# Ex-Post Project Evaluation 2015: PackageIII-3 (Philippines, Laos, Cambodia)

September 2016

JAPAN INTERNATIONAL COOPERATION AGENCY

VALUE FRONTIER CO., LTD

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The Republic of the Philippines

FY2015 Ex-Post Evaluation of Technical Cooperation Project

"the Project on Philippine Coast Guard Human Resource Development (Phase I)"

and

"the Philippine Coast Guard Education and Human Resource Management System Development Project (Phase II)"

External Evaluator : Koichiro Ishimori, Value Frontier Co., Ltd

## 0. Summary

The program consisting of Phase I and II aimed to develop personnel with knowledge and skills required to perform the functions of the Philippine Coast Guard (PCG). For its aim, Phase I developed education and training courses and Phase II developed education and training system at the Coast Guard Education and Training Command (CGETC), where PCG provides its personnel with education and training. The implementation of the program was in line with the development policies and needs of the Philippines as well as the development policies of Japan, and thus its relevance is high. The program achieved the project purposes of both the phases: Through Phase I, PCG personnel with the knowledge and skills required in performing their functions were developed; and through Phase II, PCG's education and human resource management system was developed. It also had great impacts on the four target areas of the program, i.e., search and rescue (SAR), aids to navigation (ATON), marine pollution/oil spill combating (MARPOL /OSC), and maritime law enforcement (MARLEN), in conjunction with numerous contributions by other Japanese cooperation. Thus, its effectiveness and impacts are high. The cost and period of the actual program were almost the same as planned, and thus, its efficiency is high. However, the sustainability of the program effects is fair because of the minor problems in the organizational and technical aspects of PCG, which are required to sustain the program effects.

In light of all the above, the program is evaluated to be highly satisfactory.

## 1. Project Description


Project Location

Search and rescue training

### 1.1 Background

A number of marine accidents resulting in the loss of lives was occurring every year in the sea near the Philippines consisting of over 7,000 islands. However, PCG did not have an adequate search and rescue system. There were also many accidents and incidents such as the pollution of the marine environment by oil spills from tankers, piracy activities, and illegal maritime trafficking of drugs and firearms. Therefore, ensuring maritime safety and security was imperative to the Philippines.

### 1.2 Project Outline[1]

| | | |
|---|---|---|
| Overall Goal | | (I) PCG improves capacities to perform its functions.<br>(II) PCG improves capacities as a law enforcement organization. |
| Project Purpose | | (I) PCG develops its personnel's knowledge and skills required to perform its functions.<br>(II) PCG develops an education and human resource management system. |
| (I) Outputs | Output 1 | PCG strengthens its education and training management system. |
| | Output 2 | PCG develops training courses and holds seminars in the four areas[2] with participants from other concerned governmental and private organizations. |
| | Output 3 | PCG strengthens its basic training courses including OJT/unit training. |
| (II) Outputs | Output 1 | PCG establishes a concurrent instructor system. |
| | Output 2 | PCG develops training programs on MARLEN. |
| | Output 3 | PCG develops and strengthens training programs on ship operations. |
| Total cost (Japanese Side) | | (I) 801 million yen, (II) 314 million yen |
| Period of Cooperation | | (I) July, 2002 - June 2007, (II) January 2008 - December 2012 |
| Implementing Agency | | Philippine Coast Guard (PCG) |
| Supporting Agency / Entity in Japan | | Japan Coast Guard (JCG) |
| Related Projects | | 【Technical Cooperation】<br>・Dispatching experts on coast guard administration (2003-2006, 2006-2009, 2009-2012)<br>・Enhancement of practical capability for maritime law enforcement project (2013-2015)<br>・Enhancement of practical capability for maritime law enforcement project II (2016- )<br>【Grant Aid Assistance】<br>・The Project for enhancement of communications system for maritime safety and Security (2007-2009)<br>・The Project for enhancement of coastal communications systems (2014- )<br>【ODA Loan Assistance】<br>・Maritime safety capability improvement project for PCG (2013- ) |

### 1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Time of the Terminal Evaluation

【Phase I】

[1] English expressions in some parts of the project outline have been modified from the original ones.

[2] The four areas are search and rescue (SAR), aids to navigation (ATON), marine pollution/oil spill combating (MARPOL /OSC), and maritime law enforcement (MARLEN).

The terminal evaluation of the Phase I project expected that the project would achieve its project purpose because it provided training on the knowledge and skills required to perform functions of PCG for an equivalent or even greater number of personnel than planned.

【Phase II】

The terminal evaluation of the Phase II project expected that the project would achieve its project purpose because it appointed an equivalent number of concurrent instructors as planned and developed training on MARLEN and ship operations.

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

【Phase I】

The terminal evaluation of the Phase I project expected that the project would achieve its overall goal because the number of missions in SAR, ATON, MARPOL/OSC, and MARLEN increased, meaning that PCG was able to take appropriate actions.

【Phase II】

The terminal evaluation of the Phase II project expected that the project would achieve its overall goal because the number of missions in MARLEN and patrols by patrol boats increased.

### 1.3.3 Recommendations at the Time of the Terminal Evaluation

Recommendations at the time of the terminal evaluations of the Phase I project and the Phase II project and follow-up situations of the recommendations are as follows.

Table 1: Recommendations and follow-up situations of the recommendations at the time of the terminal evaluation

| Recommendations | | Follow-up situations |
|---|---|---|
| 【Phase I (2006)】 | | |
| 1 | It is desired that the curriculum and syllabus of SAR, ATON, MARPOL/ OSC, and MARLEN as well as the evaluation/feedback system are improved. | Curriculum and syllabus in respective areas as well as the evaluation/feedback system were improved by the end of the project. |
| 2 | It is desired that a permanent faculty system is launched. | A permanent faculty system was approved by the commandant of PCG and was launched by the end of the project. However, it ended in six months because it did not fit in with the existing career system that required rotations on a regular basis. Therefore, the Phase II project established a concurrent instructor system that fit in with the existing career system. |
| 【Phase II (2012)】 | | |
| 1 | Regarding Output 3 of developing and strengthening training programs on ship operations, it is desired that a course for trainers, apart from the ship operation course, is developed. | No course for trainers, apart from the ship operation course, has been developed. However, the ongoing Enhancement of Practical Capability for Maritime Law Enforcement Project II is planning to develop one. |
| 2 | Regarding Output 3, it is desired that a certification program for trainers, apart from the certification program for coast guard officers/non-officers, is developed. | A certification program for trainers was developed by the end of the project. |

Source: JICA

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Koichiro Ishimori, Value Frontier Col., Ltd

### 2.2 Duration of Evaluation Study

The ex-post evaluation was conducted according to the following schedule.

