

Summary of Terminal Evaluation

1. Project Overview	
<u>Country</u> : Egypt	<u>Project Title</u> : “The Project for Improvement of Management Capacity of Operation and Maintenance for Water Supply Facilities in Nile Delta Area”
<u>Issue/Sector</u> : Water resource management	<u>Cooperation scheme</u> : Technical Cooperation
<u>Issue/Sector</u> : Water Resources and Disaster Management Group, Global Environment Department	Total cost (as of March 2014) : 430 billion JPY
<u>Cooperation period</u> : (R/D): April 2011 – May 2014 (Extension): April 2011 – August 2014	<u>Partner Country’s Implementing Organization</u> : Holding Company for Water and Wastewater (HCWW), Sharkiya Potable Water and Sanitation Company (SHAPWASCO), Gharbia Potable Water and Sanitation Company (GHAPWASCO), Minufia Company for Water and Wastewater (MCWW)
	<u>Supporting Organization in Japan</u> : Yachiyo Engineering Co., LTD.
	<u>Related Cooperation</u> : “The Project for Improvement of Management Capacity of Operation and Maintenance for SHAPWASCO”
1-1. Background of the Project	
<p>The Arab Republic of Egypt (hereinafter referred to as “Egypt”) has strived to improve water utilization efficiency and protection of water resources in order to supply clean and safe water to the growing population. Towards achieving this goal, in 2004, the Government established the Holding Company for Water and Wastewater (HCWW) and designated water-supply entities into public corporations.</p> <p>Since the managerial responsibility for operation and maintenance (O&M) of</p>	

water supply facilities was transferred to public corporations, each company was urged to improve operational efficiency and reduce Non-Revenue Water (NRW), which is potable water that cannot be billed, for example, leakage and illegal taps. Given the request by the Egyptian government, JICA carried out a technical cooperation project, “The Project for Improvement of Management Capacity of Operation and Maintenance for SHAPWASCO (Sharkiya Potable Water and Sanitation Company)” between 2006 and 2009 (hereinafter referred to as “the previous technical cooperation project”), which confirmed the effectiveness of utilizing Standard Operation Procedure (SOP) and implementing NRW reduction activities in the improvement of operational efficiency. HCWW formulated a plan to transfer successful practices and lessons learned from the previous technical cooperation project to Nile Delta Area for improving management capacity. Given this background, the Egyptian government requested technical cooperation from the Government of Japan for promoting the transfer of technologies produced in the previous technical cooperation project to GHAPWASCO and MCWW as well as further improving the technology of SHAPWASCO, which led to the implementation of the Project for 3 years. However, the project period was extended from 36 month to 41 month.

1-2. Project Overview

(1) Super Goal:

Management capacity of operation and maintenance of water supply facilities is improved in Nile Delta Area.

(2) Overall Goal of the Project:

Management capacity of operation and maintenance of water supply facilities is improved in Sharkiya, Gharbia and Minufia Governorates.

(3) Project Purpose:

Management capacity of operation and maintenance of water supply facilities is improved at the model areas/facilities in Sharkiya, Gharbia and Minufia Governorates.

(4) Outputs

- 1) Human Resource Development through collaboration among water supply companies in Sharkiya, Gharbia and Minufia Governorates is strengthened.
- 2) Based on the experiences of SHAPWASCO, SOPs are developed and utilized

at the model facilities in Gharbia and Minufia Governorates.

3) The institutional skills and experiences of SHAPWASCO for NRW reduction are transferred to NRW teams at the model areas in Gharbia and Minufia Governorates.

4) The water distribution management (WDM) capacity is improved in Sharkiya Governorate as an advanced model.

0) The project is managed and coordinated properly.

(5) Inputs (as of Terminal Evaluation (February-march 2014))

Inputs by the Japanese side:

Long-term Expert 0 expert Equipment 81 million Yen

Short-term Expert 12 experts Local cost 65 million Yen

Trainees received 15 trainees

Inputs by the Egypt side:

Counterpart 41 persons

Equipment 1.44 million Egyptian Pounds (LE)

Local Cost 1.56 million Egyptian Pounds (LE)

Office rooms or space are secured for Japanese and local experts at GHAPWASCO, MCWW, SHAPWASCO, respectively.

