Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by El Salvador Office: May 2015

Country Name	**The Project for Capacity Development of ANDA (National Administration of Aqueducts and Sewers) for Operational Improvement**
Republic of El Salvador	

I. Project Outline

Background	In El Salvador, the National Administration of Aqueducts and Sewers (ANDA) provided water supply service to about 62% of the total population in the country in 2007. ANDA covered 168 municipalities with population of more than 3.5 million. The coverage ratio of ANDA was 89.2% in urban area and 16.9% in rural area. There were the following issues of water supply service by ANDA: a) weak financial base due to expensive operation and maintenance (O&M) cost and low tariff level as well as large proportion of non-revenue water (NRW); b) intermittent water supply due to the limited capacity of water supply and lack of water resources; c) inflows of untreated sewage and drainage into rivers. Under those situation, JICA dispatched a long-term expert for preparation of action plans to cope with those problems. Based on the action plan, this technical cooperation project was formulated in order to improve O&M capacity of ANDA.
Objectives of the Project	Through NRW reduction activities at the model areas and the practical pilot areas, power-saving activities at the pilot facilities as well as development of manuals for NRW reduction measures, power-saving measures and sewerage system development, the project aimed at enhancement of ANDA's capacity to operate and maintain water supply facilities, thereby contributing to strengthening of ANDA's capacity to manage water services. The project objectives are as follows: 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.
Activities of the project	1. Project Site : Metropolitan, Central and Western Regions 2. Main Activities: 1) Training for the NRW reduction action team, reduction management team, the power-saving management team, 2) Implementation of NRW reduction measures at the model areas by the NRW reduction action team, 3) Implementation of power-saving measures at the pilot facilities by the power-saving management team, 4) Implementation of survey of existing conditions and sewerage system development, 5) Development of manuals for NRW reduction measures, power-saving measures and sewerage system development. Japanese Side 1. Dispatch of Experts: 7 persons 2. Acceptance of trainees in Japan: 21 person 3. Provision of equipment: CAD, equipment for NRW reduction measures, PCs, , Pickup trucks, etc. El Salvador Side 1. Staff allocated: 86 persons 2. Land and facilities: Office space for Japanese experts in ANDA headquarters 3. Local cost: Security cost, operation cost of metropolitan regional office, the central regional office and the western regional office

Ex-Ante Evaluation	2008	Project Period	January, 2009 – December, 2011	Project Cost	(Ex-ante) 450 million JPY (Actual) 370 million JPY
Implementing Agency	National Administration of Aqueducts and Sewers (ANDA: Administración Nacional de Acueductos y Alcantarillados)				
Cooperation Agency in Japan	Nihon Suido Consultants Co., Ltd.				

II. Result of the Evaluation

<Constraints on the Ex-post Evaluation>

Due to the security reason, the following project sites were not covered by the site visits of this ex-post evaluation. After the project completion, the following sites have had a high insecurity and even ANDA's staffs have not been able to go there without proper security:

- Ciudad Corinto (Model District - ANDA Metropolitan Region)
- San Rafael Cedros (Pilot District - ANDA Central Region)
- Tonacatepeque (Model District - ANDA Central Region)

<Special Perspectives to be Considered in the Ex-post Evaluation>

[Verifiable Indicator for the Overall Goal]

- Target value of the verifiable indicators: Two verifiable indicators are set in the PDM ver.2 but no clear target and no clear baseline is mentioned in each indicator. The target value to verify achievement of each indicator is based on the NRW reduction long-term plan and the power-saving plan elaborated by the project and approved by the ANDA board.
- Difficulty to verify the indicator 2 of power consumption efficiency: Difficulty to identify actual water consumption in the project target areas due to the high insecurity constrains verification of power consumption efficiency against water supply volume. Therefore, changes in power consumption in the target areas were alternatively verified as an effect of the power saving plan developed by the project.
- Supplemental information to verify contribution of the project to achievement of the Overall Goal: It is inevitable to check whether the NRW reduction long-term plan and the power-saving plan have been implemented or not. Also, in order to assess contribution of the project to the Overall Goal of the increase in ANDA's income from water supply, changes in the NRW rates by region and ANDA should be assessed.

1 Relevance

<Consistency with Development Policy of El Salvador Government at the time of ex-ante evaluation and the project completion>

The project was consistent with the El Salvador's development policy of "expansion of water supply and sewerage services and access in urban rural areas" as set forth in the policy documents, including "Government Plan: País Seguro (2004-2009) and "5 year Development Plan (Plan Quinquental de Desarrollo (2010-2014)".

<Consistency with Development Needs of El Salvador at the time of ex-ante evaluation and the project completion>

The project met the development needs of ANDA to improve management for water supply service and to modernize the service.