Duration of the Study: September 2015 - October 2016

Duration of the Field Study: January 10, 2016 - January 26, 2016, and April 10, 2016 - April 16, 2016

## 3 Results of the Evaluation (Overall Rating: A[3])

### 3.1 Relevance (Rating: ③[4])

#### 3.1.1 Relevance to the Development Plan of the Republic of the Philippines

【Phase I】

"The Mid-Term Philippine Development Plan (1994-2004)" at the time of the project planning highlighted the importance of "ensuring maritime safety and security" in one of the

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

[4] ③: High, ② Fair, ① Low

six priorities, “development of infrastructures”. Similarly, “the PCG 15 Year Development Plan (2000-1015)” highlighted the importance of “building the capabilities of PCG personnel through training and human resource management system” in one of the seven priorities.

“The Mid-Term Philippine Development Plan (2004-2010)” at the time of the project completion continuously highlighted the importance of “securing maritime safety and security” in one of the 24 priorities, “infrastructures”. “The PCG 15 Year Development Plan (2000-1015)” was still valid.

The Phase I project that aimed to ensure maritime safety and security in the sea near the Philippines through training of PCG personnel was thus in line with the development policies of the Philippines both at the time of the project planning and completion.

【Phase II】

Similar to the Phase I project, the Phase II project was in line with the priorities of “the Mid-Term Philippine Development Plan (2004-2010)” and “the PCG 15 Year Development Plan (2000-1015)” at the time of the project planning.

“The Mid-Term Philippine Development Plan (2011-2016)” at the time of the project completion continuously highlighted the importance of “ensuring maritime safety and security” in one of the nine priorities, “acceleration of infrastructure development”. “The PCG 15 Year Development Plan (2000-1015)” was also still valid.

The Phase II project that aimed to ensure maritime safety and security in the sea near the Philippines through training of PCG personnel and development of human resource management system was thus in line with the development policies of the Philippines both at the time of the project planning and completion.

### 3.1.2 Relevance to the Development Needs of the Republic of the Philippines

【Phase I】

When the project was planned, PCG’s management had been transferred from the Philippine Navy to Department of Transportation and Communications and restructured as a civilian organization. However, because all PCG personnel were from the Philippine Navy, they did not possess adequate knowledge and skills required to ensure maritime safety and security.

When the project was completed, PCG still had its mission to ensure maritime safety and security. For this reason, PCG continued to be responsible for responding to maritime incidents such as piracy activities in the South East Asia, although such activities had exhibited a decreasing trend since 2004[5].

[5] While there were 158 cases in 2004, there were 70 cases in 2007 (“Maritime security” in the HP of the Ministry of Foreign Affairs of Japan)

The Phase I project that aimed to ensure maritime safety and security in the sea near the Philippines through training of PCG personnel was thus in line with the development needs of the Philippines both at the time of the project planning and completion.

【Phase II】

PCG developed an education and training system and strengthened the training courses in the four areas through the Phase I project. When the Phase II project was planned, however, it was necessary for PCG to develop a more efficient human resource management system in order to further improve its performance. However, PCG did not have adequate knowledge and skills required to develop it, and thus had difficulties in developing it by itself.

When the Phase II project completed, PCG still had its mission to ensure maritime safety and security. Due to this, PCG continued to be responsible for responding to maritime incidents such as piracy activities in the South East Asia that had exhibited an increasing trend since 2010[6].

The Phase II project that aimed to secure maritime safety and security in the sea near the Philippines through training of PCG personnel and development of human resource management system was thus in line with the development needs of the Philippines, both at the time of the project planning and completion.

### 3.1.3 Relevance to Japan's ODA Policy

【Phase I and II】

"Aid policies on the Philippines (2000 and 2007)" of the Ministry of Foreign Affairs of Japan at the time of the projects' planning recognized that the Philippines was geopolitically important because it was located in a strategic point of the sea lane in the South China Sea. They also highlighted the importance of building the capacities of administrative organizations in one of the four priorities, development of human resources and system. Similarly, the data books (2000 and 2007) of the Ministry of Foreign Affairs of Japan recognized that the Philippines was geopolitically important because it was located in the sea lane connecting Japan to the South East Asia, the Middle East, and the Europe.

The Phase I and II projects that aimed to secure maritime safety and security through the training of PCG personnel and development of human resource management system were thus in line with the development policies of Japan at the time of the projects planning.

In light of the above, the Phase I and II projects were highly relevant to the Philippines' development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

[6] While there were 70 cases in 2010, there were 104 cases in 2012 ("Maritime security" in the HP of the Ministry of Foreign Affairs of Japan)

### 3.2 Effectiveness and Impact[7] (Rating:③)

#### 3.2.1 Effectiveness

##### 3.2.1.1 Project Output[8]

【Phase I】

The Phase I project developed education and training courses in the four areas, SAR, ATON, MARPOL/OSC, and MARLEN, and also developed basic education courses to improve the skills of ship operations based on the mid-term evaluation of the project. As a result, it achieved the following project purpose to the same or a greater extent than planned. Therefore, the Phase I project is considered to have achieved its project purpose of PCG developing its personnel's knowledge and skills required to perform its functions.

Table 2 Achievement of the project purpose of the Phase I Project

| Project purpose | Indicators | Actual achievement |
|---|---|---|
| Project purpose of the Phase I project | ① A total of 2,050 personnel are trained such that they can take appropriate actions in the four areas by 2007. | ① A total of 2,325 personnel were trained such that they can take appropriate actions in the four areas by 2007. |
| | ② A total of 450 personnel including the concerned public and private organizations are invited to and participated in training in the four areas by 2007. | ② A total of 515 personnel including the concerned public and private organizations were invited to and participated in training in the four areas by 2007. |
| | ③A certain number of personnel who have knowledge and skills as instructors are trained in the four areas by 2007. | ③ A total of 74 personnel who have knowledge and skills as instructors were trained in the four areas by 2007. |

Source: JICA documents

【Phase II】

Based on the achievement of the project purpose of the Phase I project, the Phase II project further strengthened education and training courses in MARLEN that needed crackdown on crafted crimes in recent years and courses in ship operations. As a result, it achieved the following project purpose to the same or a greater extent than planned. Therefore, the Phase II project is considered to have achieved its project purpose of PCG developing an education and human resource management system.