2. Evaluation Team

Members of Evaluation Team	<p>(1) Mr. Yoshiaki OMURA, Team Leader/Senior Advisor for Water Resources Management, Global Environment Department, JICA</p> <p>(2) Ms. Momo FUKUSHIMA, Water Resources Management Division 1, Water Resources and Disaster Management Group, Global Environment Department, JICA</p> <p>(3) Ms. Emi YOSHINAGA, Evaluation Specialist, Japan Development Service Co. Ltd</p>	
Period of Evaluation	12 th of February to 3 rd of March, 2014	Type of Evaluation: Terminal Evaluation

3. Results of Evaluation

3-1. Project Performance

Project Purpose: "Management capacity of operation and maintenance of water supply facilities is improved at the model areas/facilities in Sharkiya, Gharbia and Minufia Governorates" (Satisfactory)

The overall level of attainment of the Project Purpose Indicator of “*Performance Indicators (PIs) in the fields of management capacity of operation and maintenance are improved at the model areas/facilities*” was by and large achieved, and was evaluated as satisfactory.

- On the Performance Indicators(PIs) related to SOP, the result of performance monitoring and evaluation at 4 model facilities (2 for each governorates) revealed that the target value was achieved at these facilities for average one third of all monitoring period. For the individual PIs which did not reach the target, improvements have been observed in later project period as compared to the same months of the previous year. For these results, the attainment of PIs for SOP was evaluated as satisfactory.
- On the PIs for NRW, the number of model areas that strictly reached the PI target figures was limited to two out of 6. However, the monitoring results for 3 other model areas were close to target values or showed satisfactory improvements. For one model area whose progress was limited, relevant reasons and justifications were also found. For these reasons, the attainment of PIs for NRW was evaluated as satisfactory.
- The evaluation of the PIs for WDM was found too early to undertake, because their monitoring is yet to be initiated due to the delay in the WDM activities under Output 4. There is a need for the Project to complete the activities first, and conduct the evaluation of the PIs for WDM after certain monitoring period.

Output 1: “Human Resource Development through collaboration among water supply companies in Sharkiya, Gharbia and Minufia Governorates in strengthened”(expected to be achieved)

- Indicator 1.a “*More than 3 members each of SOP/NRW teams in SHAPWASCO · GHAPWASCO · MCWW are approved as trainers by Steering Committee*” is expected to be achieved. The establishment and the selection of more than 3 trainer candidates from each SOP/NRW teams are complete by June 2011, and the selected candidates are to be certified as trainers by June 2014.
- Indicator 1.b “*More than 20 times of seminars/workshops are organized under inter-company cooperation by the Project team*” has been achieved, where total 20 seminars and workshops were co-hosted by the participating

organizations.

Output 2: “Based on the experiences of SHAPWSCO, SOPs are developed and utilized at the model facilities in Gharbia and Minufia Governorates” (expected to be achieved)

- Indicator 2.a “*More than 80% of SOP team members rates understanding of trainings more than 3 on the 5-scale evaluation*” is expected to be achieved. Although the formal evaluation of training is to yet be conducted in June 2014, the questionnaire survey and interviews during this evaluation revealed the understanding of the SOP team as sufficient for the implementation of the SOP activities.
- Indicator 2.b “*The model facilities are operated and maintained based on SOP*” has already been achieved. The operation and maintenance based on the SOP has been practiced at model facilities since late 2012.
- Indicator 2.c “*Improvement of PIs for the model facilities are evaluated based on SOP*” is already achieved. The monitoring and evaluation of the PI improvements is on-going since late 2012.

