Ex-Post Project Evaluation 2013: Package III-4

(the Philippines, Sri Lanka, Cambodia)

December 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

FOUNDATION FOR ADVANCED STUDIES ON INTERNATIONAL DEVELOPMENT (FASID)

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2011, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2010. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

December 2014

Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

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JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Republic of the Philippines

Ex-Post Evaluation of Japanese Technical Cooperation Project

"Establishment of Ecological Solid Waste Management System"

External Evaluator: Keiko Asato,

Foundation for Advanced Studies on International Development

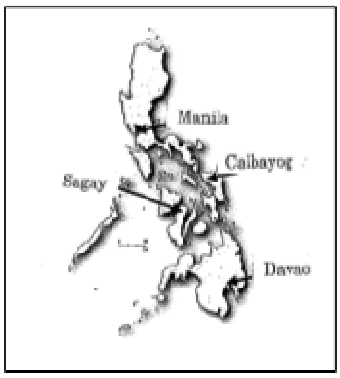
0. Summary

This project is consistent with the issues of solid waste management (SWM) designated as important themes in the development plan of the Republic of the Philippines as well as the sector plan and development needs. At the same time, it is aligned with Japanese aid policy. In this regard, the relevance of the project is high. During the project period, technical assistance was provided to the three target cities to enhance the basic capacity to manage solid waste, such as the capacity to elaborate the SWM plan, to promote the IEC (Information, Education and Communication) campaign for "3R" (Reduce, Reuse and Recycle)[1] and also to monitor SWM-related activities. On the other hand, the capacity development to strengthen the operation and management of the final disposal facilities was not enough due to the delay of the construction of the facilities caused by the time-consuming fundraising process. Since the completion of the project, the National Solid Waste Management Commission (NSWCM) has tried their best to diffuse the knowledge of SWM by various approaches. Even though the number of SWM plans approved by NSWMC is not high, the rate of construction of SWM-related facilities has been increasing. This change can be considered an effect of the project. Therefore, the effectiveness and impact of the project are fair. Both the project cost and the period of cooperation were mostly as planned, therefore the efficiency of the project is high. The local government units (LGUs) work on their possible SWM activities, even though their progress varies due to different factors, such as political, financial, economic, and technical factors. In the three target cities, the officials equipped with technical capacity by the project continue the SWM-related activities. However, some issues still have yet to be improved, such as increasing the number of officials equipped with SWM skills and securing the budget to maintain the equipment, among others. The introduction of a waste charge system is particularly important to secure the budget and reduce waste. Considering these situations, even though no problem can be seen in the policy background, some problems have been observed in terms of the institutional, technical and financial aspects of the project. Therefore, the sustainability of the project is fair.

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

[1] 3R is the endeavors to minimize the wastes. It is the general term of "reduce", "reuse" and "recycle", referring the treatment of wastes.

1．Project Description



Project Location

Material Recovery Facility（Calbayog City）

1.1 Background

In the Philippines, inadequate SWM in metro Manila and the LGUs was a serious social problem, and the Ecological Solid Waste Management Act, Republic Act 9003 (RA9003) was enacted in 2001. The law prescribes that the LGU is the entity responsible for SWM, aiming to reduce the final disposal waste amount via the promotion of 3Rs and to manage the solid waste appropriately. RA9003 also obliged the LGUs to transfer all existing dump sites to the sanitary landfill (SLF) by 2006.

Japan had been cooperating with the concerned sector since 1990 in the Philippines. However, there still remain many LGUs that have neither conducted the proper waste management nor gone forward with the arrangement of the disposal facilities due to a lack of understanding about RA9003 and the technical, institutional and financial constraints. At the start of the project, of the roughly 1,600 LGUs, fewer than 2% had complied with the proper waste management procedures requested by RA9003.

Considering this situation, this project selected three cities (Sagay City, Calbayog City and Davao City) to strengthen the capacity of SWM and cooperated with NSWMC to promote RA9003 by standardizing the process of establishing a SWM plan and the procedures to transfer to SLF, based on the cooperation of the three cities.

1.2 Project Outline

Overall Goal	Knowledge and experience of ecological SWM in the three cities[2] are

[2] The outline of three cities at the time of ex-ante evaluation was as follows: Sagay city is with the population of 143,226 persons, 25 barangays and the area of 330 km2, Calbayog city is with the population of 166,036 persons, 157 barangays and the area of 903km2, and Davao city is with the population of 1,338,403 persons, 182 barangays and the area of 2,440km2.

		replicated in other LGUs.
Project Purpose		Ecological SWM systems is established in the three cities.
Outputs	Output 1	Capacity of LGUs on SWM planning is strengthened.
	Output 2	Solid waste diversion system is improved.
	Output 3	Final disposal system is improved.
	Output 4	Guidebooks and manuals are developed as a tool of planning and implementation of SWM based on the experience of the three cities.
Inputs		Japanese Side: 1. Experts: 7 Experts (Dispatched as contract-out type experts) 2. 12 Trainees received（Counterpart training in Japan） 3. Equipment: 17 million yen 4. Local Cost: 16.6 million yen Philippines Side: 1. Counterparts (CP): 37 (4 at NSWMC secretariat, 6 at Sagay city, 8 at Calbayog city, 9 (from October 2007 to September 2009) and 10 (from October 2009 to October 2010) at Davao City) 2. Local Cost: Personnel expense, provision of vehicle (including driver), fuel, cost to acquire the Environmental Compliance Certificate (ECC) 3. Other cost (only at Sagay City and Calbayog City): The cost to close existing dump site, the cost for construction of SLF
Total Cost		364.8 million yen
Period of Cooperation		October, 2007 – October, 2010
Implementing Agency		Department of Environment and Natural resources (DEN) and NSWMC
Cooperation Agency in Japan		Nippon Jogesuido Sekkei Co., Ltd.
Related Projects		Master Plan Study, “Solid Waste Management for Metro Manila” (1997-1999) Independent Expert, “Administration of Solid Waste Management”（2003-2006） Basic information collection survey: “Survey for the selection of prioritized cities for the establishment of the appropriate treatment of solid waste” (2004) Other projects by other donors

	・USAID, “Eco-Governance Project (Phase 1)” (2001-2004) ・USAID, “Eco-Governance Project (Phase 2)” (2004-2011) ・GIZ, “Solid Waste Management Program for Local Government Units (SWM4LGUs)” (2005-2011)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Overall Goal at the time of the Terminal Evaluation

Indicators 1 and 2 of the project purpose were confirmed to be achieved. However, indicator 3 was difficult to achieve during the project period, influenced by external factors, which implied a low probability of the complete achievement of the project purpose.

1.3.2 Achievement of Project Purpose at the time of the Terminal Evaluation

During the implementation of the project, seminars to diffuse the knowledge and the experience of SWM in the target cities were held four times (93 LUGs participated.), and seven similar seminars were planned to be implemented from July to December of 2010. Twenty SWM plans had been approved, which implied the possibility of achieving the overall goal.

1.3.3 Recommendations at the time of the Terminal Evaluation

The recommendations at the time of the terminal evaluations and the actions taken at the time of the ex-post evaluation are as follows:

＜Recommendation to the three target cities＞

- On-site operation and maintenance training of new SLFs (at Sagay City and Calbayog City) had been completed before completion of the project.
- Consideration of the welfare of the waste pickers[3] working at the existing dump site (at Sagay city and Calbayog city): Some of the waste pikers were hired by the city and continue to work at the SLFs.
- Statement of the cost analysis of SWM to the annual report: The annual reports have not been prepared.
- Increase in understanding by the decision makers of the cities (mayor and city council) about SWM：SWM is understood and accepted at certain levels, but the level of understanding is not enough for them to promote the SWM strongly.

＜Recommendation to NSWMC＞

- Review the progress and the degree of enforcement of RA9003, cooperating with other ministries, and develop a new strategy to further promote and accelerate implementation of

[3] The independent business person who collect the recycle waste at the disposal facility such as final disposal.

RA9003：Besides “National Solid Waste Management Strategy” (2011-2016), which has been elaborated. The annual work plan and the completion report are prepared every year, and the degree of achievement is reviewed by NSWMC.

2. Outline of the Evaluation Study

2.1 External Evaluator

Keiko Asato, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: October 2013 - December 2014

Duration of Field Study: January 6, 2014 - February 1, 2014; April 23, 2014 - May 6, 2014

3. Results of the Evaluation（Overall Rating：B[4]）

3.1 Relevance (Rating：③)

3.1.1 Relevance to the Development Plan of the Philippines

The effective development plan at the time of start and completion of the project was the Medium-Term Philippines Development Plan (MTPDP 2004-2010). In the area of “Economic Growth and Job Creation” in this policy, the theme of “Environment and Natural Resources”, where “Safe environment of living condition for the residents” is set as an objective. For this purpose, “Control of contamination and risk” in the living environment is necessary, and “Establishment of SLF and Material Recovery Facility (MRF)[5]” and “Mainstreaming of SWM at educational site” were expected as strategies to attain the purpose. This technical assistance project tried to address these strategies.

In this regard, this project was consistent with the development plan of the Philippines at both time of planning and completion of the project.

3.1.2 Relevance to the Development Needs of the Philippines

The LGUs in the Philippines did not manage solid wastes properly, which threatened the safety of the living environment. Due to this situation, RA9003 was enacted in 2001. This law aimed to reduce the final disposal amount of waste, to have LGUs promote the segregated collection and effective reuse and recycle of resources, and transfer the existing dump sites[6] to SLFs. To put this law in practice, NSWMC was set up by this law.

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[4] A：Highly satisfactory, B：Satisfactory, C：Partially satisfactory, D：Unsatisfactory

[5] In this project, MRF was established to promote the recycle the waste, to compost the organic waste and to share the information to promote 3R.

[6] Disposal area with a low utility value at which waste are disposed of.

However, as of the planning stage of this project, only 21 LGUs (less than 2% of the approximately 1,600 LGUs in the whole country) conducted SWM by constructing SLFs, complying with RA9003. Many LGUs faced financial and technical constraints, and so could not promote the construction of the facilities. They also lacked of understanding of SWM and could not set up the necessary institutional arrangements (such as appointing officials and arranging the organization); thus, they could not take proper action on SWM.

When the project was completed (December 2010), only 20 SWM plans had been approved, and 790 LGUs continued to use their existing dump sites. Many LGUs did not comply with RA9003, and the need to develop facilities was also high.

Moreover, the Department of Interior and Local Government (DILG) applied an evaluation system of LGU's administrative performance, which contained the criteria to assess disaster response management and environmental conservation. The ability to manage solid waste was incorporated into this evaluation system. As such, improving this ability was regarded as a high priority from the perspective of administrative performance.

3.1.3 Relevance to Japan's ODA Policy

According to the Country Assistance Policy for the Philippines (under revision when the project was planned, came into effect in 2008), the necessity to cooperate for the improvement of the urban environment, including waste management, was recognized in the section "Improvement of the Urban Living Environment," which was a part of "Development of a Base for Economic Growth" in the important development issue of "Sustainable Economic Growth for the Creation of Job Opportunities." Moreover, in the Country Assistance Program (2006), the proper management of solid waste was regarded as an important issue in the "environment program" with the same aspect, under the area of "Support for the Development of a Base for Economic Growth".

In light of the above, this project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Effectiveness and Impact [7] (Rating : ②)

3.2.1 Effectiveness

3.2.1.1 Project Outputs

The degree of achievement of the indicators in each output at the time of project completion was as follows:

[7] Sub-rating for Effectiveness is to be put with consideration of Impact.

1）Output 1: Capacity of LGUs on SWM planning is strengthened[8]。

Indicator	Achievement
1) The developed SWM plan is approved by the city council (Sagay and Calbayog city).	Achieved
2) Workshop and seminars for officials responsible for SWM in 3 cities are held at least 7 times.	Achieved
3) Cost on SWM is grasped in details (all cities)	Achieved
4) Fee collection options are proposed to the cities' SWM Boards (Sagay and Calbayog).	Not achieved
5) Basic managerial indicators such as collection efficiency and unit figures per operation are collected and analyzed annually (all cities).	Achieved

The project assisted Sagay and Calbayog City with on-the-job training methods for them to establish the objectives based on the analysis of the current SWM situation, and to examine the strategies and measures to achieve these objectives and also to elaborate the SWM plan. At the same time, the revenue and the expenditure of the city as a whole and income and cost related to SWM were grasped and analyzed to examine the several fee collection options, the most realistic of which were presented to each city[9].

The SWM plans (draft), worked out as such, were approved by the city council and DENR Environmental Management Bureau (EMB), in June 2009 at Sagay City and in March 2009 at Calbayog City. Based on these SWM plans, the basic management indicators related to SWM were collected, such as the population covered by collection service; estimated volume of waste collected, estimated volume of waste composted and other estimates, and recorded in the 2009 annual report.

The information about the project activities, the outputs and the professional knowledge regarding SWM were shared with the relevant personnel in the three target cities, EMB officials at the respective regional offices, the Provincial Environmental Natural Resource Office (PENRO), the

[8] According to the Japanese consultant, Davao city had already received assistance for SWM from USAID, therefore, in this project, the city carried out activities mainly at barangay, and did limited cooperation to the city SWM office

[9] The project examined and compared the options of 1) the charge to collect all the necessary cost related to SWM (including the cost for operation and maintenance), 2) the charge only to cover the cost for the waste collection, 3) the affordable charge by the residents (2% of the monthly income), 4) the charge that takes into account the residents' willingness to pay (results of residents survey), and proposed the option 2). The option to cover all the cost is desirable. However, the exact calculation of charge in proportion to waste amount is difficult, and some households might reject the collection service subject to the amount of charge, they dare to throw the wastes illegally. Taking into consideration these factors, the project decided to introduce the charge system acceptable by the residents. Even though, all the cost cannot be collected, the waste charge system was expected to be introduced so that the residents understand that the SWM needs budget and they had to reduce waste generation. The amount of charge calculated in the option 2) is similar to that of 4), therefore, the residents are easy to accept that charge, therefore the project proposed that option. (Project completion report (2010) and interview with the Japanese consultant).

City Environmental Natural Resource Office (CENRO), representatives from barangays,[10] the people in charge of SWM, NGOs and the neighboring cities through workshops and technical seminars. The record of the workshops and technical seminars is as stated in the Table 1.

Table 1: Record of workshops and technical seminars

	Workshop	Technical Seminar
First year	December, 2007 (for Davao City：March, 2008)	
Second year	August, 2008	February, 2009
Third year	June, 2009	February, 2010
Forth year	June, 2010	October, 2010

Source: "Project Completion Report" (October 2010)

On the other hand, the fee collection options proposed by the SWM plan had not been presented to the SWM board because the new administration (mayor and city council) elected in 2010 showed an unwillingness to introduce the fee options.[11] In the case of Davao City, a city ordinance issued in 2005 included general residents in the waste charge system. However, the fee set in the said waste charge system was not realistic, so the Japanese experts presented a revised option. But Davao City was also reluctant to introduce the revised waste charge system, which imposed an additional economic burden on the residents. Therefore, no action was taken on that proposal.

2）Output 2: Solid waste diversion system is improved

Indicator	Achievement
1) WDR[12] is monitored periodically (Sagay and Calbayog).	Achieved
2) The amount and type of materials collected at the pilot MRF are recorded and reported monthly (Sagay, Calbayog and Davao)	Partially achieved
3) IEC campaign on 3R activities is carried out according to the IEC campaign plan in barangays (Sagay, Calbayog and Davao)	Achieved

[10] The minimum unit of the local government composing the city/municipality.

[11] The new administration was reluctant to impose the economic burden to the residents, and had an opinion that the cost for SWM should be borne by tax.

[12] WDR is the abbreviation of "Waste Diversion Rate". This is the rate of the volume of waste diverted, by recycle, compost and other ways, to the volume of waste in generation or in collection. High WDR means that the volume transferred to the final disposal is small, and that facility can be used longer. In this project, supposing the situation as the following formula, (collected volume of waste) – (diverted volume of waste) = (final disposed volume of waste), WDR is calculated as follows: WDR = (diverted volume of waste) / (collected volume of waste). Another formula to calculate WDR is the diverted waste will be divided by the total generated volume of waste, and in the Philippines, this formula has not been fixed yet. In this project, the exact amount of generation is difficult to know, so the formula with the denominator of "collected volume of waste" is introduced.

In this project, the main measures to divert and dispose the waste to reduce the final disposal amount were the sales of the recycled waste to the junkshop[13] (the sales through the MRF or the direct sales by the residents) and the composting[14] of organic waste. In order to grasp the volume of the sales and the disposal of the waste to junkshops or at MRFs, the personnel in charge of SWM in each city were instructed how to monitor these processes. During the project period, the sales volume of the recycled waste was checked by interviewing at the Junkshop every year.

The construction of the pilot MRF in each city was completed from February to March 2009, and the volume and characteristics of the waste brought to MRFs were recorded every month. In Calbayog and Davao, the records at MRF were reported monthly to the SWM section in the city offices, as they were necessary to calculate the WDR. However, in Sagay City, the record of the barangay MRF was not reported to the LGU, and the person in charge, for his necessity, was referring the record at MRF to manage the transition of waste volume.

Based on those collected data, Sagay City and Calbayog City monitored the WDR in 2009 and 2010. However, in Davao City, the section responsible for SWM did not agree on the necessity of monitoring its data, and did not comply with this process.

The IEC campaign activities on SWM to the residents and educational institutions were conducted as stated in table 2. These IEC campaign activities were implemented as nearly planned, and some IEC programs directly targeted to the students were also carried out[15]. In addition to this, in Davao the seminar to facilitate the understanding of SWM, the “Barangay Summit,” was held, and roughly 400 residents from all the 187 barangays were present at the seminar.

[13] The distributor who circulate the goods with no value as an original products.

[14] Making compost from organic waste using microbe

[15] In Sagay and Davao city, the IEC campaign activities to teachers were conducted less than planned. This is because the IEC campaign activities were programmed during the summer vacation and the officials in charge in Sagay and Calbayog city could not conduct them. However, these officials had already learned the way to conduct the IEC campaign activities, so this difference did not negatively affect the capacity of implementation of IEC activities of city officials. In case of Davao city, no exact reason was found for the less number of IEC campaign activities conducted.

Table 2：Record of IEC Campaign Activities related to SWM

（Unit：institution: number of institution, participants: persons）

City	Target	2009			2010		
		Plan	Actual		Plan	Actual	
		institution	institution	participant	institution	institution	participant
Sagay	Barangay	3	3	19,423	3	3	35,543
	Schools	No data	4	1,896	No data	6	8,008
	Schools for teachers training	7	7	242	18	13	350
Calbayog	Barangay	7	7	19,264	5	5	19,133
	Schools	No data	3	1,875	No data	6	5,643
	Schools for teachers training	8	8	209	15	16	321
Davao	Barangay	10	5	46,463	17	17	64,974
	Schools	No data	4	4,071	No data	27	44,398
	Schools for teachers training	25	25	748	24	20	1,199

Source: “Project Completion Report” (October 2010)

3) Output 3: Final disposal system is improved (only at Sagay and Calbayog City[16]).

Indicator	Achievement
1) The current dump site is closed in accordance with the safe closure guidebook	Not achieved
2) On-site operation and maintenance training for sanitary landfill management are conducted using the operation and maintenance manual	Achieved

Existing dump sites were expected to be closed only after the SLFs started operations. The construction of the SLF at each city was completed just before the project was finalized, so the existing dump site could not be closed before the completion of the project.

Construction of the SLF was delayed because of the tardiness of the fundraising, attributed to time-consuming loan procedures. Originally, Sagay City planned to use their own budget to construct SLF. But the distribution of the internal revenue allotment (IRA) was delayed[17], and furthermore, the full amount was not allocated to each city. Sagay was obliged to borrow twenty million pesos from the Land Bank of the Philippines (LBP), which took a lot of time, and the start of construction of the SLF was delayed[18]. Calbayog City borrowed 48.2 million peso from the fund of Environmental Development Program (EDP)[19] via the Development Bank of the Philippines

[16] Davao city had already designed and started to construct SLF before this project started, therefore, they were excluded from the support for the facility construction.

[17] Originally, Sagay city planned to shoulder the cost of construction of SLF using IRA and annual city budget. They planned to allocate 10 million peso from general budget. However, due to the delay of disbursement of IRA, they were obliged to compensate their expense using general budget, therefore only 1.5 million peso remains as a budget for construction of SLF.

[18] The loan request was approved at the city council in December 2008.

[19] EDP is the yen loan program with the ceiling of 24,846 million yen, whose loan agreement was exchanged in September 2008. This program offers the mid-long term loan fund to be invested to the facilities for the environment

(DBP)[20]. However, it took time to conclude the loan agreements, which was another reason for the delay of starting construction. Even after the loan agreements were concluded, the partial payment by LBP and DBP took time to scrutinize the loan documents, and Sagay and Calbayog city also needed some time to elaborate the necessary documents, which delayed the completion of construct ion of facilities. By the end of the project in September 2010, only the first cell of the SLF in Sagay City was completed, and at Calbayog City, the entire facility except for the electric and equipment installation, was finished at the beginning of October 2010. On the other hand, the production of operation and maintenance manuals for the facility was completed as planned, and the on-site operation and maintenance training was carried out as stated in table 3[21].

Table 3：Record of on-site operation and maintenance training for SLF

Contents	Sagay city (number of participants)	Calbayog city (number of participants)
Lecture on SL O&M	13 September 2010 (5)	20 September 2010（23）
On-the Site Guideline on Facility Inspection	14 September 2010（4）	13 September 2010（9）
Landfill Operation Training	13 September 2010（15）	13 September 2010（13）

Source: “Project Completion Report” (October 2010)

4) Output 4: Guidebooks and manuals are developed as a tool for planning and implementation of SWM based on the experience of the three cities.

Indicator	Achievement
1) The number of technical working group meetings held	Achieved (5 times)
2) The number of LGUs who participated in the consulting seminar	Achieved (22 LGUs)
3) The necessary procedure for the Department Administrative Order initiated by the NSWMC to reflect the contents of the manuals/ guidebooks produced.	Achieved

Source: “Project Completion Report” (October 2010)

NSWMC had completed the following three guidebooks, ”Guidebook for Formulation of Solid Wastes Management Plan”, “Guidebook for Safe Closure of Disposal Sites” and “Technical Guidebook on Solid Waste Disposal Design Operation & Management” through the working group

improvement. Four target sectors are designated, one of which is “solid, medical and hazardous waste disposal”.

[20] Calbayog city had not have prior business with DBP, which required them to take additional procedures, such as opening of new account among others. In July 2009, the loan agreement was concluded and the construction started in September 2009.

[21] The guidebook on operation and maintenance for SLF was accomplished in March 2010, and were distributed to Sagay and Calbayog city respectively.

meetings, which were held five times between October and December 2009, and organized the consultation seminar to receive public comments from the 22 LGUs on these guidebooks . NSWMC revised the guidebook based on their comments and finalized them in March 2010.

In order to standardize these guidebooks, their contents were originally planned to be reflected to the Department Administrative Order (DAO). However, the reflection process takes time, while, the issuance of a Resolution by NSWMC takes less time though holding the same effect as legal enforcement. Therefore, NSWMC issued the resolution[22] to prepare the smooth set-up of the legal framework, which implied that the guidebooks were to become the national standard for preparing SWM plans, closing existing dump sites and constructing the new SLFs.

3.2.1.2 Achievement of the Project Purpose

The degrees of achievement of the Project Purpose at the time of the completion of the project are as follows:

1）Indicator 1: SWM plan is reviewed annually (Sagay & Calbayog city): Achieved

As reviewed in Outputs 1 and 2, the basic data related to SWM have been collected since 2009, and the SWM plan was reviewed in February 2010. The indicator was achieved.

2）Indicator 2: Waste diversion rate (WDR) is improved as compared with the baseline :Partially achieved

The transition of WDR in each city is as follows:

Table 4：the record of WDR in each city

	2008	2009	2010
Sagay City	21.1%	23.1%	19.2%
Calbayog City	25.2%	24.7%	26.5%
Davao City	25%	NA	NA

Source: For 2008: “Terminal Evaluation Report” (July 2010)
For 2009-2010: Project Completion Report (Note: 2010 data were calculated from January to June for Sagay City, and from January to August for Calbayog and Davao City）(October 2010)

The main measures to improve the WDR were collection of recycled waste and composting of organic waste. According to interviews with residents, the segregation of waste had already put in practice before the start of this project. But by participating in this project, they could grasp the whole picture of 3R, and tried to separate waste and follow 3R more positively. In each city, the volume of collected waste at MRF was 20kg/day at Sagay City, 41kg/day at Calbayog City and

[22] The Resolution was in effective on October 22, 2010.

308kg/day in Davao City.[23] When the project was in the planning stage, there were no MRFs in any of the three cities, which implied that the generated waste could not be diverted at all. Therefore, only the establishment of MRFs by this project would have raised the diverted waste amount by recycling and composting at the MRFs.

Furthermore, the WDR at the completion of the project in Sagay City did not improve compared with that of the baseline data in 2008. This is because of the expansion of the waste collection area, the increased waste generation per person and the increased amount collected, caused by the unexpected launch of a big commercial shopping mall.[24]

Considering these situations, even though the WDR did not improve in some cities compared with that at the time of planning, the establishment of MRFs increased the diverted waste volume, which implies that the volume disposed at final facilities decreased.

3) Indicator 3: New SLFs are operated in compliance with RA9003 (Sagay and Calbayog City): Not achieved

Both Sagay and Calbayog City delayed in the construction of the final disposal, which hindered the start of the operation of these facilities in alignment with RA9003. The existing dump sites have finally been closed, and the SLFs have only been utilized since February 2012 in Sagay City and since May 2012 in Calbayog City.[25]

Regarding the degree of achievement of Project Purpose, indicator 1 was achieved. However, indicator 2 was achieved only in Calbayog City and was not achieved in Sagay City because of the increase in waste collection. Indicator 3 could not be achieved because of the delay of the completion of the final disposal site. Considering these situations, this project purpose was partially not achieved.

3.2.2 Impact

The degree of achievement of the Overall Goal at the time of the ex-post evaluation is as follows.

3.2.2.1 Achievement of the Overall Goal

In the Philippines, RA9003 was enacted in 2001, but only a few LGUs could put it in practice, so its application by more LGUs was an urgent task. In this project, three cities were selected as model LGUs to strengthen the capacity to elaborate the SWM plan, to implement and monitor the planned

[23] "Project Completion Report" (October 2010)
[24] Interview with Sagay City official
[25] Sagay city completely stopped using the existing dump site in June 2013. On the other hand, Calbayog City could not get the loan from DBP necessary to close the dump site safely due to the delayed follow-up action on the incomplete documents. After starting to use SLF, they stopped using the dump site but they did not take proper procedure for safe closure of the dump site.

activities;[26] to safely close the existing dump sites and to construct, operate and maintain the SLFs. Their experiences were summarized and compiled into the three kinds of guidebooks. After the completion of the project, NSWMC was expected to expand their activities to spread SWM methods utilizing these guidebooks, and LGUs were also expected to implement any SWM-related activities stipulated in RA9003.[27]

1) **Indicator 1: The number of seminars and workshops held at a regional or national level by the NSWMC for other LGUs**
2) **Indicator 2: The number of LGUs participating in the above mentioned seminars and workshops**

Although neither indicator 1 nor 2 set the numerical indicator, the related activities were conducted. During the project, seminars to spread knowledge and experience about SWM were conducted four times, and 93 LGUs participated. Moreover, after completion of the project, the related workshops were implemented 7 times from October to December 2010, and NSWMC made an effort to promote the SWM, utilizing the guidebooks produced by this project, through the various activities, such as hosting the seminars and workshops and distributing the IEC materials. As for indicator 2, the number of participants in these seminars and workshops was set as an indicator; however, it was difficult to get that information, so the number of seminars and workshops held on this issue was evaluated instead (refer to table 5). According to the opinion of NSWMC, the approximate number of participants in each seminar and workshop was 30 to 50, even up to 100 for some popular events.

Table 5：Record of SWM education activities after completion of the project

	2011	2012	2013	total
SWM seminars and lectures* (number of events)				
－for LGUs	24	29	30	83
－for universities and academic institutions	21	19	18	58
－for other (private NGOs etc.)	18	39	39	96
Dissemination of guidebooks（copies）				
－SWM plan	534	919	NA	1,453
－Safe closure of Open Dump Site	534	735	NA	1,269

[26] IEC campaign activities, the waste diversion through the recycling and composting at MRF.

[27] "Implementation of SWM" covers wide range of activities, such as SWM planning; the segregation of waste; the collection of waste; the collection of recycled waste; composting; the IEC campaign activities; the waste charge calculation, approval and collection; the construction, operation and maintenance of disposal facilities (MRF, SLF and others); the monitoring of related activities and others. Whether LGUs can put all these elements into practice is affected by institutional and financial factors, and is beyond the range of control of NSWMC. According to Japanese experts and NSWMC, to "replicate the knowledge and experience of SWM" in the overall goal means the implementation of "any kinds of activities," not expecting the all the modeled activities.

－Construction, operation and maintenance of SLF	534	642	NA	1,176
Action plan preparation seminars for LGUs**				
－seminars	13	NA	NA	13
－participating LGUs	256	NA	NA	256

Source: internal documents from NSWMC

* This is the seminar of one day for one LGU . (For 24 LGUs, 24 seminar were organized)

** This is the seminar for LGU of 3 days, including the training of Waste Amount and Characterization Survey (WACS) and others.

3) **Indicator 3: The number of approved SWM plans : Numerical figure is not set, and the number of approved plans remains at 43.**

By May 2014, 565 SWM plans had been submitted to the NSWMC secretariat, and 43 SWM plans (8%) had been approved. Aside from these approvals, an additional 39 plans are waiting to be examined, and 461 plans were returned to LGUs.

One of the reasons for the slow pace of approval of SWM plan is attributed to the lack of institutional capacity in terms of technical support for LGUs in the regions. The preparation of SWM plans by LGUs was expected to be supported by EMB regional offices. However, in most EMB regional offices, only two or three officials responsible for SWM are equipped with the requisite knowledge and experience regarding the environment and solid waste, which is quite a limitation, as they cannot cover all the LGUs or give technical advice to revise imperfect SWM plans.[28] Some EMB regional offices need technical support from NSWMC due to technical deficiencies to prepare SWM plans in giving LGUs technical guidance.

In DENR, there are offices of PENRO or CENRO in the regions, but they are not mainly responsible for SWM, so they are not so cooperative in promoting the SWM. At the beginning of the project, the National Ecology Center (NEC) and Regional Ecology Center (REC) were expected to be established and enhanced as an SWM-promoting entity, as designated in RA9003. However, in reality, the officials assigned to the NEC and REC were EMB officials with double assignments in most cases, and institutional capacity to support LGUs technically to prepare SWM plans is not sufficient.

On the other hand, even LGUs understand the necessity of putting RA9003 into practice; many LGUs do not establish a section exclusively to direct SWM. They allocate the SWM-related tasks to already-existing sections. However, the preparation of SWM plan demands a wide range of technical knowledge and experience, such as WACS survey, collection and update of knowledge of SWM-relevant data. Therefore, it is difficult for officials not in SWM-related section to respond to

[28] In the case of EMB Region 8, two official cover 27 LGUs (seven cities and 20 municipalities) and have to visit these LGUs so frequently that they cannot give each LGU detailed technical advice regarding technical flaws found in the SWM plan drafts, such as WACS survey, projection of waste generation, and collection of waste based on these analyses.

the issues and take action properly. They cannot prepare a proper SWM plan with the appropriate information and data updated to suitably align with the necessary items designated by the guidelines. An SWM plan that does not meet these guidelines are not examined by NSWMC and will be returned back to LGU. However, many LGUs not equipped with an SWM section cannot afford to request the technical support to EMB or NSWMC to correct and revise an incomplete SWM plan. Therefore, many SWM plans remain unapproved.[29]

4) Dissemination of SWM by NSWMC other than the activities set as indicators

In addition to the expected activities set as indicators, the NSWMC secretariat has expanded various activities to disseminate the SWM.

① **Facilitation of MRF construction**

In 2012, NSWMC secured a budget of 16 million peso from DENR and allocated one million peso to each region to facilitate MRF construction. All over the country, the fund was allocated to 42 LGUs. At the end of 2013, 19 LGUs had completed the construction of an MRF (of 19 LGUs, 14 LGUs were already in operation, and 5 LGUs were waiting to start to operate), and 7 LGUs were under construction.

② **Facilitation to transfer the existing dump site to SLF**

According to the results of monitoring by EMB regional offices, at the end of 2013, 55 SLFs were in operation and 61 SLFs were under construction. At the beginning of the project, the number of SLFs in operation was 21. The number of established SLFs, including those under construction, has increased almost fivefold since the beginning of the project. NSWMC coordinated with DILG so that the ombudsman would issue warning letters addressed to the mayors of the LGUs that were behind in their transfer of final disposal to SLFs in order to accelerate its process. NSWMC makes use of the external pressures so that LGUs push through the necessary SWM-related tasks prescribed by RA9003.

③ **Promotion of SWM with collaboration with other departments (Department of Education and DILG)**

NSWMC collaborated with the Department of Education to support the implementation of the segregation of wastes and 3Rs at educational sites. In 2013, NSWMC started the “Eco Savers Club” program as a trial at schools in metro Manila with the budget from DENR.[30] Since 2014, this

[29] According to an interview with an official of Cadiz and Bayawan City.

[30] “Eco Savers Club” is the program that makes students keep a “path book” to record the point, which is calculated based on the weight of waste brought to the office that the Supreme Pupil Government (SPG) manages. These

program has been expanded to other areas across the country by involvement of EMB regional office.[31]

Moreover, taking into consideration the importance of the political will of the mayors to practice the SWM at LGUs, NSWMC makes use of DILG's program of "Seals of Good Local Governance (SGLG)[32]" which commend the good performance of LGUs for the implementations of SWM. In addition to this, lectures addressing the topics of SWM are provided by the persons in charge at LGUs to the newly elected mayors and the newly elected barangay captains in the "Newly Elected Officials Program" (NEO).

In addition to these activities by NSWMC, the three target cities have also disseminated their knowledge and experience acquired from the project activities to other LGUs that visited them to observe their activities.

Regarding the degree of achievement of the overall goal, the dissemination activities by NSWMC generate a certain effect concerning activities related to indicators 1 and 2, and other various activities without indicators. As for indicator 3, even though the concrete figure has not been set, the approval rate of SWM plans remains at 8%. Considering these conditions, the degree of achievement level of the overall goal is fair.

3.2.2.2 Other Impacts

1) Environmental Impact [33]

Both Sagay and Calbayog city acquired the ECC, and no negative influence to the natural environment was found during the construction of their SLFs. Sagay acquired the ECC in August 2009, and no bad odor has been reported at the current SLF. The leachate received circulatory treatment, and no water contamination is seen around the SLF.[34] The proliferation of disease-causing insects, such as flies and cockroaches, has ceased, and the inundation caused by the clogging of drainage ditches by waste in the rainy season has decreased.

Calbayog City acquired the ECC in February 2008. Leachate has been inspected every month for its water quality at eight sites around the SLF, and the results have been reported to the EMB regional office. However, a bad odor has been found around the SLF in Calbayog City. It is believed that the bad odor is caused by the incomplete segregation of waste and leachate staying at the bottom of the

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accumulated points can be used to purchase stationery and snack sold at school. This is a sustainable mechanism because the students are motivated to collect and bring the wastes to the office with these advantages mentioned, and SPG can also manage their activities with the income brought from sales of recycled wastes to junkshops. Calbayog City also conducts a similar program by their own initiative in collaboration with schools.

[31] At the time of ex-post evaluation, EMB was selecting target schools to implement this program.

[32] Some banks consider winning of this award to be requisite for LGU to obtain loan, which implies that, this approach can influence the behavior of local chief executive.

[33] Only Sagay and Calbayog constructed SLFs that might cause environmental influence. Therefore, this section refers only to the situation at Sagay and Calbayog.

[34] This is confirmed by the periodical report submitted to EMB regional office every half year.

landfill area. According to the periodic inspection report of Calbayog City submitted to the EMB regional office every half year, the regulations set by DENR have not been violated. The leachate water under the landfill area should have been extracted at the proper time. But due to budget constraints and other factors, prompt actions could not be taken to solve this problem.[35]

2) Social Impact [36]

Regarding the waste pickers worried about the prospect of unemployment due to the operation of SLFs, of 13 waste pickers in Sagay City, six Sagay citizens were hired as blue-collar workers to work at the SLF. They get vaccinations against diseases such as tetanus as safety measures. At Calbayog City, among the 48 waste pickers who had been working at final disposal, 12 who were willing to work at the new SLF are now working at the facility. In both cities, the waste pickers who do not work at the current SLF are the ones who were not willing to work at the new SLF, and they are now engaged in other jobs in the city, such as garbage collection and street sweeping.[37]

3) Behavioral change of the residents

The beneficiary's surveys of residents regarding current SWM-related activities were conducted in Sagay, Calbayog and Davao.[38]

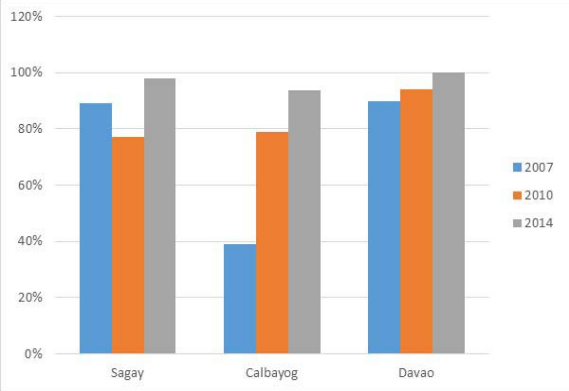

Figure 1: Proportion of residents who segregate their waste

[35] According to the person in charge of operation and maintenance at the SLF, the pipe to collect and treat the leachate is clogged by stone, sand and small waste, which hinders the leachate flow to the outside. They recognize this situation is problematic, but a big volume of waste is already accumulated on the landfill area, and it is difficult for them to take action to this situation.

[36] See 32.

[37] According to an interview with officials in Sagay and Calbayog.

[38] The data of beneficiary's survey in 2007 and 2010 are taken from the survey conducted during the project. In this ex-post evaluation, the same questions posed in 2007 and 2010 were applied to 45 residents (19 males and 26 females) of Sagay City, 63 residents (6 males and 57 females) in Calabayog City and 53 residents (25 males and 28 females) in Davao City. In Sagay and Calbayog, the survey was done at the same barangays where surveys had been done in 2007 and 2010, but in Davao city, 20 residents out of 53 were from the same barangay.

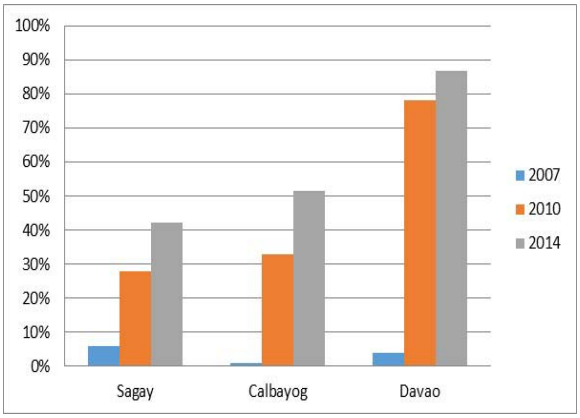

Figure 2：Rates of MRF use

Source: beneficiary's survey by evaluator

The segregation of waste had been taught to residents as part of environmental education before starting this project, which shows the high rate of implementation of the "segregation of waste." Except in Calbayog, more than 80% residents already segregated the waste at the time when the project began, as shown in the figure 1. However, it was reported that the residents learned 3R as a whole, not only the topic of segregation of waste through this project, and they became more conscious of the significance of the segregation of waste and its economic effects, which led to thorough segregation of waste. At some barangays, the policy of "No segregation, no collection" was enforced strictly,[39] and the segregation of waste was promoted by residents.

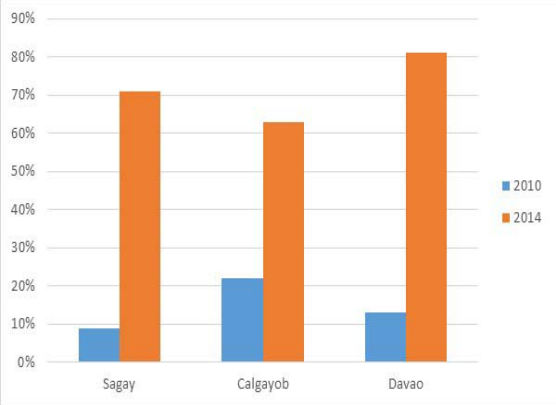

Figure 3：Rate of participation of the residents in the seminar on SWM

Source: beneficiary's survey by evaluator

MRFs were also constructed in each city to facilitate waste disposal and to guide environmental and hygienic education. During the implementation of the project, the number of MRF users has increased and continues to increase. However, in spite of the high rate MRF use in Davao City—more than 80% of residents—In Sagay and Calbayog city, the rate remains only 50%. According to the residents, recycled wastes generate income, so they sell them directly to junkshops by themselves rather than bringing them to the MRF. Also, many residents said that they were not aware of the difference in the quality of the compost of food waste produced at their own backyard and at MRFs, and they did not understand the necessity to utilize the MRF. In the case of the MRF in Calbayog City, the facility was supposed to be used and operated jointly by three barangays. But some residents said that due to friction among barangays, the joint operation was difficult to put into practice, and the frequency of

[39] At some barangays (such as barangay Fabrica in Sagay, barangay Carmen in Calbayog and others), the waste collectors or the Kagawad (barangay council members) checked the segregation of waste, and waste that was not segregated well was not collected, in fact. In Bayawan city, which is not the target city in this project, but highly evaluated by NSWMC secretariat for its good practice of SWM, the waste segregation came to be conducted thoroughly, by identification of the household who does not segregate waste completely and its return to them by garbage collector.

MRF use by the residents has decreased.

On the other hand, in Davao city, residents of barangays where the MRFs were constructed are well off and have different concern. They are not motivated by the possible income from waste by taking time in selling them at junkshops by themselves, so they bring these wastes to the MRF and entrust the job of negotiating with junkshop to the operator of MRF. In the case of Sagay City, a women's group makes products from the recycled waste, and their sale volume reached to 20 thousand peso in 2013. Considering these situations, the barangays that are not aware of the advantages of MRFs do not make use of MRFs.

The number of the residents who have participated in the SWM-related seminar has increased since the project completed. This is the effect of continuous IEC campaign activities by each city since the completion of the project.

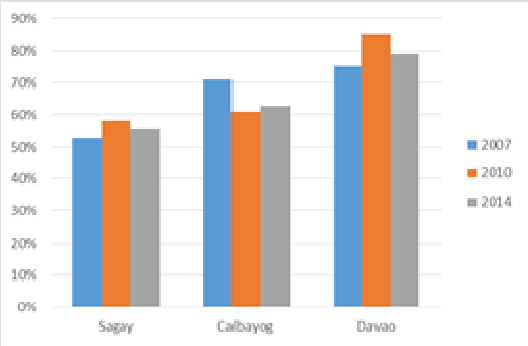

Figure 4: Rate of residents to have willingness to pay
Source: beneficiary's survey by evaluator

Regarding the recognition of the residents as for the importance of waste charge, 50-60% of residents of Sagay and Calbayog and roughly 80% of the residents of Davao City showed their willingness to pay the waste charge. However, 80% of residents in any city said that their tolerance range of payment for waste charges is 5–20 peso (monthly), which is the minimum range of the payment.