[7] Sub-rating for Effectiveness is to be put with consideration of Impact.
[8] Achievements of respective outputs that bring about achievement of the project purpose are described in the appendix.

Table 3 Achievement of the project purpose of the Phase II Project

| Project purpose | Indicators | Actual achievement |
|---|---|---|
| Project purpose of the Phase II project | ①28 PCG personnel and private instructors are appointed as concurrent instructors by 2012. | ①27 PCG personnel received training not only at CGETC but also in Japan and were appointed as concurrent instructors by 2012. Due to legal problems with employment, no private instructor was appointed. |
| | ②300 new and mid-career officers and non-officers receive training in MARLEN courses by 2012. | ②1,559 new and mid-career officers and non-officers received training in MARLEN courses by 2012. |
| | ③153 PCG personnel become eligible for ship operations by 2012. | ③483 PCG personnel passed the final exam of the training in ship operations after receiving the training and became eligible for ship operations by 2012. |
| | ④6 instructors[9] receive courses in ship operations by 2012. | ④24 candidates for instructors passed the final exam of the training in ship operations after receiving the training by 2012. They later became instructors after 3 years of shipboard experience. |

Source: JICA documents

In light of the above, it is considered that the Phase I and II projects achieved their project purposes.

### 3.2.2 Impact

#### 3.2.2.1 Achievement of Overall Goal

As mentioned above, the Phase I and II projects achieved their project purposes. To effectively achieve the overall goals of the projects in improving PCG's capacities to perform its functions, however, it is necessary not only to sustain the achievement of the project purposes but also to strengthen other PCG activities through personnel's capacity building and infrastructure development. . Therefore, firstly, the degree of achievement of the overall goals that can be achieved if the project purposes can be sustained is described, and secondly, the contributions that other forms of Japanese cooperation, namely technical cooperation, grant aid assistance, and ODA loan assistance, can make to strengthening other PCG activities through personnel's capacity building and infrastructure development.

【Phase I】

The Phase I project has achieved indicator ① and ② to measure the extent of achievement of the overall goal, but has not achieved ③. Therefore, it is considered to have partially achieved the overall goal of PCG improving capacities to perform its functions.

[9] It was written in the indicator that instructors would receive trainings. However, candidates for instructors should receive training. Therefore, it is understood that "instructors" in the indicator refers to candidates for instructors.

Table 4 Achievement of the overall goal of the Phase I project

| Overall goal | Indicator[10] | Actual achievement |
|---|---|---|
| Overall goal of the Phase I project | ①The number of PCG missions in SAR from 2007 to 2011 improves, in comparison with the number of missions from 2002 to 2006. | ①While the number of PCG missions in SAR was 2,149 from 2002 to 2006, it was 3,233 from 2007 to 2011. Since it increased, the indicator is considered to be achieved.<br>(The annual average number of PCG missions in SAR was 430 from 2002 to 2005, 583 from 2006 to 2010, and 694 from 2011 to 2015.) |
| | ②The number of PCG missions in MARPOL/OSC from 2007 to 2011 improves, in comparison with the number of missions from 2002 to 2006. | ②While the number of PCG missions in MARPOL/OSC was 39,705 from 2002 to 2006, it was 48,762 from 2007 to 2011. Since it increased, the indicator is considered to be achieved.<br>(The annual average number of PCG missions in MARPOL/OSC was 7,470 from 2002 to 2005, 9,980 from 2006 to 2010, and 10,075 from 2011 to 2015.) |
| | ③The number of PCG missions in MARLEN[11] from 2007 to 2011 improves, in comparison with the number of missions from 2002 to 2006. | ③While the number of PCG missions in MARLEN was 804 from 2002 to 2006, it was 678 from 2007 to 2011. The reasons for the decrease were that the Philippine Drug Enforcement Agency, in addition to the Philippine National Police, has become active since 2006 and that crafted crimes of recent have made it difficult for PCG to crack down on unidentified objects. Because the number of PCG missions in MARLEN from 2007 to 2011 decreased in comparison with the number of missions from 2002 to 2006, it is considered that the indicator was not achieved. |

Source: JICA documents

【Phase II】

The Phase II project has achieved all the indicators to the same or a greater extent than planned. Therefore, the overall goal of PCG improving capacities as a law enforcement agency is considered to have been achieved.

Table 5 Achievement of the overall goal of the Phase II project

| Overall goal | Indicator | Actual achievement |
|---|---|---|
| Overall goal of the Phase II project | ①The number of missions in MARLEN increases. | ①While the number of missions in MARLEN before the Phase II project (in 2007) was 98, the annual average number of missions from 2011 to 2015 was 119. Since it increased, the indicator is considered to be achieved. |
| | ②The number of patrol missions by patrol boats increases. | ②While the number of patrol missions by patrol boats before the Phase II project (in 2007) was 2,097, the annual average number of patrol missions from 2011 to 2015 was 4,328. Since it increased, the indicator is considered to be achieved. |

Source: JICA documents

The contributions that other forms of Japanese cooperation, namely technical cooperation, grant aid assistance, and yen loan assistance, can make to strengthening other PCG activities through personnel's capacity building and infrastructure development are described below.

[10] PDM1 used the rate of responses (the number of missions/the number of incidents) in each of the indicators ①-③. However, the mid-term evaluation changed it into the number of missions as shown in PDM2.

[11] Missions in MARLEN include reactions to piracy activities as well as illegal maritime trafficking of drugs and fire arms.