Output 3 : The institutional skills and experiences of SHAPWASCO for NRW reduction are transferred to NRW teams at the model areas in Gharbia and Minufia Governorates.” (achieved)

- Indicator 3.a “*More than 80% of NRW team members rate understanding of trainings more than 3 on the 5-scale evaluation*” is already achieved. The result of examination on 5-scale evaluation for 7 NRW members revealed the average rating of 4.6.
- Indicator 3.b “*Water balance analysis is conducted properly for the 3 model areas A*” is achieved, because the analysis is complete in all 6 model facilities by June 2013.
- Indicator 3.c “*100% of detected leakage is repaired at the model area*” is achieved, as a result of NRW teams’ efforts to address all the detected leaks.

Output 4: “The water distribution management capacity is improved in Sharkiya Governorate as an advanced model” (activities on-going (4.a)/evaluation too early (4.b)

- The activities for Indicator 4.a “*Water distribution is managed based on SOP at the model areas*” are still on-going, and the attainment of this indicator is not likely within the Project period. The reason for the non-achievement is attributed to the delay in the procurement of the equipment for the distant water distribution network monitoring system provided by Japan, as well as to the technical errors found in the equipment. Although most of the errors with the equipment are solved, the commencement of WDM activities based on SOP is not likely to take place within the Project period.
- The attainment of indicator 4.b “*Issues on water distribution capacity are reported to top management of SHAPWASCO*” is too early to evaluate. For such evaluation to take place, distant monitoring of the distribution network should first be realized through the achievement of Indicator 4.a.

Output 0 : ”The project is managed and coordinated properly”. (achieved)

- Indicator 0.a “*Agreement on the coordination among SHAPWASCO · GHAPWASCO · MCWW is prepared*” was achieved. A Minutes of Meeting (M/M), signed at the beginning of the Project, agreed the establishment of SC mentioned in Output 1, and the coordination among the 3 companies for the implementation of the Project.
- Indicator 0.b “*Project activities are regularly monitored based on PO/APO*” is already achieved. The approval of the Annual Plan of Operation (APO) prepared by the Project and the monitoring of the activities have been conducted at regular Joint Coordination Committee (JCC) meetings.

3-2. Evaluation Results

(1) *Relevance : High*

- ***Relevance to Egypt’s policies:*** The objective of this Project directly contributes to the Egyptian government’s efforts toward achieving the United Nations (UN)’ Millennium Development Goals (MDGs), by assisting the expansion of water supply through efficient O&M of WTPs, NRW reduction, and the WDM. The Project is also relevant to the recent and current Egypt’s national development strategies, such as the “Sixth Five-Year Plan (2007/08-2011/12) “, and the current Annual Development

Plan formulated by Ministry of Planning. The Sixth five-year Plan focused on improving the public utilities for human- and social development through minimizing water network loss and implementing cost recovery in water project, and the current Annual Development Plan recognizes the efficient O&M of water- and wastewater plants and the cost recovery as a priority of Egypt's public utilities.

- ***Relevance to beneficiaries' need***: Given the traditionally low water price in Egypt, the low rate of cost recovery has posed a significant challenge for the ACs who are tasked to cover the cost of their operations. The demand for increasing the capability for operational efficiency is such, the capacity development in efficient O&M and NRW reduction is deemed highly appropriate as a response to these challenges. For SHAPWASCO who have already experienced the SOP-based O&M and NRW in the previous project, the focus of this Project is a relevant next step to address low water pressure in the governorate.
- ***Relevance to Japan's policy and comparative advantage***: Japan's Country Assistance Policy for Egypt recognizes this Project as contributing to its priority assistance area of "Poverty Reduction and Improvement of Quality of Life". Japan also possesses hands-on experiences in the assistance to target governorates, giving Japan a comparative advantage in providing further assistance in this field. Such experiences includes the construction of a water treatment plant (WTP) in North-west of Sharkiya (2003-2007) as well as a renovation in El Mahala El Kobra in Gharbia (2006-2009) , and the previous technical cooperation project Sharkiya. The focus of this Project is therefore considered as consistent with Japan's policy and comparative advantages.

