

Summary of Terminal Evaluation Study Results

I. Outline of the Project		
Country : Republic of El Salvador		Project title : The Project for Capacity Development of ANDA for Operational Improvement
Sector : Water Supply and Sewerage		Cooperation scheme : Technical cooperation project
Division in charge : Environmental Management Division 2, Environmental Management Group, Global Environment Departmen		Total cost: 370 million yen
Period of Cooperation	(R/D) December 2, 200	Partner country's implementing organization : ANDA (National Administration of Aqueducts and Sewers)
	January 2009 to December 2011	Supporting organization in Japan : Nihon Suido Consultants Co., Ltd.
		Related cooperation: NA
<p>1 Background of the Project</p> <p>Of all the 262 municipalities of the Republic of El Salvador, ANDA (National Administration of Aqueducts and Sewers / Administración Nacional de Acueductos y Alcantarillados) provides its services to 167 municipalities. In other municipalities, mainly located in rural areas, water supplies have been carried out by other agencies.</p> <p>The coverage rate of water supplies in urban areas of El Salvador is 88.2%, of which 81.6% is supplied by ANDA¹. However, ANDA has had the long-lasting problems as follows.</p> <p>① The non-revenue water (NRW) is estimated to be approximately 50%. Due to high maintenance cost and electricity cost comparing with low water tariffs, management situation has been deteriorating. However, ANDA does not have the authority to amend the water tariff on its own, and is accustomed to receive government subsidy to cover its financial deficit.</p> <p>② Due to insufficient water resources and capacity of the water facilities, certain regions have intermittent water supply.</p> <p>③ Although sewer network covers approximately 70% of the country, the number of sewerage plants is limited. Thus, 97% of sewage water is discharged into rivers untreated.</p> <p>Under these circumstances, JICA dispatched an expert for “Improvement Plan of Water Supply at Primary Cities” (January - August 2007) . He analyzed the problems and made the action plan to improve the situation.</p> <p>ANDA has made the request for the Project based on this plan. During the ex-ante evaluation of the Project in July 2008, the priority components of the Project were identified. Based on this, the Project was launched in December 2008 for the period of 3 years, with the aim of improving operational management capacity of ANDA.</p>		

¹ “ANDA annual report, year 2010”

In October 2011, two months before the termination of the Project, JICA dispatched the terminal evaluation team.

2 Project Overview

This Project is divided into 3 components. For the NRW, NRW reduction management team is established in the ANDA Headquarters; and the NRW reduction action teams are established in Metropolitan, Central and Western regional offices, implementing “On the Job Training (OJT)” of the NRW reduction activities at the respective “model area” and “the pilot area” . The cost benefit resulting from these activities will be analyzed and used to formulate the long-term NRW reduction plan.

As for power saving, a power saving management team is set up at the Metropolitan Office where large scale facilities are located, to enhance the formulation of power saving plan through OJT. Inefficient electrical facilities are identified under the pilot activity. The activities to improve its power saving measures are to be implemented in relation with water supplies.

Training sessions are held for the Sewerage Planning Team established at the ANDA headquarters to improve the capacity for the formulation of sewerage facilities plans.

All the results are to be disseminated throughout ANDA by means of training materials and workshops.

(1) Overall goal

ANDA’s capacity to manage water services is strengthened.

(2) Project purpose

ANDA’s capacity to operate and maintain water supply facilities is enhanced.

(3) Outputs

1. ANDA’s technical capacity of NRW reduction is enhanced.
2. ANDA’s planning capacity of NRW reduction is enhanced.
3. ANDA’s planning capacity of power-saving program is strengthened.
4. ANDA’s planning capacity of sewerage system development is enhanced.

(4) Inputs (to the point of the terminal evaluation study)

Japanese side :

Dispatch of 7 experts (71.8M/M)

Provision of equipments 59,720,000 yen

Local Cost 60,098,000 yen

Invitation of 8 trainees

El Salvadorian side :

Assignment of 45 counterparts

Provision of facilities

Local cost US\$ 353,770²

² The local cost is a sum of the security expenditure, operation cost of the metropolitan regional office, the central regional office, and the western regional office; however, the expenditure of the western regional office for the fiscal year of 2011 is not included.