【Technical cooperation】

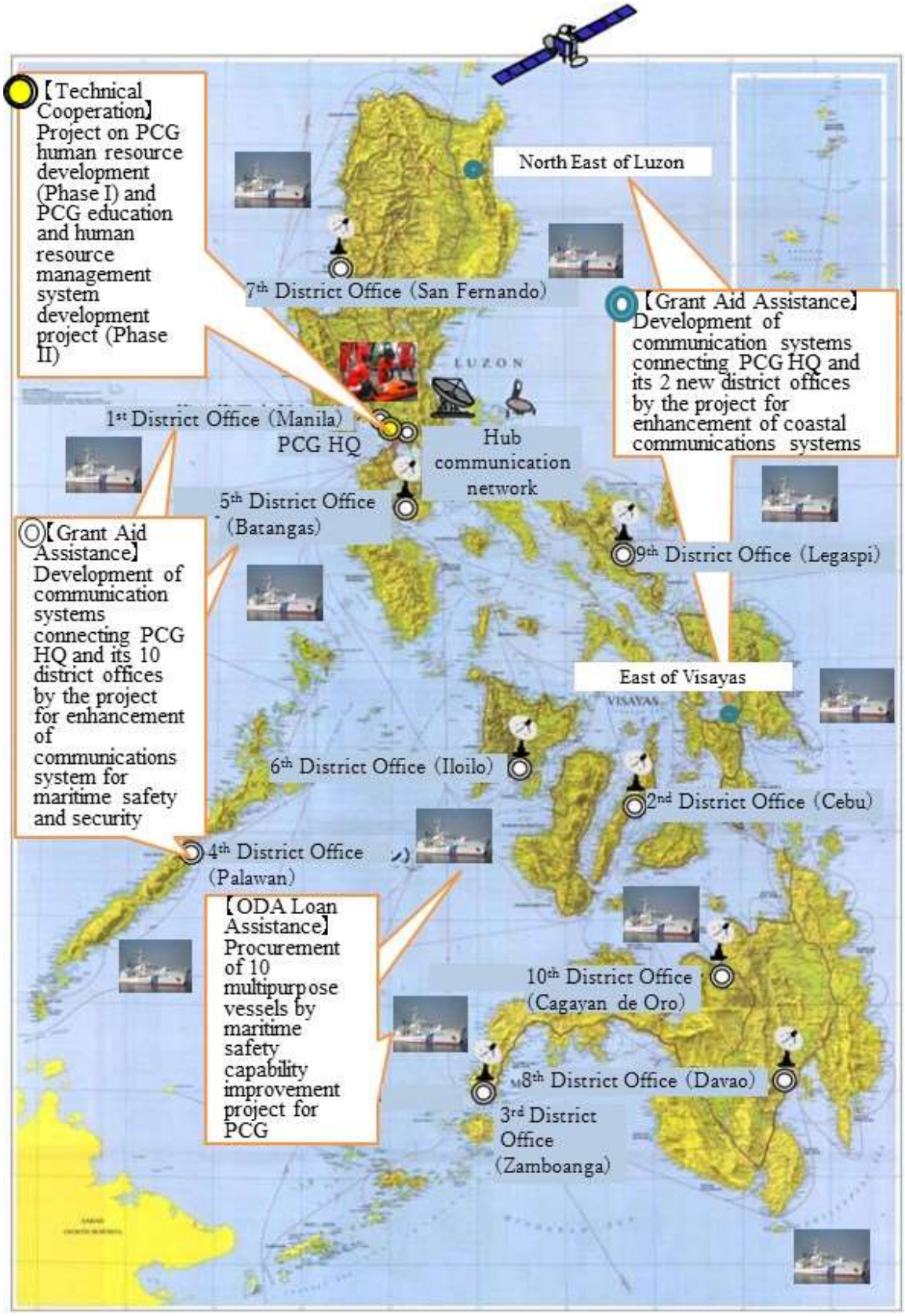
Group training courses (2007- ) have annually invited five mid-career or executive officers on the average to Japan and provided them with numerous trainings in the four areas of SAR, ATON, MARPOL/OSC, and MARLEN. For example, “Maritime search and rescue, marine disaster prevention and marine environment protection course for the officials for maritime safety operational level (2011- )” has been providing PCG’s field commanders with 1) lectures on SAR, marine disaster prevention, and marine environment protection; 2) field training using facilities, ships, and aircrafts of Japan Coast Guard; 3) training on marine disaster prevention; and 4) training on marine environment protection. It has thus been contributing to improving PCG’s capabilities on the ground to respond to incidents in the areas of SAR and MARPOL/OSC. Therefore, group training courses (2007- ) are considered to be supporting the functions of PCG and are contributing to the achievement of the overall goals of the Phase I and II projects. Similarly, dispatching experts on coast guard administration (2003-2006), (2006-2009), and (2009-2012) as well as “Enhancement of practical capability for maritime law enforcement project” (2013-2015) and “Enhancement of practical capability for maritime law enforcement project II” (2016- ) have been providing numerous policy advice and field trainings primarily in the areas of ATON and MARLEN. For example, “Enhancement of practical capability for maritime law enforcement project” (2013-2015) developed the maritime training system for maritime law enforcement, and “Enhancement of practical capability for maritime law enforcement project II” (2016- ) has been providing field trainings including instructions on arresting techniques. They have thus been contributing to improving PCG’s capabilities on the ground to respond to incidents in the area of MARLEN. Therefore, they are considered to be supporting the functions of PCG and contributing to the achievement of the overall goals of the Phase I and II projects.

【Grant aid assistance】

“The project for enhancement of communications system for maritime safety and security” (2007-2009) developed a communications system connecting PCG HQ and its 10 district offices. “The project for enhancement of coastal communications systems” (2014- ) has been developing communication systems connecting PCG HQ and its newly established 2 district offices in addition to the 10 district offices. With these projects, PCG is and will be able to accurately send and receive confidential information in greater areas that is necessary for prompt and well-coordinated SAR activities. In conjunction with contributions to the capacity development of PCG through Phase I and II projects, particularly in the area of SAR, these grant aid assistances have been bringing about synergies for supporting PCG functions. Therefore, grant aid assistance is considered to be contributing to the achievement of the overall goals of the Phase I and II projects.

【ODA loan assistance】

“Maritime safety capability improvement project for the Philippines Coast Guard” (2013- ) is a project that procures 10 multipurpose vessels to cover the shortage of vessels at PCG. With the project, PCG will be able to patrol in greater areas. In conjunction with contributions to the capacity development of PCG through Phase I and II projects, particularly in the areas of SAR and MARLEN, they have been bringing about synergies for supporting functions of the PCG. Therefore, ODA loan assistance is considered to be contributing to the achievement of the overall goals of the Phase I and II projects.