(2) ***Effectiveness: Relatively High***

- As stated in 3.1, the Project Purpose is by and large attained, through the satisfactory achievement of PIs for SOP and NRW. This achievement is likely to have been realized through the following factors: 1) the visualization of the outcomes of the activities through the introduction of the PIs; 2) the gains from the surveys conducted during the Project, such as the skills to analyse the facility design that causes inefficiency, and the opportunity to discover the illegal connections; and 3) the cooperation and positive competitions among the different agencies participating in this Project. Since all of these contributing factors are the results produced

from the project design and implementation process, it appears fair to conclude that the achievement of the Project Purpose was made possible by the activities and outcomes of this Project.

- In achieving the Project Purpose, there were also challenges. These challenges include: 1) the existence of large number of aged and inaccurate meters which at times made the acquisition of correct data difficult; 2) the difficulty in evaluating the performance through the PIs. The introduction of measurable indicators, such as the PIs of this Project, is highly effective on one hand; on the other hand, if the PI evaluation should be based only the quantitative data without consideration to the situation in the field or without a well thought-out evaluation standard, there is a risk for the evaluation results to fail to capture the real performance.

(3) *Efficiency : Relatively High*

- On the Output 0, 1, 2, and 3, the activities are mostly complete and their indicators are expected to be attained. Output 4, however, is experiencing significant delay in the implementation of activities, on which further follow-ups are required. NOPWASD has handed over water supply facilities to ACs without related material, such as manuals and designs, and training on operation and maintenance by the contractor that the NOPWASD ordered. The evaluation also found that the time and cost spent by the Project for facility renovation and for the replacement of equipment would have been saved if the feedbacks from the facility operators were reflected on the initial design of the model WTP facilities. Likewise, if the information related to the facility design was passed on to its operators from the NOPWASD, more time would have been saved for the Project who had to recover these information through surveys.
- generally appropriate, and the counterparts (C/P) have expressed satisfaction with the expertise of the Japanese and local experts. However, the activity of output 4 has been delayed, because the equipment for distant water distribution network monitoring for Output 4 is experiencing technical errors.
- There are multiple efforts to increase the efficiency made by the Project. To facilitate the implementation of SOP and NRW reduction activities, for example, the Project received support from GHAPWASCO who purchased additional acoustic rods, and from MCWW who undertook the

renovation of model facilities. The Project also utilised local experts and project facilitators, and which appears to have facilitated the skills transfers from the Japanese experts to a great extent.

(4) *Impact*

- Owing to a well-thought project design that integrates the dissemination of outputs in model areas/facilities into the current project activities, the activities for Overall Goal is already being realized simply through the implementation of this Project. That is, activity dissemination strategies were created as part of the Project activities, and the SOP and NRW activities have been disseminated within the two governorates based on these strategies. Therefore Overall Goal of “Management capacity of operation and maintenance of water supply facilities is improved in Sharkiya, Gharbia and Minufia Governorates” is expected to be achieved. At the time of Terminal Evaluation, specific plans was yet to be prepared to reach the Super Goal of “Management capacity of operation and maintenance of water supply facilities is improved in in Nile Delta Area” and extend the activities outside of the target governorates. However, ad-hoc, individual initiatives for dissemination are being initiated, and the need for such extension activities was also reconfirmed at the JCC meeting during the Terminal Evaluation.
- As a result of this Project, several positive impacts were produced that influenced the people/sectors outside the Project. GHAPWASCO, for example, has taken its own initiative to disseminate the NRW activities nation-wide, through hosting a Special Workshop for NRW Reduction Activity for Nationwide Dissemination in September 2012. This workshop was evaluated as a good example of cooperation with the private sector in the field of NRW. Another example is the dissemination of project’s knowledge to the Technical Water School, where the NRW team members from MCWW serve as lecturers on the leak detection. This effort was recognised by the Terminal Evaluation Team as an impact on human development outside of the Project.

(5) *Sustainability: High*

- The national policies framework to support the future activities appears solid, given the Egypt’s pledge for the UN-MDGs, and in light of the

country's next 10-year plan of "Strategic Framework for Economic and Social Development plan Until year 2022".