II. Evaluation Team		
Members of evaluation team	1. Leader: Shozo Yamazaki (Tokyo Suido Services Co., Ltd.) 2. Cooperation and Planning: Hideaki Matsuoka (Environmental Management Division 2, Environmental Management Group, Global Environment Department, JICA) 3. Evaluation and Analysis: Yukiko Haneda (Japan Development Service Co., Ltd.)	
Evaluation period	9 October, 2011- 28 October, 2011	
III. Results of Evaluation		
1 Project Performance		
(1) Achievement of the Project Purpose		
<u>Project Purpose: ANDA's capacity to operate and maintain water supply facilities is enhanced.</u>		
<p>It was evaluated that the Project purpose would be achieved by the time of the termination of the Project.</p> <p>Regarding the NRW pilot areas (the metropolitan and central regional offices) , NRW was reduced, and ANDA is currently expanding the NRW reduction plan. As a part of the additional USD 15 million that ANDA has secured for the fiscal year 2012, the expansion of the NRW reduction plan is included. Similarly, at the pilot facilities where power saving operations took place, electricity consumption efficiency was improved. ANDA headquarters has already drafted the budgetary plan to expand the plan for power saving.</p>		
(2) Achievement of the Results		
<u>Result 1: ANDA's technical capacity of NRW reduction is enhanced.</u>		
<p>Result 1 is expected to be achieved by the end of the Project period. The water pipelines in the ANDA metropolitan, central and western regions were more deteriorated than previously expected, causing much leakage so that repair works could not catch up. Thus, the NRW reduction rate resulted in the average of 35% in these areas, and the indicator, "NRW reduction rate in the model areas falls by 50%" , had not been achieved at the mid-term review. However, the NRW reduction rate at the pilot areas fell in the average of 49% (Metropolitan regional office 44%, and Central regional office 51%) . Both areas achieved the indicator set as an objective. Unfortunately, the pilot project at the Western region has not been completed due to delay of field workers' assignment and late delivery of materials such as valves, and the reduction rate was not estimated. It is expected to be completed by the end of November. The NRW reduction manual is expected to be completed by the end of the Project.</p>		
<u>Result 2: ANDA's planning capacity of NRW reduction is enhanced.</u>		
<p>The indicator of Result 2 "Draft of a long-term NRW reduction plan is formulated" was confirmed and the result was achieved. At the time of the final evaluation period, the draft Plan is waiting for the authorization of the ANDA Board. On the other hand, following the draft Plan, ANDA is planning to purchase 300,000 house meters, out of which already 90,000 meters were purchased in April 2010, and ANDA plans to purchase further 175,000 meters within this year.</p>		
<u>Result 3: ANDA's planning capacity of power-saving program is strengthened.</u>		
<p>Regarding the indicator "Power consumption in the pilot facilities decreases", as the power saving</p>		

efficiency and cost benefits were confirmed at all the pilot facilities, the result is achieved.

At the pilot site 1 (ANDA Headquarters power receiving and transforming facilities) , a condenser was placed in order to improve the power factor at the time of electricity consumption and the power factor has improved from 76.7% to 92.6%. Consequently, monthly penalty placed on low power factor below 90% no longer needs to be paid.

At the pilot site 2 (Caites del Diablo pumping facility) a speed regulating device for the pump was installed. As a result, approximately 533kWh was reduced per day, and the investment cost can be recovered in about 2 years and 2 months.

At the pilot site 3 (El Socorro pumping facility) 6,300kWh was reduced per month, and the investment cost can be recovered in about 2 years and 1 month.

At the pilot site 4 (La Universitaria pumping site) , also resulted in about 11% power reduction rate compared to before the operation.

The power-saving plan and the power-saving manual have been drafted. The power-saving manual (draft) will be assessed by the ANDA technical staff and shared with ANDA staff of the other regional offices through workshops.

Result 4. ANDA's planning capacity of sewerage system development is enhanced.

As informed at the mid-term review, these activities have been completed on the second year, and the result 4 has been accomplished. The planning manual for sewerage system development has been assessed by the technical staff of ANDA, and is now being studied on the legal side at the time of the termination evaluation study. On the other hand, this manual has already been utilized by 8 municipalities.