Considering this situation, since starting the project, the three target cities have continued to conduct SWM-related IEC campaign activities, and that encourages residents of each city to segregate, recycle and compost the waste more actively and thoroughly. The way of using MRF is not as originally expected, but it is used to respond to the needs of residents. Regarding the waste charge, even though relatively many residents showed their willingness to shoulder the cost, its tolerable amount is not so big.

4) Utilization of the effects of the project by other donors.

The guidebooks produced by this project were approved as a national guidebook of official procedures, and the LGUs in regions 6 and 7 empowered by GIZ also utilized these guidebooks.

Even though the indicators of the project purpose and the overall goal have partially not been achieved, certain effects caused by the project have identified. Moreover, regarding the impacts other than the overall goal, no negative environmental or social impacts were seen, residents' consciousness of SWM has been changed and the amount of waste diverted has increased.

Thus, a certain level of effect by this project is recognized, therefore the effectiveness and impact of the project are fair.

3.3 Efficiency（Rating：③）

3.3.1 Inputs

Inputs	Plan	Actual（at the time of completion）
(1) Experts	Chief advisor/Solid Waste Management, Final Disposal, Environmental and Social Consideration, and other expert(s) will be dispatched when necessity arises for the effective implementation of the project.(No differentiation of long and short term of its dispatch, nor description of their number)	In total, 7 experts: (Dispatched as contract-out type experts) 1）Chief advisor/Solid Waste Management, 2) Waste Diversion, 3) Final Disposal, 4) Financial Analysis, 5) IEC campaign activities, and 6) Environmental and Social Consideration/Coordination
(2) Trainees received	No description	12 personnel（6 in 2008 and 6 in 2009). Main training field: Waste management administration, operation and maintenance of final disposal facility
(3) Equipment	No description	Portable weigh bridge, office supplies (FAX/printer/scanner/copy machine), IEC campaign material (video recorder, laptop PC, digital camera, LCD projector, vehicle), water quality analysis material, combustible gas detector among others
Total Project Cost	380.0 million yen	364.8 million yen (96% of plan）
Project Cost borne by counterpart country	No description	● Cost for construction of SLF: Sagay : 20 million pesos Calbayog: 50.2 million pesos Davao: None (No construction of SLF) (Cost to acquire ECC related to SLF construction at Sagay and Calbayog) ● Fuel for the transportation[40] : (for three cities)

[40] The information of the actual amount could not be obtained.

3.3.1.1 Elements of Inputs

The experts for each assigned assistance field were dispatched for 65.5 MM. The project activity was conducted at four sites, so the period to stay at one site was necessarily short. To compensate for this situation, the experts tried to have smooth communication with CP by coordinating the timing of the dispatch of each expert with continuous communication through email during their absence from the project site. However, some CP at the target city said that more time ought to be spent for the technical assistance, especially for financial analysis and examination of the waste charge.

Regarding the counterpart training, the trainees had visited and observed various activities on SWM at Japanese LGUs. Among the twelve trainees, eight continue to be engaged in SWM-related duties, and they evaluate the knowledge and experience acquired during the training in Japan was effective.[41] After returning to their country, they utilized this knowledge and experience to improve their IEC campaign activities and to promote the understanding of mayors on SWM. A certain level of effect by this counterpart training is recognized.

The equipment was procured as planned and utilized for the project activities. However, some equipment, such as the combustible gas detector, was used barely, and the truck scale in Calbayog has not been used due to parts trouble.

3.3.1.2 Project Cost

The actual project cost was 364.8 million yen (96% of the plan), which is within the planned amount of 380 million yen. Therefore, the project cost was appropriate.

3.3.1.3 Period of Cooperation

The period of cooperation was 3 years (from July 2007 to July 2010), in comparison with the original plan of 3 years (from 2007 to 2010). The period of cooperation was also appropriate.

In light of the above, both the project cost and project period were as planned. Therefore, efficiency of the project is high.

3.4 Sustainability（Rating : ②）

3.4.1 Related Policy towards the Project

At the time of ex-post evaluation, RA9003 is an effective policy related to waste management. The development objective “Quality, adequacy and accessibility of infrastructure facilities and services enhanced” stated in the “Medium Term Philippine Development Plan (2011-2016)” set the indicator of “Increase percentage of total LGUs served by Sanitary Landfill” from 2.7% in 2010 to 7.76% in

[41] According to the interview with seven officials who had participated in the counterpart training.

2016.

At the same time, the following policies are stated in “National Solid Waste Management Strategy” (2012-2016) elaborated by the NSWMC such as “Bridging Policy Gaps and Harmonizing Policies,” “Capacity Development, Social Marketing and Advocacy”, “Sustainable SWM Financing Mechanisms”, “Support for Knowledge Management on Technology, Innovation and Research”, “Organizational Development and Enhancing Inter-agency Collaboration,” among others, to promote the RA9003 from various approaches.

At the target three cities, the city ordinance related to SWM had been issued,[42] and the SWM plan was approved in Sagay and Calbayog in 2010.[43]

Related policies are prepared for the sustainability of the project.

3.4.2 Institutional aspects of the implementing Agency

NSWMC, composed by the representatives of fourteen ministries and three private organizations, does the decision making on the policies, and the secretariat of NSWMC is responsible for its implementation. The NSWMC undertakes the activities, such as providing “appraisal and support of elaboration of SWM plan,” “support for establishment of MRF,” “[enhancement of] the safety closure of existing dump site and the establishment of SLF,” “promotion of various kinds of IEC campaign activities,” and “[review and monitoring of] the implementation of SWM by LGUs,” among other responsibilities. In order to put these policies into practice, NSWMC collaborate in various programs with DILG, Dep. Ed., DOST, and DTI, who are the member ministries of NSWMC. The number of officials assigned to the NSWMC secretariat is thirty-three, and they are responsible for these diversified duties. This number is not so many, but they are somehow able to execute the responsibilities as a central government. Rather, the capacity development of the EMB regional office is more critical, which is expected to promote the SWM implementation in regions. In each EMB regional office, two or three officials are assigned to take care of an SWM issue, which is not enough to promote the implementation of the SWM plan.[44]At the time of ex-post evaluation, the rationalization is still in the process. NSWMC esteems that the number of officials responsible for SWM at an EMB regional office would increase through re-allocation of officials under rationalization because the original number is so small.[45]

Sagay has currently the setup described in Figure 5. This is the defacto setup for implementation,, and there is not an independent section exclusively responsible for SWM. The officials in the

[42] The city ordinance related to SWM was issue in 2011 in Sagay and Calbayog and in 2005 in Davao.

[43] Davao had already formulated ISWMP (integrated solid waste management plan) supported by USAID at the time of planning the project.

[44] According to the interview with the director of EMB regions 8 and 11.

[45] According to the interview with NSWC, even though the rationalization might decrease the number of officials assigned, in the case of officials responsible for SWM, the original number is so small that they can expect that its number would increase by the rationalization.

different sections are assigned concurrently to these posts in the SWM. Only the "focal person" is the exclusively assigned official responsible for SWM and overseeing the SWM activities.

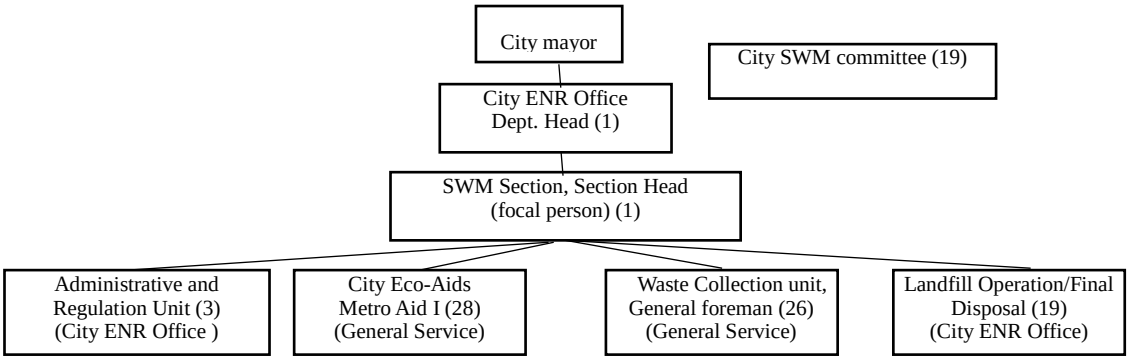

Figure 5：Organizational structure of SWM implementing group in Sagay City

Source: Documents given by Sagay City (the number in the parentheses is the number assigned to each unit (in total, 95), and the names are the organizational units' names).

Comparing the current number of officials with that at the time of ex-ante evaluation (2007), the number of officials for street sweeping and waste collection has drastically decreased[46]. However, according to the focal person, the target community where the waste is collected by city is fifteen out of the total twenty-five communities. The city has only four waste collection trucks and other equipment, so the decrease of the number of officials for street sweeping and waste collection does not create much problem with their duties. Now the trucks circulate each house to collect the garbage. If the collection point system, where each household brings their garbage out to a certain point, can be introduced, then the collection process can be more efficient requiring less number of officials. Even introducing any kinds of efficient system for SWM, the establishment of the exclusive section of SWM is indispensable. The City Development and Planning Office is also aware of this point, and they are now discussing the establishment of such an independent SWM-related section directly under the city mayor's office.

In Calbayog City, the SWM committee, with the mayor as a president, examines and supervises the policy of SWM, and the CSWMO (City SWM Office), which is the independent office, takes care of the implementation of daily duties. One responsible person is assigned to this office, and actual SWM-related activities are conducted by the officials under the unit of general affairs and final disposal facility.

[46] For SWM and administrative and Regulation unit: 8 officials, for General Service office (for sweeping streets, collection of waste): 113 officials, and for CSWMB: 22 officials, in total 143 officials were assigned.

Table 6: Organizational structure of the SWM Section at Calbayog City

（Unit: person）

Section		2007	2010	2013
SWM Board		15	15	15
City SWM Section	City SWM officer	0	1	1
	General affairs	20	21	21
	Collection/Transportation	24	Contract out to private entity	Contract out to private entity
	Final disposal	12	17	18
	Street sweeping	30	Contract out to private entity	Contract out to private entity
	Others	11	NA	NA
Total		97	54	53

Source: Data for 2007 are from the ex-ante survey report; data for 2010 and 2013 are the answers to the questionnaire.

In Davao City, there is an independent section that takes care of SWM. In Davao, there are so many as 182 barangays, so they try to conduct efficient SWM by commissioning the task of garbage collection and street sweeping to a private company, and making use of volunteers for the IEC campaign activities and the supervision of enforcement of the SWM policy among others.[47]

Table 7: Organizational structure of SWM section at Davao

（Unit:person）

Section		2007	2010	2013
City SWM Board		20	20	20
CENRO (City Environment and Natural Resources Office) / EWMD	SWM	65	50	50
	Total	65	50	50
Commissioned to Private Sector				
	Street sweeping	10	300	300
	Waste collection	55	350	350

Source: Data for 2007 are from the ex-ante survey report; data for 2010 and 2013 are from the answers to the questionnaire.

In any city, in Sagay, Calbayog, and Davao, the office responsible for SWM tries to implement SWM and compensate for their insufficient organizational set-up by collaborating with educational institutions[48] and barangays.

[47] They assign 31 volunteers to the IEC campaign activities and 60 volunteers to the policy enforcement. There are also four city permanent officials who supervise their activities.

[48] Dep. Ed., as a central government, promotes SWM as a part of environmental education. They embed the SWM topic into their curriculum and also implement the YES-O program (Youth for Environment in School Organization

As stated above, in both the central government and the targeted three cities, the officials, though small in number, are assigned to work on SWM, and they are managing it in some way or other. However, in case of Sagay, an independent section for SWM should be established. The more technically competent officials should be assigned to Sagay and Calbayog, even if the number of officials remains the same, so that they can reinforce their SWM activities in the future.

3.4.3 Technical Aspects of the Implementing Agency

The thirty-three officials assigned at the NSWMC secretariat are all university graduates. Among them, more than half of the officials have backgrounds in engineering or science, and others have mastered public administration and economics. This formation of officials enables the execution of technical and procedural duties to promote SWM as a central government. Moreover, the three kinds of guidebooks prepared by this project were elaborated by the NSWMC secretariat officials under the direction of Japanese experts. NSWMC officials are fully equipped with comprehension of SWM plans and with the technical capacity to diffuse SWM to the LGUs. On the other hand, as for the officials at the EMB regional office, they have the capacity to understand and manage solid waste, but they have not been given the chance to elaborate on the SWM plan, which makes it difficult for them to instruct and guide LGUs to formulate the SWM plan. The officials at the EMB regional office sometimes need technical support from the NSWMC secretariat to guide LGUs, so they also need capacity development for the formulation of SWM plan.

Principal officials at the three target cities have well enhanced their capacities for SWM. For example, the counterparts were trained on this project, the technical officials of the local consultant company are commissioned parts of this project, and the technical officials are supported by other donors.[49] They are well equipped with the necessary knowledge and experience and have no technical problems. Other officials in each city have improved their skills by participating in the seminar and training courses on SWM, sharing information on SWM among officials, being trained through on-the-job-training, utilizing the guidebooks created for this project, and improving their knowledge and experience on SWM. However, the officials in Sagay and Calbayog still need to strengthen their capacity to be able to conduct the duties without guidance from seniors.[50] With this situation, it is important to assign officials with technical capacity in these two cities. The opinion was expressed that it is necessary to assign the enforcers to supervise the practice of SWM by residents and to strengthen the officials with competence in processing the collected data and also in

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Program) to promote the segregation of wastes, 3R activities, and the establishment of MRF.

[49] The official in Cadiz, who is the focal person on SWM, has strengthened his capacity since 2013 by participating in the diploma course on SWM offered in Iloilo, supported by GIZ. The official responsible for SWM in Davao had been assigned to the current position and trained by USAID to formulate the SWM plan and conduct the SWM-related activities.

[50] In Sagay, there is only one official who understands SWM technically and is able to promote the activities. Similar opinions were expressed in Calbayog, too.

explaining 3R in a simple way to the residents in order to reinforce the implementation of 3R and to execute the necessary measures for the improvement of WDR.[51] On the other hand, in the case of Davao City, there are some officials, other than the principal ones, who have been working on SWM since the 1980s continuously, and also there are officials who are able to respond properly in a technical and social aspect to the SWM-related issues. There cannot be seen any technical problems.

At the same time, correct monitoring is a common issue in all 3 LGUs. In Sagay and Calbayog, the office responsible for SWM tries to establish the periodical reporting system from the barangays and junkshops to collect the information of the diverted amount of the recycle and compost. However, the current information collecting system confronts the problems of the credibility of the data collected, the rejected data submitted by barangay and the junkshop, and also the insufficiency of on-site monitoring due to budget constraints. In case of Davao, they have already given up collecting reliable data from barangay and the junkshop, and now they do not monitor the data to calculate the WDR.

In addition to these, Calbayog needs to improve its operation of SLF. Some problems that arise from operation of SLF cannot be handled properly due to budget constraints and lack of communication among the officials, which delays taking actions and worsens the situation.[52] Even though NSWMC has been pointing out to improve this situation, effective actions have not been taken.

3.4.4 Financial Aspects of the Implementing Agency

The NSWMC secretariat prepares the annual work plan and secures the budget for their activities every year. The budget since 2012 is as follows. The budget to support the construction of MRF[53] and IEC campaign-related activities are the major items to be expensed. The NSWMC secretariat supports LGUs for their promotion of SWM. For that purpose, the budgets for their activities to visit these LGUs are secured, even though it is not sufficient.

Table 8: Annual activity budget of NSWMC secretariat (except personnel cost)

(Unit : thousand peso)

	Activities	Details	2012	2013
Improvement of WDR			*54,016*	*66,627*
	Establishment of MRF	Cost for establishment, LGU assistance	44,300	50,498
	Appraisal of SWM	Evaluation, approval and enhancement of LGU	6,346	4,166
	Support to execute the ESWMC	Support to LGU, monitoring, elaboration of criteria	3,370	11,963

[51] Calbayog needs officials who can understand the statistics for appropriate monitoring, analyze the situation to activate the 3R activities at barangays, and have good command of communication.
[52] Refer the footnote no.34.
[53] Detailed information can be referred to 3.2.2.1 Achievement of Overall Goal (p.13)

Closure of current dump site			*1,534*	*97*
	Monitoring	Support for LGU and monitoring	1,534	97
Construction of SLF			*2,524*	*1,498*
	Monitoring and others	Finalization of guidelines, evaluation of proposal, fund establishment	2,524	1,498
IEC campaign			*12,531*	*9,068*
	Training	Training of SWM to LGU/schools/staff, guidelines finalized	3,957	787
	Production of teaching materials	IEC materials printed, purchased, disseminated	5,178	5,918
	Advocacy	Technology transfer, TV segment, LGUs awarded,	1,964	509
	SWM-related data inventory	Module development, EMB regions training, database/website updated, inventory development	1,432	1,854
Others			*2,085*	*2,270*
	Collaboration with other ministries	Eco-labelling standard preparation, support to Eco-saver's program and others	2,085	2,270
	Total		**72,690**	**79,560**

Source: Documents given by NSWMC Secretariat

In Sagay, due to the absence of the independent SWM-related section, the SWM exclusive expenses are not grasped clearly. The activity expenses are borne by the several different sections to which the double-assigned officials belong. Under this situation, the expense presented by Sagay in this survey is as stated in table 9.

Table 9：Annual expenditure on SWM at Sagay City

(unit: thousand peso)

（Expenditure）	2006	2007	（Expenditure）	2012
Personnel	4,152	2,532	Program management	313
Fuels	2,763	1,865	Collection and Transport	817
Office supplies	48	19	MRF/Treatment & Processing	985
Maintenance of Vehicles	(N/A)	312	Disposal &Storage Facility	3,213
			Other expense	185
Total	**6,953***	**4,728***	**Total**	**5,513***

* The expenditure in 2006 and 2007 does not include the cost for collection of wastes and operation of facilities, and the expenditure in 2012 does not include the personnel.

Source: For 2006 and 2007: Ex-ante evaluation report, for 2012: documents given by Sagay city

According to the officials related to SWM activities, the lack of budget to procure and maintain the equipment to collect the garbage is most remarkable (allocated under the items of "Program management" and "Collection and Transportation"). In 2009, the total income of Sagay was 485,116 thousand peso[54] and the expense of SWM in 2013, without including the personnel cost, was roughly 1% of it. Before starting the project, this rate was 0.54%. The expense rate of SWM to the city revenue has increased, compared with the figure before starting the project, but it is not enough.

The focal person on SWM has been proposing to introduce the waste charge system to the mayor and the city council. However, they have not consented to this proposal, and the waste charge collection system has not been put into practice. In 2011, the city surveyed the residents on their willingness to pay the waste charge. Only one quarter of the residents showed willingness to shoulder it, and the city judged it would be difficult to introduce the waste charge system.[55]

The annual expense of SWM in Calbayog is as stated in table 10.

Table 10: Annual expenditure on SWM at Calbayog City

(unit : thousand peso)

Expenditure	2007	2010	2011	2012	2013	2014
Personal services	5,505	5,569	6,056	7,347	6,782	9,211
Travel, supplies, training and public expense	397	417	315	265	265	265
(*sub-total*)	*5,902*	*5,986*	*6,371*	*7,611*	*7,048*	*9,476*
SWM Board	50	50	50	50	50	
SWM program	---	550	550	1,663	1,663	
Waste collection and street sweeping	5,388	6,100	7,709	7,709	9,043	
Maintenance pf SLF	---	2,610	2,610	2,610	2,610	
Maintenance of dumpsite	---	264	264	264	264	
Others	---	210	210	210	210	
(*sub-total*)	*5,888*	*9,784*	*11,393*	*12,506*	*13,840*	
Total	**11,790**	**15,770**	**17,764**	**20,117**	**20,888**	

Source: For 2006 and 2007: Ex-ante evaluation report, For 2012: Answers to the questionnaire

Recently, the expense amount for SWM has increased. The annual income of the year of 2009 in

[54] Homepage of Bureau of Local Government Finance DOF (http://www.blgf.ph/)

[55] Sagay City collects the waste charge from its business sector at the time of renewal of the business license, as a part of its renewal cost.

Calbayog was 622,830 thousand peso[56] and the SWM-related expense in 2013 was 3% of that amount. The expenses for SWM in the city's revenue before starting the project were 2.54%. A subtle increase can be seen, but it is not enough. This city has a relatively wide area and many barangays compared to its population, which brings difficulties in implementing effective SWM,[57] and they confront the problem of monitoring, even though they try their best to implement the effective SWM. Moreover, they limit the collection area to 33 barangays among 182, and still they confront the lack of operation and maintenance of facilities and equipment for the collection of garbage.[58] Regarding the introduction of the waste charge system by the residents, the city management has not consented to this proposal, and the city still cannot have introduced the charge collection system.[59] However, they plan to secure the budget, including the cost for the allocation of the enforcers to implement the SWM activities.[60]

The city ordinance of Davao issued in 2005 regulates collecting the waste charge from both the general residents and the business sector. The waste charge from the business sector is collected at the time of renewal of the business license; on the other hand, the full collection of the waste charge from the general residents cannot be achieved.[61]

The annual revenue in 2009 in Davao was 4,006,605 thousand peso,[62] and the SWM-related expense in 2013 was roughly 7% of that. The budget for SWM is not enough, but they can somehow manage to continue the current SWM-related activities. The rate of expense of SWM in proportion to the annual revenue before starting the project was 0.79%, and it has increased, comparing with that at the beginning of the project.

Table 11：Annual expenditure on SWM in Davao

(Unit：thousand peso)

		Personnel	O&M	Contract personnel	Total
2010	Road cleaning	2,113	281	27,171	29,565
	SWM-related work	11,591	64,500	53,081	129,172
	Total	**13,704**	**64,781**	**80,252**	**158,737**
2011	Road cleaning	2,210	885	27,171	30,266
	SWM-related work	12,329	164,570	53,936	230,835

[56] Homepage of Bureau of Local Government Finance DOF (http://www.blgf.ph/)
[57] They try to cluster the several barangays and set the BSWMC to collect the basic SWM related data.
[58] In Calbayog city, the truck scale was provided with by the project. However, they cannot respond to malfunction of the parts due to budget constraints, and this equipment has not been used.
[59] Calbayog collects the waste charge from business sector at the time of renewal of the business license (once a year). The charge is set according to the type of business, with the area of office. In 2010, 522 thousand peso, in 2011, 546 thousand peso, and in 2012, 558 thousand pesos were collected.
[60] According to the interview with the official responsible for SWM in Calbayog.
[61] According to the interview with the official in Davao.
[62] Homepage of Bureau of Local Government Finance DOF (http://www.blgf.ph/)

	Total	**14,539**	**165,655**	**81,107**	**261,301**
2012	Road cleaning	2,390	286	28,755	316,645
	SWM-related work	13,227	176,770	58,860	248,857
	Total	**15,617**	**177,056**	**87,615**	**280,288**
2013	Road cleaning	2,363	286	35,676	323,539
	SWM-related work	14,157	176,770	57,327	248,254
	Total	**16,620**	**177,056**	**93,303**	**286,979**

Source: Documents given by Davao City

The SWM fund that was expected to have been established at the time of completion of the project has not been set up at the time of ex-post evaluation. Provided with this situation, NSWMC examines other schemes of financial support and actually has given support to LGUs. For example, financial support to construct the MRF is one of its endeavors. In addition to this, NSWMC is in the final stage of negotiation with ADB to get a loan of 70 million dollars, preparing the matching fund of 3.8 million dollars from the Philippines government to cover the cost of procurement of the facility and equipment and also capacity development. The EDP fund from JICA, which amounts to 150 million dollars, also remains to be used for the preparation of the environmental infrastructure, including the SWM sector. The fund to facilitate implementing RA9003 is secured as such; however, the administrative capacity to utilize these funds for LGU to promote SWM is not enough, nor is the political will.

In light of the above, some problems have been observed in terms of the institutional, technical and financial aspects of the implementing agency. Therefore, sustainability of the project's effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project is consistent with the issues of SWM designated as important themes in the development plan of the Republic of the Philippines as well as the sector plan and development needs. At the same time, it is aligned with Japanese aid policy. In this regard, the relevance of the project is high. During the project period, technical assistance was provided to the three target cities to enhance the basic capacity to manage solid waste, such as the capacity to elaborate the SWM plan, to promote the IEC campaign for "3R" (Reduce, Reuse and Recycle) and also to monitor SWM-related activities. On the other hand, the capacity development to strengthen the operation and management of the final disposal facilities was not enough due to the delay of the construction of the facilities caused by the time-consuming fundraising process. Since the completion of the project, the NSWCM has tried their best to diffuse the SWM by various approaches. Even though the number of SWM plans approved by NSWMC is not high, the rate of construction of SWM-related facilities has

been increasing. This change can be considered an effect of the project. Therefore, the effectiveness and impact of the project are fair. Both the project cost and the period of cooperation were mostly as planned, therefore the efficiency of the project was high. The LGUs work on their possible SWM activities, even though their progress varies due to different factors, such as political, financial, economic, and technical factors. In the three target cities, the officials equipped with technical capacity by the project continue the SWM-related activities. However, some issues still have yet to be improved, such as increasing the number of officials equipped with SWM skills and securing the budget to maintain the equipment, among others. The introduction of a waste charge system is particularly important to secure the budget and reduce waste. Considering these situations, even though no problem can be seen in the policy background, some problems have been observed in terms of the institutional, technical and financial aspects of the project. Therefore, the sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

1) Common recommendations to all 3 LGUs

・Re-examination of the method of monitoring

It is difficult to expect to receive the reliable data from the general residents and junkshop. Therefore, it is recommended to implement the sample monitoring, selecting the specific barangays to align with the waste flow, instead of collecting information from all households, in order to collect the reliable basic data related to SWM. This way, LGUs can introduce the credible and feasible monitoring system.

2) Recommendation to Sagay and Calbayog

・Assignment of the technically competent officials

SWM covers a wide range of activities, requesting the capacity of data processing, smooth communication with residents and others. Therefore, it is recommended to assign the officials who are equipped with these abilities and able to respond to the necessary duties even with the same number of officials.

・Examination of how to make use of MRF

The effective use of MRF contributes to increasing the diverted amount of waste. Properly, MRF can be utilized to produce compost with high productivity, to process the waste-recycled product, and to discuss the method of these activities for its improvement and to share these ideas with residents; therefore, its utility value is high. However, at the time of ex-post evaluation, the MRFs were used just to collect tentatively the recycle products, to produce the compost not recognized the

difference in its quality with the ones produced at the backyard of each household and to process and sell the recycled product as elaborated by a group composed of partial residents. This usage of MRF does not show the clear picture of an advantage to utilize MRF for all the residents. Discussing the usage of MRF is recommended, which would bring the practical advantage to the residents, as a whole, to increase the diverted amount of waste.

・Re-examination of the introduction of the waste charge collection system

The waste charge system enables increasing the revenue of the city and also reducing the cost to collect and process the waste, due to suppressing the generation of waste.. The management board of the city should consider the long-term positive impact brought by this system and re-examine introducing the waste charge collection system. (The amount proposed by the project was 44 peso in Sagay and 31 peso in Calbayog [both per month per household],[63] which are considered to be affordable.)

3) Only for Sagay City

・Establishment of the independent section responsible for SWM

Establishment of the independent section responsible for SWM is a basis of implementation of SWM. Establishing an independent section to secure the budget, to allocate the necessary officials, and to work on SWM issue sustainably is recommended.

・Modification of the waste collection system

At the time of ex-post evaluation, the waste was collected at each household. However, it is recommended to set-up the waste collection points in barangays where the households bring their waste, and the garbage collection truck would pick up the waste only at these points so that the collection system would be more efficient and the cost for the collection could be cut.

4) Only for Calbayog City

・Smooth communication among the officials

It is recommended to have smooth communication among officials and to respond to the problems by proper and opportune way, including the secure of budget, for the sooner solution. Especially, regarding the operation of SLF, due to improper communication about the troubles, budget allocation and technical action could not be done properly, which worsened the problem of the presence of leachate at the bottom of the landfill area.

[63] This charge covers only the cost of the collection of waste. This amount is about 15% of the entire cost, including the cost for operation and maintenance of SLF. (Project completion report [2010]).

5) Recommendation to NSWMC

・Capacity development of EMB regional office to follow-up the implementation of SWM by LGUs

The rationalization of the government is still in the process in 2014. From now on, it is recommended that the officials newly and already assigned to the EMB regional office, under the rationalization of the government, should strengthen their capacity to formulate the SWM plan and other SWM-related skills so that they can support that task at LGU, by reinforcing their institutional capacity (such as assignment of the officials and securement of the budget).

4.2.2 Recommendation to JICA

None.

4.3 Lessons Learned

1) Formulation of the project with risk management of the delay of fundraising borne by the counterpart country

In this project, the fundraising to construct the final disposal facilities was for the responsibility of the counterpart country. However, the loan procedure was delayed and the construction of the facility had finished just before completing the project; therefore the technical transfer on the operation and maintenance of the facility could not be done fully as planned. In the case that the series of activities, outputs and project purpose are dependent on the proposed budget secured by the counterpart country, the uncertainty related to the accomplishment of fundraising should be well examined, and also the internalization of that uncertainty should be studied as much as possible. For example, in the case of this project, the period of cooperation could be designed deliberately forecasting the necessary time for the loan approval because this process was led by LGUs who had no prior business relations with DBP. Moreover, if the internalization of the risk factor is difficult, it is recommended to examine how to respond to that risk, and to formulate the project. (For example, we should examine the necessity to implement the additional complementary support to strengthen the loan procedure by other schemes.)

2) Clear Indicator of the Overall Goal in the case of "Model Dissemination" type of the project

In this project, it was expected to develop a SWM model case, during the period of cooperation, that will be the prototype for other LGUs, and that model SWM would be replicated to other LGUs by the Philippines government after the completion of the project. The SWM model plan elaborated in the project comprehensively covers necessary measures for the implementation of SWM, from time-consuming endeavors such as thorough implementation of 3R to cost-consuming endeavors such as construction of SWM facilities, among others. However, when LGUs launch any kinds of

measures of SWM, they cannot execute all these measures and have to choose the feasible activities under the political, technical, legal, financial and social constraints.

In the case that the “replication of model” elaborated by the project is set as an overall goal, the expected degree of the “replication” should be made clear as indicators, such as the number of replicating LGUs, the area of replication of the model, the specific activities in the model to be replicated (such as establishment of MRF, and ratio of communities who implement the segregated waste collection, among others).

3) Collaboration with organized institutions and organizations

The well-organized institutions, such as the Department of Education, who has a network from central government to the schools at the regions, can deliver the command using a top-down system and is good at expanding the activities. In case of the project that aims to disseminate some model as an objective, the implementation of the activities at most lower levels of institutions, monitoring the status of implementation of activities and the collection of related data is important. Therefore, working together with well-organized institutions or parties is effective as it enables efficient dissemination.

4) An approach to the Local Chief Executive

In the Philippines, even though the law is enacted, its execution might be affected by the political will of the local chief executive. In case of the project in which LGUs are the principal implementers of some endeavors, even if the technical transfer was done successfully, the sustainability of the project is subject to the political will of the local chief executive. The sustainability can be hindered by reshuffling the trained officials or not securing the necessary budget among others, if the chief executive does not have a will to utilize and continue that capacity. Moreover, even if the local chief executive has a good will to promote SWM, he might be replaced through the election and the policy for SWM cannot be continued. In case that these kinds of risks can be foreseen to the results of the technical assistance, it is important to work on the political will of that local chief executive in addition to the technical capacity development. In this project, the effort by NSWMC to utilize the SGLG scheme can be appreciated, which is the performance evaluation system for LGUs, to raise the motivation of the local chief executive to promote SWM, in collaboration with DILG.

<Column>

This project was conducted to help the NSWMC, the central government responsible for the diffusion of SWM, formulate the guidebooks regarding the SWM plan and the arrangement of the final disposal facility (such as safe closure of the open-dump site and the construction of the SLF) based on experience gained through technical assistance in the three target cities, and then diffuse

the SWM to LGUs other than the three targeted LGUs utilizing these guidebooks.

The diffusion of SWM is the duty of NSWMC, as stipulated by RA9003; therefore, NSWMC continues to make efforts to promote the SWM by diversified approaches even after the completion of the project through its collaborations with the EMB regional office. On the other hand, not many LGUs can execute SWM-related practices due to the comprehensiveness of its duty from waste generation to final disposal of waste, composed of various processes that require techniques and financial resources. Many LGUs cannot have an independent SWM-related section, allocating the duties to other existing sections, which impede the execution of SWM in line with the methods stipulated by RA9003.

NSWMC can keep promoting SWM to LGUs continuously after the completion of the project because NSWMC is the appropriate implementing agency as a counterpart to promote SWM and was fully involved and strengthen its necessary capacity during the project period. However, considering the large number of LGUs in the regions, the officials in the EMB regional office, who were supposed to be responsible for the promotion of SWM after the completion of the project, should have more actively enhanced their SWM-related capacity during the project, which might have led the reinforcement of the implementing agency to promote SWM after the completion of the project.

On the other hand, the important factors that affect the degree of realization of SWM by LGUs are the enhancement of the capacity of the LGU officials who are engaged in SWM issues, the behavioral changes in the residents, the securement of the budget, the institutional arrangements for SWM implementation, the initiative of the mayors, and others. Among these factors, those other than the enhancement of the capacity of the LGUs' officials are significantly influenced by the LGUs' initiative. Under this situation, it is difficult for the LGUs to execute all the activities, as planned, which are incorporated in the SWM plan.

In light of the above, in the case of the project that aims to disseminate its effects after completion of the project, it is crucial to select the proper counterpart agency, make it fully involved in the capacity development process during the project, clearly define the achievable and specific activities expected to be implemented, and conduct the technical assistance, with the reinforcement of the implementing system in mind to push through those specified activities.

Democratic Socialist Republic of Sri Lanka

Ex-post Evaluation of Japanese Technical Cooperation on the Capacity Upgrading Project for the National Solid Waste Management Support Center (CUP-NSWMSC) in Sri Lanka

External Evaluator: Mayumi Hamada
Foundation for Advanced Studies on International Development

0. Summary

This project was implemented to enhance capacity development of the National Solid Waste Management Support Center (hereafter, NSWMSC), which is at the central level, in terms of its planning and implementation for the sake of supporting solid waste management (hereafter, SWM) of local governments. Relevance is high, because improvement of SWM is consistent with the development needs and development policy of the country and with Japan's ODA policy. Effectiveness/Impact is fair, as the Outputs and the Project Purpose were mostly achieved by the project completion except for some indicators. Efficiency is high, since quality, quantity and timeliness of the inputs were appropriate in comparison with the achievement of the Outputs and the Project Purpose, except for allocation of human resources. Sustainability is fair, because sustainability from policy and financial aspects is high, whereas there is some concern about organizational and technical aspects. In light of the above, this project is evaluated to be satisfactory.

1. Project Description

（Project Location）

（Compost plant in Kuliyapitiya UC[1]）

[1] UC stands for Urban Council, which is one of the categories of Local Authorities in Sri Lanka. The LAs

1.1 Background

In Sri Lanka, the increased amount of waste which is not properly processed due to activated commercial activities and diversification of life brought about environmental degradation (water pollution, bad smell, etc.), deteriorating of the country's impression as a tourist destination. However, many of the problems were left unaddressed, and there were concerns that sanitary and environmental problems caused by wastes would worsen. Also, since the budget for SWM shared approximately 20% to 50% of the annual budget of the Local Authorities (hereafter, LAs), it was an urgent task to improve SWM and establish a sustainable management system for the sake of maintaining and improving the administrative service of the LAs.

In order to address the problem, Japan International Cooperation Agency (hereafter, JICA) conducted a development study called "The Study on Improvement of Solid Waste Management in Secondary Cities of Sri Lanka" from March 2002 to December 2003 upon request by the Sri Lankan government. This development study recommended that the government should establish a support system by the central government to the LAs, because it was technically difficult and inefficient for small-scale LAs and Provincial Council (hereafter, PC) without engineers with expertise in SWM to formulate SWM plans by themselves. More specifically, the study recommended the establishment of the NSWMSC to support LAs for improving SWM under the Ministry of Local Government and Provincial Council (hereafter, MLGPC), which is responsible for supervising LAs. Furthermore, for the same purpose, it also recommended strengthening the financial system for SWM by LAs. In July 2006, the Sri Lankan government established the NSWMSC as a part of the MLGPC, but there was a delay resulting from the necessity to cope with the damage caused by a tsunami in the Indian Ocean in 2004.

However, difficulty was anticipated for the MLGPC to provide high-quality support for SWM of the LAs, due to insufficient accumulation of knowledge and capacity on the solid waste management. Thus, the Sri Lankan government made an official request to Japan to implement a technical cooperation project for the sake of enhancing capacity of the NSWMSC in August 2004. Upon this request, JICA conducted a preliminary study in November 2006 and started to implement a technical cooperation project with the

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in Sri Lanka are under supervision of Provincial Council, and categorized into three; Municipal Council (hereafter, MC), Urban Council (hereafter, UC) and Pradeshiya Sabha (hereafter, PS). MC corresponds with a city, UC with a town and PS with a village in Japan. Administrative service of MC is positioned as transferred authority from the Provincial Council, which is limited to general local environment such as hygiene, waste management, protection of regional environment, management of parks, etc. It is almost the same in UC and PS (Preliminary study report).

NSWMSC as the counterpart for a four-year period from March 2007, after signing the R/D[2].

1.2 Project Outline

Overall Goal		Local Authorities improve solid waste management.
Project Purpose		The NSWMSC acquires the capacity to support the SWM activities of LAs with close collaboration of relevant stakeholders so that the LAs can implement SWM activities in accordance with the National Strategy for Solid Waste Management.
Output(s)	Output 1	The NSWMSC establishes basic organizational structure with a mid-term implementation strategy.
	Output 2	The NSWMSC establishes an efficient mechanism for supporting LA's SWM by stakeholders.
	Output 3	Facilitation capacity of the NSWMSC for implementation of SWM Action Plans of LAs is acquired.
	Output 4	The NSWMSC provides necessary information so that the ministry can contribute national SWM policy and strategy.
Inputs		Japanese Side: 1. Experts ・12 experts for 6 fields (81.78M/M) 0 experts for Long Term 12 experts for Short Term 2. 1 trainee received (counterpart training in Japan) 3. 0 trainees for third-country training programs 4. Equipment: 6.1 million yen and 400 thousand Rs. (PC, software, printers, spring balance, 4WD car, etc.) 5. Local cost: amount unknown Sri Lanka Side: 1. 12 counterparts[3] 2. Facilities and equipment (desks, chairs, cabinets, tables for OA equipment such as PC, etc.) 3. Facilities: facility for project office (in the MLGPC)

[2] R/D stands for Record of Discussions, which is a document which stipulates the framework of the project (name, period, objectives, main inputs, etc.). It is formulated when JICA starts its technical cooperation project to be agreed upon between Japan and its partner country. It is signed by both countries.

[3] Although the number of counterparts varies depending on the year, the maximum number throughout the project is shown here. The minimum number is seven in 2010. For further details, see the part of Efficiency.

	4. Local cost: 357,509,428.67 Rs.
Total cost	336.8 million yen
Period of Cooperation	March 2007–February 2011
Implementing Agency	The Ministry of Local Government and Provincial Council (MLGPC), National Solid Waste Management Support Center (NSWMSC)
Cooperation Agency in Japan	Kokusai Kogyo Co., Ltd.
Related Projects	・"The Study on Improvement of Solid Waste Management in Secondary Cities of Sri Lanka" (March 2002–December 2003) (Development study, JICA) ・"The Project for Development of Pollution Control and Environmental Restoration Technologies of Waste Landfill Sites Taking Into Account Geographical Characteristics in Sri Lanka " (April 2011–March 2016) (Technical cooperation project, JICA) ・"Local Government Infrastructure Improvement Project (LGIIP)" (L/A signed in 2005) (ADB) ・"The Environmental Remediation Programme (ERP)" (2010–2013) (UNOPS)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Project Purpose at the time of the Terminal Evaluation

The project purpose was assessed to have been mostly achieved. The reasons mentioned were enhanced capacity of the NSWMSC in terms of management and technique improved efficiency by strengthening collaboration with external stakeholders after the Mid-term Review, and increased budget of MLGPC. On the other hand, a concern was expressed on the staff allocation, especially on the shortage of technical staff of the NSWMSC.

1.3.2 Achievement of Overall Goal at the time of the Terminal Evaluation

The probability of achieving the overall goal was not clearly mentioned. It was positively evaluated that the project could increase the amount of compost plants in the country.

1.3.3 Recommendations at the Time of the Terminal Evaluation

The following recommendations were made at the Terminal Evaluation.

(1) Personnel placement in the NSWMSC
(2) Collaboration with Provincial Level for supporting LAs as well as collaboration among LAs (extension to other provinces and LAs)
(3) Human resources development through training (technical staff at provincial and LA levels, environment, health, and community development staff)
(4) Development of manuals for formulating Action Plans
(5) Establishment and management of SWM systems in each LA
(6) Raising public awareness and access to mass media
(7) Continuation of steering committee

As for (1) among the above recommendations, the number of allocated staff increased after the project completion.

2. Outline of the Evaluation Study

2.1 External Evaluator

Mayumi Hamada, Foundation for Advanced Studies on International Development

2.2 Duration of the Evaluation Study

This ex-post evaluation survey was conducted as follows.

Duration of the Study: October 2013–October 2014
Duration of the Field Study: January 5, 2014–January 25, 2014
April 21, 2014–May 7, 2014

3. Results of the Evaluation (Overall Rating: B[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance to the Development Plan of Sri Lanka

At the time of planning, the Sri Lankan government was promoting SWM with the "National Environment Act" (1980) and the "National Strategy on Solid Waste Management" (2000). Afterwards, the government started the "Pilisaru Project[6]" in 2008, in which the national budget is allocated for SWM by LAs and which is an example of the government's higher priorities in terms of policy. At the time of the project's completion, there was no change in the "National Environment Act." Although the "National Strategy on Solid Waste Management" was replaced by "National Policy on Solid Waste Management,[7]" which was enacted in 2007, there was

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[5] ③: High, ② Fair, ① Low
[6] It was completed in 2013. Later, it was extended.
[7] It was enacted in September 2007. Thus, "the National Strategy on Solid Waste Management" enacted in

no big difference between the two in terms of content, and promotion of SWM was stressed at the time of the project's completion. Thus, it has been assessed that the project direction had been consistent with the national policy of the country from the ex-ante evaluation until the project's completion.

3.1.2 Relevance to the Development Needs of Sri Lanka

At the planning stage of the project, improvement of SWM of LAs met the development needs of the country for the following reasons: 1) provision of service by the NSWMSC is meaningful because it is technically difficult and inefficient for the small-scale LAs and PC without in-house SWM engineers to formulate SWM plans by themselves, 2) activation of commercial activities and diversification of life brought about increase of wastes, and dumping of the collected wastes resulted in environmental degradation, and 3) the budget for SWM shares 20% to 50% of the total budget of LAs, which was one of the biggest issues for LAs. On the other hand, 1) above was almost the same at the time of project completion. Also, at the time that the questionnaire survey was conducted for the ex-post evaluation, a question concerned "the needs of improving SWM (only from the project commencement till the project completion)." Both of the replies from MLGPC and the NSWMSC rated the level of concern as "very high" (5 out of 5 levels, i.e., the highest level). Further, the average of the replies to the same question for PCs and LAs, which were the targets of the project, were high, i.e., 4.5 out of 5 for 4 PCs and 4.8[8] for 6 LAs. Hence, it was assessed that the development needs of improving SWM had been high at all of the national, provincial and local authority levels, from the project commencement till the project completion.