- The organizational structure to implement future activities is also in place. GAPWASCO, MCWW, SHAPWASCO already established the specialized departments or units for SOP, NRW, and WDM, and these departments/units are already implementing the project activities as part of their routine work.
- In the process of confirming the level of attainment of Output Indicators, technical skills of the C/Ps for SOP and NRW were confirmed as sufficient to sustain the future activities. The skill level for WDM could not be confirmed during this Terminal Evaluation, for which further monitoring is necessary.
- On the finance, the experience of the Project indicates that the budget for the investment in certain infrastructure can be made available. The funding for renovation of facilities can allegedly be made available from either each governorate or NOPWASD on ad-hoc basis, as well as the financing from the European Union to the HCWW. Therefore, the budget is generally secured for the operations of HCWW and its ACs. It is expected to allocate adequately this budget to related activities of the project.

3-3. Factors that contributed to achievements of goals

(1) Factors relating to Project Design

- The introduction of the quantitatively measurable PIs helped visualize the efficiency- and resource losses, thereby bringing about the change in the awareness and attitudes of the C/Ps.
- The activities of the Project themselves, which were effective in achieving the Project Purpose. The surveys of model facilities and the preparation of diagrams helped the C/Ps understand the design of the facilities for the first time, and rendered them the ability to identify ways to improve the efficiency in recognition of the facility design problems. For NRW, the leak detection survey in model areas contributed to the discovery of illegal connections, which was highly effective for the improvement of the PIs.
- The involvement of multiple ACs. The cooperation and positive competitions among the ACs was effective in strengthening the commitments to the Project by participating ACs.

- The utilization of human resources from the previous project. The advice from SHAPWASCO staff who work in the same water- and wastewater operations, facilitated the transfer of skills to GHAPWASCO and MCWW, and at the same time ensured the sustainability of the previous projects.
- The design of this Project that incorporated the dissemination of Project Outputs into the project activities. Such project design enabled the achievement of the Overall Goal.

(2) Factors relating to Implementation Process

- The cooperation from GHAPWASCO and MCWW in the project implementation, such as the additional purchase of equipment and the renovation of the facilities. The commitments gained from the management of these agencies contributed to greatly promoted the implementation.
- The utilization of Egyptian experts, whose expertise produced synergy with that of Japanese experts; the existence of Project Facilitators also enhanced the communication between Japanese experts and Egyptian C/Ps. In sum, the utilization of these existing in-country knowledge base produced an effect in promoting the understanding by the C/Ps during the training and OJT by the Japanese experts.

3-4. Issues/factors that caused the issues

(1) Factors relating to Project Design: NA

(2) Factors relating to Implementation Process:

- The delay in the implementation of Output 4 activities. This delay hindered the achievement of some of the indicators of the Project Purpose, that is, of the PIs for WDM.
- The large number of aged and inaccurate customer meters, posing a challenge for NRW team to ensure the credibility of the NRW data.
- The facility design that lacks the consideration to the actual facility operations. This required the Project to spend time and cost for the facility renovation and the replacement of the equipment. The lack of communication and information on the facilities from NOPWASD likewise required the Project to recover the information through project activities. There would have been more efficiency gain if they were solved before the

beginning of the Project.

3-5. Conclusion

“The Project for Improvement of Management Capacity of Operation and Maintenance for Water Supply Facilities in Nile Delta Area” provided the skills for the SOP-based operations, the reduction of NRW, and the WDM, with a view to improving the operations and maintenance at the water treatment plants in 3 target governorates. So far, the C/Ps are all committed to the project activities, and efforts have been observed to increase the implementation efficiency through the utilization of existing knowledgebase in the country. As a result, the indicators for Outputs related to SOP and NRW reduction activities are expected to be complete by the end of the Project period, and the PIs for these activities are by and large achieved. WDM activities so far have only limited progress due to the delay in the equipment procurement and to the software errors with the equipment, which requires further follow-ups. Although the coup d’Etat in Egypt in July 2013 delayed the response by the Japanese experts to address the said software errors, the impact of this incident on the overall project implementation was not as significant as initially expected.

