

## The Summary of Terminal Evaluation

1. Outline of the Project		
Country : Republic of Indonesia		Project Title : The Project for Water Service Improvement in Mamminasata Metropolitan Area in South Sulawesi Province
Field : Water Supply		Cooperation Scheme : Technical Cooperation Project
Department in Charge : Water Resources and Disaster Management Group, Global Environmental Department		Cooperation Amount : About 430 million Yen
Cooperation Period	R/D : July 2009 September 2009～March 2012 (2year and 6months)	Counterpart Organization :  Project Managing Organization : Directorate General of Human Settlements, Ministry of Public Works  Project Implementing Organization : Department of Spatial Planning and Settlement, South Sulawesi Provincial Government 4PDAMs in Mamminasata Metropolitan Area
		Supporting Organization in Japan : Nagoya City Waterworks & Sewerage Bureau, Okayama City Waterworks Bureau, Nihon Suido Consultants Co., Ltd. KRI International Corp.
		Related Organization : Ministry of Health, Labour and Welfare
1-1. Background of the Project		
Mamminasata Metropolitan Area which is situated in the south of Sulawesi Island is stipulated as Metropolitan Area consisting of Makassar, Maros, Gowa and Takalar. Its population is about 2.25 million and it is a center of east Indonesia's economy. However water supply coverage of Makassar is about 70% and those of Maros, Gowa and Takalar is about 15%. Construction of water supply infrastructure was slower than progress of urbanization. The main reasons are as follows; Non revenue water ratio is about from 30% to 50%. Burden of debt repayment is heavy. Water tariff is too low. These things made the PDAM's management difficult and investment fund for water pipe renewal and expansion of service area cannot be allocated. Water sources of 4 PDAMs are surface water and turbidity becomes high in rainy season. Therefore appropriate operation of water treatment plant is necessary based on appropriate water quality management. However in small scale water treatment plant, even fundamental equipment for water quality analysis is not installed and water was distributed without conducting water quality analysis. This low service quality deteriorated willingness to pay of water tariff by residents and was the cause of high NRW ratio. Furthermore interregional issues which are common to 4 PDAMs such as response to progress of urbanization and securement of water sources were recognized. However there was no coordination mechanism among 4 PDAMs and system for problem solution		

was not made. Based on these backgrounds, targeting 4 PDAMs in Mamminasata metropolitan area technical cooperation project was commenced for the purpose of enhancement of water supply service through 5 outputs.

- (i) constitution of interregional coordination system
- (ii) measures of NRW improvement
- (iii) financial improvement
- (iv) improvement of facility operation and maintenance
- (v) improvement of water supply utility operation and maintenance through water quality improvement

## 1-2. Project Overview

In PDAMs of Makassar, Maros, Gowa and Takalar in Mamminasata Metropolitan Area, technical transfer is conducted through OJT to each PDAM's staff in order to improve water supply service.

### (1) Overall goal

Inter-regional cooperation and coordination mechanism among PDAMs is strengthened.

### (2) Project Purpose

Capacity of PDAM staff for technical management (O&M) and financial administration of water supply service in Mamminasata Metropolitan Area is enhanced.

### (3) Outputs

Output1: Inter-regional cooperation and coordination mechanism among PDAMs is strengthened.

Output2: PDAM's financial administration capacity is strengthened.

Output3: PDAM's technical capacity for NRW reduction is strengthened.

Output4: PDAM's technical capacity for establishment of GIS database is strengthened.

Output5: PDAM's technical capacity for water quality management of small scale water treatment facilities is strengthened.

