

Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by JICA/JOCV Jamaica Office: March, 2015

Country Name	Capacity Building of Water Maintenance
Jamaica	

I. Project Outline

Background	<p>In Jamaica, the National Water Commission (NWC) has been operating its water supply systems. In 2003, the volume of revenue water was limited to 35% of the planned volume of purified water of 291 million m³. In addition, the technical capacity of their staff and the management capacity of middle managers still remained at low level. The limited capacity of NWC brought about inefficient and inadequate operation and maintenance of water treatment plants (WTPs), inappropriate process management of purification according to raw water quality, and insufficient well-planned non-revenue water control including leakage control. Therefore, enhancement of human resource development and management system for NWC was one of the key issues to improve operation of water treatment plants in order to supply quality water to the people in country. .</p>												
Objectives of the Project	<ol style="list-style-type: none"> Overall Goal: Reliability of NWC's (National Water Commission) water supply is enhanced both in terms of quality and quantity. Project Purpose: The capacity of the NWC to provide quality and quantity of water supply is enhanced through four piloting at four water treatment plants. 												
Activities of the project	<ol style="list-style-type: none"> Project site: Four pilot WTPs (Hope WTP, Spanish Town WTP, Logwood WTP and Great River WTP) Main activities: <ol style="list-style-type: none"> Development of manuals for operation and maintenance of water treatment facilities; Trainings for maintenance of water treatment facilities, operation, and water quality testing and control; Design of water supply management plans for the service areas covered by HOPE WTP and Logwood WTP, and other service areas. Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Jamaican Side</td> </tr> <tr> <td>1) Experts: 7 persons</td> <td>1. Staff allocated: 27 persons</td> </tr> <tr> <td>2) Trainees received: 18 persons</td> <td>2. Land and facilities: Office space for Japanese experts</td> </tr> <tr> <td>3) Equipment: Ion chromatography, portable flow meter, motor diagnostic kit, laser alignment equipment and vehicles, and so on.</td> <td></td> </tr> </table> 					Japanese Side	Jamaican Side	1) Experts: 7 persons	1. Staff allocated: 27 persons	2) Trainees received: 18 persons	2. Land and facilities: Office space for Japanese experts	3) Equipment: Ion chromatography, portable flow meter, motor diagnostic kit, laser alignment equipment and vehicles, and so on.	
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Ex-Ante Evaluation	2007	Project Period	March 2007 to November 2010	Project Cost	345 million yen								
Implementing Agency	National Water Commission (NWC)												
Cooperation Agency in Japan	NJS Consultants, Co.												

II. Result of the Evaluation

1 Relevance
<p>This project had been highly relevant with Jamaica's development policy of "promotion of water supply system and improvement of water supply facilities" as set in the Strategy and Action Plan (2004) and the Vision 2030 Jamaica National Development Plan, development needs of stable and safe water supply and improvement of management of water supply system as well as human resource development of NWC, at the time of both ex-ante and project completion. It was also consistent with Japan's ODA policy for Jamaica prioritizing human resource development at the time of ex-ante evaluation. Therefore, relevance of this project is high.</p>
2 Effectiveness/Impact
<p>The project aims at water quality control and water supply management through improvement of operation and maintenance (O&M) at the four pilot WTPs in order to improve water supply by NWC in quality and quantity.</p> <p>The Project Purpose was almost achieved at the time of project completion. Reduction of water loss was realized at two of the four pilot WTPs, Great River and Logwood. For water quality, Spanish Town and Logwood reached the target for the percentage of samples above the standards. In terms of energy efficiency, Hope and Logwood decreased electricity consumption for water treatment. For improvement of O&M of water supply facilities, a total of 17 training courses were conducted by the time of the terminal evaluation. And 23 master trainers were registered for 8 training courses.</p> <p>Some of project effects have been sustained after the project completion and contributed to the achievement of the Overall Goal. Continuation of the improved O&M practices based on the manuals developed by the project, and the water quality control activities contributed to improvement of water quality supplied by the four pilot WTPs. Also, since the Water Supply Management Plans have been continuously prepared for the four pilot WTPs, efficiency of O&M at the pilot WTPs improved.</p> <p>For the Overall Goal, it has been partially achieved as well. The quality of water supplied by NWC was improved and satisfied the Ministry of Health water quality standards at all four pilot WTPs. In addition, the water loss was reduced at Hope WTP. Energy efficiency also decreased at Hope and Spanish Town.</p> <p>Also, other positive impacts have been observed at the time of ex-post evaluation. In order to improve O&M, NWC promoted information sharing and standardization of operational documents such as manuals in the organization. The improved operation contributed to the growth of sales and profitability. The sales growth rate (base year: 2004/05 at the time of ex-ante</p>