3.1.3 Relevance to Japan's ODA Policy

Japan's Country Assessment Program for Sri Lanka (April 2004) indicated that Japan will support Sri Lanka to realize and maintain "beautiful Sri Lanka" through improving the infrastructure of urban areas and preserving life and social environments (water supply and sewage, air pollution and solid waste management, etc.) from the viewpoint of promoting environment-oriented tourism. Also, "improvement of environment in urban [areas]" was included in one of the priority areas of JICA's assistance, and this project was positioned as the core project of the "Urban Environment Program." Thus, it was assessed that the project direction was

2000 was abolished. There is no big difference in terms of basic standpoint.

[8] Both are the five-level evaluation. The five answers were "5: very high 4: high 3:medium 2: low 1: very low."

identical with Japan's assistance policy at the time of ex-ante evaluation.

Therefore, this project is highly relevant because its implementation sufficiently conformed to the Sri Lankan development policy, its development needs and Japan's ODA Policy.

3.2 Effectiveness and Impact[9] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Output

The achievement of the indicators for each output at the time of project completion is shown in Table 1.

(1) Output 1: The NSWMSC establishes basic organizational structure with a mid-term implementation strategy.

The output 1 intends to establish the basic infrastructure of the NSWMSC, which was newly established, from an organizational aspect. The output 1 is assessed as achieved because all the indicators were achieved.

(2) Output 2: The NSWMSC establishes an efficient mechanism for supporting LA's SWM by stakeholders.

The output 2 was added after the Mid-term Review for the sake of improving sustainability of support to LAs. It aims at institution-building, which enables the ministries at the central government to formulate policy[10], the NSWMSC to provide technical support, and PCs to establish their master plans and give advice to LAs (including technical ones). Although the importance of collaboration among the stakeholders was indicated from the initial stage, specific measures were not clarified in the plan. The PCs are responsible for supervising LAs. However, until then, PCs neither formulated a provincial-level master plan, nor continuously gave advices to LAs, without being conscious that those were some of their responsibilities. It was necessary to therefore increase the awareness of people concerned at the PC-level, but the necessity was not sufficiently recognized by the Japanese mission team at the time of planning stage[11]. Upon receipt of recommendations as the result of the Mid-term Review, the NSWMSC started to conduct training programs for the staff of PCs and LAs, starting from the latter half

[9] Sub-rating for Effectiveness is to be put with consideration of Impact.
[10] The Ministry of Environment and Renewable Energy mainly formulate policy, while MLGPC supervises implementation and promotion of the policy from the central ministry's standpoint.
[11] Ex-Japanese mission team hearing

Table 1: Achievement of Outputs by Project Completion (February 2011)

Outputs	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
Output 1: The NSWMSC establishes basic organizational structure with a mid-term implementation strategy. （○）	①	The NSWMSC formulates and updates a comprehensive mid-term plan for NSWMSC.	The mid-term plan was formulated in 2009, and updated in 2009 and 2011.	○
	②	Each staff of NSWMSC can effectively work with understanding its tasks.	The staff shared the activities schedule, project documents, etc. All the staff understood their own tasks and concentrated on them.	○
	③	The NSWMSC can execute activities with clear work and decision making processes.	Work flow charts and task plans were formulated. Progress was reported and shared at the monthly meeting, and manuals were produced. The instructions by the Director were clear and quick.	○
	④	Staff training materials produced are compiled for self-learning.	The training materials utilized for more than 40 times are edited and utilized for self-learning by the staff.	○
	⑤	All staff in the NSWMSC can work on SWM with basic understanding.	All the staff acquired basic knowledge of SWM.	○
Output 2: The NSWMSC establishes an efficient mechanism for supporting LA's SWM by stakeholders. （△）	①	SWM committees are established in more than 5 PCs and they start to function.	The committees were not established in the Northern Province where negative effects by the civil war still remained, but were established in 4 provinces. The basic framework of the committee was established and the activities started although they were rather limited.	△
	②	A provincial SWM action plan is formulated in more than 5 provinces and it is executed.	Action plans were formulated in 4 provinces (Central, Sabaragamuwa, Eastern and North Western).	○/△
	③	The NSWMSC can disseminate information with regard to SWM to stakeholders through various means.	This indicator is the same as Indicator 4 below. Thus, Indicator 4, which is more specific, is utilized as the indicator instead of Indicator 3.	―
	④	The NSWMSC's website is updated more than 4 times a year, and NSWMSC News is sent to all stakeholders quarterly.	The NSWMSC's website is updated once every year. A Sinhalese version of NSWMSC News, which was most frequently issued, was sent to stakeholders 1 to 3 times per year.	×
	⑤	The NSWMSC can promote guidelines and manuals produced to be used by stakeholders.	8 kinds of manuals were developed. NSWMSC staff were enabled to utilize the manuals for extension as they acquired basic knowledge on SWM.	○
	⑥	SWM training is conducted to cover 5 PCs and more than 20% of trainees utilize the knowledge learned.	18 training programs were conducted in 8 provinces, in which 728 participants took part. Information on the extent the knowledge was utilized to was not available during the ex-post evaluation.	△
Output 3: Facilitation capacity of the NSWMSC for implementation of SWM Action Plans of LAs is acquired. （○/△）	①	The NSWMSC can assist LAs to formulate SWM action plans.	14 action plans were formulated.	○
	②	The NSWMSC can assist LAs to acquire new lands.	The NSWMSC supported 2 LAs, i.e., Kuliyapitiya UC and Nawalapitiya UC, to acquire lands that needed support during the project period.	○
	③	The NSWMSC can assist LAs to get legal permission and approval.	The NSWMSC supported 7 LAs to apply environmental permission, which succeeded to acquire it.	△
	④	The NSWMSC can assist LAs to manage social problems.	The NSWMSC organized meetings for briefing the residents and the residents agreed on the construction in 4 LAs, whereas the construction was suspended due to opposition of the residents at 2 LAs.	△
	⑤	The NSWMSC can assist LAs to get funds for projects.	The total amount disbursed to support LAs was 358 million Rs.	○
	⑥	The NSWMSC can assist LAs in procurement work (detailed design, tender, contract, supervision, project account).	A "small-scale compost plant design manual" developed by the project enabled technical staff at LAs to design the compost plant and estimate and prepare for tender documents.	○

	⑦	The NSWMSC can assist LAs in operation and maintenance of the facilities.	The NSWMSC developed a manual for the maintenance of compost plants and utilize it for lectures and on-the-site training. The NSWMSC also supported the 1-week on-the-site training programs in Balangoda and Weligama so that the supervisors and workers at the compost plant acquire knowledge and skills on maintenance of the facility before the compost plant starts its operation.	○
	⑧	The NSWMSC can assist LAs in monitoring.	The NSWMSC organized monitoring committees involving residents. Also, monitoring by the SWM committee (on the 3 LAs, i.e., Kuliyapitiya UC, Matara MC and Wennappuwa PS) was conducted.	○
	⑨	More than 17 SWM action plans for LAs are formulated.	SWM action plans were formulated in 17 LAs.	○
	⑩	More than 50% of projects formulated in the action plans are materialized.	8 out of 14 model projects were implemented (including those with construction completed and that are under construction).	○
Output 4: The NSWMSC provides necessary information so that the Ministry can contribute National SWM policy and strategy. （○/△）	①	The NSWMSC can understand the present SWM conditions in the country.	A database was developed with the data of an overview of the LA's SWM in the country, detailed information on the LA's SWM, an overview of night soil treatment of LAs, and the result of a questionnaire survey on the actual SWM by LAs in the country.	○/△
	②	Valuable recommendations to National SWM policy and strategy are included in the NSWMSC's annual report.	Recommendations to National SWM policy were not included in the annual report. On the other hand, the indicator itself is not relevant to the position of the NSWMSC. The data on SWM shown in the annual report is useful to some extent.	△
	③	National and international institutional links and communication channels are established and maintained.	The linkage was established with other donors, international organizations, other ministries in the process of discussions and exchange of information to enhance collaboration with them.	○/△

Source: Produced based on document review, hearing, questionnaire survey results
Remarks: 1. The symbols in the "Level of Achievement" column show the following:
○ Achieved ○/△ Mostly achieved △ Middle level ×Not achieved －Not applicable

Table2: Achievement of Project Purpose by Project Completion (February 2011)

Project Purpose	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
The NSWMSC acquires capacity to support SWM activities of LAs with close collaboration of relevant stakeholders so that LAs can implement the SWM activities in accordance with the National Strategy for Solid Waste Management. （○/△）	①	100% of the proposed staff (1 Director, 2 Deputy Directors, 3 Assistant Directors and 8 Staff) is to be assigned as of the end of 2010.	As of August 2010, 1 Director, 1 Assistant Director and 5 Staff (7 in total) are assigned.	×
	②	The NSWMSC's management capacity achieves 70% of the target.	Both the staff's self-evaluation and the Chief Advisor's evaluation reached more than 70%.	○
	③	The NSWMSC's SWM knowledge and skills achieve 70% of the target.	Neither the self-evaluation of the staff nor the Chief Advisor's evaluation reached 70%. But compared with the initial stage of the project, the capacity seemed to have enhanced drastically.	×
	④	The NSWMSC's working conditions achieves 70% of the target.	The Chief Advisor's evaluation exceeds 70%, although self-evaluation by staff remained at between 60% and 70% since 2008.	○/△
	⑤	The ministry's SWM expenditure exceeds 50 million Rs. per year.	The expenditure from MLGPC increased year by year and reached 55.3 million Rs. in 2010.	○
	⑥	The NSWMSC's budget to be used for the execution of site surveys reaches 1 million Rs. per year.	The data does not exist because there is no item of expenditure for "site surveys" in the financial record. It was indicated that about 1 million Rs. were available as the cost for the site surveys.	○
	⑦	The NSWMSC maintains a good	The NSWMSC maintains a good relationship with	○

		network with various stakeholders.	domestic organizations such as the Central Environment Authority for the Pilisaru Project, SWM committee of Western Province, Morotuwa University, as well as other donors such as UNOPS, USAID and AusAId.	

Source: Produced based on document review, hearing, questionnaire survey results
Remarks: The symbols in the “Level of Achievement” column show the following:
○ Achieved ○/△ Mostly achieved △ Middle level ×Not achieved －Not applicable

of the project period. As a result, 728 staff members were involved in SWM by PCs and LAs (technical and non-technical staff) and heads and cadres of LAs (mayors, deputy mayors, etc.) in 8 provinces participated. Also, in the five target provinces, SWM committees were established, field surveys were done on SWM conditions, ranking from A to D in terms of SWM conditions based on the field surveys, and support for formulating provincial-level Action Plans was provided by the project. Thus, the activities started under a new framework.

As shown in Table 1, there are 6 indicators for the outputs. However, as Indicator 3 and Indicator 4 are the same, Indicator 4, which is more specific, is utilized instead of Indicator 3. Concerning the achievement of indicators, Indicator 5, the extension of manuals, was achieved, Indicator 4, dissemination, was not achieved, and the rest of the indicators were mostly achieved or medium. The achievement of the output 2 by the end of the project period was medium, because basic institution-building was completed to some extent, although there were some concerns such as that the activities at SWM committees in 5 provinces were limited.

(3) Output 3: Facilitation capacity of the NSWMSC for implementation of SWM Action Plans of LAs is acquired.

The output 3 aimed to enhance the NSWMSC's capacity to support LAs. This project selected 14 LAs as model projects, and took an approach in which the NSWMSC staff actually experience the whole process of the SWM cycle to support LAs to enhance NSWMSC's capacity. The indicators were achieved except for Indicator 3 and Indicator 4. Thus, the output 3 is assessed to be mostly achieved.

(4) Output 4: The NSWMSC provides necessary information so that the Ministry can contribute national SWM policy and strategy.

The output 4 intended that the NSWMSC disseminates information, which contributes to the formulation of national strategy on SWM by MLGPC. The indicator 2 was not achieved because policy recommendations were not made by the NSWMSC. However, this indicator is not appropriate, as it requires contents that are higher (policy recommendation) than what the output level objectives (information dissemination) can expect. On the other hand, the Indicators 1 and 3 were mostly achieved, so the Output 4 is assessed to be mostly achieved.

3.2.1.2 Achievement of Project Purpose

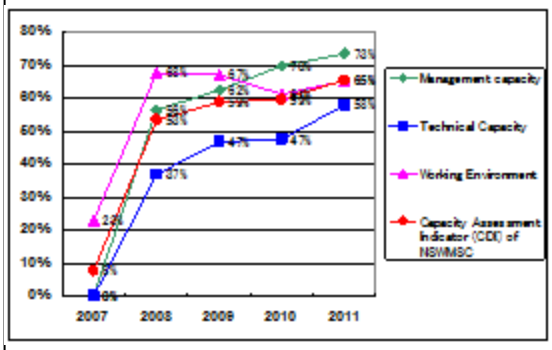
The achievement of the indicators of the project's purpose by the end of the project cooperation period is shown in Table 2.

(1) Indicator 1: Allocation of Staff

This indicator was originally a part of "Inputs" with which "Activities" were implemented in order to achieve "Outputs." Thus, it is logically inappropriate for an indicator to measure the achievement of the "Project Purpose, which should be achieved by the Outputs." Therefore, it is not proper to put the same stress with other indicators (such as Indicator 2, 3 and 4), although this indicator was not achieved by the end of the project period.

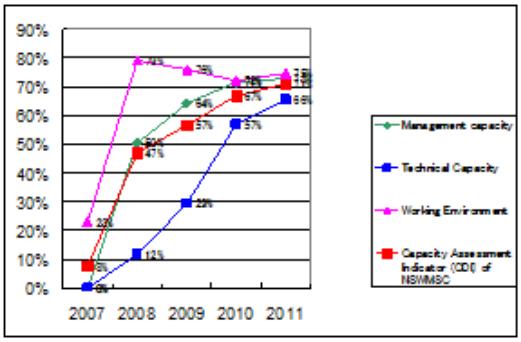
(2) Indicator 2: Management Capacity

In order to measure the improvement of the organizational capacity of the NSWMSC, detailed lists of capacities to be acquired and organizational capacity assessment sheets for each of the three fields, i.e., management capacity, knowledge and skills (technical capacity), and working environment, were formulated in this project. Based on them, both staff of the NSWMSC and the Chief Advisor made organizational assessments every year (Figure 1, Figure 2). The target amount was 70% for all the three fields. As for the management capacity, the results of both staff's self-assessment and the Chief Advisor's evaluation reached more than 70% and achieved the target in 2010 and 2011.



Source: The Project Completion Report

Figure 1: Capacity Assessment of NSWMSC (Self-assessment by NSWMSC staff)



Source: The Project Completion Report

Figure 2: Capacity Assessment of NSWMSC (By Chief Advisor)

(3) Indicator 3: Knowledge and skills

The figure showed a drastic increase compared with the commencement. In 2007, the result of assessment on knowledge and skills by both the NSWMSC staff themselves and the Chief Advisor was 0%. As for the self-assessment of the NSWMSC, it increased to 47% in 2010 and 58% in 2011. In case of the assessment by the Chief Advisor, it increased to 57% in 2010 and 66% in 2011. However, they did not achieve the target level of 70%, although it drastically improved compared with the time of project commencement.

(4) Indicator 4: Working Environment

The working environment in the capacity assessment increased in 2008. Since then, although self-assessment by NSWMSC staff was between 60% and 70%, the assessment by the Chief Advisor exceeded 70% every year. Thus, this indicator is assessed to be mostly achieved. Concerning the self-assessment by the staff, a staff member whose self-assessment is high does not necessarily mean that his/her capacity is high. Rather, staff with high capacity tended to give low assessment of himself/herself[12]. On the other hand, the Chief Advisor was experienced in the sector and had continuous contacts with the staff through accompanying field visits, human resources development, daily work and so on, which means that he can make more objective assessments on the enhancement of capacity of the staff. Therefore, emphasis was put on the Chief Advisor's assessment in the ex-post evaluation.

(5) Indicator 5: SWM Budget

As shown in Table 2, this indicator was achieved. In addition to the MLGPC's budget, the Pilisaru Fund was also established by the Central Environment Authority, the total of which amounted to more than expected.

(6) Indicator 6: Budget for Field Visits

As shown in Table 2, this indicator was achieved.

(7) Indicator 7: Network

As shown in Table 2, the indicator was achieved.

[12] Project Completion Report (P65)

Based on the above points, although Indicator 3 did not reach the target level, Indicators 2, 5, 6 and 7 achieved the target, while Indicator 4 was mostly achieved. Though Indicator 1 was not achieved, the indicator itself is regarded as inappropriate. Therefore, the achievement of the Project Purpose was fair

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

(1) Achievement of Overall Goal

1) Indicator 1: The number of Grade C and D local authorities in terms of SWM condition in 2010 will be reduced by 50% by 2015.

a) Data of the Indicator

As part of the support for formulation of the action plan at the provincial level conducted between 2009 and 2010 in five provinces (Central Province, Sabaragamuwa Province, Northern Province, Eastern Province and North Western Province), a field survey on the actual condition of SWM in LAs was conducted by PCs and the NSWMSC. In the survey, all of the targeted LAs were categorized into 4 grades, i.e., A, B, C and D. Based on the survey result, the indicator of the overall goal was revised as above (PDM3). The criteria of "the grades" are i) hygiene condition of town, ii) hygiene condition of landfill sites & disposal sites, iii) negative impact to natural environment and iv) negative impact on living environment of disposal site. The conditions of SWM at the target LAs were rated according to the criteria, to be categorized into 4 grades.

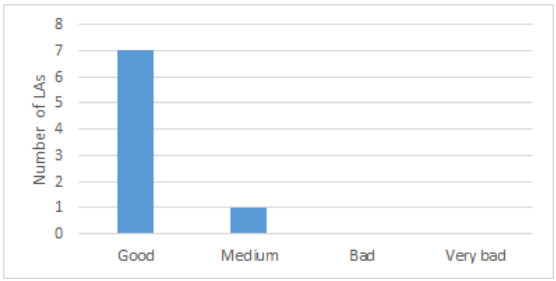
At the time of ex-post evaluation, however, neither SWM committees at the provincial level were functioning, nor site surveys to comprehend the actual situation of SWM mentioned above with ranking of the LAs from A to D were conducted. Therefore, the actual data for the indicator of the overall goal does not exist, and a simple comparison between the present situation and the set indicator is not possible.

b) Questionnaire survey to LAs

On the other hand, in the questionnaire survey conducted at the ex-post evaluation to the LAs that were selected as the model project during the project period, questions were made on the hygiene condition of town (i of the above-mentioned 4 criteria) and hygiene condition of landfill sites (ii of the above). The results are as shown in Figure 3 and 4 (8 valid respondents). As for the hygiene condition of landfill sites, except for 1 LA, which rated 2 among the 4 levels (4: good, 3: fair, 2:

bad, 1: very bad), 7 LAs rated either 4 or 3. Particularly concerning the hygiene condition of towns, 7 out of 8 LAs rated 4, which is high. Also, at the hearing from people concerned at PCs and LAs, there were some comments that the situation before the project was terrible with scattered garbage, a bad smell and illegal dumping, but those are significantly improved at present.

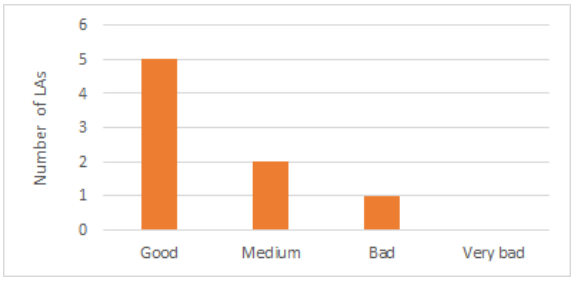
(Unit: number of LAs)



Source: Questionnaire to the Model Project LAs

Figure 3: Hygiene Condition of Town (LAs 2014)

(Unit: number of LAs)



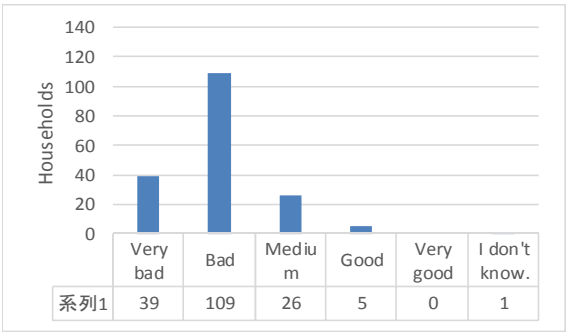
Source: Questionnaire to the Model Project LAs

Figure 4: Hygiene Condition of Landfill and Disposal Sites (LAs 2014)

c) Interview Survey to the Households

On the other hand, in the interview survey to residents (6 LAs in 2 provinces, with 180 samples[13]), a question was asked on the hygienic condition of towns (scattering

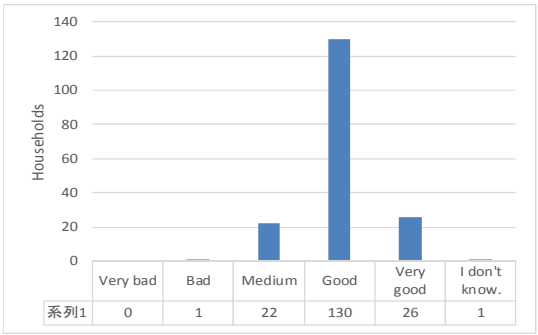
(Unit: Households)



Source: Questionnaire Survey to Residents

Figure 5: Hygiene Condition of Town (Residents 2007)

(Unit: Households)

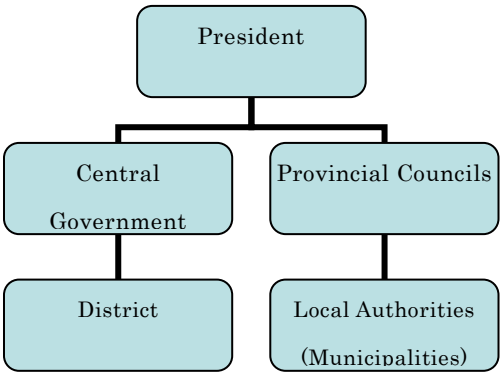


Source: Questionnaire Survey to Residents

Figure 6: Hygiene Condition of Town (Residents 2014)

[13] As for the selection of the samples, North Western Province was selected from among the provinces supported by the project during the project period in terms of establishing collaborative institutions. Southern Province was selected as one of the provinces where the effects of diffusion were expected after the project is completed. From each of the 2 provinces, 2 LAs that received support from NSWMSC and 1 LA that had not received support from NSWMSC were selected, and hearing to 30 households in each LA were selected, which makes 180 samples in total, and the interviews were conducted based on the questionnaire. Among 30 households at each LA, 15 were chosen from the town area, another 15 from rural area, and the survey was implemented.

of garbage, bad smell, etc., which are some parts of the indicator for the overall goals) in the 1st year of the project, as well as at the time of ex-post evaluation by 5-grade [14] evaluation. As shown in Figure 5 and 6, the hygiene condition of towns was significantly improved compared with 7 years ago.



Source: Produced based on the Preliminary Study Report (P237)

Remarks: See Footnote 2 on Page 1 for Reference for Local Authorities.

Figure 7: Administrative System in Sri Lanka

(2) Project Effects to Achieve Overall Goal after Completion of the Project

a) Involvement of Provinces after project completion

The project expected to see institutions in which PCs would take initiative to decide the priority of LAs, of which the SWM should be improved based on the result of the field surveys, and formulate action plans. However, this did not happen after the project completion in any province. The SWM committees at the provincial level established in 4 provinces during the project period were seldom held after the project completion and do not function. Although the project intended to establish a SWM committee in the Northern Province within the project period, the committee has not been established by the time of ex-post evaluation. Also, thefield survey by PC to comprehend the situation of the SWM by LAs has not been conducted after the project completion. However, only the North Western Province established a multi-year action plan (from 2009 to 2013) and has been actively promoting SWM, while some indicators even exceeded the target amount.

There are some reasons that the collaborative system between the target provinces and the NSWMSC was not maintained, and why other provinces and the NSWMSC could not establish a collaborative system after completion of project duration.

Firstly, “parallel mechanism,” which consists of Districts under direct control of the central government, and PCs and LAs resulted from the administrative organization of the country. Though PCs receive administrative support and financial allocation

[14] There are five options, but “I don’t know” was actually added to the questionnaire.

from MLGPC, the NSWMSC cannot directly give instruction to or order PCs, because PCs are not under the control of the MLGP[15].

Secondly, the duration was too short to radically change consciousness of those at the PCs concerned. As already mentioned in the Effectiveness section, a radical change in consciousness was necessary in order for PCs to be proactively involved in SWM and take initiatives. However, it was only in the latter half of the project when the activities to establish a new relationship were clarified and started. During that period, a basic foundation was made, but a radical change in consciousness was not realized except for some of them. Thus, even in the province where the responsible person promoted the project activities with the core organization of an SWM committee during the project period, when a key person at a provincial level was transferred to another place after the project period, no other seniors had interests in SWM and activities were stopped in spite of the effort for coordination by the NSWMSC[16].

Thirdly, politicians' influence is very big at PCs. The draft plan formulated by the Commissioner of Local Government (hereafter, CLG)[17] and his staff often tends to be affected by politicians' wills and political factors. In one province, approximately 80% of the formulated plan was sometimes modified by the political background[18]. So, in this type of the province, the motivation of the people concerned to prioritize LAs based on the site survey and to formulate regional level action plans that conform to the needs of the people tends to decrease.

b) Support to LAs by the NSWMSC

The support implemented by the NSWMSC to LAs since the project completion until the ex-post evaluation is as follows. Concerning the support to LAs on selection of LAs for allocating budget from the MLGPC, training, land acquisition, coping with social problems (only 1 case in 2013) and procurement (2 cases in 2012, designing only), the NSWMSC is continuing its support. On the other hand, support

[15] In Sri Lanka, PCs have responsibility of management of LAs and authority to dissolve the local assembly, instead of the central government or Districts, which is stipulated in the constitution (The Thirteen Amendment (November 14, 1987) Article 154G).
[16] NSWMSC hearing
[17] PC basically consists of politicians. The top position of the secretariat is assigned more than one CLG. Also, under CLG, Assistant Commissioners of Local Government (ACLG) are assigned. Some of the ACLG are assigned to PC secretariat, others are posted to the branch office of the province. In both cases, ACLG performs the task as an administrative officer of PC.
[18] Provincial staff hearing

for formulating action plans, legal procedures and F/S are not continued after the project completion. The reason that the support to formulate the action plans were not implemented was that the LA's capacity for action plan formulation increased[19] compared with the beginning of the project. Also, in addition to the effects of this project, the government's efforts to recruit a huge number of new graduates with bachelors' degrees in order to enhance the level of the civil servants in the country also gave complimentary effects[20].

The construction and operation of the model projects after project completion until the ex-post evaluation are shown in Table 3. 8 out of 14 LAs completed construction of compost plant and landfill sites, and 1 LA is now constructing it (as of April 2014). Among the 8 LAs that completed construction as indicated in Table 3, one of the LA facilities was an Internally Displaced Person (hereafter, IDP) camp, and it has completed its mission. The facilities at the rest of the 7 LAs are operating at the time of ex-post evaluation[21]. One of the model projects categorized in

Table 3：Situation of Model Project at the time of ex-post evaluation

（Number of LA）

Planned	Construction completed	Under construction	Gave up construction	Other
14	8	1	4	1

Source: Questionnaire survey and hearing to NSWMSC

Remarks 1. The 8 LAs of "construction completed" include Badulla MC, where a compost plant was constructed but not a landfill site, due to difficulty in land acquisition, and an IDP camp in Cheddikukumu PS in Northern Province, which was set at the time the civil war was over.

Remarks 2. "Other" means Kurunegala MC, which was transferred to the Pilisaru Project in May 2010.

"Other" received support from the Pilisaru Project before construction started. On the other hand, in 4 LAs, the facilities were not constructed, due to the difficulty of land acquisition. With regard to the SWM facilities "operating," some are properly

[19] NSWMSC hearing
[20] NSWMSC hearing
[21] It includes Badulla MC, of which the compost plant was already completed, while landfill site could not be constructed due to difficulty of land acquisition.

maintained and operated at the time of ex-post evaluation, such as Kuliyapitiya UC, Wennappuwa PS and Matara MC, although the situations of maintenance and operation differ from each other. The manual developed by the project was initially targeted for engineers at the provincial level[22]. However, it is also utilized for other LAs[23] in addition to engineers at PCs.

c) Support to LAs by PCs

As described before, neither the established SWM committee functions nor the support by SWM committee at PCs to LAs, which was aimed at during the project period are implemented in other provinces after the project completion. On the other hand, the North Western Province, which was recognized as its capacity was enhanced during the project implementation, has been actively promoting SWM of LAs after the completion of the project as well. The North Western Province already completed construction of 16 compost plants out of 33 LAs. It will continue to construct compost plants in the remaining 17 LAs[24]. Also, North Western Province has been conducting progress meetings every three months, to share the progress and the problems, and to give advices, inviting Environmental officers of LAs in the province. The strong leadership to enhance SWM and allocation of staff in charge with SWM expertise are the key factors in their success. Also, technical assistance by the project to the model projects, as well as continuous implementation of the National SWM Contest, also accelerated the effects.

d) Other effects, continuation of activities

The frequency of information dissemination by the NSWMSC after the project completion has not achieved the target level at the time of ex-post evaluation either, although it updates the website once a year and the newsletter[25] is also issued once a year. Although policy recommendations were not made by the NSWMSC after project completion, the annual report with the basic information on SWM was issued up to 2012. The amount of the data input did not increase after the project completion, but the database is now being prepared, with financial support from JICA Alumni of JICA SWM training in Japan program. The database is expected to be completed by the end of 2014.

[22] Japanese Mission Team member hearing
[23] LAs hearing
[24] As of April 2014.
[25] Issued in Sinhala, Tamil and English. However, the English version of 2013 has not been issued.

Concerning the linkage and establishment and maintenance of information channels between the NSWMSC and domestic and international organizations since the project completion till the ex-post evaluation, the NSWMSC continuously maintains a good relationship with Morotuwa University, in the process of establishment of the database above, and with UNOPS in the "Environmental Remediation Programme" (2010–2013) in the Eastern Province.

For the above reasons, although the latest data for the indicator 1 of the overall goal do not exist, the major parts of the indicator, such as the hygiene condition of towns and the hygiene condition of landfill sites, appear to be improved to some extent. The construction of the compost plants and the landfill sites, distribution and utilization of manuals, technical support and monitoring by the NSWMSC contributed to achieving the overall goal to some extent in combination with the Pilisaru Project. On the other hand, the effect of output 2 (involvement of PC to establish effective mechanisms) did not last after the project completion and did not expand to the rest of the PCs. Thus, it became a hindering factor for achieving the overall goal. Therefore, it is assessed that achievement of the project purpose is fair[26].

3.2.2.2 Other Impacts

(1) Impacts toward the natural environment

As mentioned already, scattered garbage is decreasing, so a positive impact is observed (beneficiary survey to residents).

(2) Impacts on resettlement or land acquisition

No resettlement and land acquisition have occurred, and no negative impact was observed.

(3) Other indirect impacts

- Increase in the number of compost plants

  The number of compost plants was 17 in 2006 in Sri Lanka, and it increased to 56 in 2010, which amounts to 17% of 330 LAs[27]. As for the causes of the phenomenon, they include not only the effects coming from the Pilisaru Project, but also LA such as Weligama UC, which had a compost plant with high quality

[26] There are 4 components in the indicator of the overall goal. As for the remaining indicators, i.e., "negative impact against natural environment" and "negative impact of dumping site against natural environment," the residents must be most familiar with the facts. However, it is rather difficult for residents without specific knowledge of SWM to understand the specific content. Thus, at the time of ex-post evaluation, survey was conducted on "Hygiene condition" (scattered garbage, bad smell), which is easily understandable for both residents and LAs, and "Hygiene condition of landfill site" which is easy to assess for each LA.

[27] Terminal Evaluation Report (P18)

even before this project started. Furthermore, manuals and guidelines developed and extended; continuous implementation of the National SWM contest, which enhanced the motivation of LAs, together with Pilisaru Project, are regarded to have given certain effects on promoting construction of compost plants by LAs.

- Positive/negative impacts from the viewpoint of LAs

  In the questionnaire survey to the 14 model projects, respondents were asked whether or not the following changes had occurred (8 respondents). The results are shown below. Seven LAs out of 8 LAs replied that "the reputation of the scenery" and "the reputation of the hygiene condition" improved.

Table 4: Other positive impacts (LAs)

Questions	Yes	No
Improved reputation of the scenery	7	1
Improved reputation of the hygiene condition	7	1
Improved drainage capacity at the time of rain	6	2
Decrease of expenditure of SWM of LA due to improvement of SWM	5	3

Source: Questionnaire survey to the model projects

- Change in consciousness and behavior among residents

  With regard to the change of consciousness about waste, a question was asked in the beneficiary survey whether there was a change compared to 7 years ago. Out of 180 households, 172 (96%) replied that they had changes in their consciousness. For example, some people explained changes such as, "We became more collaborative to the waste collection," "We stopped illegal dumping," "We began to segregate the waste before waste collection[28]," and so on.

[28] The residents who replied "We began to segregate the waste before waste collection" were limited to those who lived in Kuliyapitiya UC, where waste segregation is successfully conducted among the 6 LAs targeted for the interview survey.

- Negative impact
  No negative impact was observed[29].

Source: Interview Survey to Residents

Remarks: Sample number is 180 in 6 LAs in 2 Provinces

Figure 8: Change of Consciousness on Waste (Comparison with 7 years ago)

As a result of the implementation of the project, certain effects appeared and effectiveness and impact is fair. As for the project purpose, though Indicator 3 did not achieve the target level, Indicator 4 was mostly achieved, and the rest of the indicators were achieved. Concerning Indicator 1, it was not achieved, but Indicator 1 itself is inappropriate as an indicator. With regard to the achievement of the overall goal, the actual data for the indicator does not exist, and simple comparison with the planned target is not possible. However, judging from the other information, a certain improvement is observed. The project contributed to achievement of the overall goal by development and extension of manuals, implementation of the national SWM contest, which enhanced the motivation of LAs, and so on. Also, other positive impacts are partly observed.

3.3 Efficiency (Rating: ③)

3.3.1 Inputs

Inputs	Plan	Actual
1. Japanese side (1) Experts	● No description on the number of experts for long-term and short-term ● Approx. 75 M/M in total	● 0 Long-term, 12 Short-term ● 81.78 M/M in total
(2) Trainees received	The number and the major fields will be decided during the implementation period.	• 1 trainee (ex-Director). • The field: SWM management system.
(3) Third-country training programs	If it is implemented, major fields will be decided during	Nil. (However, 6 staff of NSWMSC participated in the

[29] Negative impact on the people who are engaged with the work of collecting recyclable wastes could not be checked in this survey, because they were not included in the respondents of the interview survey to the residents.

	the implementation period.	group training in Japan.)
(4) Equipment	Equipment for data management	PC, software, printer, spring balance, 4WD vehicle, etc.
Total project cost	350 million yen	336.8 million yen
2. Sri Lankan side (1) Counterparts	Assignment of staff (no description on the number)	Maximum number of staff was 12 during the project.
(2) Equipment	—	Desk, chair, cabinet, tables for OA equipment, etc.
(3) Facilities	Office space, training room, meeting space	Facilities for project office (including (3) left.
(4) Local Cost	(No indication on the amount)	Total: 357 million Rs.

Remarks: The amount of the local cost born by the Sri Lankan side includes not only the MLGPC but also the Pilisaru Fund and 2KR (Project Completion Report). The JICA exchange rate for May 2010 was Yen=0.826 SL Rupee.

3.3.1.1 Elements of Inputs

The equipment and facilities from both sides were utilized in terms of quality, quantity and timeliness. Although the number of the participant of a counterpart training in Japan is only one, who is the ex-Director, the knowledge was sufficiently utilized for achievement of the four outputs[30]. Also, including 6 NSWMSC staff and 9 from outside the NSWMSC (CLGs from Central, North Western, Eastern Provinces, and the Director at CEA in charge of Pilisaru), altogether 15 persons in total participated in JICA's group training on "Sri Lanka Special SWM Group Training Course." The participation of the key persons at major organizations concerned helped the understanding of SWM and enhanced awareness, which resulted in a smooth implementation of activities and contributed to achievement of the project outputs. Also, the assessment of quality of the Japanese experts by the Sri Lankan side was high[31]. In terms of quantity of the Japanese experts, the duration increased by 6.78 M/M compared with the initial plan. However, this increase is regarded to be appropriate, because of the new output concerning the establishment of new collaboration mechanism with PCs, which was added during the implementation period. The number of the model projects was also increased from 13 to 14 and the activities also increased. However, the total cost borne by the Japanese side is still

[30] Ex-participant questionnaire
[31] Questionnaire survey with those who were concerned with NSWMSC during the project implementation

within the planned amount.

On the other hand, the staff allocation by the NSWMSC did not reach the proposed number indicated in PDM3 by the project completion. Insufficient allocation of NSWMSC staff (most of them were of non-science backgrounds, and engineers are limited) led all the project team to be pressed with tasks. This resulted in a shortage of time for technology transfer from the Japanese experts to the counterpart team, since the Japanese experts were given the work that the Sri Lankan side was originally supposed to do. Thus, the insufficient allocation became a hindrance factor for the former half of the project period. However, in order to cope with this problem pointed out by the Mid-term Review Mission Team, the project strengthened the collaborative relationship with external local resources, such as utilization of university teaching staff and the Environment Officer at the World Bank, so that they gave lectures and exercises at the technical training programs, in order to make up for the insufficiency of the staff and to produce expected effects. For the same purpose, the development and extension of manuals and guidelines were promoted. With these actions, the organizational or institutional system was improved. As a result, the Japanese experts returned to their original jobs such as instruction and guidance, while the center keeps the quality of service. Although the number of staff who were the target of the technology transfer was limited due to the shortage of staff with science background, planned activities were implemented owing to the efforts of the staff who worked even on weekends in order to keep up with the schedule, with technical advice from the Japanese experts. Thus, the outputs except for Output 2 were achieved or mostly achieved.

3.3.1.2 Project Cost

As shown in Table 5, the project cost was lower than planned (96.3%).

Table 5: Project Cost and Period of Cooperation

	Planned	Actual	Ratio Against the Plan (%)
Project Cost	3.5 hundred million yen	3.37 hundred million yen	96.3
Period of Cooperation	Mar 2007–February 2011 (4 years)	Mar 2007–February 2011 (4 years)	100.0

Source: Documents provided by JICA

3.3.1.3 Period of Cooperation

The period of cooperation was as planned (100%) (Table 5).

Based on all of the above, the quality, quantity and timeliness of the inputs were appropriate, except that the number of allocated staff was below the target, while the outputs were achieved except for Output 2. Since the project cost and the period of cooperation were also as planned, efficiency is high.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy toward the Project

Sri Lanka has been putting emphasis on promoting waste management as indicated in the "National Environment Act" and the "National Policy on the Waste Management," etc. Further, the policy priority on SWM is still high at the time of ex-post evaluation, which is exemplified by the extension of the Pilisaru Fund for the 2nd phase (2014~2018). The Pilisaru Fund allocates a national budget to SWM of LAs, the 1st phase of which started in 2008 and was completed in 2012.

Also the priority on SWM is still high from the viewpoint of MLGPC, which indicates that the direction will not be changed in the future as well[32]. LAs also put high priority on SWM. In the questionnaire survey at the ex-post evaluation, a question was asked to LAs on the priority of improvement of SWM at 5-grade evaluation[33]. The average of the replies from 8 LAs selected for the model projects was 3.9 out of 5. As for the priority on SWM from the viewpoint of PCs, on the other hand, the average of the replies from 7 PCs to the same question was 3.4, which was rather high at the time of ex-post evaluation. Thus, improvement of SWM is still emphasized by the Sri Lankan government.

3.4.2 Institutional Aspects of the Implementing Agency

3.4.2.1 Institutional Aspect of NSWMSC

At the time of ex-post evaluation, there is no change in the position and the function of the NSWMSC[34]. After the project completion, the number of NSWMSC staff has

[32] Questionnaire survey to MLGPC
[33] The 5 grades indicates the followings; "5: Very high, 4: High, 3: Medium, 2: Not so high, 1: Not high at all."
[34] NSWMSC hearing

Table 6: NSWMSC Staff after the project completion

(Unit: persons)

	2011	2012	2013	2014
1:Management Staff	**3**	**3**	**3**	**4**
Director	1	1	1	1
Acting Director	0	0	0	0
Deputy Director	0	0	0	0
Acting Deputy Director	0	0	0	0
Assistant Director	2	2	2	3
2:Technical Staff	**2**	**3**	**8**	**8**
Development Officer	1	2	6	6
Assistant Development Officer	1	1	2	2
3: Administrative Staff	**3**	**3**	**2**	**1**
Assistant Administrator	3	3	2	1
Total	**8**	**9**	**13**	**13**

Source: NSWMSC Questionnaire Survey

increased as shown in Table 6. Especially, technical staff, the insufficiency of which was pointed out as an issue before, increased staff since 2013.

The total number of NSWMSC staff became 13 since 2013, which is getting close to the targeted figure, i.e., 14. On the other hand, 4 staff left the NSWMSC due to transfers or quitting the job, after the project completion. Although the successors were allocated and received briefing from the management staff, being in an environment accessible to the related manuals and documents, all of the successors are less experienced compared with the predecessors[35], which is problematic in terms of quality. It is still clear where responsibility lies within the NSWMSC and no problems which impedes sustainability of the project effects are seen in terms of decision-making process even after the project completion.

3.4.2.2 Collaborative System with PCs

The NSWMSC will promote 3Rs mainly in villages, while continuing further construction and maintenance of compost plants. At the time of ex-post evaluation, in order to realize it, the NSWMSC is considering to establish a new system to strengthen collaboration with PCs and will submit a proposal to MLGPC soon. The

[35] NSWMSC hearing

major points of the proposal are: 1) to establish provincial-level committees and district-level committees, in order to monitor SWM of LAs and solve the problems; 2) that provincial-level committees will monitor the office of ACLG. ACLGs belong to PC, but are responsible for the district level, mostly located in the District Office. The Chairman is the Chief Secretary of PC, members are ACLGs (10 to 20 persons, depending on each PC); and 3) that the district-level committee is where substantial discussions are made at the regular meeting with LAs, of which the chairman is ACLG, and members are the LA staff such as environment officers, who are in charge of SWM. Staff at NSWMSC also attend the meetings when necessary. The objective of the new system is to establish a new monitoring system at the district level with ACLGs as the key persons, in order to substantially cover LAs more easily. As for the possibility of maintaining or reorganizing the collaboration system, monitoring is required on the future situation.

3.4.2.3 Collaborative Monitoring System with LAs

As for the model projects for which construction is already completed and that are currently under operation, monitoring through field visits are still made by the NSWMSC, and the pipeline between them are maintained. Due to constraints on the budget of field visits for NSWMSC staff, the frequency of the visits after the project completion is in decline[36]. However, decreased frequency of the visits by NSWMSC staff is not a problem[37] for the LAs, which acquired sufficient capacity through the project.

