conducted by Cambodia Office: October 2014

Country Name	The Project for Infectious Disease Control
Kingdom of Cambodia	

I. Project Outline

Background	In Cambodia, the average immunization rates over the last decade had been improved by the government efforts for implementation of the National Immunization Program (NIP) with the donors' cooperation to provide vaccines and cold chain equipment, including Japan. However, there was still remaining issue of ensuring the quality of vaccines at end-use vaccination sites such as remote areas and urban slums. Cold chain equipment with solar system to adequately stock and control vaccines were not sufficiently available in such remote areas where gas supply for cold chain equipment was limited. Also, used syringes had not been safely disposed at health facilities due to the luck of incinerators. Therefore, installation of cold chain equipment and incinerators was a key issue to implement the Extended Program on Immunization (EPI) in the areas left behind.				
Objectives of the Project	To enhance immunization activities by installation of cold chain equipment for vaccines and incinerators for disposal of medical wastes as well as procurement of measles vaccines for the second round immunization campaign in 2011.				
Outputs of the Project	1. Project Site: Whole Cambodia including the following health facilities of the National Immunization Program, 24 Provincial Health Departments (PHDs), 28 Operational Districts (ODs), 376 Health Centers (HCs)/ Health Posts (HPs), and 24 Referral Hospitals (RHs) 2. Japanese side Cold chain equipment (refrigerator and icepack freezers, refrigerator and icepack freezers with solar system, vaccine cold boxes, vaccine carriers, data loggers, freeze watch indicators, refrigerator monitor cards), Incinerators, Motorcycles and pickup trucks, Measles vaccines, syringes for measles (Auto-disable (AD) syringes (0.5ml), disposable syringes (5ml)) 3. Cambodian side: Inland Transportation of procured equipment and vaccines, installation and training on operation and maintenance of equipment (excluding refrigerators with solar power system and incinerators)				
Ex-Ante Evaluation	2008	E/N Date	January 11, 2009	Completion Date	September 24, 2010
Project Cost	E/N Grant Limit: : 230 million yen, Contract Amount: 229 million yen				
Implementing Agency	Ministry of Health, National Immunization Programme				
Contracted Agencies	International Total Engineering Corporation, Toyota Tsusho Corporation				

II. Result of the Evaluation

1 Relevance

This project has been highly consistent with Cambodia's development policy prioritizing reduction of child mortality by immunization under "Health Sector Strategic Plan (2003-2007, 2008-2015)", and development needs for improvement of coverage of immunization programme for villages with low immunization coverage and for cold chain equipment at HCs in order to adequately control necessary vaccines for immunization at the time of both ex-ante and ex-post evaluation. It is also consistent with Japan's ODA policy for supporting socially vulnerable people through assistance in the area of health under the Country Assistance Plan (2002) at the time of ex-ante evaluation. Therefore, relevance of this project is high.

2 Effectiveness/Impact

The project has mostly achieved its objectives, "to enhance immunization activities". At 94 HCs, the cold chain equipment, such as freezers and refrigerators were installed by the project. By the time of ex-post evaluation, all the HCs (1,093), including the HCs not covered by the project, have been equipped with the cold chain equipment also supported by other donors such as the World Health Organization (WHO). Out of the 94 HCs, 92 HCs have been utilizing the equipment for stock of necessary vaccines. On the other hand, out of 48 data loggers that were provided by the project and distributed to PHDs, 17 data loggers have not been utilized due to the limited capacity of the health staff and lack of equipment such as computer to connect[1]. Although it had been confirmed at the time of Basic Design Study that the Cambodian side would prepare computers for data logger, it has not been fulfilled. 50 motorcycles and 3 pickup trucks procured by the project have been utilized by Extended Program for Immunization (EPI) staff. Also, measles vaccines procured by the project were used for the 2011's Measles Vaccination Campaign and more than 1.5 million children aged between 9 months and 4 years were benefited. The most of incinerators at the RHs have been utilized for incineration disposal of medical waste including used syringes for vaccination.

The cold chain equipment and temperature monitoring devices such as freeze watch indicators and/or refrigerator monitor cards procured by the project improved temperature control and decreased the wastage rate of measles vaccines from 73% in 2007 before the project to 54% in 2013. In addition, types of vaccines stocked at the HCs equipped by the cold chain equipment have been increased.

As for their impacts, despite the limited data provided by NIP, the number of immunized population increased. The number of immunized infants (under 1) and pregnant women (only for tetanus) in 2013 were 354,614 and 383,043, respectively. This increase suggests the possibility that the project contributed to decrease in incidence of preventable infectious diseases such as measles. For example, the incidence of measles significantly dropped from 1,294 cases in 2007 to 0 case in 2013.

[1] At the time of ex-post evaluation, paper based data log system is used to monitor temperature.

Also, according to the National Health Care Waste Management Working Group, the installation of incinerators at the RHs prevented the second infections caused by inappropriate disposal of used syringes and disposed vaccines despite no available statistical data. There was no environmental negative impact observed.

Therefore, effectiveness/impact of this project is high.

Quantitative Effects

Indicator	Year 2007 (before the project) Actual value	Year 2010 (target year) Target value	Year 2010 (target year) Actual value	Year 2014 (ex-post evaluation year) Actual value
Indicator 1: No. of health facilities (HCs) not equipped by cold chain equipment	108	0	14*	0**
Indicator 2: No. of referral hospitals to begin safe disposal of medical waste	0	24	24	23****
Indicator 3: Volume of measles vaccines procured for the 2011's Measles Vaccination Campaign	0	200,000 vials***	200,000 vials	

Source: Ministry of Health National Immunization Programme

Note: *Out of 108 targeted HCs, 94 HCs were equipped by the project and the rest of 14 HCs were equipped by supports by other donors.