### (4) Inputs (as of terminal evaluation)

Japanese side : Cooperation Amount: About 430 million Yen

Placement of Experts	13 experts : 86.17MM (as of November 2011) field : Chief Advisor/Water Supply Management/Capacity Development, Water Supply Utilities Management Advisor, Deputy Chief Advisor/NRW Reduction, Leak Detection, Finance Management, Business Management/Customer Relations, O&M of Water Treatment Facilities, Water Quality Management, GIS, Inter-organizational Coordination Advisor, Coordinator/Assistant to Water Quality Management
C/P trainees received	17 C/Ps (Total:8.07MM)
Provision of Equipment	JPY52.9million Major Equipment is PCs for financial management, Leak Detector, Flow Meter, GIS server, GIS software, equipment for water quality

analysis.	
Local Cost :	First year : JPY3.031million Second year : JPY2.561million (plan)
Indonesian side	
Counterpart allocation	Project Director, Project Manager, Staff allocation for each field from each PDAM
Local Cost :	<ul style="list-style-type: none"><li>Counterparts' travel cost including allowance and accommodation fee (Each PDAMs disburse for counterparts' travel cost)</li><li>Electricity fee, internet connection fee, water tariff for the project office in DSPS</li><li>Installment cost and operation and maintenance cost of customer meters and water quality analysis equipment procured in the project</li><li>Allowance and travel cost for the steering committee members and JCC members to attend the meetings</li></ul>
Buildings and Facilities	<ul style="list-style-type: none"><li>Office space and necessary facility in DSPS in South Sulawesi Government</li><li>Meeting rooms for project activities and training</li></ul>

2. Evaluation Team			
Members	Job title	Name	Occupation
	Team Leader	Hideo Miyamoto	Senior Advisor to the Director General, Water Resources and Disaster Management Group, Global Environment Department, JICA
	Urban Waterworks	Yuji Honda	Nagoya City Waterworks & Sewerage Bureau
	Cooperation Planning	Ryosuke Isobe	Deputy Director, Water Resources Management Division I, Water Resources and Disaster Management Group, Global Environment Department, JICA
	Evaluation Analysis	Ayako Namura	Tekizai Tekisho LLC
Period	3 Nov 2011-26 Nov 2011		Type of Evaluation : Terminal Evaluation

3. Results of Evaluation	
3-1. Confirmation of Actual Achievement	
(1) Output 1 :Inter-regional cooperation and coordination mechanisms among PDAMs are strengthened.	
Strengthening of inter-regional cooperation and coordination mechanisms is partially achieved.	
Discussion on inter-regional cooperation and coordination mechanisms was conducted with stake holders. As a result two themes are identified as inter-regional coordination;	

One is the cross border water supply between PDAMs and the other is inter-regional water supply initiated by provincial government. So far regarding cross border water supply between PDAMs, two MOUs were concluded between Gowa and Takalar and between Makassar and Takalar. Regarding inter-regional water supply, contents of cooperation mechanism was clarified and framework was drafted. So far this general inter-regional agreement was not agreed. However there is application of inter-regional water supply enterprise in the water supply plan in new town of Baru city by provincial government initiative.

(2) Output2: PDAM's financial administration capacity is strengthened.

Strengthening of PDAM's financial administration capacity is almost achieved.

As a result of OJT implemented in the project, counterparts in each PDAM were able to analyze financially utilizing financial statements, to analyze and estimate BPPSPAM index utilizing financial model made in the project and to calculate water tariff based on the guideline of Ministry of interior. Also collection rate of water tariff was improved and target for 2010 was achieved in the most of PDAMs. For example, Makassar's collection rate of water tariff increased from 86% in 2007 to 96% in 2010. Water tariff collection activity for the persons who didn't pay water tariff was conducted. Since output had been raised by conducting collection activities for the persons who didn't pay in Makassar, the project supported the water tariff collection activities for 3 PDAMs in Maros, Gowa and Takalar. Through activities for water tariff collection in pilot area, counterparts in 3 PDAMs learned procedure of collection activity and recognized that collection activities for the persons who didn't pay are effective. Also the project explained to governors and mayors that project activities contribute to improvement of water supply service of PDAMs. Workshop was held for discussing countermeasures for improving financial situations of PDAMs. Through workshop municipal officials understood the PDAM's financial situation and understood the necessity of strengthening of management of water supply enterprise. As a result of workshop report of PDAM's financial situation, Takalar PDAM raised the water tariff.