Picture 1: Images of technical cooperation, grant aid assistance, and ODA loan assistance

Source: JICA documents

As illustrated above, other forms of cooperation, namely technical cooperation, grant aid assistance, and ODA loan assistance, have been and will be contributing to strengthening other PCG activities through personnel's capacity building and infrastructure development. Therefore, it is expected that they have been and will be contributing to bringing about the impacts of the Phase I and II projects through increases in the number of missions that are indicators of the overall goals of the projects.

Cases in the four areas of SAR, ATON, MARPOL/OSC, and MARLEN are described below.

【SAR】

On August 16, 2013, a ferry, Thomas Aquinas, with 870 crew members and passengers on board leaving Mindanao for Cebu crashed into a cargo ship, Sulpicio, 2 km away from the port of Cebu. This disaster resulted in 116 deaths and 21 people missing. However, PCG was able to save 750 crew members and passengers on board the two vessels. According to the beneficiary survey[12] administered during the ex-post evaluation with 37 survivors, 31 survivors expressed their satisfaction with PCG's SAR activities because their lives had been saved, while 1 expressed his dissatisfaction because he had to wait in the sea for 4 days to be rescued due to lack of vessels (5 did not express opinions).

PCG personnel searching survivors in Thomas Aquinas

【ATON】

In September 2006, the Philippines became a signatory nation of the "Regional cooperation agreement on combating piracy and armed robbery against ships in Asia" that Japan advocated. Japan relies on the Middle East for approximately 84% (2013) of its oil[13], and many oil tankers pass through the South China Sea in the West of the Philippines. Because PCG as an enforcement organization of the agreement contributes to the safety of navigation in the South China Sea, it is also considered to indirectly contribute to the energy security of Japan.

【MARPOL/OSC】

On August 11, 2006, a tanker, Solar 1, sank off the coast of Guimaras due to effects of the typhoon and spilled over approximately 0.5 million liters of the approximately 2 million liters of heavy oil it was carrying. It was the biggest marine pollution accident in history. PCG succeeded in dealing with the oil spill in collaboration with the Japanese

PCG dealing with the chemical treatment of the spilled oil

[12] For carrying out the beneficiary survey, the external evaluator obtained information about the survivors from PCG and visited Bolinao in the North West of Luzon where the evaluator was able to meet as many as 37 survivors despite time and financial constraints. The evaluator then obtained responses from all of them through individual interviews.

[13] Annual statistical review of resources and energy (2013), Ministry of Economy, Trade and Industry of Japan.

expert who was being dispatched to the Phase I project at that time. According to the beneficiary survey[14] administered during the ex-post evaluation to the 7 ship companies that had been salvaged by PCG's MARPOL/OSC activities, 5 companies expressed their satisfactions because PCG succeeded in preventing the spreading of marine environment pollution (2 companies did not express opinions). Similarly, according to the beneficiary survey[15] administered to 3 ship associations, all the associations expressed their satisfactions because PCG succeeded in preventing the spreading of marine environment pollution.

【MARLEN】

Production of illegal drugs is active in the Philippines, and some of them are smuggled to Japan. PCG regularly monitors unidentified ships that may be engaged in the smuggling of illegal drugs based on long-term undercover work and intelligence activities. On February 14, 2007, when PCG spotted an unidentified ship sailing, it chased the ship for over one hour and finally arrested smugglers of illegal drugs off the coast of Talin, Batangas province. Consequently, PCG was able to confiscate 115 million yen worth of illegal drugs from two suspects and prevent them from being sold to other countries including Japan.

3.2.2.2 Other Impacts

There are no other impacts to report.

Although one indicator for the overall goal of the Phase I project has not been achieved, all indicators for the overall goal of the Phase II project have been achieved. As a result of the contributions from other forms of Japanese cooperation made to strengthening PCG's other activities through personnel's capacity building and infrastructure development, excellent impacts have been observed as mentioned above. Their contributions to the overall goals are significant enough to make up for the unachieved indicator, and thus the overall goals of both projects are considered to be achieved.

Overall, as a result of the implementation of the Phase I and II projects, the respective project purposes—that PCG develop personnel's knowledge and skills required to perform its functions and that PCG develops an education and human resource management system—were achieved. In addition, impacts have been observed in the four areas of SAR, ATON, MARPOL/OSC, and MARLEN, and the overall goals have been achieved as planned. Therefore, effectiveness and impacts of the Phase I and II projects are high.

[14] When carrying out the beneficiary survey, the external evaluator contacted more than 10 ship companies located around Manila and visited 7 companies that agreed to take the survey under the condition that the name of the companies would not be made public. The evaluator then obtained responses from 5 of them through individual interviews.

[15] Because ship companies were hesitative, the external evaluator also contacted 3 ship associations located around Manila and visited those that agreed to take the survey under the condition that the name of the associations would not be made public. The evaluator then obtained responses from all of them through individual interviews.

### 3.3 Efficiency (Rating: ③)

#### 3.3.1 Inputs

The inputs of the Phase I project are as follows.

| Inputs | Plan | Actual（at the time of completion） |
|---|---|---|
| (1) Experts | Long-term: 5<br>Short-term: 20-25 | Long-term: 9<br>Short-term: 37 |
| (2) Trainees received | 15-20 | 32 |
| (3) Equipment | Land for constructing a pool for training, equipment, and PC required to transfer knowledge and skills | Construction of a pool for training, echo sounders, navigation system, oil analyzers, drug test kits |
| Japanese Side Total Project Cost | 600 million yen | 801 million yen |
| Philippines Side Operational Cost | Cost for training, human resources, maintenance of equipment, and others | 29,499 thousand pesos |

Source: JICA documents

The inputs of the Phase II project are as follows.

| Inputs | Plan | Actual（at the time of completion） |
|---|---|---|
| (1) Experts | Long-term: 4<br>Short-term: 15-20 | Long-term: 6<br>Short-term: 9 |
| (2) Trainees received | 10-15 | 45 |
| (3) Equipment | Database of human resource management system, equipment for ship operation training, equipment for law enforcement, and others | Database of human resource management system, equipment for ship operation training, equipment for law enforcement, and others |
| Japanese Side Total Project Cost | 360 million yen | 280 million yen |
| Philippines Side Operational Cost | Cost required to operate the project, and others | unknown |

Source: JICA documents

##### 3.3.1.1 Elements of Inputs

Following the mid-term evaluation of the Phase I project conducted in July 2005, Output 3 ―that basic training courses including OJT/unit training are enhanced―was newly added to the project. Consequently, the number of long-term and short-term experts and trainees received in Japan increased to over 150% of the planned number. The provisions of equipment were almost the same as planned.

