MoPPW & DWSS. | 1. 44 WUSCs (17% of all WUSCs) are strengthened by the support of DWSS.<br>2. The DWSS technical support model reflects to annual schedule of every RMSO & WSSDO. | 1. DWSS annual report<br>2. DWSS annual report | 1. The construction of appropriate water supply facilities are promoted.<br>2. People's awareness for the importance of safe water is improved. |
| **Project Purpose**<br>DWSS technical support system in WUSCs is improved in Morang and Jhapa districts. | 1. Based on the technical support manual established by DWSS/RMSO/WSSDO, the support system to 17 remaining WUSCs (100% of all WUSCs in Jhapa/Morang districts) is implemented.<br>2. The safe drinking water services by 3 WUSCs is improved in comparison with beginning of the Project. | 1-1 WUSC annual report (Management, Water Quality Monitoring, Future Business Plan)<br>2-1 DWSS monitoring report<br>2-2 Annual/periodical reports of DWSS/RMSO/WSSDO<br>2-3 Support Activity Report of WSSDO | 1. Necessary budget for expansion of WUSC support model in semi-area is allocated. |
| **Output**<br>1. Basic information for the Project and necessary information for indicators are collected, and water supply management of the Project is appropriately executed and implement periodically monitoring for appropriate water supply management.<br>2. "Small and Medium-sized Water Supply Support Model" and "Small and Medium and Medium-sized Water Supply Support Management Model" are collected as models for WSSDO/ERMSO and WUSC.<br>3. Model of Output 2 is disseminated in Jhapa/Morang districts. | 1-1 PDM is revised.<br>1-2 Monitoring for indicators is regularly executed.<br>2-1 "Small and Medium-sized Water Supply Support Model" manual and "Small and Medium and Medium-sized Water Supply Support Management Model" manual are completed.<br>3-1 17 WUSCs (100% of all WUSCs in Jhapa/Morang districts) made a plan to conduct "Small and Medium-sized Water Supply | 1-1 Revised PDM<br>1-2 Monitoring report<br>2-1 "Small and Medium-sized Water Supply Management Model"<br>2-2 "The support manual for WUSC"<br>3-1 WUSC annual reports<br>3-2 ERMSO/WSSDO/DWSS annual | 1. National Water Policy is not changed drastically.<br>2. Authority of DWSS including ERMSO/WSSDO is not changed drastically.<br>3. Counterpart personnel of the Project works continuously |

## Annex 3

**Tentative Plan of Operation (PO) 20100920**

Ver. No.3

**Project Name: The Project for Capacity Development on Water Supply in Semi-urban Area** Duration: January 2010 - September 2013

| Japanese Fiscal Year/Contract Period | | JFY(2010 (Stage-1) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nepal Fiscal Year | | NFY | | | | | | | | | | | |
| | | 2010 | | | | | | | | | | | |
| Description | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | | ▲ | | | | ▲ | | | | ▲ | | ▲ | |
| | | IC/R | | | | R/ | R/C/A | | | | C/R1 | WP | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1-1 | To conduct baseline survey in the target areas | | | | | | (3) | | | | | | |
| 1-2 | To conduct capacity assessment (technical/management/organization/financial) for DWSS, Eastern RMSO, WSSDO in Jhapa and Morang, 3 WUSCs | | | | | | (4) | | | | | | |
| 1-3 | To confirm current situation of water supply support by other organizations and other donors in the target areas. | | | | | | | | | | | | |
| 1-4 | To make a draft of revised PDM/PO by using information collected Activity 1-1, 1-2 and 1-3. | | | | | | | (5) | | | | | |
| 1-5 | To approve the Project direction including a revised PDM and Project progress in JCC and PMC | | | | | | | (6) | | | | | |
| 1-6 | To conduct monitoring of indicators regularly by PMC | | | | | | | | | | | | |
| 2-1 | DWSS formulates revised job descriptions for regularly supporting WUSC for DWSS/RMSO/WSSDO | | | | | | | | | | | | |
| 2-2 | WSSDO in Jhapa/Morang districts conducted technical support and training for 3 WUSCs as below. | | | | | | | | | | | | |
| | (1) O&M on WTP and distribution facilities | | | | (12) | | (13) (14) | | | (11, 12) | (13, 14) | | |
| | (2) Water quality monitoring | | | | | | | | | (15) | | | |
| | (3) Meter reading and meter accuracy | | | | | | | | | | (16) | | |
| | (4) Efficient billing | | | | | | | | | | (18) | | |
| | (5) Customer ledger | | | | (19) | | | | | | (19) | | |
| | (6) Claim management | | | | | (20) | | | | | (20) | | |
| | (7) Use's education for saving water | | | | | | | | | | (17) | | |
| | (8) Formulation of WUSC's annual report | | | | | (21) | | | | | (21) | | |
| | (9) Formulation of mid-term/long-term business plan | | | | | | | | | | | | |
| 2-3 | DWSS conducted training for staff of WSSDO in Jhapa/Morang and ERMSO as below. | | | | | | | | | | | | |
| | (1) Coordination/solution, obligation among stakeholders | | | | | | (9) | | | | | | |
| | (2) Planning, design and execution for facilities | | | | | | (10) | | | | | | |
| | (3) Performance for water supply monitoring etc | | | | | | (7) (8) | (8) | | | | | |
| 2-4 | WSSDO completed "Small and Medium-sized Water Supply Support Model" for technical support of WUSC and "Small and Medium and Medium-sized Water Supply Support Management Model" for WUSC based on Activity 2-2 and 2-3. | | | | | | | | | | | | |
| 3-1 | WSSDOs in Jhapa/Morang districts conducted technical trainings for other WUSCs in Jhapa/Morang | | | | | | | | | (22) | | | |
| 3-2 | WSSDOs in Jhapa/Morang districts established a liaison conference for WUSCs and conducted the technical exchange workshop. | | | | | | | | | | | | |
| 3-3 | MoPPW/DWSS holed a liaison M&E conference including related organizations/local authorities | | | | | | | | | | | | |
| 4 | Training in Third Country and Japan | | | | | | | | | | | | |
| 5 | Report (SOP/Model) | | | | | | (12, 14) | | | | (12, 14, 16) | | |
| 5-1 | Evaluation | | | | | | | | | | | | |
| 5-2 | JCC/PMC | | | (5) | | | | (6) | | (6) | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Manning Schedule (Field Work) | Team Leader/Water Supply: Satoshi SHIBAZAKI | | | | | | | | | | | | |
| | Water Treatment Plant O/M/Water Quality Management: Tetsuo IZAWA | | | | | | | | | | | | |
| | Improved Management /Administration Strengthening: Toru SUETAKE | | | | | | | | | | | | |
| | Water Distribution Facilities Management and a Plan, Satoru ONIKI | | | | | | | | | | | | |
| | Operational Coordination: Joshi PARIYOUSH | | | | | | | | | | | | |
| Month | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 |