(3) Output3: PDAM's technical capacity for NRW reduction is strengthened.

Strengthening of PDAM's technical capacity of NRW reduction is almost achieved.

Non-Revenue Water reduction committee was formed in each PDAM. The Project defined the role of committee members clearly and enhanced the capacity of every member and instructed the members to tackle with NRW reduction activities as a team. Training targeting water meter readers was conducted and they learned collecting method to measure the meters and learned to bill water tariff according to the measured amount. Furthermore counterparts learned the detailed activities to be implemented for NRW reduction and calculation method of necessary budget. Then budget for NRW reduction activities in the pilot areas in each PDAM was secured. Now counterparts can draft the NRW reduction plan and implement the planned activities appropriately.

Before the project was commenced, NRW ratio was calculated based on the production amount and it was almost estimation. Master meters which were installed in the project enabled the counterparts to grasp the accurate distributed water amount and NRW amount can be calculated based on the actual measured numbers. This improved the credibility of the data of distributed water amount and number of NRW ratio. NRW ratio

was decreased in every PDAM and the target of NRW reduction in pilot area was mostly achieved. For example, in one pilot area in Maros NRW ratio decreased from 61.1% to 26.6%. Since large effects appeared in pilot areas by NRW reduction measures activities, counterparts recognized the effect of NRW reduction measures activities and enhanced the motivation of these activities.

(4) Output4: PDAM's technical capacity for establishment of GIS database is strengthened.

Strengthening of PDAM's technical capacity for establishment of GIS database is almost achieved.

Although GIS was new concept for most of the PDAMs, counterparts learned the knowledge and skill on basic operation of GIS. Concretely counterparts learned to input data, make base map and edit the attribute data. Furthermore counterparts learned the system maintenance of how to check the system, how to recover when defect occurs and how to backup. All the PDAMs had completed the digitization of distribution pipes figure in model area by June 2011 and commenced the digitization of other area.

(5) Output5: PDAM's technical capacity for water quality management of small scale water treatment facilities is strengthened.

Strengthening of PDAM's technical capacity for water quality management of small scale water treatment facilities is almost achieved.

The project supported the making of standard of procedure in every targeted WTP and currently the staff of the WTP learned to analyze water quality of pH and turbidity. Through the project activities counterparts understood the meaning and importance of water quality analysis and learned the collect procedure of water quality analysis, how to record the result of water quality analysis and how to feedback the result to water treatment. Furthermore efficiency of injection of chemicals and usage of coagulant was improved.

(6) Achievement of Project Purpose: Capacity of PDAM staff for technical management (O&M) and financial administration of water supply service in Mamminasata Metropolitan Area is enhanced.

Capacity of PDAM staff for technical management and financial administration of water supply service in Mamminasata Metropolitan Area was enhanced and project purpose was achieved.

Performance index on operation and maintenance of each PDAM was drastically improved compared to that of the project commencement. Target of cost recovery ratio was achieved in most of PDAMs. For example, cost recovery ration of Gowa was 104% in 2010. Regarding house connection number, it takes some time to appear the effect of house connection number after NRW countermeasures activities and financial improvement. Therefore it is difficult to verify direct effect by the project. However it is thought to appear in number in 2012 or 2013. The number of the days of abidance of water quality standard was improved considerably. The target was achieved in most of the WTP. For instance, some WTPs in Makassar and Gowa recorded 100% in the number of the days of abidance of water quality standard. The knowledge and skill which were instructed in the project were essential for daily operation of water supply utility. Therefore skill and technique acquired in the training were utilized in daily job.