In the Phase II project, the number of long-term experts increased. Meanwhile, the number of short-term experts decreased because long-term experts did their jobs effectively. The number of trainees received in Japan substantially increased due to the requirement for numerous trainings.

##### 3.3.1.2 Project Cost

The project cost for the Phase I project increased because Output 3 and necessary activities were newly added to the project after the mid-term evaluation, resulting in approximately

134% of the planned project cost. However, the project cost is considered to be efficient because of the following three reasons. Firstly, additional activities resulting from Output 3 were necessary activities to accelerate the achievement of the project purpose. Secondly, despite the fact that the number of experts dispatched and trainees received in Japan became almost 150% of the planned number, all the activities were completed during the project period as planned. Thirdly, as a result of Output 3, materials for basic education course including three sets of materials on ship operations and one set of manual on training on rubber boats were developed.

The project cost for the Phase II project was within the planned project cost, and thus the project cost is considered to be efficient.

Overall, although the project cost of the Phase I project became almost 134% of the planned project cost due to the addition of Output 3, it was efficient for the aforementioned reasons. The project cost of the Phase II project was within the plan.

3.3.1.3 Period of Cooperation

The actual period of the Phase I project was the same as planned from July 2002 to June 2006 despite additional activities resulting from the addition of Output 3.

The actual period of the Phase II project was five years from January 7, 2008 to January 6, 2013, while the original period was five years from January 2008 to December 2012[16].

Therefore, the periods of the Phase I and II projects were same as planned.

Overall, both the project costs and periods were mostly the same as planned. Therefore, efficiency of the projects is high.

### 3.4 Sustainability (Rating:②)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

"The Mid-Term Philippine Development Plan (2011-2016)" highlights the importance of maritime safety and security in one of the nine priorities, acceleration of infrastructure development. "The PCG 15 Year Development Plan (2000-12015)" continues to be valid.

In addition, the PCG law was created in February 2010. The law gives PCG an official entitlement as the maritime law enforcement organization as well as an independent budget. Consequently, PCG is now able to obtain human resources, procure equipment, and construct facilities on its own.

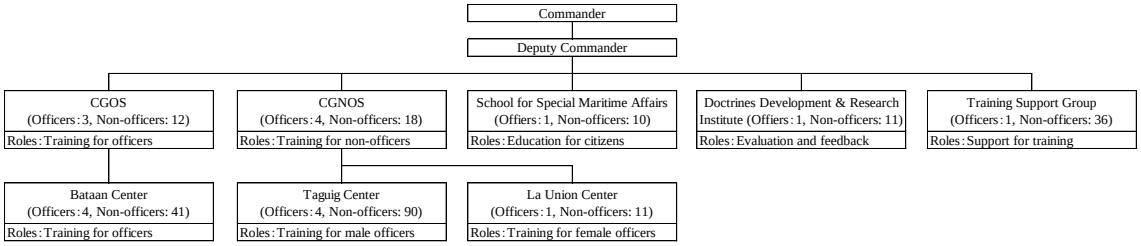
The Phase I and II projects aimed to secure maritime safety and security in the sea near the Philippines and are still in line with the development policies and sector plans of the Philippines

[16] The original period was from January 2008 to November 2012 in the ex-ante evaluation sheet. However, the period agreed on R/D was 5 years from the day of dispatch of the experts. Therefore, the external evaluator used January 2008 to December 2012.

after the completion of the projects. Therefore, it is considered that there is no problem with related policy and institutional aspects for the sustainability of project effects.

### 3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

Currently, 230 personnel (27 officers and 203 non-officers) are deployed at CGETC and engage in training for PCG personnel. The courses that the Phase I and II projects developed are taught at the Coast Guard Officer's School (CGOS) and the Coast Guard Non-officers' School (CGNOS). Each school has the number of personnel required for managing the education and training and for teaching courses. Therefore, it is considered that there is no problem with the organizational aspects of PCG for the sustainability of project effects.




Picture 2: Organigram of CGETC

Source: CGETC

When providing education and training for PCG personnel, the superintendent of each school needs to find a PCG officer who may be interested in becoming a course director for managing education and training courses. As is often the case, however, the superintendent has no choice but to select an officer from the officers deployed in Manila because the selected officer needs to perform his/her regular tasks while serving as a course director. The capabilities of the selected course directors also vary because there are no guidelines defining the knowledge and experiences required for course directors. Besides, the assigned course directors select instructors based on his/her own subjective judgement.

Similarly, course directors have no choice but to select instructors from the officers deployed in Manila because instructors need to perform their regular tasks while serving as instructors[17]. The capabilities of the selected instructors also vary because no examination certifying the instructors is held, though the PCG ordinance dated May 28, 2012 states the knowledge and experiences required of instructors. Besides, although the database for selecting instructors was established at the time of the project completion as the indicator ① for Output 1 of the Phase I project, it is out of operation

[17] As described in Table 1, the Phase I project established a permanent faculty system, but ended in six months because it did not fit in with the existing career system that required rotations on a regular basis. Due to this, the Phase II project established a concurrent instructor system that could fit in with the system.

due to technical problems[18]. Consequently, course directors cannot select instructors based on objective information including the knowledge and experiences of candidate instructors that the database was covering and have no choice but to depend on their own subjective judgement.

Furthermore, the aforementioned PCG ordinance states that instructors must engage in their instruction work for more than three years, but many of them are reassigned within half a year to a year of becoming instructors to another position that makes it difficult, if not impossible, for them to continue to be instructors due to lack of attention to the ordinance by Coast Guard 1 (CG1) in charge of Human Resource Management. Therefore, the concurrent instructor system that was established by the end of the Phase II project as the indicator ① for Output 1 of the Phase II project is not functioning as well as expected.