PARTICIPANTS ATTENDANCE — JCC Meeting — Date: September 20, 2016

| | NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|---|
| 1 | G. K. THAKUR | DWSS | DG | |
| 2 | B. C. JHA | DWSS | DDG | |
| 3 | BB Kunwar | MoPPW | DE | |
| 4 | B. R. Bhandari | WUSC (Gaushala) | ~~Secretary~~ secretary | |
| 5 | R. Basnet | " " | Chairman. | |
| 6 | K. B. Karki | DWSS | SDE | |
| 7 | (Badhang Nembang) | WUSC, Dhulabari | chairperson | |
| 8 | (Indra Bahadur Baltantaw) | " " | Secretary | |
| 9 | J. purbey | WSSDO, Jhapa | Div. chief. | |
| 10 | Shyam Pd. Upadhyay | WSSDO, Morang | Division Chief | |
| 11 | Ramchandra Sah | ERWSO, Dhankuta | Regional Chief | |
| 12 | Deepak Puri | DWSS | SDE | |
| 13 | TAKE TORU | JICA | Senior Representative JICA | |
| 14 | Yasuaki Momita | JICA | Representative | |
| 15 | Birendra Man Shakya | DWSS | Chief, Water Quality Section | |
| 16 | Chok Pd. Dhital | DWSS | Engineer | |
| 17 | Nam B. Ghimire | WUSC (mangalik) | chairperson | |
| 18 | Durga chapagain | WUSC ( " ) | secretary | |
| 19 | [illegible] | JICA/NJS | Team Leader | |
| 20 | Satoru Ohiki | JICA | Expert | |
| 21 | Meriya khadgi | JICA/NJS | Secretary | |
| 22 | Sudikshya Nakarmi | JICA/NJS | Secretary | |
| | | | | |

Set

**MINUTES OF MEETINGS**
**FOR THE JOINT COORDINATING COMMITTEE**
**ON THE PROJECT**
**FOR CAPACITY DEVELOPMENT ON WATER SUPPLY**
**IN SEMI-URBAN AREAS IN NEPAL**

The Third Joint Coordinating Committee Meeting (hereinafter referred to as "JCC") on "The Project for Capacity Development on Water Supply in Semi- Urban Areas in Nepal" (hereinafter referred to as "the project") was held on the 11th February, 2011 with both the Nepalese and Japanese sides in attendance as in Annex 1.

As a result of the discussions in the JCC, both the Nepalese and Japanese sides approved the second year's work plan report including PO, and the project shall be conducted accordingly.

Katmandu, 11th February, 2011

Norihisa Taoka
JICA Expert, Team Leader
Project for Capacity Development, Water Supply in Semi-Urban Areas in Nepal

Gajendra Kumar Thakur
Director General (JCC Chairman)
Department of Water Supply and Sewerage
Ministry of Physical planning and Works

Binod Chandra Jha
Deputy Director General (PMC Chairman)
Department of Water Supply and Sewerage
Ministry of Physical Planning and Works

Discussions:-

Meeting was started with the welcome address of DDG Mr. Binod Chandra Jha and welcome Remark of DG Mr. Gajendra Kumar Thakur and it was followed by the explanation of Mr. Noshihira Taoka about the basic policy of project implementation.

A. Main points from Mr. Norihisa Taoka

1. Mr. Taoka explained the major issues found during OJTs/trainings in the 1st year of the project which included:- power failure, participation status of C/P, inappropriate management of Simple Water Quality analysis kits and chemical reagent, unused water meter calibration equipment in Itahari and shortage of tools and equipments for electrical machinery inspection and repair.
2. After explaining about the issues, Mr. Taoka briefly explained about the basic policy of project implementation for the 2nd year, which will help to avoid the same problems encountered in the 1st year.
3. Mr. Taoka briefly explained about the methodology of project implementation. The main points are setup of Monitoring/Evaluation Liaison Conference, focus on the matters for water supply management, and development of "Small and Medium Sized Water Supply Management (Draft)" and "Small and Medium sized Water Supply Support Model (Draft)" as an outcome of the project activities.
4. After methodology, explanation was followed by summary of Project Design Matrix (PDM) in order for the participants to remind it.