### 3-2. Summary of Evaluation Results

### (1) Relevance

The policy of water supply sector in Indonesia has not changed so much since the commencement of the project. The contents of the project are consistent with National Mid-term Development Plan (2010-2014) finalized by BAPPENAS. Also Ministry of Public Works is implementing PDAM Health Program and promoting PDAM's financial improvement. The project is consistent with country assistance plan to Indonesia finalized by the government of Japan. Also the project is included in the Mamminasata Metropolitan Area development sub-program which is one of sub program of South Sulawesi Province regional development program promoted by JICA. Mamminasata Metropolitan Area is designated as special area which needs immediate urban development in national spatial plan drafted by Ministry of Public Works. Framework of urban environment preparation by broad area collaboration was prepared. Regarding urban environment, enhancement of water supply coverage and improvement of water supply service including improvement of water quality in the area are the issues and in this regard, the project is consistent with the needs of Mamminasata Metropolitan Area. Japan has strength in technique in water supply sector and has affluent experienced human resources. Especially the expert team of the project consists of staff of water supply utility in local government and ODA consultants and they were fielded so that strength was utilized each other and it was relevant to operate the project.

### (2) Effectiveness

It is regarded that effectiveness of the project is high. Staff of targeted PDAMs enhanced the capacity of financial management and maintenance management of water supply service. Also if concerned organizations can agree to the framework of cooperation of inter-regional water supply enterprise by the end of the project, base of cooperation system in inter-regional enterprise of water supply sector is established and it is expected to be utilized in promoting urban environment in Mamminasata Metropolitan Area in the future. 5 outputs set in the project is essential element to achieve the project purpose. Also external assumption which influences the achievement of project purpose is not found. Therefore it can be said that achievement of output leads to achievement of project purpose. In addition to high prospect of achievement of outputs, strong leadership and commitment to improvement of water supply enterprise by PDAM management level lead to high performance of the project.

### (3) Efficiency

The project is efficient in its operation. To date, the quality and the quantity of inputs were appropriate. The inputs were mostly utilized for project activities. The timing of assignment of JICA experts was adjusted along with the progress of activities and this promoted the smooth project implementation. The training in Japan conducted three times also boosted the project implementation by observing the Japanese water supply policy and system. Especially, the training program brought about change in the participants' mind-set toward water supply services and learned the importance of the well disciplined way of work. In this respect, the training program in Japan for water supply sector can greatly foster the counterparts' understandings of what the Project intends to achieve. The PIU (Project Implementation Unit) meeting organized monthly has promoted the smooth project implementation as well. This was a good opportunity for the counterparts to grasp the

progress of activities at other PDAMs, share the experience, and discuss the solutions toward the problems they encountered.

#### (4) Impact

It is expected that overall goal will be achieved if the activities promoted by the Project is sustained at all of 4 PDAMs in the future. To maintain the good level of activities, the staff motivation toward the water supply service needs to be sustained or promoted. Through this, the enhanced capacity through the Project will lead to the further improvement of capacity and quality of water supply service by PDAMs. In addition to this, in order to achieve overall goal, continuous financial assistance by central and local government is essential. Especially in order to achieve the increase of water supply coverage of national target by 2015, expansion of water supply facilities, for example construction of new WTP, repair of existing facilities, expansion of distribution network and so on, is needed. It is prerequisite that finance for the expansion is secured.

#### (5) Sustainability

Considering policy and institutional aspects, financial aspects and technical aspects, sustainability is considered to be secured to some extent.

##### • Policy and Institutional Aspects

The policy environment is likely to be favorable for PDAMs. The GOI keeps the target goal of drinking water access for 70% (pipeline of 32%) of the population by 2014 to meet the target of Millennium Development Goal of 80% of drinking water access by 2015. Moreover, the Ministry of Public Works and the Ministry of Finance still pursue the policy on the improvement of financial status of PDAMs and provide the investment funds to those which are successful in financial improvement. South Sulawesi Province has promoted the development program in Mamminasata Metropolitan Areas including the improvement of water supply services to date. As such good policy environment to PDAMs is considered to be kept in the future.

##### • Financial Aspects

In every targeted PDAMs financial situation was improved and capacity of financial analysis by staff is improved and staff is able to estimate the future utilizing financial model. Therefore it is considered that PDAMs maintain good financial situation in the future. This will support PDAMs in obtaining the budget allocation from the central and local governments for new investment funds, including the loans from donors, in the future. It is also expected that the PDAMs will continuously make efforts to secure the necessary budget for daily activities and maintenance for equipment, since the PDAMs are already aware of effectiveness of activities that the Project has been promoting. However attention is necessary regarding water tariff raise, since it is difficult politically.