In light of the information above, the evaluation for this Project is as follows: the relevance is “high”, for the Project’s consistency with the Egypt’s national policy and capacity needs, as well as with Japan’s assistance policy and comparative advantages. Effectiveness is “relatively high”, for its satisfactory achievement of the PIs for SOP and NRW. The PIs for the WDM was assessed as too early to evaluate, due to the delay in its activities. Efficiency is “relatively high”, because the indicators for 4 Output (0,1,2 to 3) out of total 5 Outputs are likely to be achieved, because noteworthy efforts were made to increase the efficiency, but because the delay in the WDM activities are hindering the achievement of Output 4. Impact is “high”, because the Overall Goal is likely to be achieved owing to the well-thought project design that integrates the dissemination of outputs in the current project outputs, and because other impacts and spillover effects have been observed outside of the Project. Sustainability was evaluated as “relatively high”. Existing policy framework, organizational structure, and technical skills in SOP and NRW are likely to support the sustainability of the Project outputs on one hand; on the other hand the level of WDM skills is yet to be confirmed, and there is some uncertainty as to whether the available finance will be utilized for the operations on-site.

Overall, the Project has produced satisfactory results; however, there is a limit in assessing the real final Project performance without confirming the results of the Output 4. For this reason, the extension of the project period is recommended to complete the Output 4 activities and confirm the project outcomes.

4. Recommendations

- (1) HCWW will share the view of the facility design from the aspect of O&M of WTPs, with the NOPWASD stakeholders in charge of design and construction supervision of these facilities. HCWW will also make its utmost efforts to promote increased information-sharing between the contractors and the operators, through such actions as hosting an opportunity for the NOPWASD stakeholders to visit the facilities that participated in this Project.
- (2) To sustain and disseminate the outcome of this Project, GHAPWASCO and MCWW undertake the following:
 - 1) For NRW reduction, ensure that the “5-year Plan for Non-revenue Water Reduction” formulated in this Project will be implemented. The two ACs will also undertake the following measures to facilitate the NRW activities.
 - Maintain the current staff allocation and implementation arrangement for NRW(both at HQ and at Markaz branches), and increase the collaboration with each branch;
 - Provide to the NRW teams the vehicle(s) and equipment necessary for NRW activities.
 - 2) For SOP, ensure the implementation of SOP dissemination plans created in this Project. The two ACs also regularly undertake the following actions to facilitate the implementation of the plans.
 - Purchase of spare parts necessary for the O&M at WTP and IMRP;
 - Calibration of instrumentation devices.
- (3) To achieve the Super Goal of this Project, GHAPWASCO, MCWW, and SHAPWASCO will extend the project activities also to other Governorates, upon the completion of the dissemination within their Governorates.
- (4) To sustain the skills and motivation of the staff involved in this Project, the GHAPWASCO and MCWW will take initiatives to promote the sharing of experiences and outputs of this Project. An example of possible actions

they could take is to utilize the network fostered in this Project to organize joint seminars, where the operational-level staff will be given opportunities to share their experiences with other ACs.

- (5) To ensure correct data collection and improve the water fee collection rate, HCWW, GHAPWASCO, MCWW, and SHAPWASCO will make utmost efforts to sensitize the water users on the need for regular replacement of customer water meters. The four organizations also discuss concrete measures to promote the replacement of the meters by the users. HCWW should consider the house connections (including the meters) to be the property of the ACs instead of the customers, to ensure the maintenance and replacement of these meters.
- (6) After confirming the effects of Output 4 activities, SHAPWASCO will apply the WDM activities to other water distribution facilities within Sharkiya governorate which were not covered in this Project. In so doing, SHAPWASCO will ensure not only the dissemination of the remote monitoring system, but also of the water distribution management capacity to address the issues identified through the monitoring. With precise data acquired through monitoring, SHAPWASCO is recommended to analyse the present conditions of water distribution in Zagazig, and establish countermeasures to solve the problems such as low service pressure and intermittent water supply.
- (7) SHAPWASCO will ensure the proper maintenance and management of the remote monitoring system provided by the Project. In so doing, SHAPWASCO will establish a maintenance agreement with the approval firm familiar with this system, to address any problem that may arise with the software, and undertake upgrading of the software in cooperation with the supplier. SHAPWASCO will also secure the budget to address any problem relating to the system that cannot be covered by the supplier.