B. Comments from WUSCs regarding 1st year project:-

1. Gauradaha, Chairman Mr. R.B Basnet

a.) They faced the problems regarding interpretation due to which they feel that their technicians are not much trained as they have to be.

b.) JICA experts suggested to have computerized billing system, but they are unknown of the fact that who is going to provide that.

2. Dhulabari, Chairman Mr. B.Nembang

a.) As they have computers and are aware of computerized billing system but wants to know who will provide the software for that.

C. Reply from Mr. Taoka regarding the comments

a.) Mr. Taoka assured them to hire a qualified interpreter to address their first problem and regarding second one he asked it with JICA representatives.

D. Reply from JICA Senior Representative, Mr. Take Toru

a.) JICA now realized the problem facing by 3 WUSCs, regarding the computerized billing system, he explained he cannot

promise but he will try his best to find out the every possible solution.

E. Comments from WUSCs regarding 2nd year work plan

1. Gauradaha, Chairman, Mr. R.B Basnet
   a.) As they are not getting spare parts for the filter plant, they requested to introduce the place where they can purchase the required spare parts.
   b.) Due to lack of essential test kits they are lacking water analysis and are not sure that water they are distributing is safe to drink or not.
   c.) They got to know about the leak detector machine from JICA experts so, if possible they want to have it for the better O/M of their facility.
2. Dhulabari, Chairman, Mr. B.Nembang
   a.) Chlorination unit in Dhulabari is not working and the spare parts are not locally available.
   b.) They lack test kits to assure whether the water distributed is safe to drink or not.
   c.) They also want to have leak detector instrument as they have very much leakage problem in winter season.
3. Mangadh, Chairman, R.B Ghimire
   a.) They are not getting the spare parts for the filter tank.
   b.) As they have introduced the water safety plan and to meet the requirements they have to replace some of the valves (such as Butterfly valves) but they are not getting those valves in local markets.
   c.) They have test kit which can only measure iron and chlorine but for other 27 chemical tests they have nothing, so they want to have laboratory management.
   d.) They are willing for computerized billing system.

F. Comments from DG, Mr. G.K Thakur regarding the problems raised by the WUSCs:-

He categorized problems as:-

i) Computerized billing system
ii) Leak detector instrument
iii) Test Kits
iv) Avaibility of spare parts

And for the noted problems, on behalf of all three parties (JICA, Expert team, DWSS), he assured WUSCs for their request all the 3 parties will sit together separately and find out the possible solution.

G. Comments from regional chief, Mr. Sah

a.) Gap period should be minimized for the trainings.
b.) Mr. Sah feels that PDM and PO is slightly different from each other so it will be better them to understand if it matches.

H. Closing Speech from DG, Mr. G.K Thakur

a.) DG appreciated the report prepared by NJS.
b.) DG clarified that they understand the fact that this project is not for hardware components, as this is very new form of project from JICA so they will try to turn them to that point.
c.) DG apologized on behalf of C/P side if they have used any harsh words unknowingly to anyone of JICA teams and also suggested JICA experts to use diplomatic words in the field when WUSC ask for any request rather than refusing them at the same time. This will make C/P side easier to convince them.

I. Approved Issues

JCC meeting approved 2nd year's Work Plan Report and Plan of Operations presented by JICA Expert Team/NJS consultants.

Annex:
i) List of Attendance

NT

PARTICIPANTS ATTENDANCE

Date: 11th Feb, 2011

| | NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|---|
| 1 | G. K. Thakur | DWSS | DG | |
| 2 | Binod ch. Jha | DWSS | DDG | |
| 3 | Deepak Puri | DWSS | SDE | |
| 4 | Binu Bajracharya | M.PPW | DE | |
| 5 | Jyoti kumar shrestha | DWSS, | SDE | |
| 6 | Shyam Pd. Upadhyay | WSSDO, Morang | Division Chief | |
| 7 | Jagannath pandey | WSSDO, Jhapa | " " | |
| 8 | [illegible] | [illegible] | [illegible] | [illegible] |
| 9 | [illegible] | [illegible] | [illegible] | [illegible] |
| 10 | Dan R. Shakya | DWSS | SDE | |
| 11 | Chok Pd. Dhital | DWSS | Engineer | |

PARTICIPANTS ATTENDANCE

Date: 11th Feb, 201

| | NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|---|
| 12 | Kabindra B. Karki | SDE/DWSS | | |
| | [illegible] | [illegible] | [illegible] | |
| | [illegible] | [illegible] | [illegible] | |
| | Jagannath [illegible] | WSSDO Thapa | Div. chief | |
| | Shyam Pd. Upadhyay | WSSDO, Morang | Division Chief DWSS. | |
| | Jyoti Kumar Sharma | DWSS, | section chief, NGO & CM section | |
| | Binu Bajracharya | MoPPW | DE | |
| 13 | Ram Chandra Sah | ERMSO | Reg. chief | |
| 14 | Ram Bdr Ghimire | Mangad WUSC | chairperson | |
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PARTICIPANTS ATTENDANCE

