Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by Ghana Office: January, 2021

Country Name	The Project on Electrical Engineers Training for African Countries (EETA)
Republic of Ghana	

I. Project Outline

Background	ECG Training Center under the Electricity Company of Ghana (ECG), a power distribution company, was the only training organization in Ghana in the power distribution field, and had so far provided only training for newly hired technicians (technical workers who are responsible for on-site maintenance works). However, the technician training was being conducted on old equipment, and the importance of quality of training had been poorly recognized and obsolete. In addition, in order to efficiently operate and maintain the power distribution facilities, it was necessary to provide opportunities for training to engineers who supervised and comprehensively managed the power distribution facilities. Meanwhile, ECG Training Center had provided training to Gambia, Liberia and Sierra Leone at the request of the West Africa Power Pool (WAPP) Secretariat. Since Sierra Leone and Liberia faced a serious shortage of human resources due to the collapse of their infrastructure and the outflow of human resources due to the long civil war. Gambia was similar to Ghana in that the operation and maintenance of power distribution facilities covered a wide range of old and new equipment.		
Objectives of the Project	Through (i) analyzing and identifying training needs, (ii) improving training for technicians, (iii) implementing training for engineers, and (iv) improving monitoring and managing capacity, the project aimed at strengthening training capacity on distribution system operation and maintenance for ECG and the third countries, thereby contributing to improvement in distribution system operation and maintenance.		
	1. Overall Goal: Distribution System operation and maintenance in ECG and third countries is improved. 2. Project Purpose: Training capacity on distribution system operation and maintenance for ECG and third countries is strengthened.		
Activities of the project	1. Project site: Tema (25km from Accra) 2. Main activities: (i) analyzing and identifying training needs, (ii) improving training for technicians, (iii) implementing training for engineers, and (iv) improving monitoring and managing capacity 3. Inputs (to carry out above activities) Japanese Side 1) Experts: 11 persons 2) Training in Japan: 7 persons 3) Equipment: substation for training, measurement equipment, software, etc. Ghana Side 1) Staff allocated: 8 persons 2) Land and Facilities: Project office space and facilities in ECG and control room of ECG		
Project Period	September 2013-August 2016	Project Cost	(ex-ante) 299 million yen, (actual) 504 million yen
Implementing Agency	Ministry of Energy (MOE), Electricity Company of Ghana (ECG)		
Cooperation Agency in Japan	NEW JEC Inc.		

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

・Continuation of the project effects was analyzed as factors to achieve the Overall Goal.

・Due the restrictions introduced as a result of COVID-19 situation, data for the third countries could not be obtained

1 Relevance

<Consistency with the Development Policy of Ghana at the Time of Ex-Ante Evaluation >

The project was consistent with the development policy of Ghana. Energy, oil and gas industry was one of the priority agenda under the "Ghana Shared Growth Development Agenda" (2010-2013). Also, in the "Energy Sector Strategy and Development Plan" formulated in February 2010, strengthening of the grid level was one of the priority policies.

<Consistency with the Development Needs of Ghana at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs of Ghana for improvement of distribution loss. Under the "Energy Sector Strategy and Development Plan" stated above, distribution networks were being improved and modernized with the goal of reducing the loss rate from 25% to 18%. The neighboring countries needed capacity enhancement as mentioned in the "Background" above.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project was consistent with Japan's ODA policy to Ghana. "Country Assistance Program to Ghana" (September 2006) prioritized industrial development including human resource development.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was partially achieved at the time of project completion. Although the number of training courses for technicians did not change, training courses for engineers started under the project and three courses were implemented (Indicator 1). The syllabus, curriculum and training materials were revised and developed (Indicator 2). Meanwhile, training for the third countries cannot be said to be strengthened because four training courses out of five which were planned, were cancelled due to the outbreak of Ebola hemorrhagic fever.

<Status of Continuation of the Project Effects>

As mentioned above, the status of continuation of the project effects at the time of ex-post evaluation were verified as the part of the verifiable indicators of the Overall Goal and the factors affecting the achievement levels of the verifiable indicators of the Overall Goal.

For example, technicians and engineers improved their skills by the training continuously conducted by the project, which made contributions in soft aspect to decrease SAIFI. As such, it had affected achievement level of a verifiable indicator of the Overall Goal.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal was partially achieved. The System Average Interruption Frequency Index (SAIFI) of ECG operational area improved dramatically (Indicator 1) and it can be said that the project has contributed in soft aspect by enhancing the maintenance techniques of the technicians and engineers. SAIFI has consistently improved and significantly dropping year by year from 2016 to 2019 towards the regulated benchmarks of 6 for all areas. Supply availability/reliability has been also improved over the periods under consideration. On the other hand, distribution loss did not improve, mainly due to external factors (Indicator 2). Main factors that contributed to the increase in distribution losses are due to overage and overloaded distribution equipment, meter tampering and bypasses, illegal connections and illegal vending of electricity and delay in capturing of uncaptured meters according to the ECG Training Centre.

After the project was completed, the ECG Training Centre have continued providing training courses constantly as shown in the table below. Training for technicians and engineers of ECG has largely continued by using the training materials developed by the project. Also, training of other important entities was quite significant.

Training by the ECG Training Centre

Type of training		2016	2017	2018	2019
ECG (technicians)	No. of training	4	7	16	6
	No. of trainees	45	276	354	180
ECG (engineers)	No. of training	2	1	1	0
	No. of trainees	20	18	13	0
Others (Northern Electricity Department Company, Regional Maritime University, graduate students)	No. of training	7	27	17	18
	No. of trainees	211	522	169	198

Note: No training was conducted for engineers in 2019 as the discussion on the course content with was not finalized. The Government of Ghana entered into a concession agreement with Power Distribution Services Limited (PDS), a private company in March 2019 for operation and management of ECG. However, the government was in the process of terminating a concession agreement. Until the concession agreement is terminated, the course could not be finalized.