Thus, as for the sustainability from institutional aspects, there is no problem in the NSWMSC itself, but the maintenance and expansion of the collaborative system with PC is problematic.

3.4.3 Technical Aspects of the Implementing Agency

3.4.3.1 Technical Aspect of the NSWMSC

At the time of ex-post evaluation, there is a gap between the recognition of related organizations on the technical capacity of the NSWMSC and that of the NSWMSC itself. The evaluation of PCs and LAs on the technical capacity of NSWMSC is lower than the self-evaluation of the NSWMSC, while the evaluation by PCs is the lowest among the three (Table 7).

[36] NSWMSC hearing
[37] NSWMSC, Kuliyapitiya UC and Nawalapitiya UC hearings

Table 7: Evaluation on the capacity of NSWMSC

(Unit: %)

Evaluator/Evaluation Criteria	Management Capacity	Technical Capacity	Working Environment
NSWMSC	80	80	80
PC	57	58	65
LA	67	63	-

Source: Questionnaire survey to the NSWMSC, PCs and LAs

Remarks: Average amount of the replies to the question above in the questionnaire to CLG office for PCs and the LAs selected for model projects. The number of respondents of PCs is 7, and that of LAs is 8.

The low evaluation of the PCs is regarded to be linked with the collaboration on the support to LA's SWM with the NSWMSC and motivation toward participation with the training provided by the NSWMSC. Hence, it is necessary to secure the technical advantage of the NSWMSC to PCs, and to urgently regain trust on the technical capacity of the NSWMSC by the related organizations. During the project period, 52 internal training programs were conducted for NSWMSC staff, whereas there are none after completion of the project[38]. The person responsible for the NSWMSC, however, indicated that he would like to restart the internal training by the end of 2014[39].

When a NSWMSC staff member is transferred, there is no briefing from the predecessor for taking over the task because the successor is allocated 1 week or 1 month after the predecessor leaves. However, briefing is made by the management staff, such as the director. Also, all data of the related documents, such as manuals, materials and reports, are stored in the server, and the successor is in the environment in which they are accessible[40]. With regard to the provided equipment, there is no problem in the maintenance, except that the provided PCs become old and it is necessary to replace them so that current software can be utilized[41].

[38] The reason was asked in the NSWMSC hearing, but clear answer was not given, although it is assumed to be financial reason.
[39] NSWMSC hearing
[40] NSWMSC questionnaire and hearing
[41] NSWMSC questionnaire

3.4.3.2 Technical Aspect of PCs and LAs

The manuals developed by the project were distributed to LAs in the country through PCs. They seem to be well utilized at the time of ex-post evaluation[42].

As for the training for the PCs and LAs by the NSWMSC, the number of training courses has been decreasing after completion of the project. Also, the ratio of technical staff among all the participants decreased and it reached 0 in 2013, whereas it used to include both technical and non-technical staff during the project period, and the ratio of technical staff who participated in the training was one fourth in 2009. On the contrary, the ratio of the training programs implemented for non-technical staff, such as laborers at the SWM sites, has been increasing recently. According to

Table 8: The NSWMSC's SWM training programs conducted for PCs and LAs

	2009	2010	2011	2012	2013	Total
Number of training programs	9	6	3	4	2	24
Number of Participants	560	142	26	799	426	1,953
Technical staff	140	60	0	50	-	-
Non-technical staff	420	82	26	749	-	-

Source: NSWMSC Questionnaire and hearing

the NSWMSC, the major reasons for this are importance of knowledge and attitude of the laborers,[43] who are actually engaged with waste collection and the work at the compost plant sites for the sake of improving SWM, and generally rather low interest in participation of the training by the engineers at PCs, who are too proud to participate[44].

The NSWMSC has been conducting seminars since project cooperation period. The seminar, which is different from the training program, is an event targeted for a broader audience for the purpose of enlightenment on SWM. Although the number of

[42] PCs and LAs hearings
[43] Laborers are classified as non-technical staff.
[44] NSWMSC hearing

the seminars held varies depending on the year, the number of seminars has been decreasing after completion of the projects.

Table9: Seminars conducted by NSWMSC

	2009	2010	2011	2012	2013	計
Number of seminars	1	0	7	5	2	16
Participants (persons)	100	0	700	500	1,000	2,300

Source: NSWMSC questionnaire and hearing

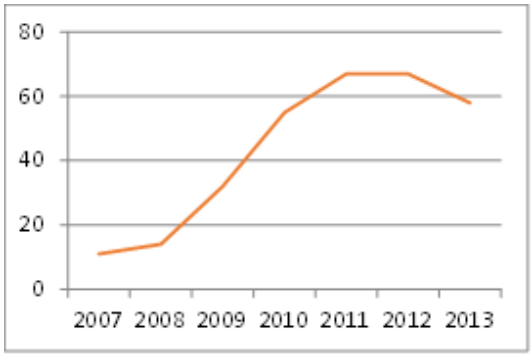
However, the number of the participants has been increasing. This is because the NSWMSC increased the size of the audience per seminar in order to secure the effects and save the cost and workload. The seminar was not held in 2010 because the expected timing of the seminar was the same as the election for president and the parliament.

Based on the above points, there are some issues in terms of sustainability in technical aspects.

3.4.4 Financial Aspects of the Implementing Agency

The NSWMSC does not have its own budget, because it is positioned as the organization to support LA's budget disbursement. However, the amount by which the NSWMSC supported LAs after the project completion exceeds that during the implementation period. It is remarkable that the project budget for constructing facilities has been borne by the Sri Lankan side from the implementation period, foreseeing the situation after the project completion. In this project, the Japanese side did not dare to bear the construction cost of the facilities from the initial stage but tried to secure the necessary budget of the Sri Lankan side (securing mainly the MLGPC budget, and the Pilisaru Fund later as well), considering the

(Unit: million Rs.)



Source: NSWMSC

Figure 9: The Budget Disbursement for SWM supported by NSWMSC

sustainability after project completion, which resulted in enhancement of sustainability from a financial aspect. Although the disbursed amount decreased in 2013 as shown in Table 9, this does not mean a substantial decrease. Some of the payment for 2013 was delayed and will be paid in 2014, while the amount will be increased in 2014[45]. Meanwhile, information on the amount of the Pilisaru Fund since 2011 was not available either from the NSWMSC or CEA.

As for the future perspective, the budget allocation from MLGPC to LAs for promoting SWM will increase in the future as well[46], due to the importance of SWM itself as well as that of support to LAs, which are suffering from bad financial conditions, according to MLGPC. Moreover, the budget for promoting SWM by LAs has the probability to further increase, as phase 2 of the Pilisaru Fund is expected to start in 2014. Although the details of the Pilisaru budget amount are not clear, the total budget for Pilisaru from 2008 till 2018 is expected to amount to 5.6 billion Rs[47].

It seems that the budget for the field visits of NSWMSC staff decreased, resulting in less frequent field visits to LAs[48]. However, as the budget for field costs is not an independent item of expenditure in the government of Sri Lanka, it is not possible to obtain the data of field visits to comprehend this tendency.

Thus, the budget for SWM by LAs exceeds that of the project implementation period, and the sustainability from a financial aspect has been secured, although there is a slight concern that the decreased budget for field visits of the NSWMSC decreased frequency of the monitoring.

As explained above, this project has some issues on institution-building for collaborative relationship with PCs, as well as technical aspects of the NSWMSC. Although some actions will be soon taken to establish a new system mainly with ACLGs, and resumption of the internal training of the NSWMSC, there are some uncertain elements to foresee at the moment on the actual improvement to be made in the future. Therefore the sustainability of the effects resulting from this project is fair.

[45] NSWMSC hearing
[46] MOLGPC questionnaire survey
[47] Unstoppable Sri Lanka 2020 – Mahinda Chintana – Vision for the Future; Public Investment Strategy (2014-2016)
[48] Hearing from those who are concerned such as NSWMSC

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to enhance capacity development of NSWMSC, which is at the central level, in terms of its planning and implementation for the sake of supporting SWM of local governments. Relevance is high, because improvement of SWM is consistent with the development needs and development policy of the country and with Japan's ODA policy. Effectiveness/Impact is fair, as the Outputs and the Project Purpose were mostly achieved except for some indicators. Efficiency is high, since quality, quantity and timeliness of the inputs were appropriate in comparison with the achievement of the Outputs and the Project Purpose, except for allocation of human resources. Sustainability is fair, because sustainability from policy and financial aspects is high, whereas there is some concern about organizational and technical aspects. In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

- Strengthening technical capacity of the NSWMSC

Although the number of NSWMSC staff increased after completion of the project, there remain some concerns from a technical aspect, as the successors of those who quit or were transferred have less experience compared with the predecessors, and so on. Also, there is a gap between the recognition of PCs and LAs on the NSWMSC's technical capacity and that of the NSWMSC itself. In order to enhance trust from PCs, improve the quality and quantity of technical support to LAs, and cope with the training needs, MLGPC and the NSWMSC should urgently strengthen allocation of technical staff, and increase recruitment of new engineers or new graduates with science backgrounds to be intensively fostered after recruitment, in addition to resumption of internal training of the NSWMSC.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

- The involvement of related organizations in a country under parallel administration system

In Sri Lanka, the administrative system is parallel, with the District directly under the central government, while the Local Authorities are under the supervision of the Provincial Councils. The Provincial Councils are political, and not positioned under the

Ministry of Local Government and Provincial Councils. Under these circumstances, this project tried to change the consciousness of the secretariat at the Provincial Councils so that they would proactively address SWM and establish a supporting system in which PCs and the NSWMSC closely collaborate with each other to improve SWM by LAs. However, the time was not sufficient for raising their consciousness, as the project's substantial activities for it were conducted within 2 years after the Mid-term Review was conducted. As a result, the SWM committees established during the project's duration neither function after the project completion, nor were new SWM committees established in other provinces. When a project is planned in which a certain organization, such as a Provincial Council, which is not positioned under the central government, should be involved as a substantial partner in a country with a parallel administrative system, it is especially important to secure sufficient time for comprehending the situation for project design, as well as for implementing with more years than usual. Also, it would be effective to make it a pre-condition, to be met before starting this kind of project, that the recipient country must strongly influence the specific organization at the top level of the government and clarify its policy or direction at the planning stage, because an ordinary approach in which project staff coordinate with the organization is assumed to be difficult.

<Column>

In Sri Lanka, the budget for SWM shares 20% to 50% of the total budget of LAs, which shows that improvement of SWM is still a big task. In this project, compost plants were adopted as a SWM system for the model projects, which was an appropriate decision reflecting components of waste in the country and the experience of the preceding Development Study Project conducted by JICA. In a sample survey conducted in 3 LAs in each of 2 provinces at the ex-post evaluation, the compost plants were properly maintained in 3 LAs in North Western Province and 1 LA in Southern Province. Also, in a beneficiary survey, the residents recognized that their consciousness on waste had significantly changed and that the hygiene condition had drastically improved. As for the latter point, the recognition was especially remarkable in North Western Province. The promoting factors for the above are regarded as: the technical support by the NSWMSC during the project duration; continuous implementation of the National SWM Contest, which maintained the motivation of the stakeholders; the clear and specific planning as well as monitoring of LAs by organizing regular progress meetings; and the technical capacity and the commitment of the CLG secretariat of North Western Province. Also, at the LAs level, LAs that have both chiefs with strong commitment and a person in charge with knowledge, skills and strong commitment are successful in SWM.

Therefore, it is important for improvement of SWM to simultaneously strengthen the commitment of the leaders and knowledge and skills of technical staff, and the major stakeholders at the PCs and LAs, starting from the project's duration. It is also essential for maintaining sustainability to continue training on the above for both leaders and technical staff, because the leaders and the staff change by election, transfer, etc., as well as to strengthen the infrastructure of human resources and the technical capacity of the counterpart organization during the project period so that it can continue the training after the project's completion.

Democratic Socialist Republic of Sri Lanka

Ex-post Evaluation of Japanese Technical Cooperation on The Project for Promoting Energy Efficiency Improvement in Sri Lanka

External Evaluator: Mayumi Hamada
Foundation for Advanced Studies on International Development

0. Summary

This project was implemented to strengthen the organization of the Sri Lanka Sustainable Energy Authority (hereafter SLSEA) in order to promote the energy efficiency activities of general households, private companies, and public and governmental organizations in all of the country's urban, agricultural, and estate areas. Relevance is high: energy efficiency and conservation is consistent with the developmental needs of Sri Lanka because it depends on imports for most of its energy resources, and the consistency with its development policy as well as Japanese aid policy is high. Also, effectiveness/impact is at a medium level, because the achievement of the project Purpose and the outputs are at a medium level. Efficiency is fair, since the cost borne by the JICA side exceeded the planned amount, while the quality, quantity, and timeliness of the inputs were adequate for the achievement of the outputs and the project purpose. Sustainability is fair, as there are some concerns regarding the technical aspect, while sustainability in policy, organizational, and financial aspects are high. In light of the above, this project is evaluated to be partially satisfactory.

1. Project Description

（Project Location）

（Provided equipment for energy audit）

1.1 Background

Sri Lanka depends on imported petroleum, which is 62% of the country's total generated energy. The electricity price is high compared with other Asian countries,

which particularly impedes enhancement of the competitiveness of its export industry, which competes with other Asian countries in overseas markets. As there are certain limits in new construction of electric power plants, Sri Lanka's government was concerned that the country might fall into a severe electricity shortage in the future. Under these circumstances, energy efficiency was an urgent task for Sri Lanka to promote. Hence, the Sri Lanka Sustainable Energy Authority Act (hereafter, SLSEA Act) was enforced in October 2007. SLSEA was established as the implementing organization for promoting renewable energy development and energy efficiency policy, and was authorized for related regulations. As for SLSEA's specific responsibility and authority, establishment of energy efficiency benchmarks for private companies and public organizations, introduction of accreditation system of Energy Managers and Energy Auditors and ESCOs, etc. were stipulated in the legislation.[1] Under these political circumstances, the country formally requested cooperation for a technical cooperation project named "Project for Promoting Energy Efficiency Improvement in Sri Lanka," in order to introduce Japan's advanced technology and knowledge on energy efficiency. Hence, the request was accepted and this project was started in May 2008 for a three-year period.

1.2 Project Outline

Overall Goal		High efficiency in energy consumption is achieved.
Project Purpose		Infrastructure necessary for materializing energy efficiency activities in the country is enhanced.
Output(s)	Output 1	Necessary resources (rules and regulations, human resources, equipment and materials) for implementing the SLSEA Act are prepared.
	Output 2	Incentive/disincentive mechanism for promoting energy efficiency is prepared.
	Output 3	Mass consciousness is created among general public, private, and public sectors on energy efficiency improvement.
Inputs		Japanese Side: 1. Experts ・11 fields (56.43M/M) 0 M/M for Long Term 56.43 M/M for Short Term 2. 22 trainees received (22 for counterpart training in Japan) 3. 0 trainees for third-country training programs

[1] Preliminary study report (P9)

	4. Equipment: $302 thousand USD and 2.3 million yen 5. Local cost: 40 million yen Sri Lanka Side: 1. 15 counterparts 2. Facilities and equipment (facilities for office work, installation and operation of equipment, seminar and meeting rooms) 3. Local cost
Total cost	346 million yen
Period of Cooperation	May 2008–April 2011
Implementing Agency	Sri Lanka Sustainable Energy Authority (SLSEA)
Cooperation Agency in Japan	J-Power
Related Projects	・E-FRIEND II[2] (yen loan) ・Sustainable Power Support Project (ADB) (It includes "Implementation of Energy Efficiency Policy Initiatives—Sri Lanka" in its technical assistance component.) ・Sustainable Guarantee Facility (USAID) ・Promotion of Eco-efficient Productivity (PRP) Project (implemented by Ceylon Chamber of Commerce, supported by Dutch Embassy)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Project Purpose at the time of the Terminal Evaluation

As for Indicator 4, the "penetration rates of CFLs[3] at households" drastically surpassed the target level. Concerning Indicator 5 (the "10-year Plan for EE&C"), it had been approved by SLSEA's board of directors and was going through the Ministry's approval process during the project completion period. On the other hand, it was pointed out that the remaining indicators would hardly be achieved by the project completion, due to the delay in legalization and unsuccessfulness of introducing new

[2] Formal name of E-Friend II is Environmentally Friendly Solutions Fund. Its purpose was to promote private companies' investment in plant and equipment for environmental measures and improve environment by prevention and mitigation of pollution. Investment for Energy
Efficiency was also included as the target of the Fund.

[3] CFL stands for Compact Fluorescent Lamp, which is a type of fluorescent lamp in the shape of bulb. It is a fluorescent lamp which can utilize socket of incandescent light bulb, and consists of integrated inverter lighting circuit of the same kind of fluorescent lamp and bent small fluorescent lamp. A CFL consumes less electricity compared with an incandescent lamp with the same brightness.

financial scheme.

1.3.2 Achievement of Overall Goal at the Time of the Terminal Evaluation

With regards to Indicator 1, among the indicators for overall goal; i.e., "Energy consumption efficiency converted into commercial energy (Commercial Energy Intensity[4]) is reduced to 1.8 TOE/Million Rs. By 2017," it was judged that the prospect of the achievement by 2017 was good, because the commercial energy intensity was certainly improving. As for Indicator 2; i.e., "Electricity load factor is increased annually by 1%," it was indicated that the figure shows the general tendency of improvement, although the recent rate is slightly less than the annual target figure of 1%. The probability of achieving Indicator 2 was not clearly shown. Besides, contribution to the formulation of the program CDM[5] in the country, as well as the methodology for raising awareness, which has the potential to be utilized by other technical cooperation projects, was mentioned as other positive impacts.

1.3.3 Recommendations at the time of the Terminal Evaluation

Seven recommendations were made, which were categorized into two; i.e., those which needed to be addressed with urgent actions and those which required continuous efforts. The achievement of each recommendation is shown below.

Table 1: Recommendations at Terminal Evaluation and Achievements

No	Recommendations	Achievement by the time of Ex-post Evaluation
（Recommendations that Require Urgent Actions）		
1	Early enforcement of regulation by scrutinizing the legal compliance and obtaining cabinet approval as soon as possible (mandatory energy reporting; accreditation of energy managers and energy auditors)	Regulations on all three points were enforced in July 2011 (3 months after the project completion).
2	Filling the three vacant posts at the	The post of Head, Monitoring and

[4] Commercial Energy Intensity is a standard measure of efficient use of commercial energy in a country (Terminal evaluation report P18). While Energy Intensity means energy is energy consumption index for GDP, Commercial Energy Index excludes primary energy. This Indicator was revised as the result of Mid-term Review, because including primary energy such as biomass, etc. into the target was regarded as inappropriate considering the country's situation.

[5] CDM stands for Clean Development Mechanism. It is a mechanism in which advanced countries with emission reduction commitment of the greenhouse effect gas which leads to global warming can apply the amount of the gas reduced in emission-reduction projects in developing countries where they provided technical and financial support, to the reduced amount of their own (advanced countries).

	management level of the Energy Management Division, SLSEA	Verification is still vacant at the time of ex-post evaluation (for studying abroad).
3	Sharing the results of the pilot projects (CFL promotion and pump replacement of National Water Supply and Drainage Board) among the stakeholders and reach consensus about the future actions to be taken.	The results were shared but consensus on actions to be taken was not made.
4	Capacity enhancement of the project management unit, SLSEA, as well as improvement of financial scheme for energy efficiency and conservation (hereafter EE&C) by implementing the following: (1) Facilitating at least 10 showcase projects in 2011 and adding experience in fund management and project implementation in EE&C (2) Proactively adding staff who have experience in loan operations to the project management unit	Financing for EE&C has not been promoted, nor has the financial scheme for EE&C been improved.
（Recommendations that Require Continuous Efforts）		
5	To implement monitoring and verification of the new schemes to be introduced (labeling system, etc.)	A survey on CFLs with “energy efficient” labels in stores was conducted in November 2013 (94% of CFLs were labeled).
6	Annual assessment of impact/effect of EE&C promotion	Achievement could not be confirmed as the specific content of the recommendation was not clear.
7	Reviewing the 10-year EE&C plan periodically and formulating a middle-term financial plan under the supervision of the Ministry of Power and Energy	The 10-year EE&C plan was approved in 2013 (the supervising ministry was changed to the Ministry of Environment and Renewable Energy), and has not been reviewed.

Source: The Terminal Evaluation Report for the recommendations, Questionnaire and Interview Surveys to SLSEA for the achievement

2. Outline of the Evaluation Study

2.1 External Evaluator

Mayumi Hamada, Foundation for Advanced Studies on International Development

2.2 Duration of the Evaluation Study

This ex-post evaluation survey was conducted as follows.

Duration of the Study: October 2013–October 2014

Duration of the Field Study: January 26, 2014–February 15, 2014

April 30, 2014–May 8, 2014

3. Results of the Evaluation (Overall Rating: C[6])

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance to the Development Plan of Sri Lanka

At the time of the preliminary study, the importance of promoting energy efficiency was stressed in the National Energy Policy & Strategy of Sri Lanka, which was enacted on May 11, 2008. During the implementation period until the project completion, a long-term national objective to reduce energy consumption by 8.7% by 2020 was also clarified, with the direction toward promoting the usage of energy-efficient electric light bulbs, “energy efficient” labels on electric appliances, energy-efficient design of buildings, etc., as shown in “Mahinda Chintana—Vision for the Future,” which was revised in 2010. Therefore, it is assessed that promoting energy efficiency had been consistent with the development policy of Sri Lanka since the time of the preliminary study until the project completion.

3.1.2 Relevance to the Development Needs of Sri Lanka

Sri Lanka has been enjoying annual economic growth of greater than 6%. Because demand and supply of oil has been tight, however, it was an urgent task for Sri Lanka to promote energy efficiency and convert its present system into a more energy-efficient social and economic structure. This situation did not change through the project completion. Thus, the consistency between the project direction and the development needs was high.

3.1.3 Relevance to Japan’s ODA Policy

[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[7] ③: High, ② Fair, ① Low

The “Basic Energy Plan,” which was enacted in March 2007 and based on Japan’s Basic Act on Energy Policy, pointed out that international cooperation on energy efficiency will significantly contribute to relief and stability of energy demand and supply, as well as global environment conservation, such as global warming, etc. It also indicated that it was necessary for Japan, which has achieved the world’s highest level of energy efficiency, to positively promote international cooperation on energy efficiency in Asian countries, where huge amounts of energy are consumed and energy efficiency is low. In the Country Assistance Program for Sri Lanka, it was emphasized that an efficient energy policy that brings the national development into perspective was necessary as a part of support for “the improvement of economic infrastructure.” Since promotion of energy efficiency is an important means for energy policy besides improvement of the electricity supply infrastructure, its consistency with the above Country Assistance Program is high. Moreover, this project was positioned in the “Electricity Program” of the JICA Country Program for Sri Lanka. Therefore, the consistency with the Japan’s ODA Policy is also high.

3.1.4 Appropriateness of the Project Plan and the Approach

In this project, some of the indicators of the objectives, such as outputs, project purpose, and overall goal, were not achieved within the predetermined timeframe, although all planned activities were implemented. The major reason for this was inappropriate setting of the target level and timeframe of the indicators. The setting of those indicators were not regarded as realistic enough in view of the time required for legalization in the country and the three-year cooperation period, considering the following were set as the indicators of the outputs of the project: introduction of an Annual Reporting System of Energy Consumption, which presupposes legalization, as well as fostering energy auditors and allocating energy managers at companies, which can be realized by training and accreditation only after the accreditation systems are legalized.

On the other hand, the major reason why the activities of this project were smoothly implemented was the influence of the counterpart training in Japan during the first year, in which senior management staff of the counterpart organization and major related organizations participated. As the result, major senior stakeholders recognized the importance of the problem by sharing the latest information on advanced cases for promoting energy efficiency, hence the project’s direction was clearly shared between both countries’ teams. This led to good communication among the stakeholders and prompt actions by the counterpart organizations.[8]

[8] SLSEA, ex-Japanese expert hearings

Based on the above, this project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy. Although setting the indicators was slightly problematic, the counterpart training in Japan was effectively implemented, because care was taken to enhance its effects. Therefore, its relevance is high.

3.2 Effectiveness and Impact[9] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Output

The achievement of the indicators for each output at the time of the project completion is shown in Table 2.

(1) Output 1: Necessary resources (rules and regulations, human resources, equipment and materials) for implementing the SEA Act are prepared.

Although there are five indicators for Output 1 on the PDM,[10] improvement of the equipment bank and IT infrastructure were also regarded to be in the same position; i.e., indicators of Output 1, in view of the related project documents.[11] Hence, the above two are added as the indicators for measuring Output 1 in addition to the indicators shown on the PDM. Concerning the achievement of the seven indicators, three of them were achieved within project duration, three others were not achieved, and one was achieved to the middle level, as shown in Table 1. Indicators 1, 3, 4, and 5 can be achieved only after related systems are legalized; therefore, the fact that they could not be legalized within the project duration became hindrance factors against Output 1. On the other hand, however, all the planned activities were finished by the project completion; and, for some indicators, such as Indicator 1, legalization was completed three months after the project completion, which is not regarded as a serious delay. Also, the organizational infrastructure of SLSEA was established to a certain level, considering the achievement in formulating an annual energy reporting system, drafting an accreditation system and a training methodology for energy auditors and energy managers, improvement of the equipment bank, and establishment of an IT

[9] Sub-rating for Effectiveness is to be put with consideration of Impact.
[10] PDM stands for Project Design Matrix. It is a matrix to show the overview of a project plan, which clarifies objectives, activities, important assumptions, objectively verifiable indicators, etc., and the logical relationship among them. It is also called as Logical Framework.
[11] Preliminary and R/D Report (P21), The project completion Report (P8)

Table 2: Achievement of Outputs by The project completion (April 2011)

Outputs	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
Output 1: Necessary resources (rules and regulations, human resources, equipment, and materials) for implementing the SEA Act are prepared. （△）	①	A mandatory annual energy consumption reporting scheme is introduced to industrial, commercial and public institutions, of which electricity consumption is larger than 250,000kwh/month.	It was not achieved within the project duration (though it was legalized 3 months after the project completion and was introduced the following year; i.e., in 2012). It was legalized after the minimum amount of energy consumption was changed to 50,000kwh/month in order to cover a larger number of companies and organizations.	×
	②	Report on “energy consumption baseline analysis” is documented and updated every year.	The report was updated every year, after it was produced in the first year. At the times of updating (twice), the reports were not published as printed materials, but were updated in the database.	○
	③	6 energy auditors are accredited.	There were no accredited energy auditors within the project period, since the accreditation system was not legalized (though it was legalized in 2013 and 6 auditors were accredited for the first time).	×
	④	Accredited energy managers are appointed in 150 organizations in public and private sectors.	They were not accredited or appointed by the project completion, as the reporting and accreditation systems were not legalized during the project’s duration (though, after the project completion, 142 energy managers were accredited in 2012 and 35 in 2013, while 138 energy managers were appointed in 2012 and 29 in 2013).	×
	⑤	Mandatory labeling systems are introduced for 3 prioritized appliances (CFLs, ballasts, and fans).	One (CFL) of the three kinds was realized within the project period (although labeling for ceiling fans was legalized in 2013, it has not been prevalent in the markets at the time of ex-post evaluation due to delay in testing).	△
	⑥	The extent the equipment bank was expanded (It is positioned as one of the intended indicators based on the related documents, although it is not written in the PDM.)	The equipment bank was strengthened and increasingly utilized every year, although some equipment had some issues. It receives mostly good reviews from the users.	○
	⑦	The extent the IT infrastructure was established (same as above)	The infrastructure of IT software and information dissemination was established through the development of software on energy efficiency, databases on the Web, and an online reporting system for the annual reports.	○
Output 2: Incentive/dis-incentive mechanism for promoting energy efficiency is prepared. （×）	①	Number of projects on energy efficiency improvement, approved for finance, increased by 10%.	It was not achieved. The proposal for a new financial scheme was dismissed and was not resubmitted.	×
	②	More than one incentive/disincentive schemes for appliances with “energy efficient” labels are introduced.	It was not achieved. Pilot projects were implemented that could not pave the way for the full-scale implementation of the financial scheme or incentive system that was intended by the project.	×
Output 3: Mass consciousness is created among general public, private and public sectors on energy efficiency improvement. （○/△）	①	Five different types of education materials are prepared and utilized (posters, leaflets, booklets, CDs, and videos).	19 kinds of educational materials on energy efficiency (10 posters, 5 leaflets, 2 booklets, 2 CDs/videos) were developed and utilized at exhibitions, events and special programs at schools.	○
	②	Number of applications for the existing national energy award increased by 10% each year.	The number of applications was 15 in 2008, 51 in 2010, 24 in 2011, and 31 in 2012 (it was not held in 2009 due to the election). This goal was achieved in every year except 2011; the year prior to that, 2010, had the largest number of applications.	○/△
	③	Penetration rate (at least one bulb per household) of CFLs grows to more than 40% in every sub-sector; namely, urban, rural	As this indicator is a duplicate of Indicator 4 in the project purpose, it is assessed at the project purpose level instead of Output 3.	—

		and estate.		

Source: Produced based on document review, hearing, questionnaire survey results
Remarks: 1. The symbols in the "Level of Achievement" column show the following:
○ Achieved ○/△ Mostly achieved △ Middle level ×Not achieved －Not applicable
2. "Finance" above means financial schemes such as E-FRIEND II, Sustainable Guarantee Fund, Sri Lanka Sustainable Energy Fund, etc.

Table3: Achievement of Project Purpose by The project completion (April 2011)

Project Purpose	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
Infrastructure necessary for materializing energy activities in the country is enhanced. (○/△)	①	Mandatory energy audits, monitoring, and follow-up are conducted annually in at least 150 organizations in the private and public sectors.	Energy audit was not mandated. The data on monitoring and follow-up does not exist. On the other hand, the number of borrowers at the equipment bank increased to 109 in 2010 and 131 in 2011, which indicates an increase in the number of audits and monitoring.	△
	②	Amount of investment in energy efficiency and conservation is increased at least by 10%.	It was not achieved.	×
	③	All the CFLs, ballasts,[12] and fans in markets have "energy efficient" labels.	One (CFL) out of the three kinds was realized during the project duration.	△
	④	Penetration rate (at least one bulb per household) of CFLs in household sector grows to more than 40% in every sub-sector, namely urban, rural, and estate.	It was mostly achieved by the project completion because the penetration rate (at least one bulb per household) of CFLs surpassed 40% in general households in both urban and rural areas, and is also increasing in estate areas.	○/△
	⑤	10 year plan for EE&C is authorized by the ministry.	It was not achieved by the end of the project period. The draft plan was formulated and approved by the SLSEA's board of directors during the project duration; approval by the ministry, however, was not completed.	×

Source: Produced based on document review, hearing, questionnaire survey results
Remarks: The symbols in the "Level of Achievement" column show the following:
○ Achieved ○/△ Mostly achieved △ Middle level ×Not achieved －Not applicable

Table 4: Achievement of Overall Goal by The project completion (February 2014)

Overall Goal	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
High efficiency in energy consumption is achieved. (△)	①	Commercial energy intensity is reduced to 1.8 TOE/Million Rs. by 2017.	It has not been achieved, according to the latest data available at the time of ex-post evaluation (11.2 TOE/Million Rs. in 2012). On the other hand, as the target amount of the indicator is for 2017, it is difficult to simply apply the actual value to measure achievement. Considering the trend starting from the pre-project period, the amount declined from 2004 to 2009, while it has been slightly increasing since 2010. Thus, it is hard to say that the change has been brought about as a project effect.	×
	②	Electricity load factor is increased annually by 1%.	It has been achieved or mostly achieved since the 2nd year of the project duration, except for the 1st year of the project period and 2011, although there is some fluctuation. Also, looking at the tendency for the 10-year period, the gap between the increase and decrease has diminished after the project started, compared with the period prior to commencement.	○/△

Source: Produced based on document review, hearing, questionnaire survey results
Remarks: The symbols in the "Level of Achievement" column show the following:
○ Achieved ○/△ Mostly achieved △ Middle level ×Not achieved －Not applicable

[12] Stabilizer It is a device for converting voltage and maintaining electric current in order to light a lamp.

infrastructure, except for introduction of a financial system. Therefore, the achievement of Output 1 is fair.

(2) Output 2: Incentive/disincentive mechanism for promoting energy efficiency is prepared.

Output 2 intended to establish financial mechanisms for promoting energy efficiency by setting up a low-interest loan scheme for private companies and a purchase support system of energy-efficient electric appliances for general households. However, both of the indicators for Output 2 were not achieved. In order to achieve the target for Indicator 1, a draft plan of a new loan scheme for supporting energy efficiency was submitted to the Ministry of Finance in 2010 but dismissed due to insufficient capacity of SLSEA to manage the fund as well as some issues on the provisional estimate of the financial scheme. Also, with regard to Indicator 2, two pilot projects, CFL distribution as well as replacing NWSDB water pumps, were implemented. However, neither of them could pave the way for the full-scale implementation of the financial scheme or incentive system that was intended by the project. After the proposed plan was dismissed by the Ministry of Finance, a new proposal was not submitted by SLSEA, since the government changed its direction so that the financial scheme to promote energy efficiency of private companies was regarded as an issue to be covered by banks instead of the government. Thus, Output 2 was not achieved.

(3) Output 3: Mass consciousness is created among general public, private, and public sectors on energy efficiency improvement.

Indicator 3 for Output 3 (penetration rate of CFLs) is the same as Indicator 4 for the project purpose, which is logically inconsistent. Also, diffusion of CFLs is regarded to be achieved as the result of enhanced mass consciousness on energy efficiency. Hence, Indicator 3 for Output 3 is not utilized in the evaluation but is replaced by Indicator 4 for the project purpose in order to avoid duplication. Therefore, there are two indicators for Output 3. Because Indicator 1 was achieved and Indicator 2 was mostly achieved, Output 3 is assessed to be mostly achieved.

3.2.1.2 Achievement of Project Purpose

The achievement of the indicators of the project's purpose by the end of the project cooperation period is shown in Table 3.

(1) Indicator 1: mandatory[13] energy audit, monitoring, and follow-up are conducted annually in at least 150 organizations in private and public sectors.

The data on energy audits, monitoring, and follow-ups at private companies and public organizations is neither available at SLSEA nor handled by any organization in the country. Thus, the actual value of Indicator 1 does not exist. On the other hand, the "mandatory energy audit" included in Indicator 1 was not realized by the end of the project. The "mandatory" audit itself is regarded as unnecessary, considering the situation of the country because SLSEA can administratively guide companies whose performance in energy consumption is problematic based on the latest data and improves their performance without a mandatory audit. SLSEA can receive the latest data on energy consumption from major companies and public organizations once the energy reporting system is on track.[14] Indicator 1 includes implementation of an annual energy audit, which is unrealistic because it is not common in Sri Lanka for an energy audit to be conducted every year, even at major companies.

Therefore, this indicator was not achieved. However, the indicator cannot be utilized to assess the achievement of the project purpose because some parts of the indicator are not appropriate.

(2) Indicator 2: investment in energy efficiency and conservation has increased by at least 10%.

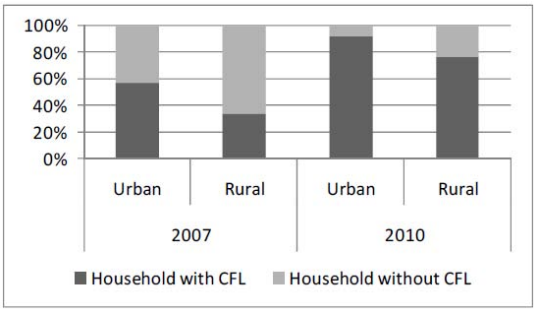
Indicator 2 was not achieved during the project. Output 2 concerned the establishment of new financial schemes to promote investment in energy efficiency, and after E-FRIEND II was completed, no similar scheme existed. For private companies, the interest rate on loans from general banks is high, which results in difficulty promoting investment in energy efficiency.

(3) Indicator 3: all CFLs, ballasts, and fans in markets have "energy efficient" labels.

Only CFLs were achieved by the end of the project. The rest (ballast and

[13] Although the word "mandatory" does not appear in the Japanese version of PDM, "mandatory energy audit" is included in the English version of PDM, on which both countries agreed upon. It was confirmed through hearings to the persons concerned also that the project initially intended to realize mandatory energy audit.

[14] SLSEA hearing



Source: Terminal Evaluation Report (data offered by SLSEA)

Figure 1: Penetration rate of CFLs (urban and rural areas)

Table 5: Amount of Purchased CFLs in Estate

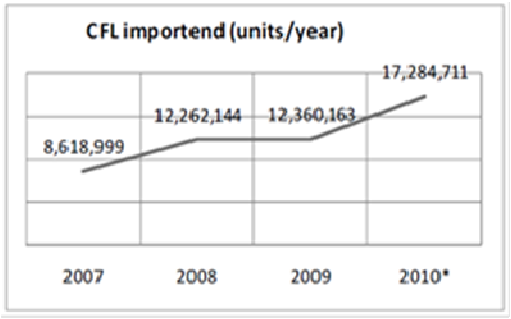
(Unit : piece)

CFL sales in 2009	CFL sales in 2010
157,882	184,550

Source: Terminal Evaluation Report (Data provided by SLSEA)

Remarks: Targeted estate area was Bandarawela, Passara, Nuwara Eliya, and Hatton.

ceiling fan) were unachieved. Factors promoting "energy efficient" labels on CFLs during the project are like many preceding programs [15] implemented to provide a foundation. Significant changes in terms of legal force toward manufacturers as well as the stance of sellers on purchase and sale were made through activities related to Output 1 of the project.



Source: Terminal evaluation report (data offered by SLSEA)

Figure 2: Imported CFLs

Some of the preceding programs did not intend to legalize mandatory labeling, but the approach did not result in the diffusion of "energy efficient" labels because it could not accelerate positive participation of manufacturers.[16]

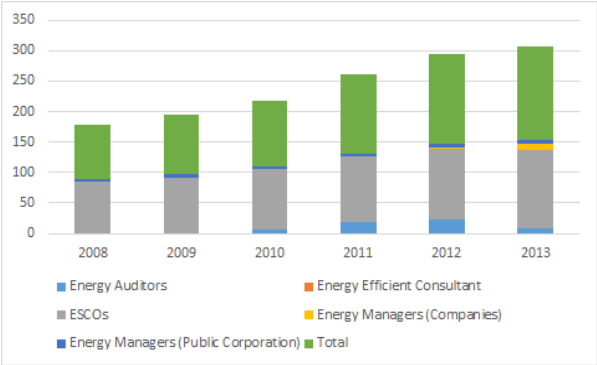
[15] Utility Driven CFL Promotion Program (1995-2003, Ceylon Electricity Board (hereafter, CEB)), which intended to enhance diffusion of CFLs by making CFLs more accessible to consumers with lower price by utilizing loan scheme, and Energy Labeling Program (2000 – 2004), which was aimed at enhancing "energy efficient" labels (without mandatory labelling).

[16] Energy Labeling Program (CEB, Sri Lanka Standard Institute (hereafter, SLSI), National Energy Research and Development Center (hereafter, NERDC)) developed "energy efficient" labels on CFLs, but it did not lead to the incentives of the sellers side because it was not mandatory but voluntary. In order to cope with this situation, CEB put condition for the loan to put energy efficiency labels on CFLs. However, the amount of CFLs with "energy efficient" labels gradually decreased after the loan scheme was completed in 2004 (Sri Lanka Country Report on Energy Efficiency Improvement & Conservation 2009 Wickramasinghe).

(4) Indicator 4: penetration rate (at least one bulb per household) of CFLs in the household sector is more than 40% in every subsector—namely, urban, rural, and estate.

Indicator 4 was mostly achieved at the project completion. The penetration rate of CFLs significantly surpassed the target level (i.e., 40% in urban and rural areas. The purchased amount of CFLs in the estate area shows a certain level of increase while the import of CFLs increased in 2010 by approximately 40% compared with the previous year after the legalization of "energy efficient" labels on CFLs.

(Unit: persons)



Source: SLSEA Questionnaire Survey

Figure 3: The number of borrowers of Equipment Bank

Among the activities for Output 3 (creation of mass consciousness among general public and private sectors on energy efficiency improvement) were the development of educational materials such as leaflets and posters, distribution of the materials at the events organized by SLSEA, uploading the leaflets to the SLSEA website, development of educational materials for elementary pupils, and distribution to schools (which were utilized at special programs). The information on CFLs is included in these materials. However, the effect of SLSEA's activities to create awareness of the energy efficiency of general households was low. According to the questionnaire to the residents at the time of the ex-post evaluation, the ratio of residents who had seen the leaflets, posters, and information on the SLSEA website on energy efficiency was 36.1% in urban areas, 2.8% in rural areas, and 0% in estate area.

(5) Indicator 5: ten-year plan for EE&C is authorized by the ministry.

Indicator 5 was not achieved by the project completion. Although the draft of the ten-year plan for EE&C was formulated during the project period and was approved by the board of directors of SLSEA, it was not approved by the ministry by the project completion as the procedure took much time.

Based on the above points, effectiveness of the project is assessed as fair for the following reasons.

- Achievement of the Output Level

Output 1 was achieved at the medium level, Output 2 was not achieved, and Output 3 was mostly achieved (Table 2). Considering that this project started soon after the establishment of SLSEA and was aimed at institution and capacity building, Output 1 is regarded as most important from the viewpoint of organizational infrastructure. Achievement of Output 1 remained at a medium level mostly due to the delay in legalization of some systems, but the draft for legislation was completed during the project, including the technical aspects. Also, some of the delays (e.g., Indicator 1, which was achieved three months after the project completion) are not regarded as serious. Though a financial scheme of Output 2 was not introduced, organizational infrastructure was established to a certain level—formulating drafts of the legislative bills for the annual reporting system, the accreditation system of energy auditors and energy managers, establishment of training approaches for energy auditors and energy managers, and expansion of the equipment bank and IT Infrastructure. Therefore, the achievement of the output level is assessed to be fair.

- Achievement of the Project Purpose

Among the five indicators for the project purpose, Indicator 2 was not achieved, Indicator 4 was mostly achieved, and the achievement of other 3 indicators the rest was medium (Table 3). Although data for Indicator 1 does not exist, certain improvement is observed except for some elements inappropriate for an indicator. Indicator 3 was partly achieved. Though the formulation of the substantial plan and its approval by SLSEA's board of directors were completed during the project, Indicator 5 was not achieved because of the time required for the procedures for approval in the ministry.

Among the five indicators, Indicator 4 (improvement of the diffusion of CFLs) was regarded as the most important due to the country's energy environment, in which the ratio of electricity consumption of households compared with that of industry is high due to its being an agricultural country. The project prioritized promotion of energy efficiency of electricity consumption in households and covered both households and industry. The share or electricity demand of the country at the time of planning was 38% for the industry and 39% for households, which shows that the ratio of electricity demand for households against that for industry is higher compared with that of other

countries.[17] Furthermore, demand for the suppression of electricity, especially of lighting in households, was recognized as urgent issue because efficiency of utilization of electric power plants decreased based on the concentration of electricity consumption in the evening (around 6:00 p.m. to 8:00 p.m.), due to the high demand for lighting—that is, 42% in households.[18] It was also confirmed through hearings with government officers and ex-Japanese experts who were involved with the project throughout the planning and implementation stages that this project planned to suppress electricity demand, especially in households, to address the above-mentioned issue. Hence, it is appropriate to assess achievement of the project purpose by considering that Indicator 4—which is directly connected with the above-mentioned issue—as mostly achieved. The achievement level of the project purpose is thus assessed as fair.