##### • Technical Aspects

Terminal evaluation team confirmed targeted PDAMs recognized that knowledge and skill improved in the project activities are essential for water supply enterprise. Therefore it is expected that activities will be

continued after the project completion. To ensure the technical sustainability, it is expected that the key counterpart personnel will transfer the acquired knowledge and skills to other staff that did not receive the training or newly recruited personnel. Since the Project prepared and utilized various training materials in all outputs, those are good tools to disseminate the knowledge and skills. The Project procured the equipment for which the PDAMs can receive the services after sales in Makassar or Jakarta; therefore it is expected that the maintenance work would not be a big problem for the target PDAMs as long as the basic maintenance works are regularly carried out for the procured equipment. In regard to GIS, if some complicated troubles occur, external assistance from local consultants or GIS related companies will be necessary. Therefore, the Project will suggest a plan to have technical support after the Project is finished.

### 3-3. Factors that promoted realization of effects

#### (1) factors concerning the planning

- JICA expert team of the project consists of staff of water supply utility of Japanese municipal government and ODA consultants. Since the project mixed water supply utility which operate water supply in Japan and ODA consultants who have affluent experience, the project could respond to the needs of counterpart organization carefully and acquire high credibility from counterparts.

#### (2) factors concerning the implementation process

- Management level of PDAMs showed strong will and determined attitude to improvement of water supply enterprise and exercise its leadership.
- Monthly Project Implementation Unit meetings were not just occasion that progress of the project was confirmed but the occasion that information and opinion were exchanged among PDAMs and enhance each other
- Provincial government officials and PDAMs top management level saw the ideal situation of water supply enterprise in the training in Japan and they recognized the direction of the project.

### 3-4. Factors that impeded realization of effects

#### (1) factors concerning the planning

The pH meters procured at the beginning of the project implementation were broken and needed to be repaired in Jakarta. The Project procured another type of pH meters which can receive the service after the sales in Makassar city. According to the JET, the Leak Noise Correlators procured by the Project were higher specification than necessary level for PDAMs. Instead, the Project could have procured less expensive but more number of equipment for NRW reduction activities. However this problem hasn't influenced much to the whole project efficiency and it's influence to the project output was limited.

#### (2) factors concerning the implementation process

Nothing special.

### 3-5. Conclusion

In sum, the Project is likely to achieve its purpose by the end of the cooperation period when the planned activities are successfully carried out in the remaining cooperation period. The PDAM's capacity of O&M



skills and financial administration of water supply services have been enhanced. Now the PDAMs are able to grasp the water supply services and financial conditions by the reliable numerical indicators. The project is very appropriate to implement, judging from the relevance of the project. The project effectiveness and the efficiency are high and any serious factors adversely affecting the Project have not been observed. It is expected that the impact will be generated if the PDAMs sustain the financially health conditions and the investment fund from central and local government is secured to expand the water supply. The sustainability is likely to be ensured since no negative factors influencing sustainability are identified. Therefore it is appropriate that the Project terminates as scheduled.

### 3-6. Recommendations

#### (1) Measures to be taken by the termination of the Project

■ **To agree on Inter-regional cooperation and coordination framework (area-wide cooperation) among stakeholders by the end of the project term**

It is expected that continuous efforts will be made to agree on the Inter-regional cooperation and coordination frameworks which the Project has been promoting among the stakeholders by the end of the cooperation period. This agreement will support PDAMs in increasing the water supply schemes since the water resources are limited in Mamminasata Metropolitan Area. This framework will also contribute to increase in the water supply population. It is expected that the provincial government will take the initiatives and take a role of coordinator, the process of project formulation and implementation will be accelerated.

■ **To compile the information of maintenance agencies or companies for the procured equipment**

It is recommended that the Project compile the information of agencies or companies which can do maintenance work for the procured equipment in the Project. This is to ensure that the maintenance for the provided equipment is carried out appropriately and to last the period of use.