Because many positive impacts have been observed up to the timing of the ex-post evaluation as described above, the issues mentioned above are not critical to the extent that they prevent the project purposes and the overall goals of the Phase I and II projects from being achieved. However, it should be noted that the achievement of the Output 1 of the Phase II project and the project purpose of the Phase II project that were both attained at the time of the project completion are weaker than before. PCG is planning to increase the number of its personnel from 9,000 in 2015 to 13,500 in 2020, and it requires PCG to stably provide them with high-quality education and training. Therefore, it should be recognized that the issues mentioned above are agendas to be tackled in the future.

### 3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

The curriculum, the syllabus, the manuals, and the textbooks that the Phase I and II projects developed continues to be used at CGETC and is the foundation for education and training. As described above, however, the levels of the course directors and instructors who teach using the manuals and the textbooks vary. The monitoring and feedback system[19] that was developed as the indicator ⑤ for Output1 of the Phase II project continues to be used for improving training and education. Meanwhile, training courses for trainers for improving ship operations by PCG personnel that the terminal evaluation of the Phase II project suggested have not yet been developed. Therefore, it is recognized that they are an agenda to be tackled in the future (one course will be developed under the “Enhancement of practical capability for maritime law enforcement project II”).

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[18] PCG is unable to use the database because its login code and password are missing. PCG has been trying to get in touch with the private programmer that developed the database, but has not been successful.

[19] Students respond to a five-point scale questionnaire (Form A) before taking education and training so that PCG can grasp their prior abilities. They also respond to a five-point scale questionnaire (Form B) after taking it so that PCG can gauge the students’ levels of satisfaction of curriculums, syllabus, manuals, and textbooks as well as with facilities and instructors. Meanwhile, instructors respond to a five-point scale questionnaire (Form C) to perform a self- evaluation. Doctrines Development and Research Institute of CGETC conducts analyses based on the completed questionnaires and takes the necessary actions. In this way, it tries to improve the overall education and training.

The swimming pool for training constructed by the Phase I project is well maintained and used even today. Similarly, although some of the equipment such as oil analyzers that the Phase I and II projects procured are not in use because they have deteriorated, there is no major problem with the operation and maintenance of the equipment because PCG maintains a budget for facilities and equipment as shown below and procures new equipment.


Swimming pool for training

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effects

The overall budget of PCG has indicated an increasing trend. The total cost combining the human resource cost and maintenance cost increased from 85,006 thousand pesos in 2013 to 96,811 thousand pesos in 2015. PCG also appropriately allocated facilities and equipment cost on a need basis. Therefore, there is no problem with financial aspects for sustaining the project effects.

Table 6：Financial status of PCG on the whole and CGETC

Unit：Thousand pesos

| | 2013 | 2014 | 2015 |
|---|---|---|---|
| PCG | 4,670,600 | 4,387,466 | 5,613,080 |
| CGETC | 124,956 | 86,666 | 112,121 |
| Human resource cost | 80,333 | 83,044 | 92,366 |
| Maintenance cost | 4,673 | 3,622 | 4,445 |
| Facilities & equipment cost | 39,950 | 0 | 15,300 |

Source: PCG

In summary, some minor problems have been observed in terms of the organizational and technical aspects of PCG. Therefore, sustainability of the project effects is fair.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

The program consisting of Phase I and II aimed to develop personnel with knowledge and skills required to perform the functions of PCG. For its aim, Phase I developed education and training courses and Phase II developed education and training system at CGETC where PCG provides its personnel with education and training. The implementation of the program was in line with the development policies and needs of the Philippines as well as the development policies of Japan, and thus its relevance is high. The program achieved the project purposes of both the phases: Through Phase I, PCG personnel with the knowledge and skills required to perform their functions were developed and through Phase II, the PCG's education and human resource management system was developed. It has also had great impacts on the four target areas of the program, i.e., SAR, ATON,

MARPOL/OSC, and MARLEN, in conjunction with numerous contributions by other Japanese cooperation. Thus, its effectiveness and impacts are high. The cost and period of the actual program were almost the same as planned, and thus, its efficiency is high. However, the sustainability of the program effects is fair because of the minor problems with the organizational and technical aspects of PCG, which are required to sustain the program effects.

In light of all the above, the program is evaluated to be highly satisfactory.

### 4.2 Recommendations

#### 4.2.1 Recommendations to the Implementing Agency

① It is recommended that PCG should either repair the database for selecting instructors developed by the project or develop a new one at the earliest so that it can select them in an objective manner.

② It is recommended that PCG should develop an examination certifying instructors at the earliest so that it can maintain the quality of all instructors.

③ It is recommended that PCG should take appropriate actions to secure three years of serving period as instructors at the earliest so that it can stably provide quality education and training.

④ It is recommended that PCG should develop training courses for trainers for improving ship operations by PCG personnel under the “Enhancement of practical capability for maritime law enforcement project II”.

#### 4.2.2 Recommendations to JICA

JICA should monitor PCG’s implementation processes of the aforementioned recommendations and promote them on a need basis so that it can sustain the project purposes and the overall goals.

### 4.3 Lessons Learned

【Establishment of effective human resource management system】

The Phase I project established a permanent faculty system, but ended it in six months because it did not fit in with the existing career system that required rotations on a regular basis. Therefore, the Phase II project established a concurrent instructor system that fit in with the existing career system. PCG also issued an ordinance that required concurrent instructors to serve as instructors for more than three years. However, many of the concurrent instructors are rotated within half a year to a year of becoming instructors and reassigned to another position due to the lack of attention to the ordinance by CG1. When a technical cooperation project establishes a human resource management system, it is important to contemplate on how it fits in with the existing career system and make it effective on the ground.