- Promoting and Hindering Factors

Although some indicators such as the increase in investment in energy efficiency (Output 2) were not achieved, the number of energy audits and monitoring using the equipment bank increased, which contributed to the achievement of the project purpose. The legalization of mandatory “energy efficient” labels of CFLs had the CFLs in the markets labeled during the project. And the penetration rate of CFLs, which would be directly connected to the reduction of electricity consumption in households, with a special emphasis in this project, significantly increased. Furthermore, the planning and implementation of the National Energy Award motivated companies and accelerated their promotion of energy efficiency activities. On the other hand, being unable to establish a financial scheme for companies’ investment in energy efficiency hindered achieving the project purpose while the contribution of IT infrastructure to the project purpose was insufficient. Considering the three-year project cooperation period, the major reasons some the indicators were not achieved were insufficient analysis at the planning stage of the necessary duration for legalization and setting the target level too high.

Based on the above reasons, the achievement of the project purpose is assessed as fair.

3.2.2 Impact

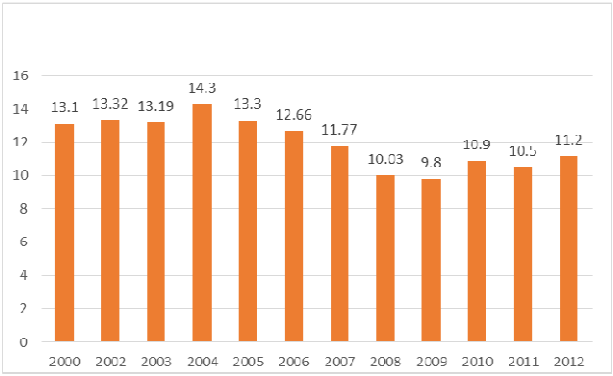
[17]For reference, the ratios of electricity consumption of households and industry in the composition of the electricity consumption by sectors(in 2011) in India, 22.0% for households and 44.8% for industry, while in China, 14.6% for households and 68.7% for industry (Japan Electric Power Information Center, Inc. http://www.jepic.or.jp/data/gl_date/gl_date06.html).

[18] Document provided by JICA

3.2.2.1 Achievement of Overall Goal

The achievement of the overall goal at the time of the ex-post evaluation is shown in Figure 4.

(Unit: TOE/Million Rs.)



Source: SLSEA

Figure 4: Commercial Energy Intensity

(1) Indicator 1: commercial energy intensity will decrease to 1.8 TOE/million Rs. by 2017.

As the timeframe of this indicator is 2017, the target figure is not appropriate to be applied at the time of the ex-post evaluation. However, in 2012, when the latest data was available at the time of ex-post evaluation, the indicator was not achieved (11.2 TOE/Million Rs.), and it was 6.2 times the target figure in 2017, or 1.8 TOE. On the other hand, before the project started, there was an increasing trend long term. After it reached its peak of 14.3 TOE/million Rs. in 2004, it continued to decrease until 2009, the second year of the project.[19] However, it increased slightly after 2010, in the latter half of the project, and has not improved. Thus, this indicator will likely not drastically improve within three years as an effect of the completed project.

One of the possible reasons why energy efficiency has not improved since the latter half of the project and after completion in spite of the improved penetration rate of CFLs: the new financial scheme could not be established, which did not lead to the increase in investment by private companies in energy efficiency. Although diffusion of CFLs was emphasized by the five indicators for the project purpose, the project also sought to increase energy efficiency in private companies by introducing a new financial scheme for investment to promote energy efficiency via Output 2. Unable to establish new financial schemes, the project could not accelerate energy efficiency activities of private companies. Thus, Indicator 1 influenced the overall goal somewhat as the medium and long-term effects decreased compared to expectations. And commercial energy intensity is affected by other things, such as change in industrial structure of the country (the service

[19] It became clear during this survey that the data shown in the Terminal Evaluation Report of the project for the period from year 2006 till 2008 was not commercial energy intensity but commercial energy index. Thus, actual value of the commercial energy intensity was utilized for the ex-post evaluation survey.

sector has expanded recently, from the conventional structure in which the main industries are agriculture and garments). Thus, the level of the indicator for overall goal was set too high.

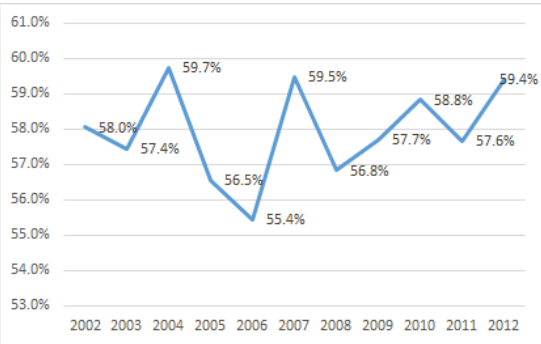
(2) Indicator 2: electricity load factor is increased annually by 1%.

Although the figures of Indicator 2 fluctuate year by year, the 1% annual increase is achieved or mostly achieved except for the first year of the project (Figure 5, 6).

Looking at the tendency of the ten-year period, the gap between the increase and decrease narrowed after the project started (Figure 6).

Hence, Indicator 2 is assessed to have been mostly achieved. The improved penetration rate of CFLs and enhanced motivation of private companies on energy efficiency by continuous implementation of the National Energy Award contributed to the achievement of this indicator, together with the other elements. The other elements include prior projects aiming at CFL diffusion, awareness of households and companies influenced by electricity price hike, and the change in pricing by electric companies (raising prices during the evening when electricity consumption is over the daily maximum).

(Unit: %)

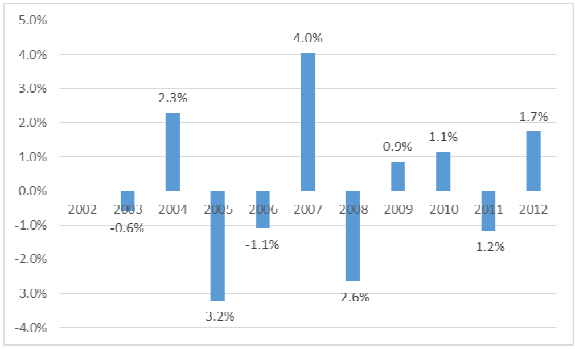


Source: Resource Management Associates (Pvt) Ltd.

Remarks: Revised figures excluding small-scale generation are shown above in order to correctly compare the figure with the past

Figure 5: Electric Load Factor

(Unit: %)



Source: SLSEA

Remarks: Revised figures excluding small-scale generation are shown above in order to correctly compare the figure with the past

Figure 6: Increase/Decrease rate of Electric Load Factor compared with the previous year

Thus, the achievement of the overall goal is assessed to be fair because Indicator 2 was mostly achieved whereas Indicator 1 was not achieved—financial schemes of investment in energy efficiency was not realized, and the level of Indicator 1 was set too high.

3.2.2.2 Project Effects to Achieve Overall Goal after Completion of the Project

The situation on the project effects for achieving overall Goal after the project completion is shown in Table 4.

(1) Effects Related to Outputs

1) Annual energy consumption reporting scheme

An annual energy consumption reporting scheme became mandatory in July 2011, after the project completion. As of the ex-post evaluation, approximately one hundred companies and organizations regularly submitted reports. As for these companies and organization, SLSEA can comprehend the situation of their energy consumption, and, if necessary, directly provide administrative guidance. In that sense, the organizational infrastructure was already founded on achievement of overall goals. However, as the total number of the companies and organizations that should submit an annual report is approximately seven hundred or eight hundred, an increase in the number of the companies/organizations that submit reports is desired. Of the total, 171 companies assigned energy managers.

(2) Energy managers and energy auditors

At the time of the ex-post evaluation, 181 energy managers and six energy auditors were accredited (Figure 6). Accreditation and assignment of energy managers resulted in energy managers mainly at major private companies acquiring certain knowledge, playing a role in enhancing energy management, and promoting energy efficiency activities at their own companies. Hence, the focal point was clarified for SLSEA as well, and the organizational infrastructure in terms of human resources in the companies/organizations of the annual reporting system was established in terms of achievement of the overall goal. Furthermore, though the number of accredited energy auditors is still limited, the infrastructure for achieving the overall goal has gradually strengthened.

Table 6: The Number of Accredited Energy Auditors and Energy Managers

(Unit: persons)

	2011	2012	2013
Energy Auditors	0	0	6
Energy Managers	0	142	29
Private Companies	0	131	26
Government/Public Organizations	0	11	3
Total	0	142	35

Source: SLSEA Questionnaire Survey

After the project completion, the Asian Development Bank (ADB) implemented a "Sustainable Power Sector Support Project" whose components related to energy efficiency to support the SLSEA's development of teaching materials and support for implementing training to energy auditors, which complemented positive effects in achieving the overall goal.

3) IT infrastructure development

The online reporting system developed by the project for the annual energy consumption reporting scheme is utilized by about only 5% of the total reports. Most of the reports are submitted through e-mail or by hard copy. So this online reporting system did not have the expected effects.[20] According to SLSEA, one of the reasons is that major companies have their own format, which is more complicated, and it takes additional time for them to enter the data in another form. To promote submission of the reports, SLSEA accepts reports using their own forms and extracts necessary data themselves. According to the hearing with private companies with obligations to report, energy managers at the companies did not know about the online reporting system, and some companies send reports by e-mail or hard copy because it is necessary to get signatures from those responsible before submitting reports and/or sending letters.[21] Thus, the contribution of this output to achieve and sustain the overall goal is small.

[20] SLSEA Questionnaire Survey
[21] Private companies hearing

4) “Energy efficient” labels

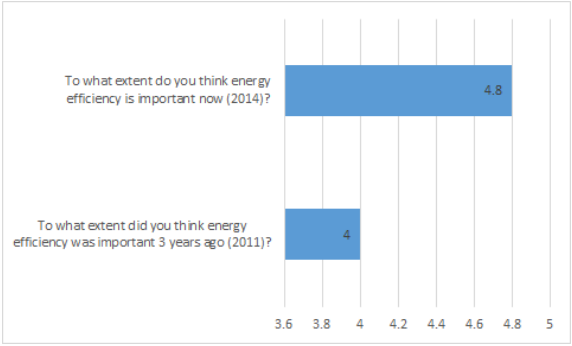
Labeling of the remaining two electric appliances was addressed during the project—the label for ceiling fans was made mandatory in January 2013. But labeling for ceiling fans has not yet been made mandatory at the markets due to delays in technical inspection. Inspection is now suspended because of a technical p roblem, but it will resume soon. Labeling for ballasts had not been implemented at the time of ex-post evaluation, but it is expected to be legalized between September 2014 and May 2015.[22] The formulation of the standard for both appliances was completed within the project period.[23]

5) Equipment bank

The equipment bank’s lending equipment increased after the project (Figure 3), and it has been effectively utilized by those involved in promoting energy efficiency at the time of the ex-post evaluation. Furthermore, the support provided by ADB for the equipment bank after the project complemented this. But maintenance is necessary in the future.

6) Mass awareness of energy efficiency

According to the results of the beneficiary survey, awareness of energy efficiency in general households increased compared to the results three years ago. This is not necessarily the result of project activities because the electricity price increase is also a major cause. For major private companies with a legal obligation to report annually their energy consumption, awareness of energy efficiency has been enhanced. Electricity price increase is a major promoting factor as well.



Source: Beneficiary survey to residents

Remarks: Average amount of the replies to 5-level evaluation (5: I think so very much 4: I think so to some extent 3: Medium 2: I do not think so much 1: I do not think so

Figure 7: Change in Consciousness on Energy Efficiency

[22] SLSEA Questionnaire Survey and hearing
[23] The project completion report

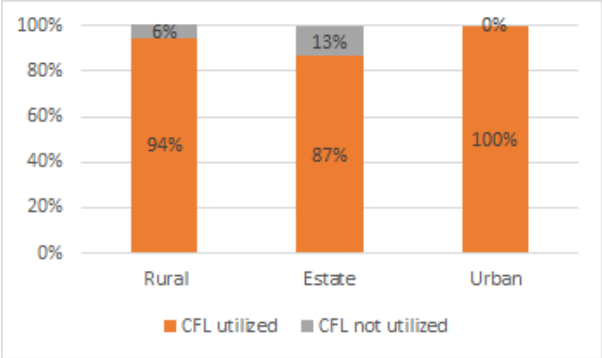
(2) Effects Related to Project Purpose

1) “Energy efficient” labels in the market

According to a survey[24] conducted by SLSEA in November 2013, 94.43% o f CFLs in the market have “energy efficient” labels. When the evaluators actually visited a mass retailer shop in Colombo City for visual observation (February 2014), all the CFLs in the shop had SLSEA “energy efficient” labels, and it is assumed that most of them are labeled in the markets at the time of the ex-post evaluation. The quality of the CFLs is maintained because poor CFLs were expelled, which led to an improved penetration rate of CFLs (to be explained later).

2) Penetration rate of CFLs

The result of the beneficiary survey of the residents at the ex-post evaluation (sample size was 109 households in total, with the breakdown of 36 in urban, 36 in rural, and 37 in estate areas) shows that the penetration rate is high in all urban, rural, and estate areas, which more than doubled of the target utilization rate of 40%. On the other hand, their knowledge of energy efficiency is insufficient, and it is difficult to attribute the improvement of the penetration rate of CFLs to improved knowledge of consumers on energy efficiency. Legalization of mandatory “energy efficient” labels on CFLs resulted in a change of attitude of manufacturers and retailers, which led to an almost 100% share of CFLs with “energy efficient” labels in the market.



Source: Beneficiary survey

Remarks: Ratio of households that use more than 1 CFL

Figure 8: Penetration rate of CFLs (general households)

3.2.2.3 Other Impacts

(1) Other Indirect Impacts

Significant indirect impacts were not observed at the time of the ex-post

[24] CFL Energy Labeling Market Penetration Survey, SLSEA

evaluation.

(2) Negative Impacts

No negative impacts were observed.

Therefore, as for the impacts, the achievement of the overall goal is medium because Indicator 2 is mostly achieved, whereas Indicator 1 is not. The reasons why Indicator 1 is not achieved are that the achievement of the project purpose remained at the medium level and the overall goal was set too high. Also, a positive impact is observed, while no negative impact is seen.

Effectiveness is assessed to be medium, as already mentioned. The positive reasons are the achievement of the project purpose is medium, the expansion of the equipment bank, the legalization of mandatory “energy efficient” labels on CFLs, and the continuous implementation of the National Energy Award, which contributed to the attainment of the project purpose. On the other hand, the negative reasons are that the financial schemes for the investment of energy efficiency were not established. Further, the IT infrastructure development did not contribute to the achievement of the project purpose.

With the reasons above, effectiveness (and impact) is fair.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Inputs	Plan	Actual
(1) Experts	4 for long term (4 fields; 144 M/M, if 4 people were supposed to be dispatched for 4 years) ● 3 fields for short term, if necessary	● 56.43 M/M in 11 fields ● all for short term
(2)Trainees received	9 trainees (about 3 people per year for training in Japan, mainly for core counterparts	22 trainees (1st: 5 seniors, 2nd: 10 practitioners, 3rd: 7 seniors and practitioners, 22 in total) Field(s) of training: energy efficiency policy
(3)Third-country training programs	N/A	N/A

(4) Equipment	Main equipment (no description of the budget): equipment for energy auditing, facilities for industrial motor testing, OA equipment, equipment for energy efficiency, etc.	Main equipment ($302 thousand USD and 2.3 million yen): measuring equipment for energy auditing, testing equipment, OA equipment, etc.
Total project cost	285 million yen	346 million yen
Total local cost	(no description)	256.9 million Rs.

3.3.1.1 Elements of Inputs

(1) Japanese Inputs

1) Japanese Experts

SLSEA recognizes that the quality and quantity of Japanese experts was medium and the timeliness was good. Thus, it is assessed that there was no problem. Also, the M/M of Japanese experts significantly decreased in comparison to the plan. However, the reason for the significant decrease is not clear.

2) Trainees received

SLSEA's recognition of the contribution of training in Japan is high (i.e., four out of five levels).[25] Also, during training in Japan in the first year for the senior level, many senior staff at related organizations participated, in addition to those of SLSEA. The training was highly satisfactory for the participants, as the curriculum was appropriate. It was effective for quick decision-making and action during the project duration,[26] as it helped the participants to recognize the importance of energy efficiency[27] and fostered the establishment of a clear vision shared among the senior staff of the stakeholders for the project direction[28].

3) Equipment Provision

SLSEA highly evaluates the quality, quantity, and timeliness of the equipment provision. However, some of the equipment provided for the equipment bank was insufficient, in terms of quantity. In addition, the level of nonconformity was not serious as a whole.

[25] SLSEA Questionnaire Survey
[26] Ex-Japanese expert hearing
[27] SLSEA hearing
[28] The completion report on" the Sri Lanka Energy Efficiency Policy (Advanced Course) 2008" (P13)

4) Local Cost

As for the amount of local cost borne and the timeliness of disbursement, no particular problem was observed.

(2) Sri Lankan Inputs

1) Allocation of Counterparts

As shown in Table 7, the number of counterparts during the project duration gradually increased after the first year. No staff members left the SLSEA, and only one staff member was on a leave of absence in order to study abroad and attain a higher degree.[29] There were three vacant posts in the Energy Management Division. Some perceive that this vacancy became a constraint for the activities' progress, while others recognize that it did not seriously influence activities in a practical sense.[30] Since all of the planned activities were completed within the project period, it is regarded that it was not a very serious problem although the manpower was insufficient.

Table 7：The Number of Assigned Counterparts
（During and After the Project Period）

	'08	09	10	11 (-4)	11 (5-)	12	13
A. Management Staff	**3**	**4**	**4**	**4**	**4**	**4**	**4**
Director (Energy Mgmt)	1	1	1	1	1	1	1
Head (EE System)	1	1	1	1	1	1	1
Head (EE Service)	0	1	1	1	1	1	1
Head (Outreach Program)	1	1	1	1	1	1	1
Head (M & V)	0	0	0	0	0	0	0
B. Technical Staff	**7**	**7**	**8**	**10**	**13**	**13**	**12**
Engineering Specialist	1	1	0	0	3	3	3
Professional Engineering	5	5	6	6	8	8	8
Engineering Assistant	1	1	1	1	1	1	1
Technical Assistant	0	0	1	3	1	1	0
TOTAL	**10**	**11**	**12**	**14**	**17**	**17**	**16**

Source：SLSEA Questionnaire Survey

Remarks: Year 2011 is divided into two; that is, until April, when the project was completed, and since May, after the project was over.

[29] SLSEA Questionnaire survey
[30] SLSEA and former Japanese experts hearing

2) Provision of Facilities

The necessary facilities were provided as planned, and there was no problem in terms of quality, quantity, and timelines.

3) Local Cost Bearing

There was no problem, in the sense of the amount and timeliness of the local cost bearing. SLSEA secures its own financial sources by obtaining sponsors for the exhibitions for promoting energy efficiency and through the equipment bank rental fee.

(3) Implementation Process

With the following reasons, the project activities were conducted smoothly and all of the planned activities were completed. The causes for not achieving some outputs were something besides the manner in which the activities were conducted (See Effectiveness and Impact).

1) Communication within the Team

It is recognized by SLSEA that the communication between the Japanese expert team and the Sri Lankan counterpart team was “very good” (a five out of five levels of evaluation).[31] As for the reason, it was pointed out that there was no gap on the project because the Japanese expert team almost always explained things with practical examples.

2) Sharing the direction and the smooth progress of activities

It is recognized by the Japanese expert side that it was easy for them to proceed with the activities because the counterparts were eagerly involved. Further, the activities and the recognition of the direction in which the project should be heading were shared with them.[32]

3.3.1.2 Project Cost

As shown in Table 8, the project cost was higher than planned (121%). One of the reasons why the project cost exceeded the planned amount was that the number of the trainees received in Japan doubled in comparison to the plan. On the other hand, the participation of the senior staff, including those at related organizations, in addition to the organization that served as a counterpart to the training in Japan in the

[31] SLSEA Questionnaire Survey
[32] Japanese experts hearing

first year, enabled them to strongly recognize the importance of energy efficiency. Such an understanding led to smooth decision-making and actions within the project.

Table 8：Project Cost and Period of Cooperation

	Planned	Actual	Ratio Against the Plan (%)
Project Cost	2.85 hundred million yen	3.46 hundred million yen	121
Period of Cooperation	May 2008–April 2011 (3 years)	- ditto -	100

3.3.1.3 Period of Cooperation

As shown in Table 8, the period of cooperation was as planned.

The quality, quantity and timeliness of the Inputs were generally appropriate for the produced Outputs and achievement of Project Purpose, which were confirmed earlier as a part of Effectiveness. Also, as for the implementation process, good communication between the Japanese expert team and its Sri Lankan counterpart, as well as the conformity of the direction in which the project was heading, resulted in smooth implementation while completing the planned activities within the project period. On the other hand, the period of cooperation was 100%, in comparison to the plan, whereas the project cost was 121% in comparison to the planned figure.

Thus, although the project duration was concluded occurred as planned, the project cost exceeded the plan. Therefore, the efficiency of the project is fair.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy toward the Project

Due to the following reasons, sustainability, in terms of related policy and institution, is high.

There is no change in the “SLSEA Act” (2007), which stipulated the function and power of SLSEA; “National Energy Policy and Strategy of Sri Lanka” (2008), which stressed the importance of promoting energy efficiency; and “Revised Mahinda Chintana” (2010), which includes the objective “to reduce energy consumption by

8.7% by 2020." Moreover, the "Unstoppable Sri Lanka 2020: Public Investment Strategy 2014–2016" maintains the above-mentioned objective shown in the "Revised Mahinda Chintana," and stipulated that the promotion of energy efficiency is one of the major components of the energy policy.

Both of the related ministries, the Ministry of Power and Energy and the Ministry of Environment and Renewable Energy, share the same view that the promotion of energy efficiency is important. Also, the managing officers of SLSEA emphasized the promotion of energy efficiency and recognizes the commercial energy intensity and electricity load factor as important parameters after the project completion as well.[33]

As the country anticipates that its energy consumption will be doubled by 2020, it has constructed some coal-fired power plants and attempted to promote renewable energy as well. It is important to imagine that the direction of the government policy emphasized energy efficiency, since energy efficiency will be required to cope with the increasing needs for energy, in addition to those actions mentioned above.

3.4.2 Institutional Aspects of the Implementing Agency

Considering the reasons below, sustainability, in terms of the institutional aspects of the implementing agency, is high.

The number of SLSEA staff has been increasing after the the project completion (Table 7). In 2013, the number of allocated staff decreased by 1, but the total staff number is still larger by two staff members than at the time of the project completion, (i.e., fourteen staff). It was the number of technical staff (professional engineering) that increased in comparison to the project period. The decrease from 2012 to 2013 represented the departure of a technical assistant. The number of vacant posts that were pointed out in the past decreased in comparison to the project duration. It is regarded that the probability of increasing the number of staff is high,[34] because the country has set a goal to reduce energy consumption by 8.7% by 2020. SLSEA is the only government organization that specializes in energy efficiency, the number of staff has been increasing, and it has already started to negotiate with the Ministry of Finance to secure additional budget for increasing the number of staff.

[33] SLSEA Questionnaire Survey
[34] Ministry of Environment and Renewable Energy hearing

As for the supervising ministry, SLSEA was under the guidance of the Ministry of Power and Energy during the project period, whereas it came under the Ministry of Environment and Renewable Energy in February 2013 after the project cooperation was completed. There is no significant change in terms of SLSEA's mission and function at the time of ex-post evaluation. Furthermore, the future role of SLSEA in further promoting energy efficiency is regarded as being unchanged because both the Ministry of Environment and Renewable Energy and SLSEA put an equal emphasis on energy efficiency and renewable energy.[35]

Concerning the strengthening of the annual energy reporting scheme, SLSEA proposed CEA, which is responsible for EPL,[36] to include additional checkpoints related to energy efficiency for the screening of companies for acquiring EPL in order to increase the number of major companies to submit an annual report. More specifically, they are now considering the possibility of adding checkpoints, such as whether or not the applicant submitted an annual energy consumption report and whether or not the company already allocated an energy manager. With this, a company which does not submit an annual energy consumption report will not be able to acquire or update EPL until it addresses it, and the ratio of companies which submit an annual energy consumption report is expected to increase. The number of companies that are required to acquire and update EPL, as well as submit this reporting scheme, appears to be about 500.[37] It seems that the addition of those checkpoints is not difficult because SLSEA, along with CEA, which is responsible for EPL, is now under the Ministry of Environment and Renewable Energy and the ministry's standpoint is to accept the addition. Based on these circumstances and considering that there is no specific hindering factor, the possibility is high that the checkpoints for screening EPL will be changed.

With regard to the promotion of "energy efficient" labels in the future, the National Engineering Research and Development Center (hereafter, NERDC) has started the preparation of testing refrigerators, which was not included in this project, while utilizing a laboratory and equipment provided by ADB. SLSEA is also going to

[35] Ministry of Environment and Renewable Energy and SLSEA hearing
[36] EPL stands for Environmental Protection License, which is a strategy stipulated in the National Environment Act for avoiding negative influence to environment by companies' activities such as air pollution, water pollution, soil pollution, etc. Companies are divided into 3 categories from A to C, according to the potential risk of environmental pollution. Each company have obligation to acquire a license and update it regularly. It is necessary to pass screenings in order to acquire and update it.
[37] SLSEA

commission Moratuwa University to conduct the testing of air conditioners by the end of 2014. Thus, it is expected that mandatory “energy efficient” labels will be promoted by SLSEA in collaboration with the related organizations.

3.4.3 Technical Aspects of the Implementing Agency

There is some concern regarding the technical aspects of the implementing agency, due to the following reasons.

(1) Stakeholders’ recognition of the technical capacity of SLSEA

The evaluation by the government and the individuals within governmental organizations on the technical capacity of SLSEA is not very high. There were several comments that their technical capacity is lower in comparison to CEB. However, there are also some comments that even so, there is no problem because there are energy auditors and energy efficiency consultants, as well as some external organizations, such as universities and NERDC, etc., with which SLSEA can collaborate.[38] On the other hand, the result of the interview survey on the technical capacity of SLSEA at the time of ex-post evaluation with twenty-one companies/organizations, which include the Energy Service Company (hereafter, ESCO) and energy efficiency consultants who provide the service of energy auditing and consulting (7), as well as major energy consumers among private companies and public organizations (14), is shown in Table 9. It is a five-scale rating and the average of the former group is 3.7, while that of latter group is 3.3, which shows that it is recognized as medium.

Table 9: Does SLSEA Have Sufficient Technical Capacity for Promoting EE&C

（5: Sufficient, 4: Sufficient to some extent, 3:Medium, 2: Not so sufficient, 1: Not at all sufficient）

Group of Respondents	Average
ESCO、Energy Auditors, Energy Efficiency Consultants	3.7
Private and public organization （major energy consumers with an obligation to provide annual reporting	3.3

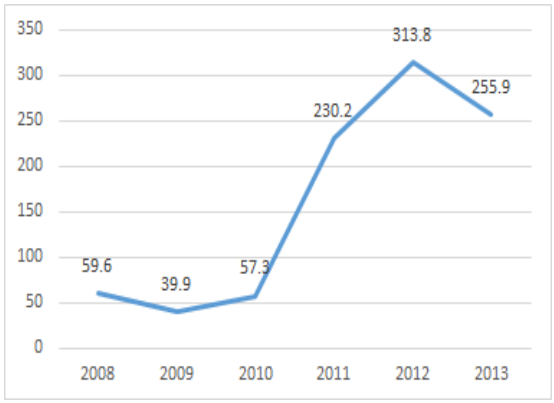
Source: Beneficiary Survey

[38] Government and governmental organizations hearing

(2) Technical capacity of SLSEA in the future

In the process of conducting the interview survey above, there were some common comments from many of the organizations, such as "The technical capacity of some senior staff who is the core members is high, while that of the middle and junior staff is insufficient." If this comment is correct, then there is concern over the future sustainability in the technical aspect. On the other hand, the salary standard of SLSEA is lower than that of CEB, resulting in the low possibility for SLSEA to hire new staff with high technical capacity.[39] SLSEA received instruction from the Board of Directors on the necessity to foster internal human resources. Thus, SLSEA will take new actions, such as by giving responsibilities to junior staff and requesting some donors to secure budget for the cost of human resources development. It is necessary, however, to pay attention to the progress and effects of the above point.

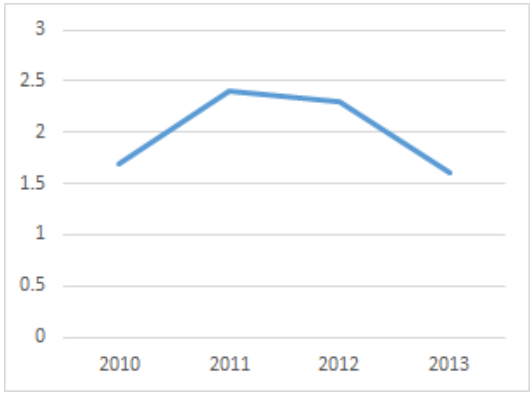
(Unit: Million Rs.)



Source: SLSEA

Figure 9: The Budget of SLSEA

(Unit: Million Rs.)



Source: SLSEA Questionnaire Survey

Figure 10: The Rental Fee of the Equipment Bank

(3) Technical capacity on the maintenance of equipment

The maintenance of equipment, mainly of the equipment bank is mostly well done, while only some of the equipment was not repaired in a timely manner. It mainly resulted from the shortage of technical staff members who are in charge of maintenance.[40] Also, as the staff in charge of maintenance has a double assignment, it is not functioning well when some of the team members are on a business trip. On the other hand, some of the equipment cannot be repaired by the suppliers in the country,

[39] SLSEA hearing
[40] SLSEA Questionnaire Survey and hearing

though it is not SLSEA's problem. In that case, the equipment had to be sent overseas. Sometimes SLSEA had to give up on fixing them, as the cost for shipping was high (six cases occurred during the project period until the time of ex-post evaluation. All of the cases pertained to Data Logger).[41]

The problem of unconformity between the provided equipment and the local pipes to be connected was already solved by the time of ex-post evaluation, as ADB provided the measuring equipment which can be used with any size of pipe. Also, due to users' enhanced consciousness of the accuracy of the equipment bank, SLSEA recognized the necessity of calibration,[42] which did not exist in the country. It started to consider the establishment of a new periodical calibration system that included identifying criteria for each respective type of equipment.[43]

3.4.4 Financial Aspects of the Implementing Agency

From a financial aspect, sustainability is high for the following reasons, although there is some concern over the maintenance cost of the equipment bank.

(1) Financial status of SLSEA

Although the annual budget of SLSEA, from the time of the project completion until ex-post evaluation, fluctuates depending on the year, the amount significantly increased in 2011—the last year of the project's duration. It maintained a high level without decreasing to the level of the project period.

(2) Maintenance cost for the equipment bank

The rental fee amount, which has been utilized for the maintenance of the equipment bank, has decreased since 2012. However, it increased during the project period, while the unit cost of the rental fee for each type of equipment was not lowered. SLSEA assumes that the reason is because of the ratio of the users who borrowed the equipment at a lower unit price was high.[44] However, the ratio of the maintenance cost of the equipment bank to all of SLSEA's budget is small.

(3) Financial scheme of investment for energy efficiency by private companies

A new financial scheme of investment for energy efficiency with the initiative of the Sri Lankan government has not been introduced at the time of ex-post evaluation.

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41 SLSEA hearing
42 Calibration in Japanese means "kosei"(correction) or "chosei"(adjustment). It means to measure deviation of an equipment with measurement standard, and to adjust it so that it can measure correct amount, in order for the measurement equipment to give the right amount according to the standard.
43 SLSEA hearing
44 SLSEA hearing

On the other hand, the European Investment Bank (hereafter, EIB) started a loan scheme with the DFCC,[45] the Commercial Bank of Ceylon, and the Regional Development Bank as the intermediary banks. The name of the financial scheme is "SME[46] and Green Energy GL," and it is divided into two components: 1) green energy and 2) SME. The first component includes investment for energy efficiency for the target. Neither of the components accepts the loan for more than 50% of the total cost. As for Green Energy, its target is energy efficiency and renewable energy; the minimum amount of the loan is Euro500,000 and maximum Euro900,000. The interest rate is 8%, and the redemption period depends on the borrower. All of the preparatory procedures were completed in April 2014, and the application started to be accepted. The DFCC already conducted a screening of fifteen application forms and sent them to EIB. The commencement of a new financial scheme is a positive factor for the future, although there is a constraint that the applicants can borrow up to 50% of the total cost. Further, monitoring the progress is necessary because the scheme was newly introduced.

Based on the above information, some problems have been observed, in terms of the technical aspects of the implementing agency, whereas the sustainability from policy, institutional, and financial aspects is high. Therefore, the sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to strengthen the organization of the Sri Lanka Sustainable Energy Authority (hereafter SLSEA) in order to promote the energy efficiency activities of general households, private companies, and public and governmental organizations in all of the country's urban, agricultural, and estate areas. Relevance is high: energy efficiency and conservation is consistent with the developmental needs of Sri Lanka because it depends on imports for most of its energy resources, and the consistency with its development policy as well as Japanese aid policy is high. Also, effectiveness/impact is at a medium level, because the achievement of the project Purpose and the outputs are at a medium level. Efficiency is fair, since the cost borne by the JICA side exceeded the planned amount, while the quality, quantity, and

[45] DFCC stands for the Development Finance Corporation of Ceylon.
[46] SME stands for small and medium-sized enterprises.

timeliness of the inputs were adequate for the achievement of the outputs and the project purpose. Sustainability is fair, as there are some concerns regarding the technical aspect, while sustainability in policy, organizational, and financial aspects are high. In light of the above, this project is evaluated to be partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the implementing agency

It is desired that SLSEA strengthen the development of its internal staff at the middle and junior levels, in parallel with increasing the number of staff member allocations. SLSEA was given instruction by the Board of Directors to enhance the capacity development of its internal staff, and it has already decided to give this development in on the job training, with more responsibility to junior staff, and request donors to provide financial support for human resources development. In addition, it is important for SLSEA to formulate a medium- and long-term plan for human resources development, mainly for the middle- and junior-class staff with focus on technical skill-up, and to start preparation for implementation for the sake of further strengthening its organizational development in the future.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

- The duration of a project for which legalization or activities by organizations other than the counterpart organization is a prerequisite.

In this project, most of the activities were completed during the project duration, but it was a prerequisite to legalize the system or to conduct technical testing, not at the counterpart organization but at other related organizations, which requires many procedures. Even after the activities were implemented and the project was over, it took a considerably long time to achieve some outputs, resulting in the delay in achieving the project purpose as well. It is necessary to make sure that a sufficient project period is secured, in case the legalization of a new system or related organizations is involved. With the exception of the counterpart organization, the others need to take specific responsibility for some activities that are indispensable to achieve outputs or project purpose.

- Institution-building of receiving reports using the online system

With respect to one of the outputs, i.e., the “development of IT Infrastructure,” it was intended that the project would develop an online system for receiving an energy

consumption report from major companies so that it would be more convenient for both the companies and SLSEA. Although the development of the online reporting system itself was completed within the project period and the expected output was achieved, the ratio of the companies which utilize the system is very low—that is, less than 5% —while most of the companies submit the annual report by e-mail or hard copy. The major reasons why the online system is underutilized are regarded to be due to the fact that most of the major companies utilize their own forms. They need to enter the data again if they have to use the online system. Other reasons are that the implementing agency did not continuously disseminate the existence of the online system and promote its usage, and that the preparatory survey was not necessarily sufficient in the country where the signature of the bosses and/or the management is a prerequisite for sending out a letter from major organizations. Insufficient analysis on the current situation, the constraints, and the needs of the companies who were the targeted users, as well as sharing the views among stakeholders, were the major hindering factors. Therefore, in case a project receives a large number of reports from external organizations with the online system, it is important to decide to introduce the system only after conducting a sufficient survey on the latest situation and the needs of the users (private companies, etc., in this case) including the special elements of the country. The result of the survey should be well reflected in the project design before finalizing the introduction of the system.

- Setting practical indicators based on the timeframe and long-term direction of a project

Some of the indicators for outputs, project purpose, and the overall goal are skeptical, in terms of the feasibility of achievement, considering that the project period is three years. For example, the accreditation of energy auditors and the appointment of energy managers can only be realized after the legalization of new schemes is complete through human resources development, such as training, etc. In this project, however, all of the formulation of new schemes and the legalization of human resources development by training are positioned as the indicators at output level, which should have been the indicators for a higher level. Similar examples are also observed and, as a result, the achievement of the indicators declined, as did the evaluation on effectiveness and efficiency, despite the fact that the organizational infrastructure has already been achieved to some extent. The major reason why the indicator levels were set too high are as follows: 1) Each objective at each level was unclear (especially the project purpose and overall goal); 2) there is a possibility that the important rules of the PDM, such as the project purpose needs to be achieved by the end of the cooperation, were not shared among stakeholders. The overall goal, which also had to be attained within three years after the project completion, etc., was not fully shared and recognized by the people concerned; 3) as a comprehensive approach is required for an energy efficiency project,

the project scope was set broadly, thus including some indicators that were set too high to achieve within the three-year project period; 4) being a project for strengthening organizational capacity, the image and change of the target group that the project intended to bring about were not clear. It is important to set realistic indicators (and objectives) after reflecting the results of the analysis of the beneficiaries and needs (i.e., companies, related organizations, and residents in rural, estate, and urban areas) on the status quo. It is also vital to pay sufficient attention to the boundary of counterpart organizations' authority.

- Sharing the project direction with the senior management staff of counterparts during the initial stage

This project was successful, in terms of sharing the same direction to which the project should be heading, among the counterparts. It also successfully communicated with the counterpart teams and the Japanese expert team by sharing advanced cases and the latest information in the sector at the training in the Japan program during the first year of the project. This training included the participation of the senior management staff of counterpart, as well as related, organizations. This approach resulted in project management without a recognition gap between the two teams, good communication, and prompt action by the counterpart organization, all of which led to smooth implementation of the activities. Effective utilization of the training in Japan during the initial stage of a project, clarifying the direction that the project should take among counterparts, as well as between the counterpart team and Japanese expert team, and fully sharing it among them results in the smooth implementation of activities.

Democratic Socialist Republic of Sri Lanka

Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Improvement of Anuradhapura Teaching Hospital"

and

"The Project for Improvement of Anuradhapura Teaching Hospital (Phase II)"

External Evaluator: Chiho Ikeda,

Foundation for Advanced Studies on International Development

0. Summary

This project aimed to enhance the quality of healthcare services for the residents of the Anuradhapura Teaching Hospital (AT Hospital) catchment area by improving its facilities and medical equipment at the Outpatient Department[1],Obstetrics and Gynaecology (OB/GYN) Operation Department, Paediatric Intensive Care Unit (PICU), and Neonatal Intensive Care Unit (NICU). AT Hospital is situated in Anuradhapura, which is the provincial capital of North Central Province in Sri Lanka, as well as the district capital of Anuradhapura District.

The relevance of this project is high as it is consistent with the national development policy and needs of Sri Lanka both at the time of project planning and the time of ex-post evaluation, as well as with Japan's aid policy for Sri Lanka at the time of project planning. Since the project completion, the number of outpatients in the Outpatient Department has increased, as has the number of OB/GYN operations. The NICU bed occupancy rate has also improved. Furthermore, the patients and medical staff have indicated high levels of satisfaction. AT Hospital staff have become more efficient in their work and the quality of healthcare services has improved. Thus, it can be concluded that the project produced a sufficient effect. In addition, this project has contributed to the enhancement of AT Hospital's function as a teaching hospital. The provision of quality healthcare services to its catchment area and areas formerly controlled by the Liberation Tigers of Tamil Eelam (LTTE) as the tertiary hospital in the North Central Province has been enhanced through the project. Taking this into consideration, the effectiveness and impact of the project are high. The efficiency of the project is fair as the project cost was within the plan while the project period exceeded the plan. In terms of Operation and Maintenance (O&M), an O&M system was established and no issues that interfere with the O&M budget have identified, but there remain challenges regarding the technical skills of O&M staff. Therefore, the sustainability of the project effect is fair.

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

[1] The Outpatient Department at AT Hospital had 26 specialised outpatient clinics at the time of the basic design study. The project covered improvement of 20 of these clinics (as shown in 3.2.1.1 Table 1) and a walk-in clinic.

1. Project Description

Project Location[2]

Anuradhapura Teaching Hospital[3]

1.1 Background[4]

Since gaining independence in 1948, Sri Lanka has focused on welfare, and health services are available to all citizens free of charge. However, there has been a great disparity in health services between regions. In particular, the north-eastern area[5] as well as the north-central area (which consists of North Central Province, parts of Northern Province and parts of North Western province), which is the catchment area of AT Hospital was affected by the long years conflict and suffered from high rates of poverty compared to other districts[6]. Health indices such as the maternal mortality rate and infant mortality rate[7] in the north-central area were higher compared to other areas in Sri Lanka. For instance, the maternal mortality rates (per 100,000 live births) of districts in the area directly serviced by AT Hospital in 2006 (before the project) were: Anuradhapura District (29.7), Vavuniya District (39.3), Mannar District (46.2), and Puttalam District (51.6) compared to the country average 39.3. The average infant mortality rates (per 1,000 live births) for the ten-year period preceding the survey (undertaken in 2006–2007) were: Anuradhapura District (27) and Puttalam District (23) compared to the country average 10.9 in 2007[8].

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[2] Map from http://www.studentsoftheworld.info/infopays/maps/SRI_map.gif

[3] Photo taken by the evaluator in January 2014.

[4] Some parts of this section are excerpts from the Basic Design Study Report on the Project for Improvement of Anuradhapura Teaching Hospital in the Democratic Socialist Republic of Sri Lanka (2008). Where sources other than the Basic Design Study Report are drawn on, this will be noted in an explanatory note.

[5] Ethic conflict broke out in 1983 between the LTTE, a separatist militant organisation that advocated the separation of the northern and eastern areas of Sri Lanka for the Tamil people, and the Government of Sri Lanka. The conflict lasted until 2009. The north-eastern area consists of Northern Province (five districts: Jaffna, Mullaitivu, Kilinochchi, Mannar and Vavuniya) and Eastern Province (three districts: Trincomalee, Batticaloa, Ampara). During the period of conflict, parts of Northern and Eastern Provinces with large Tamil populations were controlled by the LTTE, such as Kilinochchi and Mullaitivu Districts. The other six districts were partially controlled by the LTTE and divided from government-controlled areas. (Refer to p.101-109 Noriko Iseki (2005) "International effort to contribute toward the needs of rehabilitation and reconstruction of Sri Lanka" Modern Media, Vol.51, No.5), Original article was written in Japanese.

[6] According to the Household Income and Expenditure Survey 2006–2007 (Department of Census and Statistics, Ministry of Finance and Planning Sri Lanka), the poverty headcount ratio of the north-central area was worse than other provinces (and districts belongs to provinces). For a detailed poverty headcount ratio, refer to Millennium Development Goals Country Report 2008–09, UNDP.

[7] An infant is defined as up to one year after birth, and neonate is up to the first 28 days after birth.