** Among 94 procured by the project, two refrigerators in the Health Center in Kokdong (Siem Reap Province) and the Health Center in Chiphat (Koh Kong Province) do not function at the time of ex-post evaluation because the solar power system has battery troubles. Instead, the Health Center in Kokdong, where electric grid was already established, is using electricity fridge, and the Health Center in Chiphat is using ice box, in which vaccine is kept with block of ice.

*** 1 vial= 10 doses (1 dose = necessary volume of vaccine for 1 person). 200,000 vials cover the target population for immunization in 2011 of around 1.6 million persons.

**** One of the incinerators installed by the project at Sot Nikum Referral Hospital was not in service at the time of the ex-post evaluation. According to the hospital staff, it is because the solar panel has some problems.

3 Efficiency

Although the project cost was the same as the plan (ratio against the plan: 100%), project period exceeded the plan (ratio against the plan: 140%) because it took longer than planned to install incinerators to all the target hospitals. Since the cost of incinerators procured increased due to the changes in specification to meet the technical level of the staff of RHs, the number of cold chain equipment to be procured, including refrigerators, cold boxes, vaccine carriers and refrigerator monitor card, were reduced. The target number of HCs also decreased from 108 in the original plan to 94. Therefore, efficiency of this project is fair.

4 Sustainability

As for the institutional aspect, there was no change in the organizational structure and arrangement for implementation of the national vaccination activities, and the operation and maintenance of the cold chain equipment and vehicles installed by the project have been carried out by each health institution. The sufficient number of staff have been deployed at each level of institution: 25 medical staff for EPI and 1 technical staff at NIP, 48 medical staff and 24 technical staff at PHDs (provincial level), 81 medical staff and 77 technical staff at ODs (district level), 1,096 medical staff but no technical staff at HCs (community level). For medical waste treatment at RHs, 104 staff in total, including 80 technical staff for maintenance of incinerators have been deployed.

In the technical aspect, the technical staff at PHDs, ODs, HCs have skills to carry out maintenance and repair works[2] for 94 refrigerators but have difficulty for maintenance of the solar system attached to the refrigerators (such solar powered refrigerators were installed in 30 out of 94 HCs). The technical level of manufacturers in Phnom Penh for major and complicated repairs of solar system is also not sufficient. For incinerators, the technical staff at RHs, who are contract-based, also have some difficulty for maintenance and repair works of solar power system but are able to carry out regular maintenance and repair of incinerators.

As for financial aspect, the revenue of NIP in 2013 was 4.8 million riels, which covers the cost of regular O&M for the refrigerators, incinerators and other equipment procured by the project. HCs and RHs have own budget to cover some of O&M cost from user fees in addition to the budget allocated by the Ministry of Health. But the budget to procure spare parts for repairing solar power system (i.e. solar battery) is not included in this regular budget and needs to be requested to the Ministry when necessary. Although the government spends average of 2 million US Dollars annually for procurement of traditional vaccines, the funding sources for procuring new vaccines depend on donors' funds such as the Global Alliance for Vaccines and Immunization (GAVI). GAVI's grant for supporting vaccination has been approved until 2016.

At the time of the ex-post evaluation, most of the refrigerators/freezers and incinerators function as well as all motorcycles and pickup trucks are well maintained, while two out of 30 solar powered refrigerators and one out of 24 incinerators did not function because of some troubles in the solar power system (power battery and solar panel). As there are constraints in technical level of the staff at health institutions and issues of the limited budget, no repair work has been taken for the solar power system.

Therefore, the sustainability of this project effect is fair despite some concerns.

5 Summary of the Evaluation

The project has largely achieved its objectives to enhance immunization activities in Cambodia. By the utilization of cold chain equipment and vehicles, the immunization activities have been improved and extended, and contributed to reducing incidence of preventable infectious diseases and infant mortality. In addition, incineration disposal of medical wastes including

[2] Regular maintenance for refrigerators and freezers are performed 2-3 times in a year. No technical training on maintenance and repair of solar power is conducted.

disposed syringes at RHs decreased the second infections caused by inadequate disposal. Therefore, effectiveness/impact of this project is high.

As for sustainability, the NIP and the health institutions in the country have no problem in the structural aspects as sufficient number of staff being deployed. However, there are some problems observed in terms of current status of operation and maintenance, technical level of the staff and budget allocation to maintain the solar system.

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

III. Recommendations & Lessons Learned

Recommendations to implementing agency:

- NIP needs to figure out causes of the battery problem on the solar power system and repair the two solar powered refrigerators installed at Kokdong HC and Chiphat HC as soon as possible.
- The Ministry of Health and the National for Health Care Waste Management Working Group should check the condition of incinerators, especially installed at Sot Nikum RH which is not working, and arrange for repair after analyzing the failure cause.
- O&M budget for the procurement of solar battery is not sufficient. MoH needs to consider to allocate enough budget for sustainable use of the equipment procured by the project.

Lessons learned for JICA:

- Although solar powered cold chain equipment procured on this project is a recommended model by other donors in Cambodia, malfunctioning of the equipment caused by financial constraint and limitation of technical level of the implementing agency was observed in this ex-post evaluation. It is suggested to carefully plan the specification of solar powered refrigerators by comparing with other power sourced refrigerators in all aspects, including budget availability for O&M and technical level of the implementing agency.
- Careful assessment of the staff skill and availability of proper environment for utilizing the procured equipment especially at the lower level health facilities are required. In this ex-post evaluation, it is found that data loggers are often not utilized due to lack of connections between data loggers and computers and due to lack of the staff's skill on data loggers at the Health Center level.

(Refrigerator with solar power system at Varin HC)

(Incinerator at Siem Reap RH)