<Consistency with Japan's ODA Policy for El Salvador at the time of ex-ante evaluation>

The project was consistent with the Japan's ODA policy for El Salvador prioritizing the 4 areas according to the 16 action areas in "País Seguro" based on the policy dialogue on economic cooperation between El Salvador and Japan in 2004. The project supporting to capacity development of ANDA was consistent with one of the priority areas of "Environmental Conservation for Sustainable Development", including development of life environment.

<Evaluation Results> In the light above, the relevance of this project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of project completion>

The Project Purpose was achieved by the project completion. Through the project activities, the NRW reduction long-term plan was officially approved by the ANDA board in November, 2011 and the budget proposal for the new distribution areas in the 3 target regional offices were prepared. Also, the budget proposals for the 8 power saving projects were prepared.

<Continuation Status of the Project Effects at the time of ex-post evaluation>

The NRW reduction long-term plan was updated by ANDA in 2012-2013 and has been implemented. In the plan, through establishment of District Metering Areas (DMA)[1], which can be separated by valves from the distribution network, NRW countermeasures, including installation of micrometers, replacement of pipelines and detection of water leakage and illegal connections, are taken place. The 3 regional offices have now at least 1 DMA through promotion of installation of micrometers and replacement of pipelines of 20km.. In addition, the equipment provided by the project, including leak detection equipment, has been still in constant use. For power-saving activities, the specific projects listed in the Power-Saving Plan have been implemented. One of the projects for Las Pavas will be executed by the loan from Economic Integration Central American Bank (BCIE) which also provided energy efficiency consultancy. Also frequency inverters[2] have been installed for the three facilities of Las Margaritas, La Campestre and La Sultana by the fund of the Inter-American Development Bank (IDB). In addition, some extra activities, such as installation of self-generated energy at El Rosario facility and rationalization of energy at other facilities, have been taken place. For sewerage system development, the manual developed by the project have been utilized for formulation of sewerage system development projects. The Metropolitan Region elaborated 6 projects including replacement of pipelines in Las Delicias, Escalon, San Martin, Colonia Costa Rica, Panchimalco and La Rabida.

<Status of Achievement of the Overall Goal at the time of ex-post evaluation>

The Overall Goal has been partially achieved. The annual income of ANDA increased from 82.107 million USD in 2011 to 84.598 million USD in 2014 despite of decreased in 2012 and 2013. It was because some areas under command of gangs have been facing the high insecurity constraining the ANDA staff to visit the customers in order to read the micrometers and deliver the bills. For example, 2 Model Districts (Ciudad Corinto from Metropolitan Region and Tonacatepeque from Central Region) and 1 Pilot District (San Rafael Cedros from Central Region) are inaccessible; same goes to populated areas at the Metropolitan Region such as Soyapango, Ilopango and its surroundings, which are areas that have thousands of users. Also, in the populated urban and rural areas at the Regionals, it is hard to identify quantity of their actual water consumption. . Also, the high insecurity has hindered detecting water leakage and illegal connections which have been main causes of NRW as well as repair and replacement works of pipelines. For improvement of power consumption efficiency, it was difficult to verify it since the data of actual water supply volume was not available due to the reasons mentioned above. Therefore, changes in power consumption in the target areas were alternatively verified as an effect of power saving activities in the power saving plan. However, although several actions in the plan elaborated by the project have been implemented, such as the installation of, the change of lights to energy saving ones and the rehabilitation of the air conditioning system at the headquarter and the installation of macrometers at the production sources, the power consumption has not been reduced since the project completion. Also it is not expected to decrease energy consumption of ANDA as planed in 2015 because of other factors to be considered, such as new projects that will be developed and executed that require more energy use. For example, 60 new projects with the Spanish Agency of International Cooperation for Development (AECID: Agencia Española de Cooperación Internacional para el Desarrollo) funds will be executed that require energy use. One of them started the last week of July, 2015 includes 2 new equipment of over 200 Horse Power.

<Other Positive and Negative Impacts>

No other positive impact and no negative impact on environment and other aspects has been observed.

<Evaluation Results>

While the Project Purpose of enhancement of ANDA's capacity to operate and maintenance of water supply facilities was achieved by the project completion, the Overall Goal of strengthening of ANDA's capacity to manage water services was partially achieved at the time of ex-post evaluation. Therefore, effectiveness/impact of this project is fair.

Achievement of project purpose and overall goal

Aim	Indicators	Results
(Project Purpose) Enhancement of ANDA's capacity to operate and maintain water supply facilities	(Indicator 1) NRW reduction plans for new area are formulated.	Status of achievement: Achieved (Project Completion) • The NRW reduction long-term plan was drafted and officially approved by the ANDA board in November, 2011. (Ex-post Evaluation)

[1] DMA is composed of 2-4 Leak Monitoring Blocks where the NRW measures should be taken.