As for the third countries, there had been no training until 2019 due to the financial constraint; however, the ECG Training Center conducted one training for Liberia and Sierra Leone through the support of WAPP.

The substation constructed under the project has been utilized for all related training courses on operation and maintenance of distribution equipment for the various target groups.

<Other Impacts at the time of Ex-post Evaluation>

No negative impact on the natural environment has been observed.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is fair.

Achievement of Project Purpose and Overall Goal

<table>
<tr><th>Aim</th><th>Indicators</th><th>Results</th></tr>
<tr><td rowspan="2">(Project Purpose)
Training capacity on distribution system operation and maintenance for ECG and third countries is strengthened.</td><td>Indicator 1: Number of training courses for technicians and engineers will increase.</td><td>Status of the Achievement: partially achieved
(Project Completion)
Compared with before 2013, the number of training courses for technicians did not changed. However, training courses for engineers started under the project. Three courses were already conducted.</td></tr>
<tr><td>Indicator 2: Syllabus, curriculum and training materials will be revised or newly developed.</td><td>Status of the Achievement: partially achieved
(Project Completion)
The syllabus, curriculum and training materials were well prepared. Regulations for construction and safety and the current situation of Ghana were well considered and they were also created through constant and frequent communication between Japanese experts and lecturers in the Training Centre and the project office of ECG. The materials were highly regarded by the lecturers.
However, there is no reference attached in the figures and tables of the textbooks, and it is difficult to distinguish between content written by the experts and quotations from original sources.
However, there is no reference attached in the figures and tables of the textbooks, and it is difficult to distinguish between content written by the JICA experts and quotations from original sources.</td></tr>
<tr><td>(Overall Goal)
Distribution System operation and maintenance in ECG and third countries is improved.</td><td>Indicator 1: Distribution loss and SAIFI (The System Average Interruption Frequency Index) will decrease in Ghana and third countries.</td><td>(Ex-post Evaluation) partially achieved
Distribution loss (%)
<table>
<tr><th></th><th>2016</th><th>2017</th><th>2018</th><th>2019</th></tr>
<tr><td>ECG</td><td>23.6</td><td>22.6</td><td>24.3</td><td>24.7</td></tr>
</table>
*No data was obtained for the third countries.

SAIFI
<table>
<tr><th></th><th>Op. Area</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th></tr>
<tr><td>ECG</td><td>Metro</td><td>60</td><td>48</td><td>28</td><td>25</td></tr>
</table></td></tr>
</table>

	Urban	89	88	57	47
	Rural	108	104	61	59

*No data was obtained for the third countries.

Source：ECG Training Centre

3 Efficiency

Although the project cost significantly exceeded the plan (the ratio against the plan: 169%) the project period was as planned (the ratio against the plan: 100%). After the Record of Discussion was signed (November 2010), it took several years to select the Japanese consultant team. Until the commencement of the main activities in September 2013, two experts were dispatched twice in 2012. One of the reasons for the difference between planned and actual total budget is the cost to dispatch these two experts. Based on the updated information from the study by these experts on the needs and the situation of ECG, the project activities were reconsidered because much time had passed after the detail design study conducted. As a result, more activities were included. Outputs were produced as planned.

Therefore, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

Reduction of distribution losses has been prioritized by major policy documents of the current government administration, including the "Coordinated Programme of Economic and Social Development Policies" (2017-2024), the "Medium Term National Development Policy Framework" (2018-2021) and others.

<Institutional/Organizational Aspect>

The ECG Training Centre has become a Directorate on its own, with the head being a Head Office Director. The ECG Training Centre has also formulated its own business plan and developmental programs which incorporate the training system introduced by the project. Thus, the ECG Training Centre has had some level of autonomy compared to the situation before the implementation of the project. The number of staff at the ECG Training Centre is 15 (including four at the technical section, that is responsible for training, six at human resources, three at ICT (Information Communication Technology and two at accounts) which is adequate for sustaining the project effects, according to the ECG Training Centre.

<Technical Aspect>

Technical staff members (Instructors) of the ECG Training Centre have sustained the necessary skills through continuous training and field training and by utilizing training materials developed by the project.

<Financial Aspect>

The ECG Training Centre has received budget provision from their Head Office and other internal sources; however, mostly not adequate to cover all expenses.

<Evaluation Result>

In light of the above, some problems have been observed in terms of the financial aspect of the implementing agency. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project purpose was partially achieved at the time of project completion, as training courses for engineers started and training materials were created; however, training for third countries was limited. The Overall Goal was partially achieved as at ECG, SAIFI improved while distribution losses did not. As for the sustainability, some problems have been observed in terms of the financial aspect. As for the efficiency, the project cost significantly exceeded the plan.

Considering all of the above points, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

ECG Training Centre is recommended to conduct training for technicians and engineers of the third countries (Gambia, Sierra Leone, and Liberia) continuously by collaborating with WAPP.

Lessons Learned for JICA:

The equipment, especially the substation for training provided by project at its premises has enabled the delivery of practical training courses. It can be said that it contributed to the reduction of SAIFI in Ghana from soft aspect and attracted a growing number of institutions and trainees to the ECG Training Centre. When supporting a technical training institution, providing the requisite practical training facilities will enhance the project impacts and sustainability.

Training course for graduate engineers on multi skilling

Training course for ECG Technicians on Sub-station maintenance