[8] For the country average maternal mortality rate and infant mortality rate, refer to Family Health Bureau, Ministry of Health Sri Lanka. For the average infant mortality rate for the ten-year period preceding the survey of 2006–2007, refer to Demographic and Health Survey 2006–2007, Department of Census and Statistics, Sri Lanka. There was no data for the

In March 2006, the Government of Sri Lanka (GoSL) decided to raise the status of AT Hospital from a provincial general hospital to a teaching hospital and to expand its role, functions, equipment, and healthcare services as the only tertiary hospital in North Central Province[9]. At that time, approximately 1.8 million people lived in the catchment area of AT Hospital, and many Tamil patients were transferred from the north-eastern area because of insufficient medical facilities there due to years of ethnic conflict. As a result, AT Hospital was chronically overcrowded. The average bed occupancy rate was 115 percent and the hospital was providing care to approximately 1,050 outpatients per day. This situation was impeding the appropriate provision of healthcare services.

AT Hospital was first established in 1958, and many of the original facilities had deteriorated and were decrepit at the time of project planning. In particular, most of the outpatient clinics were located in a former administration building, which had no waiting areas for patients. Patients were crowded into a small corridor, so that the flow lines of patients and healthcare personnel were entangled.

Under such circumstances, AT Hospital required the construction of new facilities and the procurement of necessary medical equipment according to the newly-developed master plan for the teaching hospital, which was approved by the Ministry of Healthcare and Nutrition (MOH). However, the self-help efforts of the GoSL were limited to primary and secondary healthcare facilities, and it was difficult to cover the improvement of a tertiary medical facility, which would require a considerable sum of money. The GoSL therefore requested grant aid assistance from Japan for the construction of facilities and supply of equipment at AT Hospital.

1.2 Project Outline

The objective of this project was to improve quality healthcare services for the residents of the AT Hospital catchment area through the improvement of facilities, and medical equipment in the Outpatient Department, OB/GYN Operation Department, PICU and NICU of AT Hospital.

Grant Limit / Actual Grant Amount	Phase 1: 1,803 million yen / 1,343 million yen Phase 2: 390 million yen / 347 million yen
Exchange of Notes Date (Grant Agreement Date)	Phase 1: May 2008 Phase 2: January 2009

infant mortality rate of Vavuniya and Mannar Districts.

[9] Public health facilities in Sri Lanka are categorised as primary, secondary and tertiary. Primary health facilities, such as health centres, do not have specialised outpatient clinics due to the absence of medical consultants and only provide services like vaccinations and simple consultations. Secondary health facilities, such as Base Hospitals and District General Hospitals, have some major specialised outpatient clinics, such as medical, surgical, OB/GYN and paediatrics, together with inpatient wards. They provide minor operations as well. Tertiary health facilities such as Teaching Hospitals and Provincial General Hospitals, have many specialised outpatient clinics together with inpatient wards and intensive care unit facilities so that patients can receive more advanced healthcare services than at secondary health facilities. If provincial general hospitals are appointed as affiliated hospitals to medical faculties of universities, they are called teaching hospitals.

Implementing Agency	Responsible Agency: Ministry of Healthcare and Nutrition[10] Implementing Agency: Anuradhapura Teaching Hospital
Project Completion Date	September 2010
Main Contractors	Construction: Kitano Construction Corporation Procurement of Equipment: Mitsubishi Corporation
Main Consultants	Yamashita Sekkei Inc. and International Total Engineering Corporation
Basic Design	June 2007–February 2008
Detailed Design	March 2008–February 2009
Related Projects	[Technical Cooperation] -Master Plan Study for Strengthening Health System (2002–2003) -The Study on Evidence-Based Management for Health System (2005–2007) [Non-JICA Projects] - North East Community Restoration and Development Project (ADB[11], OPEC funds[12], GTZ[13], Netherlands, Finland, Norway, etc. 2002–2008) - Improvement of antepartum ward (UNICEF, 2006) - Construction of renal research and treatment centre (Renal Foundation, 2006–2007) - Purchase of seven vehicles for preventive medicine staff (World Bank, 2006)

[10] The official name of the MOH was "Ministry of Healthcare and Nutrition" at the time of project planning. Since 2010, it has been known as "Ministry of Health".
[11] Asian Development Bank.
[12] Organization of the Petroleum Exporting Countries.
[13] Deutsche Gesellschaft fur Technische Zusammenarbeit.

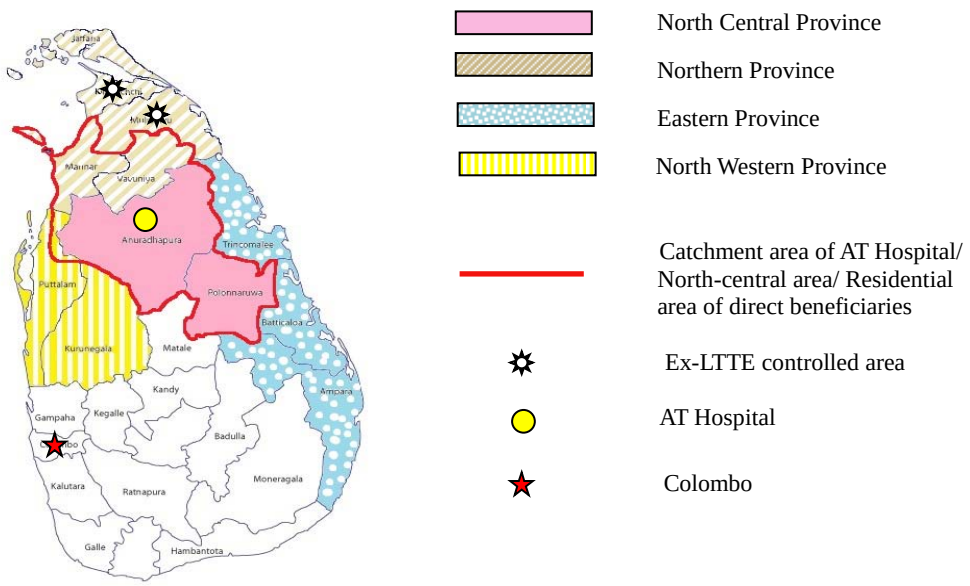


Figure 1 Residential area of direct beneficiaries and indirect beneficiaries of the project[14]

2. Outline of the Evaluation Study

2.1 External Evaluator

Chiho Ikeda, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: October, 2013–October, 2014

Duration of the Field Study: January 5–19, 2014 and April 20–24, 2014

3. Results of the Evaluation (Overall Rating: B[15])

3.1 Relevance (Rating: ③[16])

3.1.1 Relevance to the Development Plan of Sri Lanka

The project intended to promote quality healthcare services for the residents of the AT Hospital catchment area through improvement of tertiary care facilities in North Central Province. The Sri Lankan development framework called "Mahinda Chintana: Vision for a New Sri Lanka" stated that, "Ensuring easy access to quality and modern healthcare services for all, with emphasis on needs of the lower income groups and those most vulnerable in society, will be the main focus of the health sector in the medium term 2007–2016"[17]. This concept was also designated as one of the five

[14] Mapped by the evaluator based on a map from http://www.abansfinance.lk/images/sri-lanka-map.png
The direct catchment area of the project included North Central Province (Anuradhapura District and Polonnaruwa District), Vavuniya District, Mannar District, and part of Puttalam District. The indirect catchment area was ex-LTTE-controlled areas, comprising Northern Province (five districts: Jaffna, Mullaitivu, Kilinochchi, Mannar and Vavuniya) and part of Eastern Province (three districts: Trincomalee, Batticaloa, Ampara). However Vavuniya and Mannar Districts were also part of the direct catchment area of the project.

[15] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory.

[16] ③: High, ②: Fair, ①: Low.

[17] P.155 "Mahinda Chintana: Vision for a New Sri Lanka. A Ten Year Horizon Development Framework 2006–2016 Discussion Paper".

strategic objectives in the Health Master Plan (2006–2016) produced by the MOH: "to ensure the delivery of comprehensive health services" which includes rationalising and strengthening the health network of facilities and services. Thus, the project was in line with the policy of the GoSL at the time of project planning.

At the time of ex-post evaluation, "Mahinda Chintana: Vision for the Future Public Investment Strategy, Unstoppable Sri Lanka (2014–2016)", which was revised in 2013 from the original Mahinda Chintana[18], set out the strategic direction for providing advanced healthcare services through a strengthened healthcare delivery system. This was to be achieved through the provision of essential infrastructure, equipment, and human resources at all levels to develop the hospital network in order to implement universal health coverage (UHC)[19].

Therefore, the project was relevant to Sri Lanka's development plan at the time of project planning as well as the time of ex-post evaluation.

3.1.2 Relevance to the Development Needs of Sri Lanka

At the time of project planning, Sri Lanka had a great disparity in healthcare services between regions. In particular, health indices such as the maternal mortality rate and infant mortality rate in the catchment area of AT Hospital and the conflict-affected north-eastern area were remarkably higher than other districts. In addition, many patients were transferred to AT Hospital from the LTTE-controlled area of Northern Province, which suffered from underdevelopment of medical facilities due to the long years of ethnic conflict. Under such conditions, AT Hospital could not provide the appropriate healthcare services of a tertiary hospital because most facilities were decrepit, and medical equipment was old[20].

Although the infant mortality rate of Anuradhapura District, in which AT Hospital is located, had improved by the time of ex-post evaluation, it still has a higher rate than some other districts. In addition, the number of outpatients visiting the AT Hospital to access facilities such as the cardiology clinic has increased year by year due to the increase of non-communicable disease patients in Sri Lanka. Thus, the healthcare services of AT Hospital are highly demanded by patients, as it is the only tertiary hospital in North Central Province. The number of patients transferred to AT Hospital from indirectly covered areas has decreased due to the improvement of health facilities in Northern Province after the end of the 26 year ethnic conflict in May 2009, such as at Jaffna Teaching Hospital (TH Jaffna, tertiary), District General Hospital Kilinochchi (DGH Kilinochchi, secondary), District

[18] Mahinda Chintana has been revised twice. The first revision was in 2010 as "Mahinda Chintana: Vision for the Future" and the second revision was in 2013, which further revised the first revision.

[19] UHC is defined as "ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship". (WHO: http://www.who.int/health_financing/universal_coverage_definition/en/)

[20] The result of medical equipment inspection at the time of the basic design study showed 79 items that were unable to continue to be used and 25 items that were partially unable to continue to be used out of 183 inspected items.

General Hospital Mullaitivu (DGH Mullaitivu, secondary) and District General Hospital Vavuniya (DGH Vavuniya, secondary). However, AT Hospital still receives some patients from ex-LTTE-controlled areas because some specialised clinics, such as for neurosurgery, have not yet been improved in Northern Province[21]. Furthermore, AT Hospital is the nearest tertiary hospital for residents of Vavuniya and Mannar Districts, as TH Jaffna is situated further from their residences than AT Hospital. Therefore, it can be said that the project, which aims to improve quality healthcare services for the residents of the AT Hospital catchment area through enhancement of facilities and medical equipment, met and continues to meet the needs of Sri Lanka, both at the time of project planning and ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

At the time of project planning, Japan's country assistance program for Sri Lanka (April 2004) was composed of two pillars: (i) assistance to support the consolidation of peace and reconstruction, and (ii) assistance in line with the Sri Lankan mid- and long-term vision for development. In this policy, "assistance for health and medical care" was set as a sub-sector goal of "assistance for poverty alleviation and regional development", one of the priority areas of (ii) above. In addition, the sub-sector goal "improvement of social and economic infrastructure", noted the importance of implementing balanced assistance among all ethnic group and regions, for the improvement of both social infrastructure (potable water, public sanitation, primary education, health and medical care etc) and economic infrastructure (agricultural and fisheries industries). Thus, the project was consistent with Japan's assistance policy to Sri Lanka at the project planning stage.

In light of the above, this project was highly relevant to the country's development plan and development needs, as well as Japan's Official Development Assistance (ODA) policy. Therefore its relevance is high.

3.2 Effectiveness[22] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

To demonstrate the quantitative effects of the project, the number of outpatients of the 20 specialised clinics that were improved by the project, the number of OB/GYN operations, the number of PICU patients, and the NICU bed occupancy rate were set as indices in the basic design study report. The indices were expected to improve from one year after project completion (2010) and onward, compared to 2006. Therefore, this evaluation compared figures of 2006 and 2013, the year of ex-post evaluation. The results were as described below, and all indices except for the number of PICU patients showed progress.

[21] Based on an interview with AT Hospital staff.
[22] The effectiveness sub-rating is to be taken into consideration when assessing impact.

3.2.1.1 Number of Outpatients of Specialised Clinics and Walk-in Clinic Improved by the Project

The numbers of outpatients between 2006 and 2013 of the 20 specialised outpatient clinics and the walk-in clinic that were improved by the project are show in Table 1.

Table 1 Number of outpatients of specialised clinics and walk-in clinic improved by the project

	2006 (Base year)	*2007*	*2008*	*2009*	*2010 completion year: September, 2010*	*2011 (1 year after completion)*	*2012 (2 years after completion)*	*2013 (Ex-post evaluation year)*
Walk in clinic Total	**179,415**	**176,082**	**171,610**	**190,406**	**180,511**	**183,367**	**211,031**	**242,098**
Medical	57,213	57,656	52,766	52,883	50,350	44,866	42,896	44,367
Surgery	15,704	15,322	13,136	12,072	11,850	14,249	13,906	11,486
Orthopaedics	12,234	11,991	12,201	11,407	11,388	11,094	13,585	12,377
Respiratory	13,114	5,124	4,580	5,265	5,823	6,486	7,907	10,908
Cardiology	9,583	12,271	18,037	19,244	25,496	27,087	19,814	20,552
Neurosurgery	4,483	4,067	4,045	4,253	4,930	6,004	6,650	6,062
Neurology	5,455	6,416	7,412	6,733	7,330	6,801	7,137	8,007
ENT (Ear, Nose, and Throat)	8,843	8,374	8,194	7,781	8,304	9,019	8,730	13,380
Rectal	2,019	1,922	1,877	1,598	1,640	1,188	1,695	1,312
Dermatology	13,252	13,390	13,118	14,003	18,184	27,766	25,627	31,309
Paediatrics	14,752	14,096	12,338	13,348	14,573	15,682	15,881	18,830
Neonatal	7,114	5,508	3,164	3,999	2,879	3,438	6,085	3,853
Gynaecology	5,211	6,029	5,907	5,640	6,562	6,103	7,105	8,288
Obstetrics	9,240	8,883	9,377	9,575	8,983	8,428	10,214	11,916
Family planning	1,315	744	745	857	1,081	776	379	442
Oncosurgery	2,606	2,663	2,033	2,248	774	219	486	589
Oncomedical	7,077	10,786	10,735	8,318	10,522	13,478	15,204	15,806
OMF (Oral and Maxillofacial)	8,928	9,105	9,785	9,673	8,684	7,334	8,655	9,113
Orthodontics	3,396	5,028	7,858	10,504	10,908	7,640	7,776	9,831
Rheumatology & Rehabilitation	6,634	8,405	9,309	10,167	13,215	19,705	23,724	25,106
Specialised clinic total	***208,173***	***207,780***	***206,617***	***209,568***	***223,476***	***237,363***	***243,456***	***263,534***

Source: AT Hospital
Note: The number of neonatal clinic outpatients in 2013 is the total number from January to September 2013.

The number of cardiology clinic patients has increased year by year even from before the completion of the project because non-communicable diseases have tended to increase in Sri Lanka and because AT Hospital is the only hospital with a cardiology clinic in North Central Province. Patient numbers further increased between 2010 and 2011 due to the improvement of facilities and medical equipment through the project[23]. The number of patients of the clinics of ear, nose and throat (ENT); dermatology; and rheumatology and rehabilitation also increased after completion of the project in response to the improvement of facilities and equipment, as these clinics are available only at AT Hospital in North Central Province. In addition, the appointment of medical consultants also contributed to the increase in the number of patients. For instance, it can be said that the significant increase of ENT clinic patients in 2013 was due to the appointment of a well-known

[23] Because of adjustment to next consultation intervals in all outpatient clinics, the number of patients decreased from 2012 onwards.

medical consultant[24]. The total number of outpatients across the 20 specialised clinics had increased by more than 20 percent at the time of ex-post evaluation in 2013 in spite of changes to the next consultation interval from one month to two months depending on patient's condition in order to ease patient congestion.

3.2.1.2 Number of OB/GYN operations

The number of OB/GYN operations is stated below in Table 2. The number of major obstetric operations, such as caesarean sections, has tended to increase after the project completion. The number of minor gynaecological operations (such as hysteroscopies, biopsies, and polypectomies) and major gynaecological operations (such as abdominal hysterectomies) has decreased due to the improvement of some secondary health facilities within the AT Hospital catchment area, such as at Tambuttegama Base Hospital[25]. In addition, some minor gynaecological operations can be performed at the OB/GYN ward's treatment rooms in the professorial unit (PU)[26], which was constructed by the Ministry of Higher Education (MoHE) as a teaching facility of the medical faculty at Rajarata University. Therefore, that number has not counted toward the number of OB/GYN operations. Thus, the total number of OB/GYN operations forms the shape of an arch over time.

Table 2 Number of OB/GYN operations

Type of operation		2006 (Base year)	2007	2008	2009	2010 (Completion year September 2010)	2011 (1 year after completion)	2012 (2 years after completion)	2013 (Ex-post evaluation year)
Gynaecology	Major	878	923	890	704	1,221	1,123	998	704
	Minor	3,353	3,181	3,272	2,766	1,779	1,462	1,226	1,438
	Laparoscopy	45	112	81	113	249	383	420	230
	Sterilisation	135	543	814	916	1,101	1,205	1,470	903
Obstetrics	Major	2,312	2,591	3,011	2,986	3,211	3,083	3,442	3,467
	Minor	36	44	73	122	79	69	53	77
Total		**6,759**	**7,394**	**8,141**	**7,607**	**7,640**	**7,325**	**7,609**	**6,819**

Source: AT Hospital

[24] Other than ENT, the reason for the decrease in the number of respiratory outpatients between 2007 and 2009 was the absence of medical consultants. Furthermore, the decrease in the number of oral and maxillofacial surgery (OMF) and family planning patients in specific years was also caused by the absence of medical consultants. (Interview with AT Hospital)

[25] According to an interview with Tambuttegama Base Hospital (secondary health facility), which is located one hour by car from AT hospital, they conduct around 150 major operations per month and 300 minor operations per month. The number of referrals and transfers to AT Hospital has decreased after strengthening OB/GYN consultant capacity.

[26] The medical faculty students receive practical training at the PU. The establishment of the medical faculty in Rajarata University was decided in July 2006 by the MoHE, after AT Hospital was upgraded to a teaching hospital in March 2006. PU was constructed from 2009 to 2012 and was completed in February 2012. It functions as a patient ward as well. It has several patient wards including a medical ward (male: 52 beds, female: 43 beds), surgical ward (male: 44 beds, female: 45 beds), obstetrics ward (antenatal: 37 beds, postnatal: 35 beds, labour room: 10 beds), gynaecology ward (44 beds) and paediatric ward (59 beds). As the establishment of the medical faculty in Rajarata University was under the control of the MoHE and not the MOH, construction of PU in AT Hospital premises was not proposed at the time of project planning. (Interview with AT hospital)

3.2.1.3 Number of PICU Patients

The number of PICU patients has decreased as shown in Table 3. There are two main reasons for the decrease in the number of patients. The first reason is the decrease in number of patients transferred from Northern Province due to the improvement of health facilities there. The second reason is the enhancement of the paediatric ward in the PU. Because of the improved facilities, PICU patients with relatively mild conditions can be accommodated and cared for at the ward. As for the improvement in the bed occupancy rate, having increased the number of PICU beds to eight (six for general patients and two for infectious patients) from four and improving facilities through the project also have contributed to the decrease.

Table 3 Number of patients, average length of stay (ALS), bed occupancy rate (BOR) of the PICU

	2006 (Base year)	2007	2008	2009	2010 (Completion year September 2010)	2011 (1 year after completion)	2012 (2 years after completion)	2013 (Ex-post evaluation year)
Number of PICU patients	252	235	251	250	198	239	216	191
ALS (days)	5	4	5	5	4	6	5	5
BOR	86%	64%	86%	86%	54%	65%	49%	44%

Source: AT hospital

Note: BOR = (Total number of patients for a year × ALS) ÷ (365 days × number of beds). The number of beds was four beds between 2006 and 2010, and six beds between 2011 and 2013. Although the number of beds was increased to eight from four by the project, two beds for infectious patients were not available as they were utilised for PICU storage for broken equipment.

3.2.1.4 Bed Occupancy Rate of the NICU

As per Table 4 below, the NICU bed occupancy rate has decreased since 2011, reaching almost 100 percent, by increasing the number of beds (from 19 to 27) through the project.

The decrease of PICU patients due to the decrement of patient transfers from Northern Province (due to the improvement of health facilities there after the end of the conflict as described above), and the enhancement of the paediatric ward within the PU have also contributed to the improvement of the NICU bed occupancy rate. However, the previous number of NICU beds (19 beds) was still insufficient, even for the current number of patients. The capacity of the NICU has been enhanced by increasing the number of beds and its facilities through the project.

Accordingly, the number of patients transferred to Colombo from AT Hospital has decreased since 2010 because the cause of many transfers (insufficient beds in the PICU and NICU) has decreased[27].

[27] AT Hospital (Director and medical consultant of the NICU).

Table 4 Number of patients and bed occupancy rate (BOR) of the NICU

	2006 (Base year)	2007	2008	2009	2010 (Completion year September 2010)	2011 (1 year after completion)	2012 (2 years after completion)	2013 (Ex-post evaluation year)
Number of PICU patients	2,570	-	2,060	1,497	1,976	1,259	932	1,009
BOR	404%	-	324%	235%	311%	139%	103%	112%

Source: AT Hospital

Note: BOR = (Total number of patients for a year × ALS) ÷ (365 days × number of beds). As there was no data for ALS between 2007 and 2013, it was calculated using 10.9 days (ALS in 2006). The number of beds was 19 beds between 2006 and 2010, and 27 beds between 2011 and 2013. However, the BOR of the base year was calculated as 156 percent in the basic design study report, as the number of beds calculated (49 beds) included 30 beds in OB/GYN wards utilised for NICU patients whose conditions were relatively mild. The calculation formula was【(2,570 × 10.9) ÷ [365 × (19 + 30)]】.

3.2.2 Qualitative Effects

3.2.2.1 Efficiency of Hospital Functions

The centralisation of dispersed outpatient clinics by constructing the Outpatients Department building through the project has contributed to the improvement of work efficiency by solving the entangled flow lines of hospital staff and patients. The results of a questionnaire survey given to medical staff[28] shows that staff satisfaction regarding facilities and medical equipment is high, and more than half of staff feel that their work efficiency has improved (refer to Box 1 below). According to the results of an outpatient questionnaire survey[29] (refer to 3.2.2.2), the waiting time has been reduced and patients have been able to move around the building effectively due to the improvement in flow lines.

On the other hand, there were a few negative comments from medical doctors at the walk-in clinic and PICU. This is because the walk-in clinic is still overcrowded as it is difficult to change the next consultation intervals in the same way as the specialised clinics, and many patients come directly without a referral[30]. Thus, some medical doctors at the walk-in clinic feel that there has not been any change regarding congestion as a result of the project. The PICU also faces issues with medical equipment that was procured by the MOH, not by the project, and as a result, some medical doctors complain that there is insufficient space to store broken equipment[31].

[28] The total number of respondents was 51. Their occupations were consultants, medical doctors, nurses and paramedical staff.

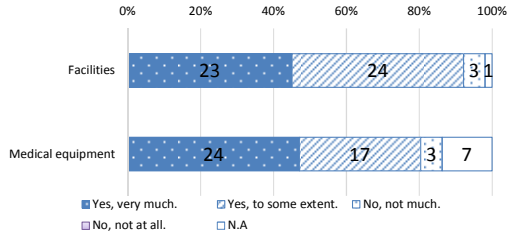
[29] The total number of respondents was 151. Respondents were patients who have received healthcare service at AT Hospital before the project, A number of patients were selected from each clinic that were improved by the project,

[30] According to the questionnaire survey given to outpatients in the walk-in clinic, only three patients out of 15 were referred from a lower-level hospital. In spite of negative comments from medical doctors, there were no negative comments, such as about overcrowding, from walk-in clinic patients. Most of them are satisfied with the renewed facilities and responded that waiting time had been reduced and the waiting space had been improved.

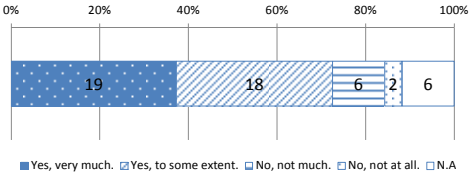
[31] Discussions about space at the PICU were held at the time of the basic design study. (Interview with MOH) Equipment has to be kept in the ward as long as it is listed in the ward's items inventory, until it is condemned and removed from the inventory by the Condemning Board. This update is usually done once every five years. Thus,even broken equipment that is difficult to repair cannot be disposed and must be kept at the PICU.(Interview with AT Hospital)

Box1 Results of questionnaire survey of medical staff at AT Hospital

■Are you satisfied with the renewed facilities and equipment?



■Do you think that the improvement of AT medical Hospital through the project has contributed to the enhancement of your work efficiency?



3.2.2.2 Improvement of Quality of Healthcare Services

Outpatients who had received healthcare services at AT Hospital before the project were largely unsatisfied with the hospital's facilities, waiting time, waiting space, flow lines, laboratory tests, quality of services and medical staff. After the project was completed, these same outpatients indicated almost 100 percent satisfaction with the current services[32]. According to the outpatient questionnaire survey, 108 out of 151 respondents now received healthcare services more frequently at AT Hospital than before the project. Respondents answered that the reasons for the increase in frequency were that "they could receive services that were not available in the old facilities", "they felt more comfortable receiving services in the renewed facilities than before" and "healthcare services provided by AT Hospital were now very reliable" (refer to Box 2)[33]. 27 out of a total of 29 individuals surveyed (14 OB/GYN inpatients, five family members of PICU inpatients, and 10 family members of NICU inpatients) also responded that access to advanced healthcare services had improved through the project (the remaining two inpatients responded that they did not know). In particular, mothers of NICU inpatients responded that their babies would not have survived without the care received at AT Hospital. Capacity enhancement of the PICU and NICU through the project enabled AT Hospital to receive more patients from neighbouring areas that are geographically closer to AT Hospital than to Colombo. As a result, cases of patient transfers to Colombo from AT Hospital due to an insufficient number of beds and facilities have decreased because AT Hospital has been able to offer more prompt diagnoses and treatment for patients with serious conditions.

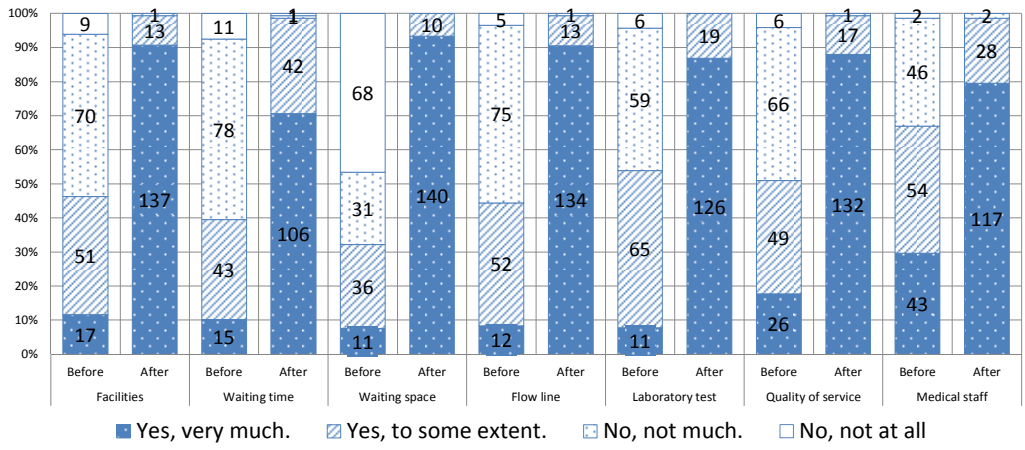
In addition, nearly 80 percent of medical staff responded that the quality of healthcare services in AT Hospital has been enhanced. Therefore, it can be said that the project has contributed to improving the quality of healthcare services in the AT Hospital catchment area as well as to providing advanced healthcare services to those areas.

[32] The following reasons were given by outpatients for increasing satisfaction: improved comfort due to sufficient waiting space; decreased waiting time; capacity to receive the results of blood tests within the day; and hospital staff are kinder than before because of sufficient staff numbers.

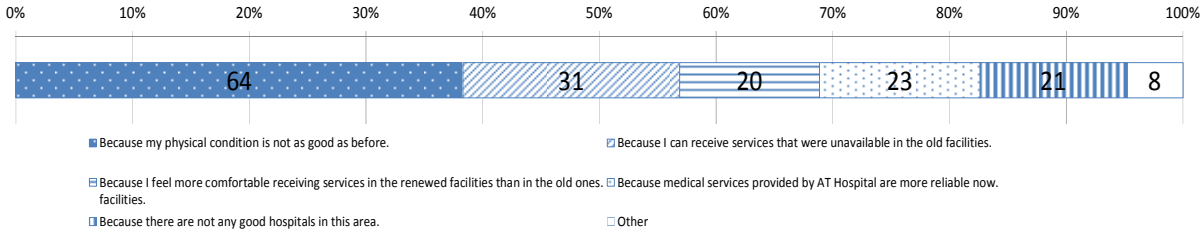
[33] The question allowed multiple answers. The 108 outpatients gave a total of 167 valid answers.

Box 2 Results of questionnaire survey regarding the quality of healthcare services

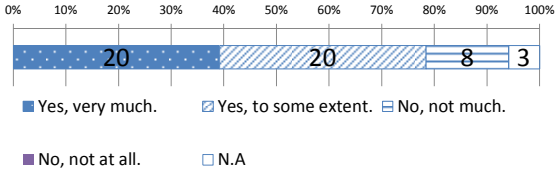
■Are (were) you satisfied with AT Hospital? (Before/after the project) *<Outpatients>*



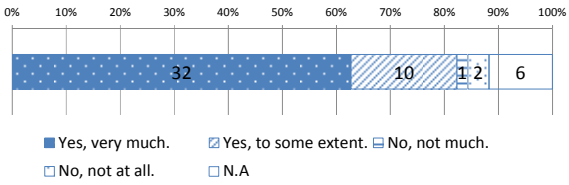
■If you visit the renewed AT Hospital more often than before, what are the reasons? *(Multiple answers) <Outpatients>*



■Do you think that the quality of healthcare services that your department offers has increased because of the renewed facilities? *<Medical staff>*



■Do you think that the improvement of AT Hospital though the project has contributed to providing quality healthcare services to the covered area? *<Medical staff>*



3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Promotion of Implementation of AT Hospital Master Plan

The project was the first stage of the AT Hospital Master Plan, which set out the improvement of AT Hospital as a tertiary hospital in stages. After the project, it was expected that the number of inpatients would increase in proportion to the increase in the number of outpatients. The next phase was to construct an improved OB/GYN ward, including a delivery room and a paediatrics ward, next to the Outpatient Department building based on the Master Plan in order to improve convenience for patients and hospital staff[34]. Although this phase of the AT Hospital Master Plan had not progressed at the time of the ex-post evaluation survey, the number of beds increased as the

[34] Reference documents provided by JICA and interview with AT Hospital.

OB/GYN (126 beds) and paediatrics (59 beds) wards were strengthened in the PU . However, as the PU has an educational function as well, the admission of inpatients is limited[35]. According to interviews with the AT Hospital, as the number of inpatients increased with the increase of the number of outpatients[36], the next phase of the Master Plan, which expects to construct OB/GYN and paediatrics wards connecting directly to the outpatient building, is scheduled to proceed as soon as the necessary budget is confirmed. Therefore, the project contribution to the improvement of the AT Hospital Master Plan has not materialised yet, but is expected to in the future.

3.3.1.2 Contribution to Decreasing Sri Lanka's Maternal Mortality Rate and Infant Mortality Rate

As the project covered the improvement of the OB/GYN Operation Department, the PICU and the NICU, it was expected to contribute indirectly to the betterment of health indices in Sri Lanka, such as the maternal mortality rate and infant mortality rate. The indices for the maternal mortality rate and infant mortality rate in 2006 (before the project) and 2012 (after the project) are shown in Table 5 below. Although the infant mortality rate in 2012 has improved compared to in 2006 across all levels (district, province and country level), the range of improvement of Anuradhapura District is small compared to the provincial and country level. Thus, the project contribution to the betterment of the infant mortality rate in Sri Lanka was minimal. The maternal mortality rate in Anuradhapura District has slightly worsened, but it has improved at the provincial and country levels[37].

Table5 Maternal mortality rate and infant mortality rate

	Maternal mortality rate (per 100,000 live births)			**Infant mortality rate (per 1,000 live births)**		
	Anuradhapura District	North Central Province	Sri Lanka	Anuradhapura District	North Central Province	Sri Lanka
2006	29.7	36.5	39.3	10.0	10.5	10.9
2012	33.6	32.0	37.7	9.4	8.9	9.2
Status	×	○	○	○	○	○

Source: Family Health Bureau, Ministry of Health, Sri Lanka (maternal mortality rate of Anuradhapura District, Sri Lanka and infant mortality rate of Sri Lanka)
AT Hospital (maternal mortality rate and infant mortality rate of North Central Province)
Regional Director of Health Services, Anuradhapura (infant mortality rate of Anuradhapura District)

3.3.1.3 Contribution to Promoting Economic Development in North Central Province

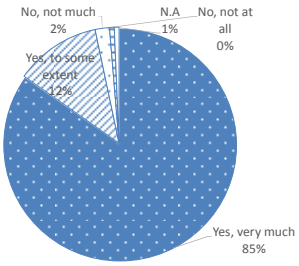
As the north-central area where AT Hospital is located adjoins the ex-LTTE-controlled north-eastern area, it was less developed than other areas. The project was expected to promote economic development by improving basic healthcare services. However, it is difficult to verify only the economic impact of the project because there were several other external factors, such as

[35] PU allows admission once every three days at the medical and paediatrics wards and twice a week at the surgical and OB/GYN wards. (Interview with AT Hospital)
[36] The total number of inpatients at AT Hospital increased by around 20,000 from 110,160 in 2006 to 129,442 in 2013. The number of beds also increased from 1,285 in 2006 to 1,861 in 2013.
[37] According to the interview with AT Hospital , it is difficult to identify the specific cause of the increase in the maternal mortality rate in Anuradhapura District because the increase rate is small.

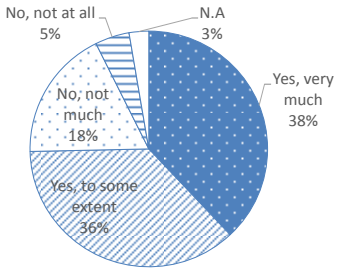
the end of ethnic conflict (May 2009), and the aggravation of kidney diseases in the north-central area[38]. Accordingly, residents of the north-central area (151 outpatients from the area who have received healthcare services from AT Hospital) were given a questionnaire survey that asked "whether they felt that the renewed facilities had helped improve their health conditions (from the perspective of improvement of basic healthcare services)", and "whether they thought that the renewed AT Hospital had contributed to an increase in family income or livelihood (from the perspective of promotion of economic development)" (refer to Box 3).

Box 3 Results of questionnaire survey of outpatients regarding economic development in North Central Province

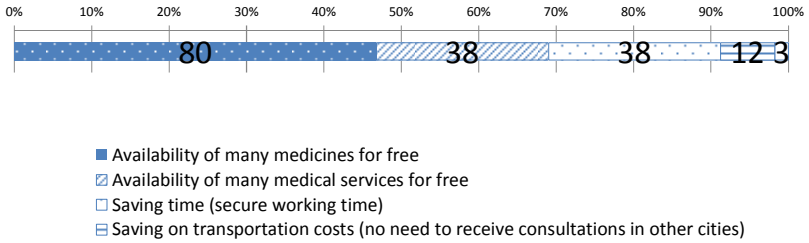
■Do you think the renewed facilities have helped improve your health conditions?



■Do you think the renewed facilities have contributed to an increase in the income of your family?



■Reasons why the renewed facilities have contributed to improved income and livelihood *(Multiple answers)*



The results showed that 97 percent of respondents thought that the project contributed to the improvement of their health condition. 74 percent of respondents thought that it contributed to their income or livelihood by enhancing free healthcare services[39], freeing up time that can be spent working due to decreased waiting time[40], and saving on transportation expenses[41].

[38] Renal disease patients have increased markedly in the north-central area. The renal research and treatment centre was developed in AT Hospital and the number of outpatients in the renal clinic has increased from 9,077 (2006) to 21,689 (2013). In order to assess the economic impact of the project, the ex-post survey was conducted from the view that health promotion for people in the north-central area by the project would enable them to secure sufficient time for work, and that this led to economic development. Aggravation of kidney diseases is regarded as an external factor hindering the enhancement of economic development in the north-central area.

[39] Some respondents commented that they received healthcare services for a fee from private hospitals before the improvement of AT Hospital through the project because they felt the healthcare services at AT Hospital were not reliable. After the improvement of AT Hospital, they now feel that the quality of healthcare services has improved and that services have become more reliable than before, so they could begin receiving healthcare services for free from AT Hospital. They are therefore now able to spend less on healthcare services.

[40] Respondents who work for hourly wages, such as famers, commented that they can work longer than before because of the reduction of waiting time after the improvement of AT Hospital through the project. Others said that they no longer need to

Therefore, it can be said that the project contributed to enhancing incomes and livelihoods of the direct target group, which is residents of north-central area, at least.

3.3.1.4 Provision of Quality Healthcare Services to North-Central Area and Ex-LTTE-Controlled Area

As AT Hospital received many transferred patients at the time of project planning, including Tamil people from ex-LTTE-controlled north-eastern areas, the project was expected to contribute to the provision of quality healthcare services to these groups indirectly. As hospitals in Northern Province have improved since the end of ethnic conflict in May 2009, residents of those areas prefer to visit TH Jaffna, which is a tertiary hospital in Northern Province, than AT Hospital at present in case when they need advanced healthcare services[42]. However, some patients were identified from ex-LTTE-controlled areas such as Mullaitivu and Kilinochchi Districts in a questionnaire survey of 50 Tamil patients[43] who receive healthcare services at AT Hospital. They receive consultations or treatment at the neurosurgery clinic at AT Hospital, as the specialised neurosurgery clinic has not been improved at TH Jaffna. At the same time, Tamil patients from Vavuniya and Mannar Districts, which are in the AT Hospital catchment area, tend to visit or be referred to AT Hospital, depending on their condition (refer to Figure 2 in 3.3.2.5). In addition, the results of the questionnaire survey of Mullaitivu District[44], an ex-LTTE-controlled area, revealed that there were several cases of referrals or transfers to AT Hospital from DGH Mullaitivu before improvement of TH Jaffna, even after the end of ethnic conflict. Currently, although TH Jaffna has improved, there are still some cases of referrals or transfers from DGH Myllaitivu to AT Hospital, such as to the neurosurgery clinic, which is not available at TH Jaffna[45]. Thus, it is said that the project has contributed to providing advanced healthcare services to the north-central area, as well as ex-LTTE-controlled areas.

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take days off on weekdays because some clinics open on Saturdays and Sundays.

[41] Some respondents commented that they received advanced healthcare services at hospitals in other districts such as Colombo or Kandy because they felt that AT Hospital healthcare services were not reliable. However, after the improvement of AT Hospital through the project, they feel that the quality of healthcare services has improved and that they have become more reliable. By receiving healthcare services at AT Hospital instead of in other districts, they can save money on transportation.

[42] Interview with MOH, AT Hospital and DGH Vavuniya and the results of the questionnaire survey of Tamil patients.

[43] Survey of 30 Tamil patients in DGH Vavuniya and 20 Tamil outpatients who have received healthcare services at AT Hospital. They were mostly residents of Vavuniya because more than half of the samples were collected in DGH Vavuniya.

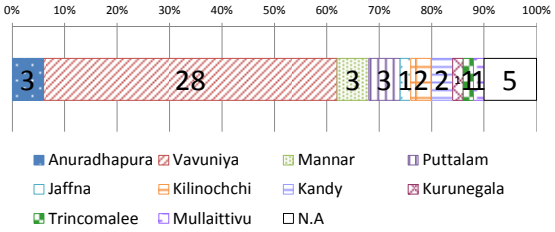
[44] Survey of 31 Tamil patients in DGH Mullaitivu who were living in Mullaitivu District before the end of ethnic conflict, Director of DGH Mullaitivu and Regional Director of health services of Mullaitivu.

[45] The number of referrals in 2013 from DGH Mullaitivu to AT Hospital was 29 and transfers were 23. (Result of questionnaire for DGH Mullaitivu)

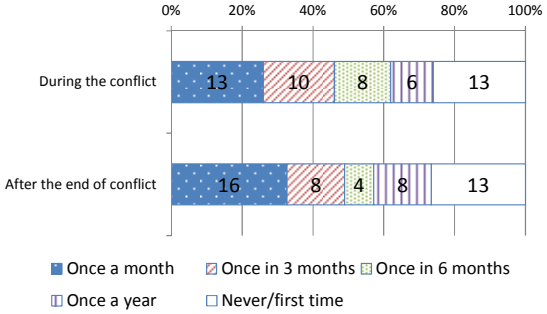
Box 4 Results of questionnaire survey of Tamil patients

<Survey of DGH Vavuniya and AT Hospital>

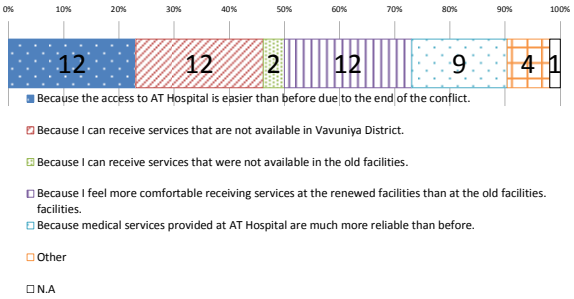
■Residence of respondents



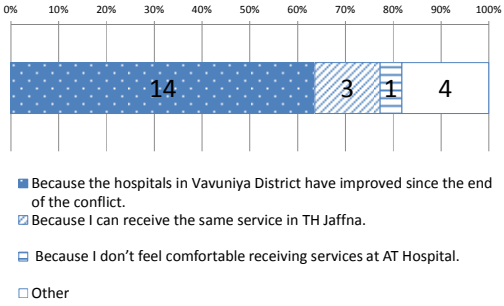
■Frequency of visiting AT Hospital
(During the conflict/after the end of the conflict)



■Why did the frequency of visits to AT Hospital increase after the end of the conflict? *(Multiple answers)*

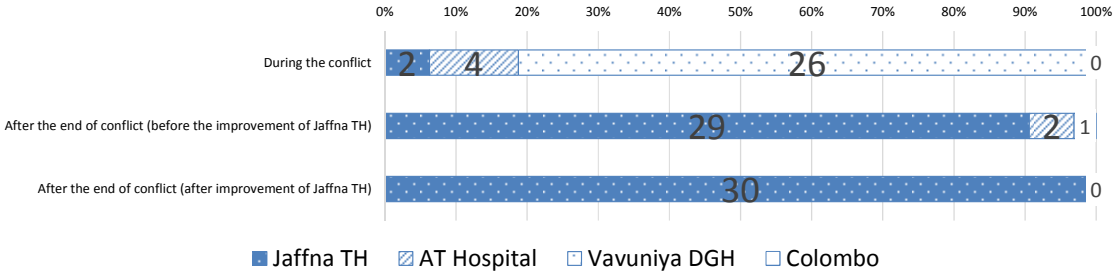


■Why did the frequency of visits to AT Hospital decrease after the end of the conflict? *(Multiple answers)*



<Survey at DGH Mullaitivu>

■Where did (do) you receive healthcare services in cases when you needed (need) advanced healthcare care services?
(During the conflict/After the end of conflict (before improvement of TH Jaffna)/After the end of conflict (after improvement of TH Jaffna)



Note: In fact, there were many cases referred or transferred to AT Hospital from DGH Vavuniya during the conflict period, thus patients that received healthcare at DGH Vavuniya during the conflict period may also be counted at AT Hospital.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

At the time of project planning, there was a negative impact on the environment. The existing drainage treatment plant was exceeding its capacity and drainage water that did not meet Sri Lankan quality standards was discharged to a lake. As a result, the burden on environment was identified .The project contributed to reducing its burden on the environment by constructing a new

wastewater treatment plant for drainage from the new building. Maintenance of the wastewater treatment plant is managed by an outsourced company, which maintains regular maintenance records. Thus, no environmental challenges have been observed.