Date: 11th Feb 201

| | NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|---|
| 15 | T. Pierce | JICA | Expert | |
| 16 | N. Taoka | JICA | Expert | |
| 17 | Satoru Onik: | JICA | Expert | |
| 18 | Meriya khadgi | JICA | Project secretary | |
| 19 | Sudikshya Nakarmi | JICA | Interpreter | |
| 20 | Krishna C. Manandhar | JICA/Nepal | Snr. Loan. Advisor | |
| 21 | Tomohiro Arima | JICA/Nepal | Representative | |
| 22 | Tom Take | JICA | Senior Representative | |
| 23 | Narad Kishor Mishra | CHRDD | Superintendent Engineer | |
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**MINUTES OF MEETING**
**FOR**
**THE FOURTH JOINT COORDINATION COMMITTEE MEETING**
**ON**
**THE CAPACITY DEVELOPMENT PROJECT**
**FOR WATER SUPPLY IN SEMI-URBAN AREAS**
**IN NEPAL**

The Japan International Cooperation Agency (hereinafter referred to as "JICA") fielded a Mid-Term Review Mission, headed by Ms. Keiko Yamamoto, from November 7th to November 22nd, 2011, for the purpose of the mid-term review for the Capacity Development Project for Water Supply in Semi-Urban Area in Nepal (hereinafter referred to as "the Project").

A Joint Evaluation Team (hereinafter referred to as "the Team"), consisting of four members, three from JICA and one member from Government of Nepal, was constituted for the purpose of conducting the mid-term review and preparation of necessary recommendations to the respective governments and the Project.

After intensive study and analysis of the activities and achievements of the Project, the Team prepared the Joint Mid-Term Review Report (hereinafter referred to as "the Report"), which was presented to the Joint Coordination Committee meeting held on November 22, 2011 on Kathmandu. The Joint Coordination Committee, discussed the issues raised in the report, and the recommendations in detail, confirmed the report and agreed on the following matters attached hereto.

Kathmandu, November 22nd, 2011

Toru Take
Senior Representative
JICA Nepal Office
Japan International Cooperation Agency

Suman Prasad Sharma
Director General (JCC Co-Director)
Department of Water Supply and Sewerage
Ministry of Physical planning and Works

Norihisa Taoka
JICA Expert, Team Leader
Project for Capacity Development, Water Supply in Semi-Urban Areas in Nepal

Binod Chandra Jha
Deputy Director General (Project Manager)
Department of Water Supply and Sewerage
Ministry of Physical Planning and Works

## Main Points Explained and Discussed

1. Joint Mid-Term Review Report

   Both Nepalese and Japanese sides agreed to implement the recommendations of the Joint Review Report and take necessary measures accordingly to implement the recommendations.

2. Modifications of PDM

   Modifications of PDM were recommended in Joint Mid-Term Review Report. Both sides agreed to modify current PDM ver.3 and approved proposed PDM ver.4

3. Involvement of Nepalese side

   Both sides agreed that though there was some project progress, much more coordinated effort is required from DWSS, Japanese Experts team and JICA Nepal Office towards the target of building of "Support Model and Management Models", and that intensive involvement of the Nepalese side is critical for development of the realistic models and the there is much to be done in this regard in the relatively short remaining period of the project. Furthermore, since the process of developing the models and how to adopt them are much more important, the involvement of the Nepalese side in the developing the models is strongly requested.

4. Budgetary Arrangement and Project Activity

   Both sides agreed that DWSS and the Japanese Experts will work more closely and meet more frequently;

   - To draw up of calendar of operations with detailed activities and budgetary requirements so that necessary counterpart budget could be included in the GON budget.

   - To plan jointly with DWSS the individual planned activities and inform sufficiently in advance DWSS, WSSDO and WUSCs so that maximum participation is ensured from all sides. Therefore, JICA Expert and WSSDOs should sit together not only at the time of working but at the time of planning phase so that they could do the systematic planning and avoid the problems which hinders the involvement of the Nepalese side.

5. Personnel in charge of coordination

DWSS will assign specific DWSS personnel in each of the WSSDOs for full coordination of activities with the Japanese Experts team at the WSSDO level.

6. Commitment to the Project
   Both sides will fulfill their commitments to the project as described in the PDM regarding equipment provision from the Japanese side and participation, sufficient human and budgetary resources allocation from the GON side.

7. Continuous Monitoring

   JICA and DWSS will monitor continuously jointly to identify constraints in the project implementation and take necessary measures to ensure smooth project implementation.

These measures are expected to address the current problems of insufficient involvement of Nepalese side and ensure full participation for successfully development of the "Support Model and Management Models".