[2] The frequency inverters change frequency and speed of motors to meet the load, thereby enable to save power consumption.

<table>
<tr><td></td><td></td><td>• The NRW reduction long-term plan was updated by ANDA 2012-2013 and has been implemented.</td></tr>
<tr><td></td><td>(Indicator 2)
Each regional office formulates a budget proposal in accordance with the NRW reduction plan.</td><td>Status of achievement: Achieved
(Project Completion)
• The budget proposals for the new distribution areas in the 3 target regional offices were prepared.
(Ex-post Evaluation)
• Despite of no specific budget allocated for NRW reduction, some activities for NRW reduction including installation of micrometers and replacement of pipeline were implemented by allocation of necessary budget.</td></tr>
<tr><td></td><td>(Indicator 3)
ANDA head office formulates a budget proposal in accordance with the power-saving plan.</td><td>Status of achievement: Achieved
(Project Completion)
• The power saving plan was officially authorized by the ANDA board and the budget proposals for the 8 power saving projects were formulated.
(Ex-post Evaluation)
• Despite of no specific budget allocated for the power saving plan, some activities such as installation of frequency inverters in the water production facilities have been implemented by the donors' support.</td></tr>
<tr><td>(Overall goal)
Strengthening of ANDA's capacity to manage water services</td><td>(Indicator 1)
ANDA's income from water supply services is increased.</td><td>Status of achievement: Partially achieved
(Ex-post Evaluation)
[ANDA's income from water supply service]
(Unit: USD million)
<table>
<tr><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015*
(Forecast)</th></tr>
<tr><td>82.107</td><td>75.848</td><td>80.725</td><td>84.598</td><td>17.235</td></tr>
</table>
(Note)* Up to February, 2015</td></tr>
<tr><td></td><td>(Indicator 2)
ANDA's power consumption efficiency is improved.</td><td>Status of achievement: Not achieved
(Ex-post Evaluation)
[ANDA's Electricity Consumption]
<table>
<tr><th></th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015*</th></tr>
<tr><td>Electricity Consumption (kWh)</td><td>508,376, 770.47</td><td>509,066, 007.71</td><td>510,705, 088.26</td><td>509,072, 866.97</td><td>250,998, 167.90</td></tr>
<tr><td>Changes (%)</td><td>-</td><td>+0.13</td><td>+0.32</td><td>-0.31</td><td>-</td></tr>
</table>
(Note) *Up to June, 2015

Electricity consumption is not expected to decrease in 2015 as much as expected. Following the implemented activities (mentioned above), as well as Energy Efficiency Fairs that the Energy Efficiency Action Team did on the headquarters and is planning on doing at the Regionals to raise awareness among the employees this year, energy consumption will be slightly less than the previous years, but will not get to the expected target of 5%.</td></tr>
</table>

Source：Terminal Evaluation Report, Interviews with ANDA at the time of ex-post evaluation

3 Efficiency

The project cost and period were within or as planned (ratio against the plan: 82%, 100%, respectively). Therefore, efficiency of this project is high.

4 Sustainability

<Policy Aspects>

Although there is no specific government policy to support the activities of ANDA in order to improve water supply service, the government of El Salvador has supported the activities of power saving and sewerage system development introduced by the project through request for the donors' financial support as mentioned above and below.

<Institutional Aspects>

The task teams organized by the project, such as NRW reduction team, the power-saving team and the sewerage system development team have been still sustaining and functioning. In addition, for accelerating the NRW reduction activities, ANDA installed the Cadaster Unit in all of the Regions, and its members were trained to collect the information required from each user of the region (name, localization, specific zone, etc.), verify which users are still active. They also learned the activities implemented in the Project, such as the creating a DMA, using the manuals, etc. and how to use the donated equipment. In addition, a coordinator has been deployed in the Headquarters in order to handle the information directly related to NRW which is collected by each of the Cadaster Units. These units send the updated information of their users, the District Metering Areas (DMAs) so that the coordinator can

The number of engineers of ANDA

	2011	2012	2013	2014	2015
Metropolitan	26	26	26	26	26
Central	18	18	18	18	18
Western	22	22	22	22	22
Eastern	3	3	3	3	3
Head Office	5	5	5	5	5
Total	74	74	74	74	74

have the information of NRW at a national level if they find leaks or illegal connections. According to ANDA staff, the Regions and the Central Facility (the headquarters) have the sufficient numbers of technicians and engineers for implementing the NRW reduction plan, the power-saving plan and the sewerage system development and the number of engineers of ANDA has not been changed for the last 5 years due to the sustaining budget at same level.