■ **To consider the options to receive the technical support for GIS from external local resources after the cooperation period is finished**

It may be better to discuss the possible options that the PDAMs can obtain technical support on GIS operation and maintenance, including support for technical troubles and software upgrade, after the completion of the project. The inputs or ideas from the experienced JICA experts will greatly help the counterparts make decision on the best way to receive the external supports on GIS in the future. Since the implementation plan to expand GIS database for whole water supply areas is currently underway at each PDAM, the options discussed between the counterparts and the JICA experts should be included in the plan.

■ **To further emphasize the public relations on the improved performance of PDAMs to promote the water supply coverage**

It is recommended that the PDAMs further enhance public relations activities on the improved

performance of PDAMs to the residents, such as the improved water quality distributed from the WTP which comply with the water quality standards, or the improved financial conditions of PDAMs. This may promote the awareness of the residents toward the efforts made by the PDAMs and lead to the residents' incentives to apply new connections. It is expected that the specific activities to strengthen the public relations on this matter will be discussed with the JICA experts by the end of the cooperation period.

■ **To visualize the effects on the cost reduction**

One way to promote the motivation of PDAM's staff would be to show the effects of the cost reductions quantitatively. For instance, the PDAMs may be able to calculate the reduced operational costs by optimizing the chemical dosage on water treatment process. Likewise, the saved volume of water by NRW reduction activities can be calculated and converted to the money value utilizing the water tariff.

(2) Measures to be taken after the termination of the project by the stakeholders

■ **To establish the technical network among the PDAMs**

Through the project activities, the human network among the counterparts of PDAMS has been enhanced. The Project organized the PIU meeting monthly or Output meetings occasionally. This was very useful for the counterparts to share the information, exchange the ideas, and discuss the possible solutions on the common problems. In this respect, formulation of technical working group or teams comprised of the 4 PDAM staff, such as Financial Management team, NRW team, GIS team, and Water Quality Management team.

■ **To emphasize the knowledge and skill transfer to other staff within PDAMs**

The Project trained the counterparts of each PDAM in target fields, such as Inter-regional cooperation, finance, NRW, GIS and Water Quality Management. They are core personnel at respective PDAMs and in good position of transferring the acquired knowledge and skills to other staff within the organization. This will further enhance the human resources capacity of PDAMs and ensure the technical sustainability of the Project.

■ **To establish a public service unit such as UPTD (Regional Technical Implementation Unit) /BLU (Public Service Organization) when area-wide water supply project is formulated and implemented with the initiatives of the provincial government**

It is expected that a public service unit such as UPTD/BLU will be certainly established with the initiatives of the provincial government utilizing the inter-regional cooperation and coordination frameworks discussed in the project activities.

3-6 Lessons learned

(1) To consider the balance of inputs toward the large-scale organizations when the size of counterpart organizations varies

In case of this Project, the Detailed Planning Survey was conducted and the Survey concluded that it was relevant to allocate the project inputs to 4 PDAMs equally. This decision was made judging from the situation that any of PDAMs were not in the position of taking the leadership among the target PDAMs. Examining the results of the terminal evaluation, this decision did not negatively affect the achievement level of the Project on the whole. On the other hand, there is an opinion that another possible option may be to give a leading role to one PDAM and develop it as a top runner among the target PDAMs by primarily providing the project inputs to said PDAM. This approach may be applicable when the plural number of organizations is targeted and the scale of the target organizations varies. It also ensures the technical sustainability effectively.

(2) To consider the possible measures to minimize the influence of resignation or transfer of the trained counterparts to the project effects

The resignation or transfer of the counterpart personnel occurred during the project implementation. This issue did not adversely influence to attain the good performance of the Project, because the JICA experts have trained the key counterpart personnel who can take leadership to absorb the knowledge and skills that Project has provided, and prepared various training materials utilized for the reference. When resignation or transfer of the counterparts is highly likely to occur, the possible way of minimizing its influence should be taken into consideration.