Annex 1: List of participants
Annex 2: Joint Mid-Term Review Report

ANNEX 1: LIST OF PAETICIPANTS DATE:22nd Nov,2011

| S.NO. | NAME | ORGANIZATION | POSITION | SIGNATURE |
|---|---|---|---|---|
| 1 | Mr. Suman Prasad Sharma | DWSS | DG | |
| 2 | Mr. Binod Chandra Jha | DWSS | DDG | |
| 3 | Mr. Deepak Puri | DWSS | SDE | |
| 4 | Mr. Lakshmi Nath Nepal | Evaluation Team | Member | |
| 5 | Mr. Jyoti Kumar Shrestha | DWSS | SDE | |
| 6 | Mr. Ram Lakhan Mandal | DWSS, WQIMS | Section chief | |
| 7 | Mr. Hari Prasad Pandey | DWSS, WQIMS | SDE | |
| 8 | Mrs. Binu Bajracharya | MoPPW | DE | |
| 9 | Mr. Rajeeb Ghimire | MoPPW | SDE | |
| 10 | Mr. Rajendra Nepal | MoPPW | Under-secretary (Law) | |
| 11 | Mr. Jagannath Purbey | WSSDO, Jhapa | Div. chief | |
| 12 | Mr. Dharmendra Kumar Keshri | WSSDO, Morang | Engineer | |
| 13 | Mrs. Keiko Yamamoto | Evaluation Team | Leader | |
| 14 | Mr. Kazayoshi Inokuchi | Evaluation Team | Member | |
| 15 | Mr. Toru Take | JICA Nepal | SR | |
| 16 | Mr. Tomohiro Arima | Evaluation Team | Representative | |
| 17 | Mr. Krishna C. Manandhar | JICA Nepal | Senior Loan Advisor | |
| 18 | Mr. Norihisha Taoka | JICA project team | Expert | |
| 19 | Mr. Saturo Oniki | JICA project team | Expert | |
| 20 | Mr. Toru Sueatake | JICA project team | Expert | |
| 21 | Ms. Meriya Khadgi | JICA project team | Secretary | |
| 22 | Ms. Bineeta Shahi | JICA project team | Secretary | |
| 23 | Ms. Sudikshya Nakarmi | JICA project team | Secretary | |
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**MINUTES OF MEETINGS**
**FOR THE PROJECT MANAGEMENT COMMITTEE**
**ON THE PROJECT**
**FOR CAPACITY DEVELOPMENT ON WATER SUPPLY**
**IN SEMI-URBAN AREAS IN NEPAL**

The Second Project Management Committee Meeting (hereinafter referred to as "PMC") on "The Project for Capacity Development on Water Supply in Semi- Urban Areas in Nepal" (hereinafter referred to as "the Project") was held on the 28th February, 2012 with both the Nepalese and Japanese sides in attendance as in Annex 1.

The discussion points and the matters agreed between both the Nepalese and Japanese sides are attached herewith.

Katmandu, 28th February, 2012

Norihisa Taoka
JICA Expert, Team Leader
Project for Capacity Development, Water Supply in Semi-Urban Areas in Nepal

Binod Chandra Jha
Deputy Director General (PMC Chairman)
Department of Water Supply and Sewerage
Ministry of Physical Planning and Works

## Discussion Points and Matters Agreed

### 1. Presentation

A. Experience sharing on Training Program in Japan

Mr. Keshab Bista (SDE, CHRDU) explained about the experience gained from the training in Japan. The outline of presentation was as follows:

1) About Japan
2) Tokyo Water Bureau
3) Major issue shared by participants
4) Outlines of business plan

B. Project Outcome

The Expert Team submitted the draft Project Completion Report (2nd Year) to the PMC members. Mr. Norihisa Taoka (JICA Expert Team Leader) explained about the project outcome of the 2nd year activities. The outline of the presentation was as follows:

1) Project activities and outcome according to the indicators by PDM
2) Current progress on the recommendation points of the Mid-term Review
3) Recommendations towards the 3rd year activities

### 2. Discussion Points and Matters Agreed

A. The planned overseas training members include the staff of DWSS, WSSDO and CHRDU. WUSC personnel shall not be included as the objective of the overseas training is TOT (Training on Trainers).

B. Regarding the project budget for the next fiscal year, the Expert Team and DWSS will consult with each other, and the budget allocation between the both sides will be determined according to the result of the consultation.

C. DWSS will check the contents of the draft Project Completion Report and provide comments if any. Then, DWSS will approve the Project Completion Report.

Annex 1. ATTENDANCE list of PMC meeting DATE:28th Feb, 2012

| S.NO. | NAME | ORGANIZATION | POSITION |
|---|---|---|---|
| 1 | Mr. Ram Lakhan Mandal | DWSS | WQIMS, chief |
| 2 | Mr. Binod Chandra Jha | DWSS | DDG/ Project manager |
| 3 | Mr. Hari Prasad Pandey | DWSS, WQIMS | SDE |
| 4 | Mr. Jyoti Kumar Shrestha | DWSS, NGOCMS | SDE |
| 5 | Mr. Kabindra Karki | DWSS, M&E | SDE |
| 6 | Ms. Rinku Shrestha | DWSS | Engineer |
| 7 | Mr. Kesnav Raj Bista | CHRDU | SDE |
| 8 | Mr. Rajeeb Ghimire | CHRDU | Chief |
| 9 | Mr. Manoj Ghimire | ERMSO, Dhankutta | Regional director |
| 10 | Mr. Shyam Prasad Upadhyay | WSSDO, Morang | Division chief |
| 11 | Mr. Jagannath Purbey | WSSDO, Jhapa | Division chief |
| 12 | Mr. Ram Bahadur Ghimire | Mangadh, WUSC | Chairman |
| 13 | Mr. Banchag Nembang | Dhulabari, WUSC | Chairman |
| 14 | Mr. Gobinda Bahadur Khadka | Gauradaha, WUSC | Chairman |
| 15 | Mr. Tomohiro Arima | JICA Nepal | Representative |
| 16 | Mr. Norihisha Taoka | JICA project team | Expert |
| 17 | Mr. Saturo Oniki | JICA project team | Expert |
| 18 | Ms. Meriya Khadgi | JICA project team | Secretary |
| 19 | Ms. Bineeta Shahi | JICA project team | Secretary |
| 20 | Ms. Sudikshya Nakarmi | JICA project team | Secretary |
| 21 | Mr. Roshan Suwal | JICA project team | Technical interpreter |
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# MINUTES OF MEETINGS
# FOR THE PROJECT MANAGEMENT COMMITTEE
# ON THE PROJECT
# FOR CAPACITY DEVELOPMENT ON WATER SUPPLY
# IN SEMI-URBAN AREAS IN NEPAL