Regarding medical waste disposal, waste is collected at the unit level such as at clinics, wards, and operation rooms, according to guidelines supplied by the infection control unit[46] of AT Hospital and is disposed under the unit's supervision. Therefore, no negative impact has been identified.

3.3.2.2 Land Acquisition and Resettlement

Land acquisition and resettlement were not required, as the project was an improvement of the existing AT Hospital facilities.

3.3.2.3 Contribution to Strengthening Function as a Teaching Hospital

As stated above, the AT Hospital's function as a teaching hospital has been strengthened by the improvement of the PU since in February 2012. Since the PU started functioning and hospital wards were improved, medical faculty students from Rajarata University could receive practical training at the PU wards. Practical training could also be conducted at the outpatient clinics because the Outpatient Department building was constructed and provided an improved environment for practical training[47]. Thus, the project has contributed to strengthening the functions of AT Hospital as a teaching hospital. It also can be said that the project indirectly contributed to human resource development of medical personnel as medical faculty students become medical doctors in the future after they graduate from Rajarata University.

3.3.2.4 Enhancement of Medical Staff Motivation

According to the questionnaire survey of medical staff, 85 percent responded that their work motivation increased due to the improvement of facilities and medical equipment through the project. The reasons described for enhanced motivation were "stress relief through the improvement of the work environment", "being able to provide appropriate medical treatment due to the improvement of facilities and medical equipment", and "the provision of private rooms". Although it was not part of the project, installation of an air conditioning system in the consultation room by the Sri Lankan side was a significant reason for increased work motivation and was pointed out by 14 staff members. In addition, the results of the questionnaire survey of outpatients also showed the satisfaction rate of medical staff performance improved greatly compared to before (refer to Box 2 in 3.2.2.2). Outpatients commented that staff were kinder than before, that their

[46] The unit in charge of surveillance of hospital infections, follow-up of infection control situations, and the development of infection control policies, etc.

[47] Interview with Rajarata University medical faculty students. 45 students (15 students/group × 3 groups), two groups in wards and one group in the outpatient department on rotation, received practical training at the time of the ex-post evaluation survey in January 2014.

services were more quickly than before etc. Therefore, it can be considered that the increased work motivation of medical staff through the project led to shifts in their performance at work.

3.3.2.5 Increasing Number of Non-Referral Patients

According to the interview with AT Hospital, the number of non-referral patients who visit AT Hospital directly without being referred from a lower-level hospital has increased due to the improvement of AT Hospital through the project. Although referral numbers from lower-level hospitals have not been recorded at AT Hospital, it is possible to assume from the results of the beneficiary survey that the referral system[48] is functioning to some extent (refer to Figure 2 below). However, there are many non-referral patients, such as in the walk-in clinic due to inadequate facilities of lower-level hospitals. In addition, there are cases where patients who received consultations at private hospitals come directly in order to receive consultations from the same consultants, as many consultants work both at AT Hospital and private hospitals. Also of concern, the counter referral system[49], in which patients in recovery after receiving treatment at an advanced healthcare hospital are referred back to lower-level hospitals, does not function properly[50].

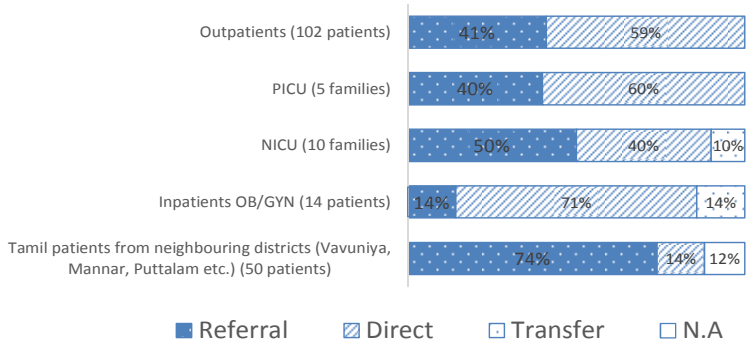


Figure 2 Mode of consultation according to AT Hospital patient questionnaire survey

As stated above, the number of outpatients and OB/GYN operations has increased, and the NICU bed occupancy rate has been improved by the implementation of the project. Indirect impacts through the project, such as enhancement of the AT Hospital Master Plan and improvement of Sri Lanka's health indices, have not been seen yet. The quality of healthcare services of AT Hospital has been improved through the project, and AT Hospital has been able to provide quality healthcare services to its catchment area and ex-LTTE controlled areas. It also has been identified that the project has contributed to enhancing the motivation of hospital staff in their work, as well as strengthening the function of AT Hospital as a teaching hospital.

Therefore, the project has largely achieved its objectives and its effectiveness and impact are high.

[48] System by which patients are not handled by lower-level hospitals and are referred or transferred to higher-level hospitals with advanced medical facilities.
[49] Process by which patients are referred back to a lower-level hospital from a higher-level hospital after they recover after receiving treatment using advanced medical facilities.
[50] Interview with AT Hospital and MOH staff.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Details of the outputs of the project are shown in Table 6. Although there were minor changes of layout and specifications of medical equipment, these changes were appropriate[51].

Table 6 Planned and Actual Outputs

Planned			Actual	Changes from the plan
Construction of facilities				
Outpatients Department Building	Pent-house	Air conditioning machine area, elevated water tank, elevator machine room, electricity room	Almost as planned	-Extension of the connecting corridor to the new building -Pharmacy: Change of layout due to the revision of medicine control procedures in AT Hospital -Orthodontic: Change of layout so that consultants can see patients in a consultant room as AT Hospital purchased a dental unit and chair -PICU: Division of staff room for technical staff working night shift and for general staff -NICU: Installation of window connecting the operation room and intensive care unit in order to transfer new-born babies, and installation of a counselling room and storage room -Walk-in clinic: Installation of consultant room in injection room because of revised MOH policy to strengthen preventive medicine
	2nd floor	OB/GYN operations department, surgical sterilisation department, PICU, NICU		
	1st floor	Special outpatient department (internal medicine, ENT department, special dentistry, etc.), endoscopy department, physiology testing (electrocardiogram (ECG), electroencephalogram (EEG), etc.), laboratory		
	Ground floor	Emergency treatment unit, walk-in clinic, special outpatient department (surgery department, OB/GYN department, paediatrics department, etc.), pharmacy, reception		
Generator Room	1st floor	Electricity room	Almost as planned	-Moved construction location 5.9 metres in order to use hospital premises more effectively in the future.
	Ground floor	Power generation room, generator, automatic voltage regulator, main low-tension switchboard, automatic change-over switch, automatic generator starting panel, automatic synchronisation panel		
Wastewater Treatment Plant	-	Machine room, sedimentation tank, rotating-disk contact tank, sludge treatment facility, disinfection and discharge facility	As planned	
Main equipment（total 122 items）				
OB/GYN Operation Department		Anaesthetic machine, theatre lamp, patient monitor, theatre table, defibrillator with monitor, cautery unit, scrub-up sink, laparoscope set, hysteroscope, infant warmer, autoclave, patient bed, etc.	Almost as planned	-Change in specification of sterilising container set
Neonatal/Paediatric ICU		Ventilator with C-pap, ICU bed, incubator, patient monitor, syringe pump, phototherapy unit, infant warmer, defibrillator with monitor, blood gas analyser, mobile X-ray machine, etc.	As planned	None

[51] Interview with AT Hospital and MOH , and reference documents provided by JICA.

Outpatient Department	Spirometer, dermatology cautery unit, US scan (B/W), ENT microscope, ENT treatment unit, dental unit with chair, panoramic and cephalometric X-ray unit, endoscope, ECG monitor, emergency bed, patient monitor, infusion pump, spectrophotometer, microscope, tablet counting machine, electrical nerves stimulator unit, bone densitometer, electromyogram (EMG) machine, haematology analyser, interferential therapy unit, etc.	Almost as planned	-Addition of laboratory vacuum for micromotor -Change in specification of medicine cabinet -Change in specification of wooden bench for waiting area

Source: Reference document provided by JICA

The main outputs that were to be undertaken by the Sri Lankan side, such as demolition of existing buildings, land levelling, and exterior work, were carried out as planned without any significant delays[52]. Although it was outside of the project, an air conditioning system was installed in the consultation rooms of the outpatient clinics after the project by Sri Lankan funds in order to meet doctors' union demands.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The actual project cost borne by the Japanese side was lower than the planned cost. The total cost was 1,690 million yen [1,343 million yen (Phase I) and 347 million yen (Phase II)], which was 94 percent of the planned cost of 1,803 million yen[53]. The actual cost borne by the Sri Lankan side was 592 million Sri Lanka rupees (the conversion to yen is 445 million yen), which was higher than the planned cost of 573 million Sri Lankan rupees (431 million yen). The additional costs of the Sri Lankan side were due to excess exterior works and the installation of an air conditioning system in the outpatient clinics[54].

3.4.2.2 Project Period

The project period, from the start date of the detailed design survey up to the project completion, was 30 months, which exceeded the planned project period of 28 months (107 percent of the planned project period). This excess was due to the following main three reasons: (1) there were no bidders for contractors because of security concerns as the project target area was near the conflict-affected area; (2) it was necessary to divide the project into two phases comprising construction of buildings (Phase I) and instalment of medical equipment and remaining building

[52] Interview with the main consultants and MOH.

[53] The planned cost for the Japanese side was originally 1,803 million yen, which was the maximum grant for the Exchange of Notes. However, it was difficult for the project to implement all components planned within the maximum grant due to dramatic price increases. It was subsequently decided to divide the project into two phases: construction of the building (Phase I) and instalment of medical equipment and remaining building construction (Phase II). As a result, an additional Exchange of Notes was signed as Phase II, with an additional maximum grant of 390 million yen. (Reference document provided by JICA) As the additional Exchange of Notes was only signed after the project had already commenced, it is not factored in as part of the original planned cost. Thus, the maximum grant for the original Exchange of Notes (1,803 million yen) was regarded as the planned project cost.

[54] Although the planned cost was noted as 573 million Sri Lankan rupees (573 million yen) in the basic design study report, both the planned and actual costs were to be based on the exchange rate at the time of project completion in September 2010 (1 Sri Lankan rupee = 0.753 yen) to enable comparison between the planned and actual costs. The cost of installation of the air conditioning system, although not part of the project, was also included in the actual cost as its unit cost was not able to be confirmed.

construction (Phase II) due to drastic price increases; and (3) minor delays in construction work[55].

As seen above, although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The O&M system was established before the implementation of the project, and there were no changes at the time of ex-post evaluation. The O&M structural chart showing the interactions between the MOH and AT Hospital is shown in Figure 3 below.

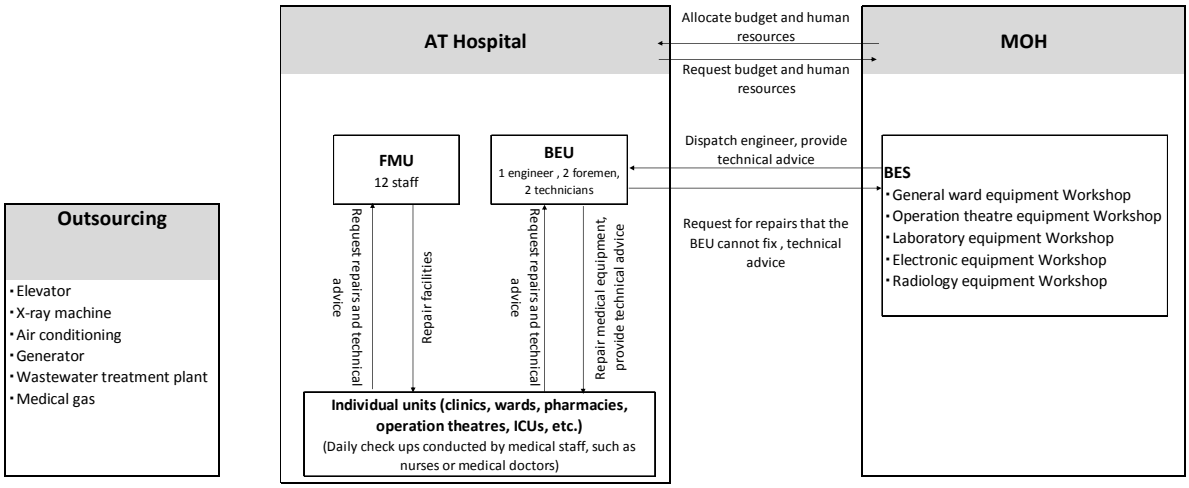


Figure 3 Structural chart of O&M at AT Hospital

The maintenance of the main facilities and some medical equipment is outsourced. O&M staff at AT Hospital belong to the Facilities Maintenance Unit (FMU), which maintains facilities, and the Bio-medical Engineering Unit (BEU), which maintains medical equipment. Although no major problems were identified related to daily maintenance, there are only 12 staff members in the FMU (the required number is 20), and two BEU foremen concurrently hold the post of technician as the BEU has only two technicians (the required number is four)[56].

The number of hospital staff[57] increased to 2,332 (as at February 2014) from 1,484 (as at 2006) as AT Hospital expanded its functions, such as by establishing the PU. Although it is difficult to secure personnel such as medical doctors, physiotherapists, pharmacists, electrocardiographers and midwives, as those specialities are in short supply throughout the whole of Sri Lanka[58], around 92

[55] Interview with main consultant.
[56] Interview with AT Hospital (overseer of FMU and engineer of BEU).
[57] Medical staff (consultants, medical doctors, nurses, paramedical staff, etc.) and operational staff (technical staff and ordinary staff).
[58] There are insufficient human resources such as medical doctors, nurses, physiotherapists, pharmacists,

percent of the required personnel of AT Hospital (2,536) were assigned at the time of ex-post evaluation[59].

Therefore, although there are insufficient staff numbers in some occupations, a basic O&M system has been established and it can be said that there are no major challenges from an institutional perspective.

3.5.2 Technical Aspects of Operation and Maintenance

Since almost all medical equipment procured by the project was renewal of old equipment, no clinics have reported having difficulty using medical equipment, according to responses to questionnaires given to each clinic. As for the O&M of medical equipment procured by the project, O&M manuals provided by the project at the time of completion of the project are referred to by Bio-medical Engineering Services (BES) in the MOH, and the BEU of AT Hospital, as needed. Repairs that require special technical skills and cannot be dealt with by the BEU or BES are outsourced. Thus, there are no major issues related to the technical aspects of O&M of medical equipment. However, it was noted by a BEU engineer that BEU staff need training for new medical equipment, as medical equipment is constantly updated and requires new knowledge.

Regarding the O&M of hospital facilities, maintenance of main facilities such as elevators, air conditioning systems, and wastewater treatment plants are outsourced. General facility maintenance other than those listed above, such as repairs to clogged water pipes, replacement of light bulbs, repairs to medical instruments like beds, and repairs to doors are done by the FMU. However, there are no technically skilled staff members in FMU, as general staff are appointed by the MOH and subsequently allocated to FMU. According to interviews with clinic, repairs that are routine for FMU staff, such as repairing malfunctioning doors, sink leaks, and toilet blockages, are unable to be completed at times due to the lack of technical skills. Although provision of technical training for FMU staff is the responsibility of AT Hospital, technical training is rarely conducted due to insufficient budget. Therefore, there are challenges related to the technical aspects of O&M[60].

3.5.3 Financial Aspects of Operation and Maintenance

AT Hospital expenditures for O&M are all covered by budget allocations from the MOH, as all public healthcare services are available to all citizens free of charge in Sri Lanka. Actual expenditures of the MOH and AT Hospital have increased year by year from 2006, the year that AT

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electorocardiographers and midwives in Sri Lanka. According to interviews with MOH staff, the MOH invests in securing new human resources. For instance, the MOH tried to conduct interviews with recent graduates from advanced level exams for recruitment into paramedical schools for nursing, physiotherapy, medical laboratory science, pharmaceutics, medical research, etc. This enabled the MOH to secure between 150 and 2,000 medical personnel per occupation per year, but outflow of human resources from the country presents an ongoing problem.

[59] Only around 75 percent of required personnel of AT Hospital (1,980) were assigned in 2006 (based on analysis from the basic design study report).

[60] The MOH gave the example of District General Hospital Ampara (DGH Ampara) as demonstrating good practice by providing FMU staff technical training. DGH Ampara provided technical training to their FMU staff through a technical school located near the hospital.

Hospital was upgraded to a teaching hospital. It can be determined that the appropriate budget for O&M for a teaching hospital has been secured for AT Hospital since 2009, as the percentage of AT Hospital expenditures from the MOH budget was stable (refer to Table 7). According to an interview with MOH, appropriate budget will be allocated to AT Hospital from the MOH budget in the future as budget allocation is based on the actual expenditure from the previous year. Additional medical equipment maintenance costs can also be requested to BES by the BEU in cases where medical equipment maintenance expenditures exceed the AT Hospital budget. Although this procedure usually takes time and causes delays in the actual repair, no significant issues have been identified that interfere with O&M[61]. Therefore, it can be said that the minimum essential budget for O&M is secured.

Table 7 Actual expenditure of the MOH and AT Hospital

(Units: thousand Sri Lankan rupees)

	2006	2007	2008	2009	2010	2011	2012	2013
MOH	37,481,726	49,584,482	46,898,023	48,975,888	53,096,550	64,816,004	68,060,192	75,088,404
AT Hospital	549,632	758,316	820,542	1,080,650	1,136,815	1,255,160	1,511,240	1,808,102
Actual expenditure related to O&M at AT Hospital								
Personnel	391,373	576,544	641,987	803,279	830,458	929,747	1,134,129	1,331,330
Medical equipment and facility maintenance	11,224	17,171	15,225	19,279	17,890	23,829	31,579	23,811
Electricity, water	59,657	51,054	47,032	97,809	97,854	93,797	90,310	139,132

Source: Document provided by the MOH and questionnaire responses from AT Hospital
Note: Rupees were rounded down to the thousand in the AT Hospital expenditure table above.

3.5.4 Current Status of Operation and Maintenance

According to the results of the questionnaire survey of each clinic, although O&M of facilities and medical equipment procured by the project are being undertaken properly, there were some minor issues. As for O&M of major medical equipment, the malfunction of a blood gas analyser provided to the PICU, and defects in the window panels of incubators provided to the NICU, were identified. AT Hospital is considering purchasing a new blood gas analyser because it is more cost efficient to replace it with a new model than to repair it as the cost of repair and consumable of current model is higher than the new model[62]. The replacement of the incubator window panels was delayed due to difficulty in finding the required spare parts. This is because the supplier that was appointed as a local agent at the time of medical equipment provision discontinued their service. However, it was identified in the second field survey that the BES has ordered the spare part for the window panel from a new appointed supplier and is awaiting delivery after inquiring with the main contractor for medical equipment procurement.

[61] Interview with BEU.
[62] However it is also considered that the reason for increasing repair costs was that AT Hospital did not prepare a contract for annual maintenance services, which was recommended at the project planning stage. According to the BEU, repair costs and consumables are free of charge or inexpensive during the warranty period when the new model is purchased.

Regarding O&M of facilities, the infectious room in the PICU is utilised as storage space for broken medical equipment and not for its original purpose[63]. Other issues identified were the malfunction of clinic doors, water leaking from sinks, and blockages in patient toilets. Wooden shelves attached under sinks have been damaged by leaking water and are unable to be used for storage in most clinics. In addition, it has been observed that roof tiles of the Outpatient Department building are in disrepair due to monkeys.

As stated above, some problems have been observed in terms of institutional and technical aspects of O&M and current status. Therefore, sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project, the improvement of facilities and medical equipment in the Outpatient Department, OB/GYN Operation Department, the PICU and the NICU at AT Hospital, was implemented in order to enhance quality healthcare services for the residents of the AT Hospital catchment area.

The relevance of this project is high as it is consistent with the national development policy and needs of Sri Lanka both at the time of project planning and the time of ex-post evaluation, as well as with Japan's aid policy at the time of project planning. After the project, the number of outpatients and number of OB/GYN operations have increased, and the bed occupancy rate of the NICU has improved. Furthermore, the level of patient and medical staff satisfaction was found to be high. AT Hospital staff have become more efficient in their work and the quality of healthcare services has improved after the project. Thus, it can be concluded that the project has produced a sufficient effect. In addition, this project has contributed to the enhancement of AT Hospital's function as a teaching hospital, and to the provision of quality healthcare services to its catchment area and ex-LTTE-controlled areas as the tertiary hospital in North Central Province. Taking this into consideration, the effectiveness and impact of the project are high. The efficiency of the project is fair as project costs were within the plan, while the project period exceeded the plan. In terms of O&M, the O&M system was established and the minimum budget was continuously secured, but there are some challenges regarding the technical skills of O&M staff. Therefore, the sustainability of the project effect is fair.

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

4.2 Recommendations

4.2.1 Implementing Agency

<AT Hospital>

4.2.1.1 Strengthening of the O&M System

Through the implementation of the project, AT Hospital has strengthened its function as a top

[63] This is because of insufficient space for storing malfunctioning ventilators that were procured by the MOH, not the project.

referral health facility in North Central Province and has come to play the important role of providing advanced healthcare services in the area. Although there are some challenges regarding FMU staff skills, basic O&M of facilities and medical equipment is currently taking place. However, facilities and medical equipment are repaired only when issues are identified. Daily inspections and preventive maintenance are not currently being undertaken by BEU and FMU. To undertake daily inspections and preventive maintenance, the appointment of more O&M staff by the MOH is required. At the same time, AT Hospital is expected to take measures to improve FMU staff skills as much as possible within their limited budget, such as by strengthening proper handover of FMU duties between predecessor and successor, and sending at least one FMU staff member to technical training who can then transfer knowledge to other FMU staff.

4.2.1.2 Restore Proper Use of PICU Infectious Rooms

Storage space is essential for the PICU because of its requirement for a large quantity of medical equipment. Currently, the infectious rooms provided by the project are utilised as storage rooms for broken medical equipment. AT Hospital should remedy this situation immediately as the accommodation of infectious patients in general rooms together with non-infectious patients leads to the risk of infection. When this issue was pointed out to AT Hospital during the second field survey of the ex-post evaluation, the hospital recognised the importance of this issue and its urgency. Therefore, it is expected that AT Hospital will take appropriate action to secure the infectious room by identifying other storage space for broken equipment or considering its disposal.

4.2.1.3 Keep Records for the Number of Referrals

The results of the beneficiary survey indicated that the referral system is functioning to some extent. However, the amount of patients arriving directly without referral letters has increased due to the improvement of AT Hospital by the project. This is because facilities at some lower-level hospitals remain unimproved, and because some consultants work at both AT hospital and private hospitals[64]. However, it is difficult to ascertain the specific details as there are no records of the number of referrals. Keeping track of the number of referrals would be the first step in understanding the current situation in order to enhance the referral system (including counter referrals), and it is important for AT Hospital to strengthen cooperation with lower-level hospitals.

<Ministry of Health>

4.2.1.4 Capacity Development of O&M Staff

O&M of the main facilities and medical equipment of AT Hospital are outsourced. FMU staff undertake other minor tasks that are not outsourced, such as repairs to clogged water pipes. However, having skilled staff in facility maintenance is essential to AT Hospital in order to

[64] Patients who receive consultation at private hospitals come to AT hospital in order to receive consultation from the same consultants for free.

implement periodical check-ups and appropriate maintenance. Currently, most FMU staff do not have sufficient technical skills in facility maintenance, as they are appointed as general staff and allocated to FMU. Provision of technical training to FMU staff is the responsibility of AT Hospital, however, it has seldom been provided due to insufficient budget. To make matters worse, there is also the challenge of staff reassignment. Even if staff were provided technical training or on-the-job training at a particular hospital, they are not necessarily allocated to the FMU at another hospital when transferred. They are usually appointed as general staff across several units. This situation makes it difficult for FMU staff to handover technical skills. Thus, the challenge of insufficient skills of FMU staff will also continuously be a challenge for other hospitals. In order to strengthen sustainable facility O&M, the MOH is expected to take action to overcome this challenge, such as through the appointment of at least one technical staff member to the FMU at each hospital. In addition, it is recommended that O&M training for medical equipment be conducted by the MOH for BES staff, in case new medical equipment is procured.

4.2.1.5 Strengthening of Medical Human Resources

AT Hospital faces the challenge of insufficient personnel in some specialities as Sri Lanka has insufficient medical human resources such as medical doctors, nurses, physiotherapists, pharmacists, electrocardiographers and midwives. Strengthening of human resources is expected in the future because the MOH is currently putting efforts into enhancing recruitment of new medical personnel. The MOH is expected to continue to invest in securing medical human resources, as well as their continuous development. It is recommended that the MOH further appoint medical personnel according to AT Hospital requests. Furthermore, an O&M system for handling daily maintenance has been established, but the current number of O&M staff is insufficient to carry out periodical check-ups and preventive maintenance work. Thus, the MOH also needs to consider strengthening human resource development of technical personnel of O&M and the securement of those personnel.

4.2.1.6 Close Communication with Manufacturer and Local Agent Suppliers

It was identified that the replacement of incubator window panels was delayed due to difficulties in finding spare parts because the supplier that was appointed as a local agent at the time of the original provision of the medical equipment discontinued their service. Although this problem has been resolved by BES by requesting that the main contractor of the project introduce a new appointed supplier, it is important for efficient O&M that the MOH monitors the condition of local agent suppliers. In order do to this, it is recommended that close communication between the MOH and local agent suppliers be maintained regularly, instead of only when equipment needs repairing.

4.2.2 Recommendations to JICA

There is no particular recommendation to JICA.

4.3 Lessons Learned

4.3.1 Good Practice of Maintaining Quality of Healthcare Services as a Tertiary Hospital

AT Hospital's practice of reducing the frequency of patient visits by adjusting next consultation intervals depending on the severity of the patient's condition has contributed to enhancing the effectiveness of the project. As stated above, the referral system is functioning to some extent at AT Hospital. However, the incidence of patients with mild conditions that could receive consultation at a lower-level hospital arriving without a referral letter has increased after the improvement of the outpatient clinics through the project. To prevent overcrowding in outpatient clinics, AT Hospital began in 2011 the practice of adjusting next consultation intervals from one month to two months, depending on the patient's condition. Although the total number of outpatients has tended to increase year by year, AT Hospital can maintain its quality of healthcare services by preventing overcrowding. Ideally, advanced health facilities, such as AT Hospital, should concentrate on caring for patients with serious conditions, but it is understandable from the patient psychological perspective that they prefer better hospitals. Under these circumstances, this practice is a good example of a service provider that is a tertiary hospital making efforts to maintain the quality of healthcare services by placing restrictions in order to give priority to patients who need advanced healthcare.

Therefore, this good practice is applicable to similar projects in other countries in which referral systems are not functioning well and where it is expected that the number of non-referral patients with mild conditions will increase after the implementation of the project. Such practices would be instrumental in enhancing and maintaining the effectiveness of the project. Furthermore, in cases where similar projects are implemented in other countries in which lower-level hospitals are improved to some extent, prior discussion with the implementing agency about measures that allow the target tertiary hospital to prioritise to ensure provision of advanced healthcare services after the project, such as strengthening the counter referral system, is essential.

Kingdom of Cambodia

Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Improvement of the Kampong Cham Hospital in Kampong Cham Province"

External Evaluator: Kyoko Harada

Foundation for Advanced Studies on International Development

0. Summary

This project aimed to improve the healthcare services of Kampong Cham province and neighbouring areas by upgrading the Surgery Ward, Obstetrics/Gynaecology Ward, Operation Theatre, Emergency and Imaging Building of the Kampong Cham Provincial Hospital. Because this project aimed to improve deteriorated health facilities and equipment for a top referral hospital at the provincial level, it is highly relevant to the priorities of Cambodia's health policy, which aims to improve healthcare services and respond to the development needs of the country. In the same way, the project supported Japanese assistance policies at the time of planning, which promoted Basic Human Needs (BHNs)[1] of the socially vulnerable in the health sector. After the project completion, the number of hospital users (including poor residents from Kampong Cham province as well as from outside the province) has increased and most of the facilities and equipment provided by the project have been utilised effectively. Users have also indicated high levels of satisfaction. Furthermore, the project has strengthened the function of the hospital as a top referral hospital and has contributed to capacity building of health workers in the region. Taking these facts into consideration, the effectiveness and impact of the project can be evaluated as high. Although the project cost remained within the plan, the project period slightly exceeded the plan; therefore, the efficiency of the project is rated as fair. Despite a lack of technical knowledge and manpower, the status of the operation and maintenance of the facilities and equipment is currently good. The sustainability of the project effect is therefore fair.

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

1. Project Description

Project Location

Kampong Cham Provincial Hospital

Obstetrics/Gynaecology and Surgery Ward

[1] BHNs are vital needs for human survival, such as the need for food, water, primary health and education, etc.

1.1 Background

The Kingdom of Cambodia (Cambodia), located in the Indochinese peninsula, experienced more than 20 years of civil war from the year 1970, yet has continued to enjoy stable economic growth in the same way as its Association of Southeast Asian Nations (ASEAN)[2] neighbours such as Thailand, Laos and Vietnam. However, the huge loss of human resources due to the civil war led to a severe decline in the number of health professionals such as doctors, nurses and midwives, which had not been remedied until now.

At the time of the Basic Design Study (BD) of the project, health facilities and equipment throughout the country remained undeveloped, which prevented the establishment of a strong nationwide health system. Particularly at provincial and lower administrative levels, quantitative and qualitative deterioration of healthcare services was a serious issue due to a lack of manpower and decrepit facilities. Eventually, this also affected Cambodia's national health indicators dropping to lower level compared to those of other ASEAN countries at that time.

In order to tackle these issues and develop the health sector, the Government of Cambodia launched its *Health Sector Strategic Plan 2003–2007* (HSP), focusing on capacity building of health-related human resources, as well as improvement of healthcare services. At the same time, the Government of Cambodia formulated the *Plan for Improving Provincial Hospitals and Strengthening Provincial Schools for Nursing and Midwifery*. The plan targeted provincial hospitals and nursing schools that were highly in need of improvement in the Western Region, the Eastern Region and the North Western Region in particular[3]. The Government of Cambodia requested grand aid assistance from the Government of Japan to support the construction of facilities and procurement of equipment under the plan.

In response to the request, the Government of Japan implemented a preliminary survey. The survey team concluded by selecting Kampong Cham Provincial Hospital in Kampong Cham province as a target hospital for the project because it was assumed to be the most effective support. Kampong Cham province had the largest population among the 24 provinces at the time of the survey. Kampong Cham Provincial Hospital was the only facility providing surgical operations in Kampong Cham province and was the top referral hospital not only in the province, but also in the whole eastern region of Cambodia. Thus, the hospital admitted many patients that were unable to access hospitals in Phnom Penh, the capital of Cambodia, due to geographical constraints or poverty. The project was also expected to benefit the north of the province, in which many poor households were identified.

[2] ASEAN was established in 1967 and consists of 10 member countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam,.
[3] There were 24 provinces in Cambodia in 2006.

1.2 Project Outline

The objective of this project was to improve the healthcare services in Kampong Cham province and neighbouring areas by upgrading facilities and equipment of Surgery Ward, Obstetrics/Gynaecology Ward, Operation Theatre Emergency and Imaging Building at Kampong Cham Provincial Hospital.

Grant Limit / Actual Grant Amount	1,039 million yen / 963 million yen
Exchange of Notes Date	May 2008
Implementing Agency	- Ministry of Health - Kampong Cham Provincial Health Department - Kampong Cham Provincial Hospital
Project Completion Date	March 2011
Main Contractor(s)	Construction: Kanto Construction Co., Ltd. Sanpo International Co., Ltd. Procurement of equipment: Nissei Trading Co., Ltd.
Main Consultant(s)	Azusa Sekkei Co., Ltd
Basic Design	April 2006–March 2007
Detailed Design	January 2008–December 2008
Related Projects	[Technical Cooperation] Project for Promotion of Medical Equipment Management System (2006–2008), Project for Improving Maternal and Child Health Services in Rural Areas of Cambodia (2007–2010), Project for Strengthening Medical Equipment Management in Referral Hospitals (2009–2014), Project for Improving Maternal and Newborn Care through Midwifery Capacity Development (2010–2015) [Grant Aid] Project for Renovation of Technical School for Medical Care (2002–2006), Project for Infectious Diseases Control (2009–2011) [Grant Assistance for Grassroots Human Security Project] Project for Constructing Training Ward at Kampong Cham Provincial Referral Hospital (2012–2013) [Other Aid from International Donors] Health Sector Support Project (HSSP) by World Bank, Asia Development Bank, and DFID (the UK) (HSSP 1: 2003–2008, HSSP 2: 2009–2013)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kyoko Harada, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: October 2013–October 2014

Duration of the Field Study: January 12, 2014–January 25, 2014, March 31, 2014–April 4, 2014

3. Results of the Evaluation (Overall Rating: B[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance to the Development Plan of Cambodia

In the *National Strategic Development Plan 2006–2010* (NSDP 1) formulated in 2004, "Capacity Building and Human Resource Development" was set out as a priority for improving healthcare services. The *National Strategic Development Plan Update 2009–2013* (NSDP 2) went on to specify action plans for developing human resources to achieve the key policy strategy of "Enhancing Health Services".

HSP, which comprised effective health policies at the time of planning the project, aimed to improve the health conditions of Cambodians as well as to contribute to poverty alleviation and socio-economic development. As one of the core strategies of HSP, "Health Service Delivery" set out several actions. These included improving coverage and access to healthcare services nationwide, especially for the poor and other vulnerable groups, through expanding provision of health facilities, strengthening the delivery of good quality primary healthcare, and improving the quality of healthcare services by all health providers through the complementary package of activities (CPA)[6] and the minimum package of activities (MPA)[7]. The *Health Sector Strategic Plan 2008–2015* (HSP 2) is currently in effect and comprises three health program areas: 1. Reproductive, Maternal, Newborn and Child Health, 2. Communicable Diseases, and 3. Non-Communicable Diseases and Other Health Problems. These are implemented through a set of five cross-cutting health strategies: 1. Health Service Delivery, 2. Healthcare Financing, 3. Human Resources for Health, 4. Health Information Systems, and 5. Health System Governance, which form a strategic framework in order to develop the health sector and also to improve healthcare services.

The *Cambodia Emergency Obstetrics and Newborn Care (EmONC) Improvement Plan 2010–2015*, which was formulated to reduce maternal and newborn mortality and morbidity, set objectives to

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[5] ③ High, ② Fair, ① Low
[6] CPA is the package of standardised services provided by the second and third level of health facilities.
[7] MPA is the package of basic services provided by the first level of health facilities.

improve coverage and utilisation of quality EmONC services, particularly among the poor and vulnerable.

As can be seen from the above, the project was highly relevant to Cambodia's policies at the time of both planning and the ex-post evaluation survey because the objectives of the project supported the improvement of hospital healthcare services at the provincial level. Also the project corresponds to Cambodia's maternal and child healthcare policies as well as EmONC since the project contributes the improvement of maternal and child healthcare through the improvement of the Obstetrics/Gynaecology and Emergency Building.

3.1.2 Relevance to the Development Needs of Cambodia

According to the BD report, Kampong Cham Provincial Hospital serviced the largest population[8] in Cambodia at that time and admitted a large number of patients from surrounding provinces as a top referral hospital in the eastern region. When compared to urban areas, most of the health facilities at the provincial and lower administrative levels remained undeveloped. Kampong Cham Provincial Hospital suffered from breakdown of medical equipment and potential collapse of facilities so on, which affected the healthcare services of the hospital.

This project aimed to reinforce the function of Kampong Cham Provincial Hospital as a top referral hospital by upgrading facilities and equipment in order to improve the healthcare services in Kampong Cham province and neighbouring areas. Of note, Kampong Cham Provincial Hospital admitted not only the residential population of approximately 270,000 living near the hospital, but also the further 1.8 million people living in Kampong Cham province. In addition, 300,000 poor residents[9] around Kampong Cham province who were unable to access quality healthcare services due to economic and geographic constraints also accessed the services of Kampong Cham Provincial Hospital.

Provincial hospitals are expected to play an important role in developing human resources for their respective provinces and to act as regional referral hospitals in order to tackle the chronic lack of health workers at the provincial or lower levels of health facilities. This has been one of the crucial issues in the health sector of Cambodia. Insufficient health services and a lack of skills in the lower-level health institutions have led to a perception of unreliability among patients. This has prompted many patients to go to upper-level hospitals such as national or provincial hospitals without referral letters and as a consequence, the referral system has been undermined. In order to

[8] At the time of planning, the BD report described the approximate population as 1,830,722 (Annual Health Statistics 2004) and 1,827,305 at the time of ex-post evaluation (Annual Health Statistics 2012). Kampong Cham province had the largest population of all Cambodian provinces at both times.

[9] As of 2004

create a strong and functioning referral system, human resource and technical skills development at the provincial and lower-level health facilities is an urgent task.

In this context, the project contributed to strengthening the facilities and equipment of Kampong Cham Provincial Hospital and facilitated clinical and technical training for health workers at lower-level health institutions. It can therefore be concluded that the project responded to both qualitative and quantitative needs of the area in the provision of better healthcare services.

3.1.3 Relevance to Japan's ODA Policy

At the time of planning, Japan's ODA policy (formulated in 2002) identified "Sustainable Economic Growth" and "Poverty Reduction" as areas of focus in Cambodia. One of the priorities, "Supporting Socially Vulnerable People", aimed to fulfil BHNs in the Education and Health sectors, through improving maternal and child healthcare, increasing the number of health workers and providing primary healthcare services in rural areas. This has direct benefits for the poor. Thus, the project is highly relevant to Japan's ODA policy at the time of planning.

This project has been highly relevant to Cambodia's development plan and needs, as well as Japan's ODA policy. Therefore its relevance is evaluated as high.

3.2 Effectiveness[10] (Rating: ③)

3.2.1 Quantitative Effects

Three quantitative outcome indicators, "number of inpatients", "number of operations" and "number of diagnoses through use of medical equipment", were set out in the BD report and have mostly been achieved as noted below. The baseline for the indicators was set as 2005, and they are expected to have further increased by the time of ex-post evaluation.

3.2.1.1 Number of Inpatients

The number of inpatients in the Obstetrics/Gynaecology Ward supported by this project started increasing significantly around 2010 when construction was completed and peaked in 2013. The number of inpatients in the Surgery Ward reached its peak in 2011 but decreased in 2012, although there are still many inpatients being serviced.

Kampong Cham Provincial Hospital has dealt with a rapid increase in outpatients (reference data in Table 1) since the completion of the project in 2011 (as per Table 1). According to the hospital and Kampong Cham Provincial Health Department (PHD) officials, not only residents around the hospital but also people living in neighbouring provinces took note of the

[10] The sub-rating for Effectiveness is to be taken into consideration for the Impact rating.

construction and informed others that new facilities had been built. As a consequence, the number of patients visiting Kampong Cham Provincial Hospital increased.

Table 1: Outcome Indicator - Number of Inpatients

	2005 (Baseline)	2006	2007	2008	2009	2010	2011 (Completion)	2012	2013 (Target)
Surgery	2,414	3,039	3,342	3,314	3,546	4,021	4,580	3,585	3,489
Obstetrics	1,024	458	613	588	956	2,497	3,279	3,194	3,874
Gynaecology	487	320	365	360	440	1,141	1,302	992	949
Outpatient (Reference data)	N/A	26,435	15,941	16,897	15,659	15,930	36,755	43,172	45,317

Source: Basic Design report and Kampong Cham Provincial Hospital

Note: New patients are registered in the Registration Ward then assessed on necessity for hospitalisation. If hospitalisation is not necessary, patients are sent to the health centre nearest to their home. Because of this procedure, the hospital does not identify which clinical department they would have been referred to. Therefore there are no records categorising visitors according to specific departments.

The Cambodian health system categorises each public health facility according to its function and services in terms of levels. Health posts and health centres comprise the first level of facilities. Referral hospitals are categorised as the second level of facilities. National hospitals and some provincial hospitals, such as Kampong Cham Provincial Hospital, are categorised as the third level of facilities, which is the top level of the referral system[11]. Normally when patients wish to be seen in upper-level facilities, a referral letter from a lower-level facility is required. Yet in the Cambodian referral system, it has become common for many patients to visit upper-level facilities without a letter and for the upper-level hospitals to admit them anyway. As a consequence, the referral system has become dysfunctional.

Most patients currently visiting Kampong Cham Provincial Hospital since the project completion do not have referral letters (Table 2), which indicates strong demand for a higher quality of healthcare services from patients than those offered by lower-level facilities.

Table 2: Percentage of Referral Patients in Kampong Cham Provincial Hospital (%)

	2009	2010	2011	2012
Referral patients	12.9	13.6	11.1	8.1
Non-referral patients	87.1	86.4	88.9	91.9

Source: Kampong Cham Provincial Hospital

[11] In order from the lowest level (first level) of facilities: health posts and health centres are categorised as MPA, and referral hospitals at the OD, provincial and national level are categorised as CPA1, CPA2 and CPA3 based on their functions and services. Kampong Cham Provincial Hospital is categorised as CPA3 as a top referral hospital.

The increase in patients at Kampong Cham Provincial Hospital caused a substantial rise in the bed occupancy rate at the Surgery and Obstetrics/Gynaecology Wards. After 2010, the bed occupancy rate of both wards exceeded 100 percent (as shown in Table 3) and the rate of Obstetrics/Gynaecology in 2012 exceeded 200 percent. In response to this situation, the hospital provided extra beds in the corridors of the Obstetrics/Gynaecology Ward for extra patients.

Table 3: Bed Occupancy Rate of the Surgery and Obstetrics/Gynaecology Wards (%)

	2006	2007	2008	2009	2010	2011	2012
Surgery	100	107	97	98	113	122	165
Ob/Gy	87	118	106	144	144	188	208

Source: Kampong Cham Provincial Hospital

Table 3 shows that although the Obstetrics/Gynaecology Ward has been congested, maternal mortality and neonatal mortality have been reduced year by year[12]and it has been identified that the quality of healthcare service has been maintained to an appropriate level in the hospital. In order to reduce congestion, changing the layout of the building has been considered for the Obstetrics/Gynaecology and Surgery Wards, as well as increasing the number of beds.[13] As far as overflow patients are concerned, so far there have been no incidences of patients with referral letters or emergency patients being refused from Kampong Cham Provincial Hospital.