5. Lessons learned

Below are the lessons learned by JICA through the implementation of this project.

- (1) The effectiveness of the Project design that incorporates the activities for achieving the Overall Goal

This Project incorporated into the current activities of the Project the dissemination of Project outcomes within target governorates. As a result, the Overall Goal of “Management capacity of operation and maintenance of water supply facilities is improved in Sharkiya, Gharbia and Minufia Governorates” is already being achieved at the time of the Terminal Evaluation, and the Super Goal of “Management capacity of operation and maintenance of water supply facilities is improved in Nile Delta Area” is being realized through several efforts, such as the organization of a special workshop. The design of this Project is deemed highly effective in ensuring Impacts and Sustainability.

(2) Effectiveness and issues with the PI introduction

As mentioned in “3-2 (2) Effectiveness”, the introduction of Performance Indicators (PIs) and the visualization of progress and outputs were on one hand highly effective in facilitating the understanding on the purpose of the activities and raise the awareness of the stakeholders. Because the results and outputs shown in numbers are easy to understand, however, there is also a risk for these figures to “walk around” without accompanying relevant qualitative explanations. PIs are ambitious indicators, since some PIs are influenced by external factors. In fact, many discussions were held during this Terminal Evaluation on the interpretation of the monitoring data. The lessons learned through these discussions and actual evaluation were: 1) when introducing the PIs, there is a need to clarify the criteria for collecting, analyzing and evaluating the monitoring the data as well as the external conditions, and to foster a common understanding among stakeholders on these criteria; and 2) both quantitative and qualitative assessments are necessary in evaluating the progress on the PIs.

(3) Utilization of In-country Human Resources

The Japanese experts transferred the advanced knowledge to C/Ps, while the human resources in the country supported that so that C/Ps easily understood it, which had synergistic effect. What SHAPWASCO share the effectiveness and the issues of the activities with GHAPWASCO and MCWW encouraged them to understand. Likewise, the utilization of Project Facilitators in addition to interpreters significantly contributed to enhancing the efficiency in promoting the understanding among the C/Ps with limited English language skills, and in reducing the administrative burden on the side of the Japanese experts in

running a large project that involves three governorates. Project Facilitators kept to stay at project's site and to monitor the process of C/P's activities, which led to maintain activities of project even if Japanese experts were dispatched intermittently.

(4) Issues to determine the spec of equipment

It is not until problems about operation for water distribution facilities were correctly recognized that the remote monitoring system provided by the Project was utilized. In fact, there was argument that it was too soon to introduce the remote monitoring system for SHAPWASCO because person in charge of operation for the system didn't recognize the problems of water distribution. In earlier discussions, however, SHAPWASCO promoted better understanding and communication across institution barrier. There was different opinion about the content to transfer in water distribution management and the spec and the number of required equipment, between Japan and Egypt. Discussion was spent much time and the remote monitoring system was introduced in response to very strong request by Egypt. When similar facility is provided it is essential to confirm the matter of the moment and the purpose for introduction of the remote monitoring system with person in charge, to discuss need of introduction for the system in order to achieve the purpose, and to evaluate whether recipient country has the capacity to do with the remote monitoring system.

(5) Issues of procurement

In introduction of the remote monitoring system, JICA purchased software as equipment and aligned it with existing date on project site. As mentioned, problem was occurred when transmitting and downloading data between software, which the Output 4 has been delayed.

It is recommended that supplier manage appropriately all process from procurement to installation and that JICA contract out supplier to check and to show defined check point even if recipient country install equipment, in order to become functional as total system.