<Technical Aspects>

The Technical Director of ANDA is currently leading all of the actions and activities at the four Regions. Through the internal trainings, knowledge and skills introduced by the project, such as information collection for cadaster and use of equipment provided by the project, have been transferred. In addition, two members of the NRW Planning Team went to Brazil in 2013 and 2014 to learn more about the NRW subject and shared the knowledge obtained in the four Regions. The District Metering Area (DMA) methodology, which enables to effectively implement countermeasures for NRW, has been partially applied in the four Regions due to lack of funds. Also, in terms of energy efficiency, the trainings were delivered by technicians from Argentina. Furthermore, the Western Region is taking interns of engineers and architects and engineering students for social service and training them in the NRW reduction activities introduced by the project. Such activities have been contributing to disseminating the knowledge about the NRW reduction. The manuals developed by the project for NRW reduction, power-saving and sewerage system development have been approved by the ANDA's Board meeting as official documents for using their daily work and utilized as guidelines of each work.

<Financial Aspects>

ANDA's revenue from water sales has decreased since 2011: from $115.03 million USD in 2011 to 109.51 million USD in 2014 due to the difficulties of revenue collection by the high insecurity and thefts of micrometers which have been getting worse year by year. However, since ANDA is an autonomous and self-governing entity with her own budget, ANDA has not received any budget from the government. Therefore, it was critical for ANDA to reduce expenditure in order to improve financial balance while the revenue has been decreased. , since the expenditure of ANDA has also decreased from 352.03 million USD to 152.17 million USD for the same period, the financial balance of ANDA have been improved by smaller deficit. It has been because of the containing cost through power saving as well as reduction of water loss by the activities for reduction of NRW introduced by the project. In addition, the electricity power cost decreased by the Presidential Decree No. 119 in September, 2012, which allows ANDA to purchase electricity directly from the Executive Commission of the Lempa River at preferential rate. .Although the budget has not been allocated to the specific areas of NRW reduction, power saving and sewerage system improvement, implementation of the some activities such as installation of micrometers and replacement of pipelines confirmed that the necessary budget had been executed for these activities. In particular, the other donors, including the Central American Bank for Economic Integration (CABEI), the Inter-American Development Bank (IDB) and AECID, have provided funds for execute the activities in the power saving plan, such as installation of frequency inverters in the water production facilities, as well as for improvement of sewerage system according to the Sewerage Planning Manual.

<Evaluation Results>

Some problems have been observed in policy and financial aspects. Therefore, sustainability of the project is fair.

5 Summary of the Evaluation

The project achieved the Project Purpose and has partially achieved the Overall Goal. Through the activities introduced by the project, ANDA was able to reduce NRW and to partially improve power consumption efficiency as well as the financial balance. As for sustainability, there is no clear government policy to support the activities of ANDA introduced by the project. Also, ANDA has been facing the decrease in the revenue despite of improving the deficit.

In the light above, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for ANDA:

- ANDA has to find a way by 2016 to implement it in 2017, to do proper measures of the consumption of the users, so they get charged exactly what they have consumed, without risking their staff security.
- ANDA has new projects that will require energy consumption, which doesn't allow for the rate to go down; ANDA must investigate with other donors for projects that won't use so much energy consumption (green Projects) so the rate decreases and don't have to spend that much in energy.
- It is recommended for ANDA to keep the staffs trained by the project working for the same regional offices in order to facilitate continuation of the activities introduced by the project and to get good results by the activities.

Lessons learned for JICA

[Involvement of the highest institutional authority for facilitating the project activities and for ensuring sustainability of them]

- The plans for reduction of NRW and power saving as well as technical manuals developed by the project were approved by the Board Meeting, which is the highest institutional authority of ANDA, as official institutional documents. Since the highest institutional authority was involved in the project, it enabled not only to facilitate problem solving during the project implementation but also to ensure sustainability of the activities introduced by the project after the project completion.

[Knowledge sharing to other people that could give a good use to that knowledge.]

- The Western Region of ANDA is currently teaching the NRW methodology to interns (internship) and through social work to students that are in there. Sharing these knowledge with future engineers enables to replicate and extend the good activities and especially in the NRW field which is not well known in El Salvador. Therefore, it can be one of alternatives for broadly disseminating the knowledge and skills introduced by the project and for expanding project effects as well as for ensuring sustainability of project effects. In addition, it is preferable to consider activities to effectively disseminate the knowledge and skills at the time of project planning.

Cadaster Unit of ANDA Wester Region

Macrometer provided by the Project for ANDA Metropolitan Region which is still in use and functioning.