The Third Project Management Committee Meeting (hereinafter referred to as "PMC") on "The Project for Capacity Development on Water Supply in Semi- Urban Areas in Nepal" (hereinafter referred to as "the Project") was held on the 29th June, 2012 with both the Nepalese and Japanese sides in attendance as in Annex 1.

The discussion points and the matters agreed between both the Nepalese and Japanese sides are attached herewith.

Katmandu, 29th June, 2012

Norihisa Taoka
JICA Expert, Team Leader
Project for Capacity Development, Water Supply in Semi-Urban Areas in Nepal

Binod Chandra Jha
Deputy Director General (PMC Chairman)
Department of Water Supply and Sewerage
Ministry of Physical Planning and Works

## Discussion Points, Matters Agreed, and Information Shared

### 1. Presentation

The Expert Team submitted the draft Work Plan Report of the 3rd Year to the PMC members. Mr. Norihisa Taoka, the leader of JICA Expert Team, explained about the detail of the plan. The outline of the presentation is below:

- Brief explanation about the changes and new issues in the 3rd Year Work Plan
- Remind of "Water Supply Management Model" and "Water Supply Support Model"
- Recommendation on forming a Patrol Team to inspect/maintain mechanical and electrical facilities in Jhapa and Morang.

### 2. Discussion Points

- DWSS agreed to consider steps to improve the institutional system for setting up the Patrol Team. The patrol team would be a regional (inter-divisional) team, and outsourcing of human resources may be possible.

### 3. Matters Agreed

- The 3rd Year Work Plan was approved by PMC

### 4. Information Shared

- The Expert Team is on the process of purchasing spare parts. On the other hand, WSSDO has purchased/going to purchase some spare parts for the WUSCs.
- It is confirmed that all WUSCs are in the process of preparing the Business Plan.

**Annex 1**

Attendance of the PMC Meeting

| | Name | Designation, Organization |
|---|---|---|
| 1 | Mr. Binod Chandra Jha | DDG, DWSS |
| 2 | Mr. Deepak Puri | Chief,Planning DWSS |
| 3 | Mr. Bipin Kr.Thakur | S.D.E. DWSS |
| 4 | Mr. Shrawan Kumar Upadhyay | S.D.E. DWSS |
| 5 | Mr. Ram Lakhan Mandal | Regional Director. RMSO |
| 6 | Mr. Keshav Raj Bista | S.D.E. CHRDU |
| 7 | Mr.Jagnnath Purbey | Div. Chief. WSSDO Jhapa |
| 8 | Mr. Ganesh Bahadur Thapa | Div.Chief. Morang |
| 9 | Mr. Ganesh Bahadur Thapa | Div.Chief. Morang |
| 10 | Mr. Gobinda B.Khadka | Chairman, Gauradaha |
| 11 | Mr.Bachang Nembang | Chairman, Dhulabari |
| 12 | Mr. Ram Bdr. Ghimire | Chairman. Mangadh |
| 13 | Mr.Tomohiro Arima | Representative. JICA |
| 14 | Ms. Bidhya Pokhrel | Program Officer. JICA |
| 15 | Mr.Norihisa Taoka | Team Leader, JICA Expert Team |
| 16 | Mr. Masaru Kasahara | JICA Expert on Mechanical Equipment |
| 17 | Ms.Yasumi Tsutsui | JICA Expert on public awareness |
| 18 | Mr.Roshan Suwal | Technical Interpreter,JICA Expert Team |
| 19 | Ms.Bineeta Shahi | Project Secretary, JICA Expert Team |
| 20 | Ms.Sudikshya Nakarmi | Project Secretary. JICA Expert Team |
| 21 | Ms. Meriya Khadgi | Project Secretary. JICA Expert Team |

**MINUTES OF MEETINGS**
**FOR THE PROJECT MANAGEMENT COMMITTEE**
**ON THE PROJECT**
**FOR CAPACITY DEVELOPMENT ON WATER SUPPLY**
**IN SEMI-URBAN AREAS IN NEPAL**

The Fourth Project Management Committee Meeting (hereinafter referred to as "PMC") on "The Project for Capacity Development on Water Supply in Semi- Urban Areas in Nepal" (hereinafter referred to as "the Project") was held on the 8th February, 2013 with both the Nepalese and Japanese sides in attendance as in Annex 1.

The discussion points and the matters agreed between both the Nepalese and Japanese sides are attached herewith.