2 Summary of the Evaluation Results

(1) Relevance: Relevance for the Project is judged to be very high

To expand the access of the water and sewage service in the urban and rural area is the principal strategy of ANDA, and it is consistent with the 5 year plan of the Government of El Salvador. To improve management of ANDA who suffers from chronic deficit, it is imperative to reduce NRW rate and to cut down on power costs.

Regarding relevance with the Japanese policy, this Project contributes to one of the comprehensive approaches, the Water and Sanitation Board Partnership Initiative (WASABI) as well as to the expansion of access to safe drinking water and basic sanitation stipulated in the Millennium Development Goals. Also, within Japan's 4 priority areas of cooperation - 1. Activation of economy and expansion of employment, 2. Conservation of environment for sustainable development, 3. Improvement of Social Vulnerability – this Project belongs to category 2. And last but not least, Japan's NRW reduction technology is placed at the world's highest level as well as its technical comparative advantage.

(2) Effectiveness: Effectiveness of the Project is judged to be high.

The results of the project have contributed to achieve the Project purpose. The NRW reduction rates at the pilot areas have fallen by more than 35% and even reached the average of 49%. The Metropolitan regional office, Central regional office and Western regional office have developed a plan to continue the NRW reduction operation at new sites; and have requested funding for the year 2012 to the ANDA Headquarters.

Also, the long-term NRW reduction plan and the power-saving plan of existing water supply facilities were drafted. The long-term NRW reduction plan is aimed to reduce the NRW rate by 25% in 12 years for the regional offices and 25 years for the metropolitan regional office. The budget plan for the next 5 years starting in 2012 was also made.

(3) Efficiency: Project was implemented efficiently

Inputs for the Project activities were appropriate in terms of quantity, quality, and timing in general. Regarding the external assumptions from project activities to output yield, due to the change of Government in June 2009, almost all ANDA management had changed as well as almost a half of the NRW action team of the Metropolitan regional office. There were concerns about its influence on the Project, but there was no major problem or delay. Also, with efforts from the JICA office and the expert team, The ANDA authorities under the new Government have understood the Project well, thus contributing to the progress of the Project.

On the implementation of the NRW reduction activities, the experts organized the on-the-job-training (OJTs) at the model areas, and the ANDA staff took initiatives at the pilot areas. In this way, the technology transfer was carried out twice in detail. This method was highly evaluated by ANDA.

(4) Impact: Impact of the Project is judged to be very high.

The largest impact of the Project made as a result of the NRW activities is that excess water resources can be used in other areas, thus improving accessibility to water supply. Another impact of the Project is that the awareness of water users to save water has improved as a result of the campaigns during the pilot activities.

In addition, through this Project, ANDA has established a mapping unit within its organization to manage and control the water systems using GIS.

(5) Sustainability: Sustainability is judged to be high.

ANDA has expressed its interest to continue expanding the results of the Project; however ANDA's Board must formally authorize the long-term NRW reduction plan (draft) , the NRW manual (draft) , power-saving plan of existing water supply facilities (draft) , the power-saving manual (draft) , and the planning manual for sewerage system development (draft) in order to secure higher level of sustainability including its financial aspects. ANDA has promised to hold a board meeting before the termination of the Project. On the other hand, ANDA is planning early implementation of the long-term NRW reduction plan (draft) ; and has already started to purchase house meters for the year 2012. To expand the Project, ANDA plans to use a part of the granted fund from the Spanish government and financial assistance from the Inter-American Development Bank.

3 Factors that promoted realization of effects

(1) Factors concerning the planning contents

As a result of the Project, ANDA's capacity to operate and maintain water supply facilities was enhanced as it had been expected. Almost all the project results came into effect, and achieved the indicators of objectives which were set at the time of planning of the Project. The Plan has been implemented step by step. There were no critical difficulties admitted during the Project in terms of quantity, quality, and timing of the inputs.

(2) Factors concerning the implementation process

The Project activities were implemented as originally planned. The factors which influenced to achieve the Project results and purpose were the following. One is that the expert team took the position of supporting ANDA and respected ANDA's initiatives; consequently ANDA implemented the Project with a sense of strong ownership. Another is that ANDA evaluated the professional expertise of the experts and their patience very high.

4 Factors that impeded realization of effects

(1) Factors concerning the planned contents

Not applicable.