3.2.1.2 Number of Operations

The BD report described Kampong Cham Provincial Hospital as the only facility in Kampong Cham province with sufficient facilities and equipment and highly specialised doctors for surgical operations. The hospital still continues now to fulfil the role of responding to serious cases as well as emergency patients.

Table 4: Outcome Indicator – Number of Operations in Operation Theatre[14] (per year)

	2005 (Baseline)	2006	2007	2008	2009	2010	2011 (Completion)	2012	2013 (Target)
Planned	312	405	460	458	265	454	468	478	380
Emergency	1,357	1,486	1,621	1,516	1,366	2,190	2,290	2,433	2,523
Total	1,669	1,891	2,081	1,974	1,631	2,644	2,758	2,911	2,903

Source: Kampong Cham Provincial Hospital

[12] Maternal mortality rate in Kampong Cham Provincial Hospital: 0.09% (2010), 0.05% (2011), 0.02% (2012). Neonatal mortality rate (below 4 weeks old): 21.14% (2010), 13.19% (2011), 12.44% (2012) (Source: Kampong Cham Provincial Hospital)

[13] Source: Interview with Directors of Kampong Cham Provincial Hospital and PHD.

[14] The number includes operations related to Obstetrics and Gynaecology at the Operation Theatre.

The operation rooms at the Operation Theatre are operating at close to full capacity all the time. From 2010 to 2011 when the project was completed, the number of emergency operations exceeded 2,000 times per year as shown in Table 4. In the delivery room at the Obstetrics/Gynaecology Ward, although two beds for delivery were set by the project, one more bed has been added to respond to rapid increases in deliveries.

According to Table 5, the growth rate of complicated/abnormal deliveries and C-sections indicates that the number of patients requiring a high quality of healthcare services has increased at Kampong Cham Provincial Hospital. The number of normal deliveries, which should be carried out by the first or second-level health facilities, also increased at the same time. It is therefore assumed that there are many non-referral patients also attending Kampong Cham Provincial Hospital.

Table 5: Number of Obstetrics/Gynaecology-Related Operations (per year)

	2006	2007	2008	2009	2010	2011	2012	Average Growth Rate (%)
Normal deliveries	791	950	941	1,315	1,240	1,782	2,168	1.18
Growth rate (%)	-	1.20	0.99	1.40	0.94	1.44	1.22	
Complicated/abnormal deliveries	363	572	538	679	1,237	1,499	1,318	1.24
Growth rate (%)	-	1.58	0.94	1.26	1.82	1.21	0.88	
C-sections	271	371	433	555	683	797	862	1.21
Growth rate (%)	-	1.37	1.17	1.28	1.23	1.17	1.08	
Gynaecology operations	274	261	182	217	289	354	346	1.04
Growth rate (%)	-	0.95	0.70	1.19	1.33	1.22	0.98	
Total	1,699	2,154	2,094	2,766	3,449	4,432	4,694	

Source: Kampong Cham Provincial Hospital

3.2.1.3 Number of Diagnoses through Use of Medical Equipment

The results of the outcome indicators, the numbers of diagnoses through use of medical equipment (such as radiograph, ultrasonic and electrocardiogram (ECG) devices) are shown in Table 6.

Table 6: Outcome Indicator – Number of Diagnoses through Use of Medical Equipment (per year)

	2005 (Baseline)	2006	2007	2008	2009	2010	2011 (Completion)	2012	2013 (Target)
Radiograph	2,561	3,929	4,370	4,547	6,219	7,628	9,835	10,578	10,781
Ultrasonic	1,565	2,459	2,419	1,974	2,001	1,731	2,276	1,999	1,902
ECG	525	692	579	658	210	560	481	479	347

Source: Kampong Cham Provincial Hospital

Note 1: Although the project provided two ultrasonic devices (one of which was for Ob/Gy and another for abdominal use), there are no records from the Ob/Gy device. Records are for the abdominal ultrasonic device only.

Note 2: The number of ECG diagnoses in 2013 includes the number of diagnoses by another ECG that was not provided by the project.

Standard medical equipment was installed at the Imaging Department in which there were many new patients required effective and accurate diagnoses to specify their illness. Before the project, the hospital utilised radiograph, ultrasonic and ECG devices and the number of diagnoses through their use had been increasing gradually. After 2011 when the project was completed, due to a rapid increase in traffic accidents, the number of radiograph diagnoses further increased. Ultrasonic diagnoses fluctuated both before and after the project. The number of diagnoses by the ultrasonic device provided for the Obstetrics/Gynaecology Department has not been recorded however, so the number counted by the hospital is for abdominal use of the device only.

The project provided two ECGs to the hospital: one for the Imaging Department and another for the Intensive Care Unit (ICU) of the Emergency Department. At the time of the ex-post evaluation survey, it was identified that the ECG at the Imaging Department had barely been utilised since the provision of the equipment. Therefore, the number of ECG diagnoses shown in Table 6 includes ECGs diagnoses by devices provided by other financial sources. There is no actual record for the ECG provided by this project.

According to Kampong Cham Provincial Hospital officials, the hospital used to utilise an ECG at the Imaging Department before the project. The project installed a new ECG at the ICU of the Emergency Department and a doctor from the Imaging Department was transferred to the ICU due to high demand for ECG diagnoses. As a result, there were no health workers who understood ECG data at the Imaging Department and the device remained unused for a long time. On the other hand, the increase of emergency patients created huge demand for effective and quick ECG diagnoses at the ICU. In response to this high demand, the hospital decided to purchase a new ECG for the ICU using the hospital's own budget. The hospital considered transferring the unused ECG from the Imaging Department to the ICU. However, it would have been necessary to discuss this with the Japanese side as the ECG was originally given to the Imaging Department. The hospital missed the opportunity to consult with Japan and finally the hospital decided to undertake their own procurement for the ICU.

From 2014, Kampong Cham Provincial Hospital has commenced an internal training program for hospital staff members on interpretation of ECG data. The hospital has committed to

utilising the ECGs effectively in order to respond to the need for correct diagnoses for new patients at the Imaging Department as well as to respond to increasing numbers of emergency cases at the ICU[15].

3.2.2 Qualitative Effects

The BD set out the expected qualitative effects of the project as “strengthening function as a top referral hospital”, “contributing to mother–to-child transmission and infection control”, “establishing a radioactive protection system” and “improving responses for emergency patients from traffic accidents”, the status of which are described below. It is concluded that this project brought positive effects.

3.2.2.1 Strengthening Function as a Top Referral Hospital

Prior to the project, Kampong Cham Provincial Hospital was constrained in its capacity to provide sufficient quality healthcare services due to the deteriorated condition of the health facilities and equipment at the Surgery, Obstetrics/Gynaecology Ward, Operation Theatre, and Emergency and Imaging Building. This project supported the improvement of facilities and equipment according to provisions for CPA3 facilities set out in the CPA Guidelines developed by the Ministry of Health (MoH). Most answers to a questionnaire completed by the hospital indicated that although it has not yet reached an adequate level to be classified as CPA3 and has not accomplished the required CPA duties[16], the functions of Kampong Cham Provincial Hospital have been strengthened by the project. Accordingly, it has become possible to provide quick responses and accurate diagnoses for patients through use of medical equipment as well as to maintain a hygienic environment as a top referral hospital in the region.

3.2.2.2 Contributing to Mother-to-Child Transmission and Infection Control

A prevention of mother-to-child transmission (PMTCT) room was prepared at the Obstetrics/Gynaecology Ward by the project. The PMTCT room has been utilised for consultations and examinations mainly for expectant mothers who are possibly infected with HIV/AIDS. Kampong Cham Provincial Hospital requires HIV/AIDS tests for all expectant mothers. In cases where patients referred from lower-level health facilities did not receive a test in the health centre or showed a positive reaction to a simplified test, the hospital asks for a full HIV/AIDS test upon admission. The PMTCT room has handled 80 to 130 patients per month.

A new dedicated corridor between the operation rooms, post-operation room and the ICU was built as a separated area in the Operation Theatre in order to prevent intersections from the

[15] 37 ECG diagnoses were counted at the Imaging Department as of April 2014.

[16] HSP 2 described the following five duties of a CPA hospital: 1. Distinct and complementary to care provided by health centre, 2. Specialised services, 3. Treatment for complex health problems, 4. Follow-up/continuing care, and 5. Support for health centre in clinical training and supervision.

movement of general patients. It was also designed to improve infection control as well as provide appropriate post-operation care, according to interviews with health workers of the hospital. Furthermore, certain answers on the questionnaire completed by the health workers demonstrated that the new facilities and equipment provided by the project encouraged motivation among workers and raised awareness of hygiene in cleaning facilities and infection control. From design and construction points of view, connecting specialised wards such as the Operation Theatre and Surgery Ward facilitates the transfer of patients from ward to ward and also contributes to infection control and greater efficiency since pavilion system is common in Cambodian hospitals.

3.2.2.3 Establishing a Radioactive Protection System through Provision of a Control and Radiologist Room Next to the X-ray Room

The project provided a control and radiologist room next to the X-ray room at the Imaging Building. According to technicians and staff working in the X-ray room, the new layout and facility protect workers from radiation exposure. An X-ray technician assigned by Japanese Overseas Cooperation Volunteers (JOCV) was working in the X-ray room at the time of the ex-post evaluation survey. The hospital officials noted that the volunteer provided instruction on the technical aspects of operation and maintenance of the X-ray machine, which enhanced the health workers' understanding of the machines.

3.2.2.4 Improving Responses for Emergency Patients such as Increasing Traffic Accidents at the Emergency Ward

Rapid economic growth has led to a large increase in motorcycle and car ownership. This has subsequently also led to an increase in traffic accidents throughout Cambodia according to the hearing with the hospital. In 2011, approximately 20 percent of operations in Kampong Cham Provincial Hospital were in response to traffic accidents (Table 7), which was the most frequent category of operations, followed by C-section, appendicitis, gastric ulcers, ovarian cysts, abdominal bruising and so on.

The number of operations at the Operation Theatre has increased since 2010 (Table 4). Presumably, this is because the capacity of the Emergency Building was developed through the project through provision of new facilities and equipment. The enhanced capacity made immediate interventions and accurate diagnoses possible for emergency patients.

However, currently planned operations with fixed operation dates in advance are prone to schedule changes due to unexpected emergency operations for high priority patients. Thus, patients receiving planned operations often need to be on stand-by for longer than the initial schedule communicated by the hospital according to the hospital officials.

Moreover, Kampong Cham Provincial Hospital regularly receives missions from NGOs and donors engaged in supporting medical services for local communities and the hospital offers operation rooms with equipment provided by the project for their use. Thus, the facilities and equipment by the project are widely used at the Emergency Department.

Table 7: Number of Operations Due to Traffic Accidents (per year)

		2010	2011	2012
Total number of operations		2,644	2,758	2,903
Number of operations due to traffic accidents	Minor operations	356	515	541
	Major operations[17]	20	25	25
	Total	376	540	566
% of operations due to traffic accidents		14%	20%	19%

Source: Kampong Cham Provincial Hospital

At the Emergency Building, the project provided six beds for the post-operation room, however due to an increase in patients, the hospital installed one more bed by themselves after the project. There are currently seven beds in the post-operation room. An interview with the hospital revealed that a treatment and minor operation room as well as an observation room provided by the project enabled health workers to offer quick diagnoses and quality of care.

3.2.2.5 Beneficiary Survey

In order to identify the level of improvement of healthcare services provided by Kampong Cham Provincial Hospital through the project, a beneficiary survey of 50 patients each from the Surgery and Obstetrics/Gynaecology Wards was conducted[18]. 39 hospital staff members working at the Surgery, Obstetrics/Gynaecology and Emergency Wards also cooperated in responding to the questionnaire and participating in interviews to verify the outcomes of the project.

The answers from the majority of patients revealed the healthcare services provided by the hospital enjoyed a good reputation, and that patients experienced a high level of satisfaction in regards to the quality of service provided by hospital staff. Some answers from the patients demonstrated that the high level of medical technology and skills of staff were the main motivations for patients to visit Kampong Cham Provincial Hospital. The answers provided by

[17] Major operations include operations such as visceral injuries and severe cases. All other cases are categorised as minor operations.

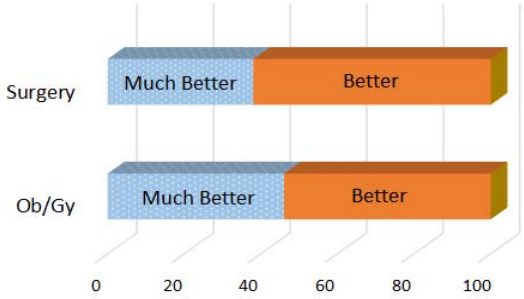
[18] More than 80 percent of patients selected by the survey team at random were from Kampong Cham province. The rest of the patients were from Prey Veng, Kratie and Kampong Thom provinces. Kratie and Kampong Thom provinces are neighbouring provinces of Kampong Cham province, which have a high incidence of poverty. (Source: Asian Development Bank “Cambodia Poverty Analysis December 2011” http://www.adb.org/sites/default/files/cambodia-country-poverty-analysis.pdf)

hospital staff illustrated that the project has contributed to improving infection control and efficiency of work (refer to BOX).

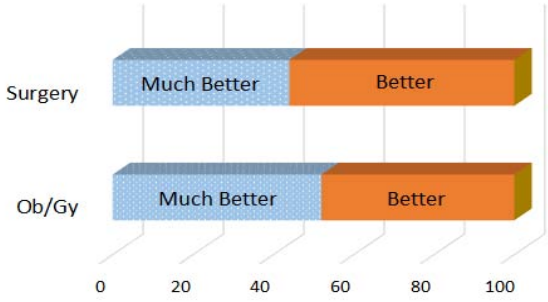
BOX Results of Beneficiary survey

1. Answers from Surgery and Obstetrics/Gynaecology patients

●Quality of healthcare services after the project



● Care provided by hospital staff after the project



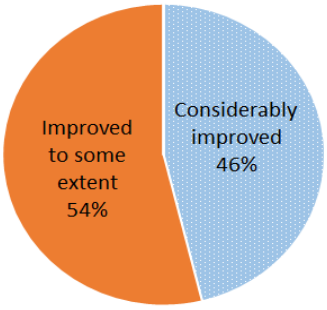
Note: There were options “No Change” and “Worse” but no one chose these answers on the questionnaire.

2. Reasons to choose Kampong Cham Provincial Hospital

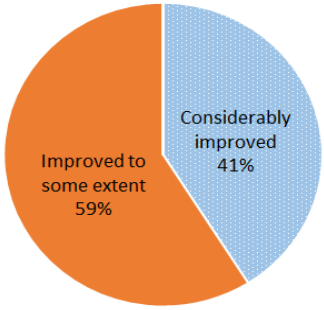
Reason (multiple answers allowed)	Surgery (person)	Ob/Gy (person)
Visit with referral (among 50 patients)	10	12
Good quality of medical technology	14	16
Good reputation	17	14
See a particular doctor	7	13
Good quality of medical equipment	10	8
Close to home	2	5
Quality of facilities	0	2

3. Answers from hospital staff/Contribution of the project to the hospital (%)

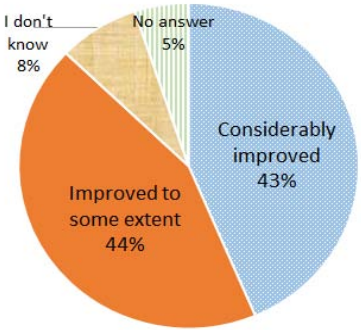
●Quality of healthcare services



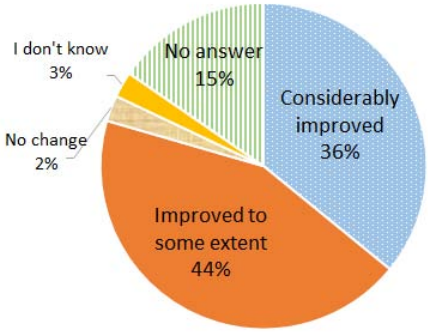
●Efficiency of work



●Contribution to infection control



●Contribution to PMTCT



3.3 Impact

3.3.1 Intended Impacts

Intended impacts such as improving the referral system in Kampong Cham province, enhancing opportunities for poor patients to access healthcare services and developing medical human resources for the region were expected at the time of planning to eventuate as results of the project. The overall impact of the project is evaluated as high because of the good status of the intended impacts as described in the section below.

3.3.1.1 Contribution to Improvement of the Referral System in Kampong Cham Province

At the time of planning, it was assumed that if Kampong Cham Provincial Hospital strengthened its medical human resources capacity as a teaching institution, those medical human resources assigned to lower-level health facilities would contribute to improvements in the healthcare services at each level of the health system in the province and also lead to an increase in users at the lower levels of health facilities. Finally, the referral system in Kampong Cham province would improve.

Kampong Cham Provincial Hospital presently organises training sessions and workshops for CPA1 and CPA2 health workers using facilities and equipment provided by the project at the Obstetrics/Gynaecology Ward, Surgery Ward and Emergency Building. The project clearly assisted in creating more opportunities for health workers from the lower level of health facilities to access training. It also worked to rebuild reliance of patients on lower-level services. Therefore it is expected that the project will strengthen the patient referral system between upper and lower-level health facilities in the long term.

Furthermore, if the quality of healthcare services at the lower level of health facilities improves and more patients are received, the upper level of health facilities, such as Kampong Cham Provincial Hospital, will be able to concentrate on provision of advanced medical technologies and healthcare services as a system of respectable referral hospitals. Therefore, it is assumed that the project will contribute to the improvement of the referral system of Kampong Cham province.

3.3.1.2 Enhancement of Opportunities for Poor Patients to Access Healthcare Services

According to the interview with the hospital, many poor residents of neighbouring provinces of Kampong Cham province such as Kratie or Northern highland areas visit Kampong Cham Provincial Hospital because of the quality of healthcare services and its location, which is closer than the capital Phnom Penh.

The above-mentioned beneficiary survey demonstrated that around 90 percent of the answers supplied were from patients from Kampong Cham province and 1 to 4 percent of answers were from patients from outside of Kampong Cham, such as from Kratie, Kampong Thom and so on.

MoH attempts to disseminate services of the Health Equity Fund (HEF)[19] throughout Cambodia in order to promote physical and financial access to healthcare services for the poor[20].

Table 8: Number of Health Equity Fund (HEF) Users among Inpatients of the Hospital

	2010	2011	2012	2013
Number of inpatients	15,605	17,725	18,618	19,152
Number of HEF users among inpatients	6,712	8,039	6,899	7,435
Percentage of HEF users among inpatients	43%	45%	37%	39%

Source: Kampong Cham Provincial Hospital

The hospital officials noted that revenue from HEF has increased since the project completion and it was interpreted as coming from the increase in poor patients. On the other hand, HEF users among inpatients, which increased in 2011, decreased in 2012 before again increasing in 2013 (Table 8).

A staff member from the HEF office at Kampong Cham Provincial Hospital commented that HEF staff allocated to particular health centres in Kampong Cham province introduced HEF services and benefits to poor residents who had no prior information about the fund. The staff explain the procedure for obtaining ID cards and also provide consultations relevant to the patient's physical conditions. In the case of serious or particular diseases identified by staff, HEF strongly advises patients to go to Kampong Cham Provincial Hospital. The coupling of increased HEF access and the project presumably has accelerated the rate of poor patients reaching Kampong Cham Provincial Hospital, especially those patients who demand a high quality of healthcare services.

Moreover, the hospital recognised that many poor patients managed their medical expenditure by borrowing from relatives or acquaintances rather than through accessing HEF. These patients are also part of the increasing number of patients seen after the project completion. Likewise, discussions with residents and health workers living and working in two different communities (Kohroka and Kien Cherry) revealed that some people did not know about HEF services and generally borrowed money from relatives and friends when necessary.

[19] HEF is run by an overseas fund and established offices and staff members in public health facilities in Cambodia to provide consultation for application and issue ID cards for the poor.

[20] It is reported that approximately 80 percent of the poor has no access to HEF. (Source: Where Have All The Poor Gone? Cambodia Poverty Assessment 2013, November 2013, The World Bank)

As a result of the interviews with the hospital and HEF staff, it is assumed that access to Kampong Cham Provincial Hospital by poor patients has been promoted after the project with the growing demand for high quality healthcare services.

3.3.1.3 Human Resource Development for the Region

Kampong Cham Regional Training Centre (RTC), located closed to Kampong Cham Provincial Hospital, trains new health workers such as nurses, midwives and co-medicals with coverage of five nearby provinces[21]. RTC also offers training for in-house health workers from Kampong Cham Provincial Hospital, CPA1 and CPA2 facilities, private hospitals, military hospitals and so on as well as hosts internships for students from medical universities in Phnom Penh. Facilities and equipment provided by the project have been effectively utilised in the training sessions held at RTC (also refer to 3.3.2.3 Unintended Positive Impacts).

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

It is noted in the BD report that a public sewerage system was not in place at the time of project planning. General service water and hospital effluent were discharged into old septic tanks for removal of solid matters or flow-through to a pond on the premises.

At the time of the ex-post evaluation survey, discharge water was being appropriately treated through new septic tanks provided by the project, resulting in a lessened environmental burden by reducing biochemical oxygen demand (BOD). Thus, there were no negative impacts on the natural environment identified through the project, but rather some positive impacts.

General garbage and medical waste are treated separately at Kampong Cham Provincial Hospital. General garbage is disposed of by a private company and medical waste is adequately burned by an incinerator in the hospital.

3.3.2.2 Land Acquisition and Resettlement

There was no land acquisition and resettlement resulting from this project because new facilities were built in place of old facilities that were removed on the site of Kampong Cham Provincial Hospital. No additional land acquisition was undertaken by the project.

3.3.2.3 Unintended Positive Impacts

In October 2013, the construction of a Training Ward at Kampong Cham Provincial Hospital was completed by Grant Assistance for Grassroots Human Security Project provided by the Japanese Embassy in Cambodia. Along with the construction, the hospital established a training

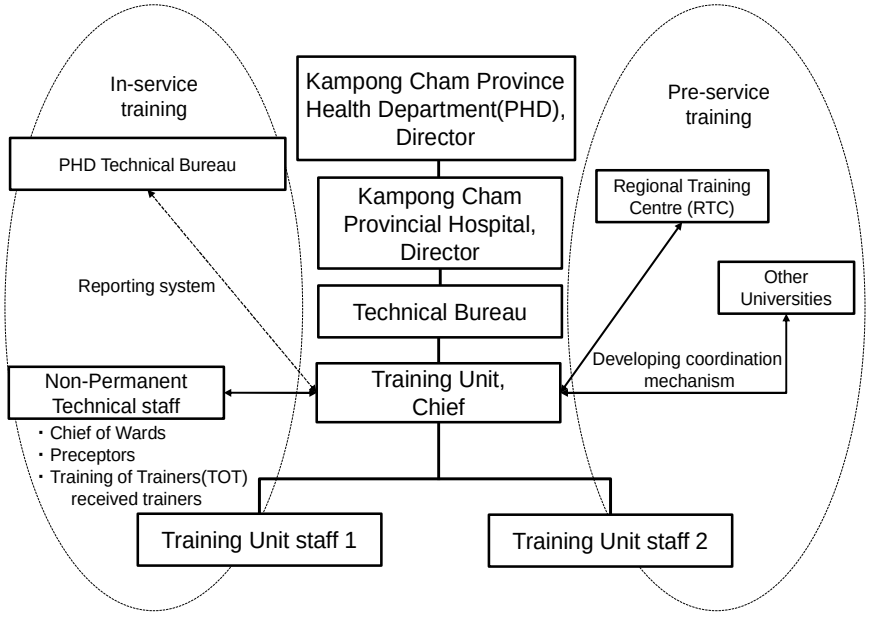
[21] Kampong Cham province, Prey Veng province, Kampong Thom province, Svay Rieng province and Kandal province.

department with technical support from experts under the Japan International Cooperation Agency (JICA) technical cooperation project "The Project for Improving Maternal and Newborn Care through Midwifery Capacity Development" (2010-2015). Three staff members were assigned to the training department in order to carry out the goal of creating a teaching institute for the region by effectively using the facilities and equipment provided by the project. The hospital is making an effort to organise training activities as a teaching institute in the region.

Kampong Cham Provincial Hospital is one of the target hospitals of the above-mentioned ongoing JICA technical cooperation project, which is based in the National Maternal and Child Health Centre (NMCH) in Phnom Penh. The training department builds on practical experience with supervision by Japanese experts assigned to Kampong Cham Provincial Hospital.

The newly established training department was approved by MoH in May 2014 and has been identified as an official teaching institute in the region. Since the latest CPA Guidelines issued in July 2014 require each CPA3 level hospital to set up a training department, it is highly possible that Kampong Cham Provincial Hospital, as a CPA3 hospital, will play an important role under this initiative in providing more opportunities for training of health workers in the region utilising the facilities and equipment provided by the project.

In addition, Kampong Cham Provincial Hospital receives various missions, such as a group from the Radiograph Association visiting for X-ray unit inspection, staff from private hospitals and medical student interns from Phnom Penh.



Source: Kampong Cham Provincial Hospital

Figure1: Newly Established Training Department of Kampong Cham Provincial Hospital

It was also noted during the interview with hospital staff that midwifery related training and workshops provided though the JICA technical cooperation project contributed to capacity building of hospital human resources in addition to improving the quality of services of the Obstetrics/Gynaecology Ward. It has been recognised that synergetic effects have been generated together with the technical cooperation project.

This project has largely achieved its objectives. Therefore its effectiveness and impact are high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The project output by the Japanese side was produced mostly as planned although there were some minor changes that had no influence on the construction schedule. There was no soft component input into the project; therefore, there was no soft component output.

Table 9: Project Output by Japanese Side

For Facilities	Planned	Actual	Change From the Plan
Phase 1	Obstetrics/Gynaecology Ward (including delivery room), Surgery Ward and Machine Building Ward	Almost done as planned	Minor changes only
Phase 2	Operation Theatre, Emergency and Imaging Building, connecting corridor and walkway, etc.	Almost done as planned	Major changes were as follows ◆ Changed foundation level of the first floor of the Operation Theatre and Emergency and Imaging Building due to the level of the floor being lower than expected in the BD. ◆ A steel door was provided for outside of the oxygen room in order to prevent contact from visitors using the central courtyard
For Equipment	Planned	Actual	Change From the Plan
Phase 1	**Obstetrics/Gynaecology-related equipment** Delivery bed, Gynaecology examination table, Ultrasound apparatus for	Almost done as planned	**Layout change** X-ray film illuminator and stretcher **Specification change** Ultrasound apparatus for Obstetrics

	Obstetrics and Gynaecology (B/W), Infant incubator, Labour bed, Phototherapy equipment, etc. **Surgery-related equipment** Suction unit (small type), Examination table, X-ray film illuminator, Bed and Stretcher (wheels), etc.		and Gynaecology (B/W)
Phase 2	**Operation, ICU and autoclave-related equipment** Operation table, C-Arm mobile X-ray unit, Operating ceiling lamp, Anaesthesia apparatus with ventilator, Electro-surgical knife, Patient monitor, Autoclave etc. **Emergency and imaging-related equipment** Defibrillator, General diagnosis X-ray unit, Mobile X-ray unit, Ultrasound apparatus for general abdominal, Electric cardiograph, etc.	Almost done as planned	**Change in number of installations** X-ray film illuminator and instalment cabinet **Change of specification** General diagnoses X-ray unit, Ultrasound apparatus, Anaesthesia apparatus or general abdominal, Patient revolving stool, etc.

Source: Basic Design Study Report and JICA provided documents

At the time of Phase 1 of construction, it was identified that the floor level of the first floor of the Obstetrics/Gynaecology and Surgery Wards was positioned at a lower level than expected in the Detailed Design Study of the project. Changes to the foundation of the building were therefore required. Also, despite the fact that there were some minor changes in the location of the water receiving tank and machine building, increases to the budget or schedule did not occur.

The Cambodian side was responsible for removing obstacles on the project site. Obstacles such as underground pipes, overhead electric wires and utility poles were removed and transferred as planned before construction. Landscaping works and power receiving expenses were also

completed by the Cambodian side as planned. Furthermore, fences surrounding the hospital were provided with financial assistance from MoH although it was not planned initially.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The actual project cost for the Japanese side was 963 million yen (93 percent of the planned amount), which was lower than the planned budget of 1,039 million yen. 16 million yen (266 percent of the planned amount) was borne by the Cambodian side, which was significantly higher than the planned budget of six million yen. The additional costs were due to building fences around the hospital and it was not expected at the time of planning. The overall cost of the project, which was the total cost of both the Japanese and Cambodian sides, was 979 million yen (94 percent of the planned amount), which was lower than the planned budget of 1,045 million yen.

3.4.2.2 Project Period

The actual project period (from the detailed design survey to the completion of the project) was 37.6 months (116 percent of the planned time), which was longer than the planned 32.5 months. The delay was caused by unsuccessful bidding at the first tender. The second tender was successfully held three months later.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The administrative structure of Kampong Cham Provincial Hospital is almost the same as at the time of planning. Likewise, the operational and maintenance structure has remained almost the same. On the other hand, approximately 40 more staff members have been assigned compared to the time of planning due to the increase in patients. The Obstetrics/Gynaecology Department has the largest number of staff members in the hospital, which is 36 due to the largest increase in patients among the hospital. In ICU at the Emergency Department, there are 20 staff members now, while there were only six staff members available at the time of planning. With regard to the Operation and Maintenance section, there were four staff members at the time of planning, which have now been reduced by one engineer due to his retirement in 2013. Accordingly, there are only three staff engaging in operation and maintenance. In addition, two of the three staff members are in charge of management and administration, so there is only one engineer available in the hospital. Kampong Cham Provincial Hospital requested that MoH increase the number of engineering staff. However, this is an ongoing issue without an obvious resolution because of the serious shortage of

engineers as well as health workers in the whole of Cambodia, as noted by a MoH officer. MoH encouraged hospitals to develop human resources and strengthen capacity building through their own budgets if they have an adequate budget from user fees (hospital revenue), however the serious lack of human resources and developed engineers has made it difficult to secure the appropriate number of staff for hospitals.

The ongoing JICA technical cooperation project "Project for Strengthening Medical Equipment Management in Referral Hospitals Phase 2 (MEDEM2) (2009-2014)"[22] aims to strengthen medical equipment management in referral hospitals in Cambodia. MEDEM2 launched the National Workshop Team (NWT)[23] in the Hospital Service Department in MoH in order to provide technical assistance and training to referral hospitals. Kampong Cham Provincial Hospital has requested the assistance of NWT[24] for their insolvable repairs and maintenance of large-sized equipment and alternatively the hospital has utilised services provided by external contractors or engineering companies. Kampong Cham Provincial Hospital owns more equipment than other referral hospitals because of the size and function of the facility. The hospital inspects the equipment regularly according to the equipment inventory in order to maintain equipment in good condition.[25] Facility inspections are also conducted on a regular basis.

PHD indicated that construction of a new building for the Operation and Maintenance Section in the hospital was under consideration within the provincial budget of 2015.[26]

3.5.2 Technical Aspects of Operation and Maintenance

Technical capacity building is a serious issue, similar to the shortage of technical human resources in Kampong Cham Provincial Hospital. Usually technical staff refer to the manuals provided by the project or MEDEM2 to resolve small equipment, minor problems and repairs. For repairing large and complicated equipment requiring advanced techniques, the Operation and Maintenance Section makes enquiries to NWT, or alternatively requests a quote from outside agents and contractors. From a financial perspective, it is important to avoid spending on outside services from agents and contractors to be able to secure good technical staff in the hospital.

Operation and maintenance staff as well as doctors, nurses, midwives and other health workers who utilise equipment are required to attend technical training to obtain knowledge and improve their

[22] Kampong Cham Provincial Hospital has been one of the target referral hospitals since MEDEM1 (2006-2008).
[23] NWT was launched under MEDEM1 to provide training on medical equipment management, monitoring and site monitoring, etc. NWT consists of staff members from MOH and engineers from the National Maternal and Child Health Centre.
[24] Although the Operation and Maintenance Section of Kampong Cham Provincial Hospital has been strengthened by MEDEM, it is still necessary to reinforce the structure and the linkage in the areas of both management and engineering.
[25] Operation and Maintenance staff monitor the equipment biannually, quarterly, monthly, etc., according to the specifications and type of equipment.
[26] PHD intends to manage the budget for the construction of the Operation and Maintenance building in the latter half of 2014 while considering other requisitions and expenditures.

skills. The staff of Kampong Cham Provincial Hospital are encouraged to attend training courses, which are organised by MoH and MEDEM2 (Table 10).

Worldwide medical equipment manufacturer General Electric Company (GE) organises training sessions on operation and maintenance for their own products in and near the capital Phnom Penh. So far only four nurses from Kampong Cham Provincial Hospital attending GE operation training sessions have been identified.

According to the hospital, in March 2014 GE contacted the hospital management directly to organise internal operation and maintenance training at Kampong Cham Provincial Hospital. The hospital is currently considering discussions with GE regarding this offer.

Table 10: Kampong Cham Provincial Hospital Attendee Status of Major Training Courses Provided by MEDEM2

●Training time period: December 2009–March 2014

Main Training Course	Main Attendee/s
Medical Equipment Management (MEM) seminar	Manager of Operation and Maintenance / Engineers
MEM brush-up seminar	Director of PHD / Manager of Operation and Maintenance / Engineers
ME user training at lead CPA3 /National Hospital	Doctors / Secondary nurses / Secondary midwives /Lab technicians
Brush-up workshop on MEM system	Manager of Operation and Maintenance /Engineers
5S seminar in Sri Lanka	Director, Kampong Cham Provincial Hospital / Manager of Operation and Maintenance
Total Attendees	85

Source: JICA MEDEM2 project team

Regarding operation of equipment, one ECG that was allocated to the X-ray examination room remained unused for a long time since no staff at the ward could interpret the data as noted above. The hospital management realised it was necessary to improve techniques and knowledge regarding equipment operation and started organising internal training on how to interpret ECG data. Now ECG diagnoses are being given to patients at the X-ray examination room.

A Japanese volunteer X-ray technician was assigned by JOCV to the X-ray examination room at Kampong Cham Provincial Hospital. The volunteer advised staff on not only operational know-how for the X-ray unit but also on how to control air ventilation and temperature in the room

to ensure the long life of the equipment. This is a substantial contribution to expanding the technical capacity of the staff of the X-ray examination room.

3.5.3 Financial Aspects of Operation and Maintenance

Kampong Cham Provincial Hospital has two major sources of revenue. One is the budget from MoH and the other is user fees (revenue from patients for medical services). As for user fees, MoH guidelines stipulate that 60 percent of the user fee is to be utilised as rewards for staff incentives and 1 percent is to be paid to MoH. The remaining 39 percent is to be utilised by the hospital management for its own purposes.

Kampong Cham Provincial Hospital has no specific budget for operation and maintenance of facilities and equipment so the hospital manages this kind of expenditure through user fees when necessary. The user fees of Kampong Cham Provincial Hospital have increased with the increase in patients since the project was implemented. As a result, the expenditure for operation and maintenance has been reliably provided. Additionally, the hospital occasionally makes use of funding services such as short-term borrowing and loans to repair large-sized equipment or to purchase new equipment.

Table11: Financial Statement of Kampong Cham Provincial Hospital Including Operation and Maintenance

Unit: Million Cambodia Riel (KHR)[27]

	2010	2011	2012	2013
Total revenue	2,341	2,777	2,958	3,284
- From MoH	1,259	1,570	1,576	1,876
- User fees	1,082	1,207	1,382	1.408
Total expenditure	1,609	2,027	2,257	2,908
Item of expenses				
Operation and maintenance	26	36	61	74
Fuel	55	92	137	179
Electricity	302	448	649	603

Source: Kampong Cham Provincial Hospital

Alongside increasing user fees, expenditure for fuel and electricity has expanded (as per Table 11) due to the increase of patients. PHD, the supervising authority of Kampong Cham Provincial Hospital, supports the budget for electricity, oxygen, internal food services and so on as the separate budget from Annual Operation Plan (AOP) by MOH. There is serious concern that in the

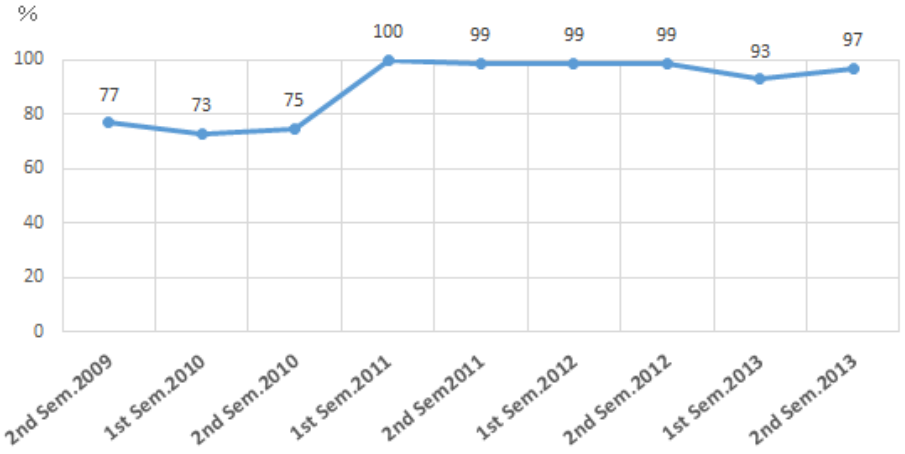
[27] Reference rate: KHR 1=JPY 0.026 (Source: JICA exchange rate as of April 2014 at the time of the second field survey for ex-post evaluation).

case of higher expenses for utilities, user fees may need to be allocated to those expenditures. Kampong Cham Provincial Hospital has applied for its operation and maintenance budget to MoH through PHD every year as a part of its AOP[28]. So far no approval has been given. Nevertheless, Kampong Cham Provincial Hospital intends to keep applying for the AOP.

Despite the fact that there are still some considerable financial issues regarding expansion of utilities costs, it is expected that future operation and maintenance costs will be covered by increasing user fees as well as securing financial support from PHD or other funding sources.

3.5.4 Current Status of Operation and Maintenance

Training and advice from MEDEM2 have assisted in sustaining good equipment operation and maintenance in Kampong Cham Provincial Hospital. The hospital effectively incorporated know-how obtained through MEDEM2 training. The operable rate of medical equipment in Kampong Cham Provincial Hospital has improved since 2011, the time of project completion (Figure 2).



Source: JICA MEDEM2 project team

Figure 2: Kampong Cham Provincial Hospital - Medical Equipment Operable Rate

Improving the operable rate (the reduction of faulty equipment) illustrates the strong status of operation and maintenance of most equipment.

In terms of facilities operation and maintenance issues, sagging cupboard doors and water leakage in the shower rooms at the Obstetrics/Gynaecology Ward have been identified and dealt with by engineering staff on an occasional as-needed basis. Food waste being discarded in bathrooms by

[28] Applied for KHR 84 million for Operation and Maintenance and KHR 479 million for purchasing new equipment in 2013.

patients or family members was recognised as an issue at the time of planning but has since significantly improved due to careful reminders to patients by hospital staff.

The sterilising machine provided by the project in the Operation Theatre broke in October 2013 and the hospital took a few months to reach an appropriate agent to repair it[29]. The extended absence of the large-sized sterilising machine certainly affected emergency operations, which were carried out several times a day due to increasing numbers of emergency patients and require the sterilisation of surgical tools and equipment. According to the hospital, some agents or contractors working with medical equipment are not very responsive in corresponding with the demands from public hospitals, although such agents and contractors are keen to deal with MoH and donors[30]. Under these circumstances, it is suggested that Kampong Cham Provincial Hospital establishes contacts with reliable agents and contractors with a proven track record.

Although some issues and challenges still remain, Kampong Cham Provincial Hospital has made maximum efforts for operation and maintenance activities for facilities and equipment with limited human resources and technical skills. These efforts are assumed to contribute to the sustainability of the quality of healthcare services offered by the hospital.

As seen above, some problems have been observed in terms of institutional and technical aspects of operation and maintenance. Therefore, the sustainability of the project effect is considered fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project intended to improve the healthcare services of Kampong Cham province and neighbouring areas by upgrading the Surgery Ward, Obstetrics/Gynaecology Ward, Operation Theatre, and the Emergency and Imaging Building of Kampong Cham Provincial Hospital. Because this project supported the improvement of deteriorated health facilities and equipment at the provincial level, it is highly relevant to the priorities of the Cambodian health policy, which aims to improve healthcare services and respond to the development needs of the country. In the same way, the project supported Japanese assistance policies at the time of planning that promoted BHNs in the health sector for the socially vulnerable. After the project, the number of hospital users including poor residents not only from Kampong Cham province but also from outside has increased, and most of the facilities and equipment provided by the project have been utilised effectively. Users have mostly been highly satisfied. Furthermore, the project has strengthened the function of the hospital as a top referral hospital and contributed to capacity building for health workers in the region. Taking these facts into consideration, the effectiveness and the impact of the project can be evaluated as high. Although the

[29] It was fixed in March 2014.
[30] The MEDEM2 project team is also aware of the issue of some contactors neglecting to respond to public hospitals that often struggle to manage funding.

project cost was within the plan, the project period slightly exceeded the plan; therefore, the efficiency of the project is fair. Despite the lack of technical knowledge and manpower, the operation and maintenance of the facilities and equipment are of good status. The sustainability of the project effect is therefore fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Improved facilities and equipment through the project assisted in expanding the good reputation of Kampong Cham Provincial Hospital and brought on a rapid increase in patients. However, given the vulnerable referral system that is the current situation in Cambodia, it is predicted that the extensive concentration of patients coming to Kampong Cham Provincial Hospital will continue to take place. There is also a possibility that high patient density will cause a reduction in the quality of healthcare services and infection control. In response to this situation, it is recommended that MoH strengthen the functions and capacities of CPA1 and CPA2 facilities in terms of technical skills and facilities and equipment to secure the referral system.

It is also suggested that Kampong Cham Provincial Hospital prepares its own database of outside agents and contactors with a good repair record to avoid a reduction in the quality of healthcare services due to poor operation and maintenance of facilities and equipment. Furthermore, the lack of engineers should be supplemented as soon as possible to reinforce operation and maintenance.

4.2.2 Recommendations to JICA

There is no particular recommendation for JICA.

4.3 Lessons Learned

4.3.1 Communications after the Project

One piece of equipment in almost unused condition at the time of the ex-post evaluation survey was identified. Usually, communications between the Japanese side and implementing agencies are prone to decreasing after the project. In order to maintain effective utilisation of facilities and equipment, it is preferable that opportunities are created for discussion between both sides to facilitate the sharing of any problems that arise after the project.

4.3.2 Decentralisation of Patients from New Facilities

The concentration of patients using the new facilities and equipment provided by the project is raised as an issue, especially in a country or region where the referral system is not yet securely established. In many cases, those patients who go to the upper level of health facilities without referral do not have serious conditions and are supposed to be treated at lower-level hospitals.

Consequently, the upper level of facilities receives too many patients beyond capacity, which causes poor functioning.

In order for the referral system to be functioned, it is necessary to create the appropriate patient flow in line with the referral system and the patient's conditions. This is especially important at the upper level of health facilities to discuss how to promote decentralisation of patients from new facilities with cooperation of all stakeholders of the whole referral system through MoH initiatives at the time of project planning. Strengthening the patient referral system and developing capacity building of both the first and second level of health facilities should be one of the solutions for decentralisation of patients.