Katmandu, 8th February, 2013

N. Taoka

Norihisa Taoka
JICA Expert, Team Leader
Project for Capacity Development, Water Supply in Semi-Urban Areas in Nepal

Tej Raj Bhatt
Deputy Director General (PMC Chairman)
Department of Water Supply and Sewerage
Ministry of Urban Develeopment

## Discussion Points and Matters Agreed

### 1. Presentation

A. Project Progress from June to December 2012

The Expert Team submitted the draft Progress Report (2) (P/R (2)) to the PMC members. Mr. Norihisa Taoka (JICA Expert Team Leader) explained about the project progress. The outline of the presentation was as follows:

1) Major project activities and outcome from June to December 2012
2) Project activities and outcome according to the indicators by PDM
3) Issues to be discussed

### 2. Discussion Points

A. It is agreed to instruct WSSDOs from DWSS to involve at least 2 persons in the Project as C/P and establish proper record system of documents and training materials etc. to ensure smooth implementation of project activities.

B. It is further agreed to instruct WSSDOs to communicate with the chairpersons of the non-participating WUSCs and try to motivate them to send their staff in the training/workshop/OJT for their own benefits.

C. The field test of the current draft will be conducted in Jhapa & Morang districts to get feedback from the field. The Model shall be finalized through discussions among stakeholders and disseminated accordingly to other areas.

### 3. Matters Agreed

- The draft Progress Report (2) has been discussed and agreed to approve by PMC.

**Annex 1** **PARTICIPANTS ATTENDANCE** **Date: 8th Feb,2013**

| S.No | NAME | ORGANIZATION | POSITION |
|---|---|---|---|
| 1 | Ishwori Prasad Poudyal | DWSS | Director General |
| 2 | Tej Raj Bhatta | DWSS | Deputy Director General |
| 3 | Deepak Puri | DWSS | Senior Divisional Engineer |
| 4 | Sudarshan Bhandari | DWSS | Senior Divisional Engineer |
| 5 | Bidhya Pokhrel | JICA | Program Officer |
| 6 | Binu Bajracharya | DWSS | Senior Divisional Engineer |
| 7 | Gobinda Bdr. Khadka | Gauradaha WUSC | Chairperson |
| 8 | Ram Bdr. Ghimire | Mangadh WUSC | Chairperson |
| 9 | Indra Bdr. Budhathoki | Dhulabari WUSC | Chairperson |
| 10 | Ganesh Bdr. Thapa | WSSDO, Morang | Division Chief,Morang |
| 11 | Hari Prasad Pandey | WQIMS, DWSS | Senior Divisional Engineer |
| 12 | Ujwol Prajapati | DWSS, Progress M6E Section | Senior Divisional Engineer |
| 13 | Mahi Narayan Chaudhary | WSSDO, Jhapa | Engineer |
| 14 | Norihisa Taoka | JICA Project | Team Leader |
| 15 | Satoru Oniki | JICA Project | JICA Expert |
| 16 | Masaru Kasahara | JICA Project | JICA Expert |
| 17 | Akira Hasebe | JICA Project | JICA Expert |
| 18 | Roshan Suwal | JICA Project | Technical Interpreter |
| 19 | Sudikshya Nakarmi | JICA Project | Project Secretary |
| 20 | Bineeta Shahi | JICA Project | Project Secretary |
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# MINUTES OF MEETING

## BETWEEN
## JAPAN INTERNATINAL COOPERATION AGENCY
## AND
## THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF NEPAL
## ON TERMINAL EVALUAION
## OF
## THE PROJECT FOR CAPACITY DEVELOPMENT ON WATER SUPPLY IN SEMI-URBAN AREAS IN NEPAL

The Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Terminal Evaluation Team (hereinafter referred to as "the Japanese Team") for the purpose of conducting a joint terminal evaluation of the Project for Capacity Development on Water Supply in Semi-Urban Areas in Nepal (hereinafter referred to as "the Project") from February 11th to March 3rd, 2013 in Nepal.

The Joint Evaluation Team (hereinafter referred to as "the Team"), comprised of four members from the Japanese Team and one member from the Department of Water Supply and Sewerage under the Ministry of Urban Development. The Team conducted intensive review and analysis of the activities and achievements of the Project.

As a result, the Team prepared the Joint Terminal Evaluation Report (hereinafter referred to as "the Report") and presented the Report to the Joint Coordinating Committee (hereinafter referred to as "JCC"). The JCC accepted the Report and also agreed to the matters stated in the documents attached hereto.

Kathmandu, March 3rd, 2013

Satoshi Fujii
Senior Representative
Nepal Office
Japan International Cooperation Agency

Raj Kumar Malla
Joint Secretary (JCC Co-Director)
Ministry of Urban Development

Norihisa Taoka
JICA Expert, Team Leader
Project for Capacity Development on
Water Supply in Semi-Urban Areas in Nepal

Ishwori Prasad Paudyal
Director General (JCC Co-Director)
Department of Water Supply and Sewerage
Ministry of Urban Development

Tej Raj Bhatt
Deputy Director General (Project Manager)
Department of Water Supply and Sewerage
Ministry of Urban Development

THE ATTACHED DOCUMENT

1. Common Understanding concerning the Actions to be Taken by Both Sides

The Terminal Evaluation Report was developed as a result of the Joint Evaluation activities as per attached in Appendix 1. The Joint Coordinating Committee endorsed the contents of the report, and both Nepalese and Japanese sides agreed to follow the recommendations made in the report and take necessary actions accordingly.