evaluation) jumped from 214% in 2010/11 to 285% in 2012/13 whereas the operating cost/sales ratio improved from 97% to 85% for the same period.

There was no negative impact.

Therefore, effectiveness/ impact of the project is fair.

Achievement of project purpose and overall goal

Aim	Indicators	Results																				
(Project Purpose) Enhancement of capacities of NWC to provide quality and quantity of water supply	Indicator1: Percentage of water loss in water production is reduced at pilot WTPs	(Project Completion) Partially achieved. ¹ Great River WTP and the Logwood WTP were reduced by 35% and 39%, respectively, in comparison between the data of 2007 and December 2009 by extending filtration time and filter washing. (Ex-post evaluation) Verified for the Overall Goal.																				
	Indicator2: Frequency of water samples being tested below a desirable water quality (< NTU1 for turbidity and above 1.5 for residual chlorine) for treated water will be increased over 80 percent for turbidity and 100 for residual chlorine of all the test samples taken at pilot WTPs in one year.	(Project Completion) Partially achieved. [Water test at the pilot WTPs: Turbidity in 2011]																				
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Indicator3: Energy consumption is reduced at pilot WTPs.	(Project Completion) Partially achieved ² Electricity consumption per water production (kWh/m ³) decreased by 6.4% at Hope WTP and 0.5% at Logwood WTP. (Ex-post Evaluation) Verified for the Overall Goal.																					
Indicator4: Training courses on operation and maintenance, water quality, and water supply management are planned and conducted with developed textbooks.	(Project Completion) Achieved A total 17 training courses including 8 for O&M, 7 for water quality and 2 for water supply management were conducted by the time of terminal evaluation.																					

¹ According to the Terminal Evaluation Report agreed with the Ministry of Water and Housing of Jamaica, the target of the indicator was "achieved." However, the data of percentage of water loss in water production was confirmed at only two WTPs out of the 4 pilot WTPs. At the ex-post evaluation, the case that the actual data of indicator with more than 80% of the target value can be considered as "achieved." Therefore, this evaluation study judged that the target of the indicator was "partially achieved" instead of "achieved."

² According to the Terminal Evaluation Report agreed with Ministry of Water and Housing of Jamaica, the target of the indicator was "achieved." However, the reduction of electricity consumption was confirmed at only two WTPs out of the 4 pilot WTPs. At the ex-post evaluation, the case that the actual data of indicator with more than 80% of the target value can be considered as "achieved." Therefore, this evaluation study judged that the target of the indicator was "partially achieved" instead of "achieved."