(2) Factors concerning the implementation process

Due to the change of the Government in June 2009, almost all the management of ANDA had been replaced. Additionally, until recently the President of ANDA had also been assigned as the head of another organization³, which raised the concern over the commitment of the President and other ANDA management to the Project. However, due to efforts made by JICA and the expert's team, there was no negative influence to the Project.

5 Conclusion

The progress of the Project is satisfactory in general, and the objective is expected to be achieved before the termination of the project. The successful results are believed to be brought in by the following two primary reasons.

- ① The design of the Project was reasonably made in accordance with ANDA's capacity. Also, the result of the Project, which has direct link to the improvement of ANDA's earning, motivated the President of ANDA and other staff members.
- ② The level of expertise of the project experts is advanced, and through the daily activities, their technical knowledge was transferred to ANDA efficiently and effectively.

In the Project, a Plan was drafted for ANDA to expand the Project results. If the draft Plan is officially authorized by the ANDA Board, then ANDA will be able to request the necessary project fund to the Central Government (Ministry of Finance) after the year 2012.

A part of the budget to implement the NRW reduction operation for the year 2012 has been already secured by the donor funds from the Inter-American Development Bank (IDB) and Spain, and the implementation of the Project is expected.

6 Recommendations (Specific measures, suggestions and advices)

Recommendations for actions to be taken before the end of the Project Termination

① Approval of the Manuals and Implementation of Long-term Plan:

In this Project, the Long-term NRW reduction plan for the next 25 years and the power-saving plan (draft) were drafted. These plans must be actually put into practice. Also, the manuals for the NRW reduction, the power-saving, and the planning for sewerage system development need to be

³ FONAVIPO (Fondo Nacional de Vivienda Popular/National fund for the low-income housing)

used and put into practice on a daily basis. At the time of the terminal evaluation, a part of these plans (draft) and the manuals (draft) were confirmed to be already integrated into the daily operations. They need to be authorized by the ANDA Board swiftly to be used officially in the ANDA operations.

Suggestions for actions to be taken after the end of the Project Termination

① Collaboration with other donors to expand the Project results:

To assist ANDA's NRW operations for the year 2012 funding from IDB and Spain are partially expected. However, to expand the results further, it is necessary for ANDA to secure its own funding and seek funding from other donors; ANDA is suggested to manifest the results of the project and the future plans to other donors.

② Consideration of alternative for DMA system:

In the model areas and pilot areas of the Project, ANDA constructed Leakage Monitoring Blocks (LMBs) within District Metered Area (DMAs) for the NRW reduction operation, and its effectiveness was confirmed. However, construction of block-flow measuring chambers for each LMB is expensive and a step test using the chambers is labor and time-consuming. On the other hand, even if the DMAs are constructed without LMBs, its effectiveness can be expected although the reduction rate of the NRW would be lower. To reduce the NRW effectively, it is important to expand the operation areas as quickly as possible. In extending the DMA method in the future, ANDA needs to do a cost benefit analysis between the DMA method with and without LMBs, and if they should have to decide, we recommended them to adopt the latter.

③ Change to micro meter (customer) boxes made of plastic:

ANDA started to replace existing old micro meters made of zinc bronze with plastic micro meters to prevent meter-theft. However, existing meter boxes in which house meters are placed are made out of concrete, which makes it more effective against meter-theft, but sometimes difficult to open the lid, and causes problems when reading meters and when trying to detect leak noises in case of leakage control work. However, changing all the meter boxes made of concrete to the ones made of plastic will be expensive, for the time being, due to economic reasons, the plastic meters can be placed only when placing new house meters, and gradually replace the old concrete ones to plastic.

7 Lessons Learned (References drawn from this Project to develop and formulate, implement and administer further projects)

This project includes the components in different areas, such as NRW reduction, power-saving, and sewerage system development. In such a congregative project, it is likely that each component concentrates on its own achievement and, as a result, synergy effect as a whole project may not be realized.

In order to overcome such a problem, the experts and other Project related persons held regular meetings and shared their information in different areas. As a result, the Project was able to achieve the objective of the Organization, to improve ANDA's operational management capacity. This method of communication is considered to be effective for other projects.

8 Follow-ups

It may be possible that the outcomes of the Project will be sustained and disseminated through seminars and workshops after the Project.