2. Institutionalizing the Models developed in the Project

With respect to "Small and Medium-sized Water Supply Support Model" and "Small and Medium-sized Water Supply Management Model" that have been developed in the Project, Nepalese side agreed to disseminate the two models throughout the country via Regional Monitoring and Supervision, Division and Sub-Division Offices to achieve the overall goal of the Project. In this regard, Nepalese side agreed to take the following actions.

1) Invite all stakeholders including development partners to obtain their feedback on the models.
2) The models shall be finalized based on the feedback from the stakeholders.
3) Contents of the models shall be incorporated into "Operational Guideline" of "Directives on Operation of Water Supply Services-2069" as well as "National WASH Programme" which are currently being developed by the Sector Efficiency Improvement Unit of the Ministry of Urban Development.
4) The models shall be reflected in the annual schedule of every RMSO and WSSDO and the adequate budgets shall be allocated to them accordingly.
5) Support shall be extended to forty four WUSCs targeted in the Project Design Matrix of the Project in order to strengthen their capacity.

Appendix 1: Terminal Evaluation Report

# MINUTES OF MEETINGS
# BETWEEN
# JAPAN INTERNATIONAL COOPERATION AGENCY
# AND
# THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF NEPAL
# FOR THE JOINT COORDINATING COMITTEE
# ON THE PROJECT
# FOR CAPACITY DEVELOPMENT ON WATER SUPPLY IN
# SEMI-URBAN AREAS IN NEPAL

Japan International Cooperation Agency (hereinafter referred to as JICA) and Department of Water Supply and Sewerage (hereinafter referred to as DWSS), Ministry of Urban Development (hereinafter referred to as MOUD), the Government of Nepal have been jointly implementing "The Project for Capacity Development on Water Supply In Semi-Urban Areas in Nepal" (hereinafter referred to as "the Project") based on the Record of Discussion concluded in February, 2009.

The Project will be completed at the end of September, 2013. Thus, The Final Joint Coordinating Committee Meeting (hereinafter referred to as "JCC") of the Project was held on 27th September, 2013 in presence of both the Nepalese and Japanese counterparts.

In the JCC meeting, the both Nepalese and Japanese counterparts endorsed the Project Final Report. The JCC meeting accepted Small and Medium Sized Water Supply Management Model and Small and Medium Sized Water Supply Support Model and forwarded to the Department of Water Supply and Sewerage for necessary actions.

Kathmandu September 27, 2013

Tsutomu Shimizu
Chief Representative
Nepal Office
Japan International Cooperation Agency

Ishwori Prasad Paudyal
Director General (JCC Co-Chairperson)
Department of Water Supply and Sewerage
Ministry of Urban Development

Satoru Oniki
JICA Expert, Team Leader
Project for Capacity Development on
Water Supply in Semi-Urban Areas in Nepal

Ram Chandra Devkota
Deputy Director General
Department of Water Supply and Sewerage
Ministry of Urban Development

## Attached Document

**1. Maintenance and Development of the Support Model and the Management Model**

(1) In the JCC held on March 3rd, 2013, both sides agreed that DWSS has a responsibility to institutionalize and disseminate the Support Model and the Management Model to all over the country.

(2) Therefore, DWSS shall approve and formalize the Management Model and Support Model developed by the Project.

(3) DWSS shall revise the Management Model and Support Model (WASMIP Model) for its implementation in other parts of the country as necessitates.

(3) DWSS shall incorporate the provision to adopt and effectively utilize the two Models in the Implementation Guidelines of the Directives on Operation 2069.

**2. Dissemination and Sustainability of the Project outputs**

(1) In order to disseminate and introduce the two Models to other districts, which is stated in overall goal of the Project in the Project Design Matrix (hereinafter referred to as PDM), DWSS shall develop Dissemination Plan of the two Models to introduce them in other districts and regions of the country.

(2) Moreover, DWSS shall share the Dissemination Plan to JICA. Then JICA can consider possible support on dissemination activities.

(3) DWSS shall take initiation to secure adequate budget in its annual program to continue activities such as MIT, MAT, MET and OJTs envisioned by the models.

(4) For the dissemination activities, DWSS can utilize the knowledge, experience and human resource as a successful example which have been developed through the Project.

**3. Sustainability of the Project in Morang and Jhapa districts**

(1) DWSS and WSSDOs shall take lead of activities like MIT, MAT and MET and OJTs as its annual program and secure adequate budget to continue activities envisioned in the Models.

(2) SOPs and Business Plans developed under the Project shall be continued in Project districts as well as introduced in other WUSCs. Similarly, Human Resources trained in different items (such as water quality analysis, electro mechanics) under the Project shall be utilized to undertake trainings and capacity development of DWSS, CHRDU, RMSO, WSSDO and WUSCs respectively.

(3) Network among WSSDOs and WUSCs developed through the Project such as liaison conference shall be maintained since the network make communication among stakeholders good and facilitate mutual learning.

**4. Project Completion Report and PDM**

(1) The Project Completion Report of WASMIP including was approved at the JCC.

(2) PDM revision was also approved in the JCC. The revised PDM was reflected by restructuring of ministries happened in May, 2012. Thus MOPPW in PDM ver. 4.0 was changed into MOUD in PDM ver. 5.0.

Attachment 1: Project Completion Report of the Project

Attachment 2: PDM ver. 5.0


jICA