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	Indicator 5: Numbers of registered master trainers on Operation and Maintenance, Quality and Water Supply Management.	(Project Completion) Achieved For 8 training courses, 23 master trainers had been registered. Some of the master trainers were registered for more than one training course (Ex-post Evaluation) Verified for sustainability.																																										
(Overall goal) Enhancement of reliability of water supply by NWC in quality and quantity.	Indicator1: Performance indicators are improved.	(Ex-post Evaluation) Partially achieved. [Water Quality] Quality of water supplied by NWC at the four pilot WTPs have satisfied the MOH water quality standards. [Water Loss] <table border="1"> <thead> <tr> <th></th> <th>2007</th> <th>June 2014</th> </tr> </thead> <tbody> <tr> <td>Hope</td> <td>54%</td> <td>45%</td> </tr> <tr> <td>Spanish Town</td> <td>65%</td> <td>69.66%</td> </tr> <tr> <td>Great River</td> <td>64%</td> <td>-</td> </tr> <tr> <td>Logwood</td> <td>58%</td> <td>-</td> </tr> <tr> <td>Other WTPs</td> <td>71%</td> <td>68.64%</td> </tr> </tbody> </table> [Electricity Consumption: kWh/m ³] Electricity consumption (kWh/m ³) decreased at two WTPs. However it increased in two WTPs because of longer operating hours due to the drought conditions and the high calcium built up. <table border="1"> <thead> <tr> <th></th> <th>2007</th> <th>2011</th> <th>2013</th> </tr> </thead> <tbody> <tr> <td>Hope</td> <td>0.16</td> <td>0.18</td> <td>0.17</td> </tr> <tr> <td>Spanish Town</td> <td>0.36</td> <td>0.20</td> <td>0.23</td> </tr> <tr> <td>Great River</td> <td>0.38</td> <td>0.44</td> <td>0.51</td> </tr> <tr> <td>Logwood</td> <td>0.51</td> <td>0.57</td> <td>0.50</td> </tr> <tr> <td>Other WTPs</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>		2007	June 2014	Hope	54%	45%	Spanish Town	65%	69.66%	Great River	64%	-	Logwood	58%	-	Other WTPs	71%	68.64%		2007	2011	2013	Hope	0.16	0.18	0.17	Spanish Town	0.36	0.20	0.23	Great River	0.38	0.44	0.51	Logwood	0.51	0.57	0.50	Other WTPs	-	-	-
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Source : Terminal Evaluation Report, Interviews with counterparts, questionnaire survey results at the time of ex-post evaluation, Data provided by NWC

3 Efficiency

Project expanded to add some more pilot plants and the project cost slightly exceeded the plan (ratio against the plan: 101%). Therefore, efficiency of the project is fair.

4 Sustainability

In the policy aspect, enhancement of water production facilities has been one of the main focus in the water sector in order to achieve the universal access to potable water by 2025 under the Water Sector Policy, which has been in the process of revision. Also, under the Vision 2030, a national development plan of Jamaica, NWC prepared a transformative programme with main focuses including refurbishing/upgrading water production source, network refurbishing to reduce technical losses and to improve service level, pumping equipment rehabilitation, well rehabilitation and supply extension, as an implementation plan over 5-10 years as a part of the Vision 2030 programme.

Institutionally, under the Water Sector Policy, NWC has been required to be more financially independent for institutional enhancement since NWC is directed by the Board of Commissioners as more accountable and autonomous entity. NWC has been in a process of re-organization/transformation since November 2010. This process has met with several challenges and delays, and as such has affected the NWC's ability to operationalize the recommendations and benefits of this project.

In the technical aspect, trainings on water quality for operators of WTPs have been continuously delivered by NWC despite of fluctuation in the number of courses and the participants. 28 master trainers, who had been trained by the project, have been continuously engaged in the internal trainings for technical staffs such as trainings of water quality. The technical staffs of the four pilot WTPs have been practicing knowledge and skills acquired through the internal trainings. The operational manuals will be expected to be adhered by the pilot WTPs staff. Also, a number of training programs, including "In-house Water Quality Control Training Program" have been taken in place in order to maintain and increase technical capacity of the employees. During the period April 1, 2011 and March 31, 2014, 503 courses were conducted and/or facilitated involving 6,042 man hours.

As for the financial aspect, the water rate has increased over the past few years: from J\$ 61.31 in 2011 to J\$85.75 in 2014. Also more customers are encouraged to become metered customers for payment of water supply charge. The increased revenue of NWC (J\$ 21.55 million in 2013) was sufficient to cover the expenditure including O&M cost (J\$ 18.37 million).

From these findings, some problems in institutional aspect has been observed, therefore, sustainability of the project is fair..

5 Summary of the Evaluation

The relevance of this project was high, but the effectiveness/impact of the project is fair because indicators have been or are partially achieved. In addition, the efficiency of the project is also fair due to slight excess of the project cost and the sustainability is fair because of some problems in institutional aspect.

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

III. Recommendations & Lessons Learned

Recommendations for Implementing agency:

- Institutional strengthening is to be done in accordance with maintaining and developing the outcome of the project.
- To monitor the performance indicators to utilize for better O&M of water supply facilities and water quality.
- To improve financial position of NWC further by efforts of cost reduction and revenue increase.

Lessons learned for JICA

None



(Spanish Town Water Treatment Plant)



(Upgraded Equipment of Logwood Water Treatment Plant)