Appendix

Achievements of the Phase I and II projects[20]

<table>
<tr><td colspan="3">Phase I</td></tr>
<tr><td colspan="3">Output 1[21] : PCG strengthens its education and training management system.</td></tr>
<tr><td>Indicator①</td><td>Start of permanent faculty system</td><td>（Achieved） Permanent faculty system requiring faculty to serve as faculty permanently was approved by the PCG Commandant in March 2007 before the completion of the Phase I project. However, it ended in six months because it did not fit in with the existing career system that required rotations on a regular basis. Therefore, a concurrent instructor system that could fit in with the existing career system was established under the Phase II project.</td></tr>
<tr><td>Indicator②</td><td>Increase in the number of OJT/unit training</td><td>（Achieved） While it was 69 when the Phase I project started in 2002, it increased to 117 in a year before the completion of the Phase I project in 2006.
<table>
<tr><td>2003</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td></tr>
<tr><td>111</td><td>312</td><td>248</td><td>117</td><td>NA</td></tr>
</table></td></tr>
<tr><td colspan="3">Output 2[22] : PCG develops training courses and holds seminars in the four areas with participants from other concerned governmental and private organizations.</td></tr>
<tr><td>Indicator①</td><td>Completion of curriculum and syllabus in the four areas</td><td>（Achieved） Curriculum and syllabus in the four areas that CGETC developed in consultation with CG12, whose roles were to engage with policy planning on education and training of PCG personnel, were submitted to Education and Training Board consisting of nine executive personnel including the PCG commandant and revised based on the received comments. They were then approved by the PCG commandant before the completion of the Phase I project.</td></tr>
<tr><td>Indicator②</td><td>Development of textbooks and manuals</td><td>（Achieved）24 textbooks and 24 manuals that CGETC developed in consultation with CG12 were revised based on comments from relevant sections and then officially approved, though detailed completion dates were unknown.<br>（SAR: 1 textbook and 4 manuals, ATON: 3 textbooks and 3 manuals, MARPOL/OSC: 1 textbook and 14 manuals, and MARLEN: 19 textbooks and 3 manuals）</td></tr>
<tr><td>Indicator③</td><td>Completion of materials for seminars and publicity</td><td>（Achieved） Materials for seminars were the same as the aforementioned textbooks and manuals, and monthly newsletters were issued as materials for publicity.</td></tr>
<tr><td>Indicator④</td><td>Completion of materials for public awareness</td><td>（Achieved） Materials for public awareness were the same as the aforementioned materials for publicity.</td></tr>
</table>

[20] English expressions of some outputs and indicators have been modified from the original ones.

[21] There was only one indicator of the annual number of meetings in PDM 1 and PDM 2. However, it was changed to 2 indicators as PDM 3 at the time of the mid-term evaluation in 2005.

[22] In PDM 1 and PDM 2, Output 2 was the development of PCG education and training course whereas Output 3 was the number of seminars held. Consequently, the indicators for Output 2 were ① and ② above, and the indicators for Output 3 were ③ and ④ above. However, Output 2 and Output 3 of PDM 1 and PDM 2 were combined as one output (Output 2) in PDM 3 and indicators of ① to ④ were applied to measure the output at the time of the mid-term evaluation in 2005.

| Output 3[23]：PCG strengthens its basic education courses including OJT/unit training. | | |
|---|---|---|
| Indicator① | Development and revision of curriculum and syllabus of basic education courses | （Achieved） Curriculum and syllabus of basic education course (consisting of lectures on the mindset as sailors, roles and functions of PCG, and international laws and treaties related to PCG as well as practices of diving and rescue training and rubber boat operations) that CGETC developed in consultation with CG12 were revised based on comments from relevant sections and then completed. In parallel, OJT/unit trainings using constructed facilities, such as the swimming pool, and equipment procured, such as rubber boats, by the Phase I project were also implemented. |
| Indicator② | Development and revision of manuals, handbooks, and teaching materials of basic education courses | （Achieved） Training materials (3 manuals of ship operations and 1 material of rubber boat training) that CGETC developed in consultation with CG12 were revised based on comments from relevant sections and then completed. They were also incorporated into CGOC and CGOS. |

| Phase II | | |
|---|---|---|
| Output 1[24]：PCG establishes concurrent instructor system | | |
| Indicator① | Establishment of database of PCG personnel on education and training | （Achieved） The database for selecting candidates of instructors was developed while referring to the existing database at PCG. However, it is not operational due to technical problems after the completion of the Phase II project. |
| Indicator② | Development of the master plan on concurrent instructor system[25] | （Achieved） PCG made a Memorandum of Understanding on Cooperation for Education with Philippine Merchant Marine Academy (PMMA) in October 2009. With the MOU, PCG became able to invite PMMA instructors on ship operation skills and engines and to supplement its concurrent instructor system. |
| Indicator③ | Development of career management plan for PCG personnel | （Achieved） The proposal of career management plan for PCG personnel including concurrent instructor system was submitted to and approved by the PCG Commandant in March 2012. Similar to the permanent faculty system, however, the concurrent instructor system is under the existing career system. Because the existing career system still requires that many of concurrent instructors rotate within a year to half a year of becoming instructors, providing stable and high-quality training continues to be an issue for PCG. |
| Indicator④ | Establishment of an appropriate selection system of concurrent instructors | （Achieved） PCG became able to reflect the selection factors of PCG instructors to the database developed under the indicator ① above and consequently to select appropriate instructors. However, the database is not operational due to the aforementioned reason after the completion of the Phase II project. |

[23] There were no output 3 and corresponding indicators to the output 3 in PDM 1 and PDM 2. They were added as PDM 3 at the time of the mid-term evaluation in 2005.
[24] It was assumed in PDM 1 that PCG would develop a permanent faculty system in which the instructors of CGETC would permanently serve as instructors. However, it did not fit in with the existing career system. Therefore, it was reassumed and readjusted in PDM 2 during the mid-term evaluation in 2011 that PCG would develop a concurrent instructor system in which personnel other than CGETC could become instructors.
[25] The master plan on concurrent instructor system meant not only the establishment of a concurrent instructor system at PCG but also the provision of quality education in consultation with PMMA.

| | | |
|---|---|---|
| Indicator⑤ | Improvement of monitoring and feedback system | （Achieved） Students answer a five-point scale questionnaire (Form A) that measures their prior abilities before undertaking the education and training. They also answer a five-point scale questionnaire (Form B) that measures the level of satisfaction with curriculum, syllabus, manuals, and textbooks that the education and training used as well as with facilities and instructors after taking the education and training. Meanwhile, instructors answer a five-point scale questionnaire (Form C) for conducting their own self evaluation. Doctrines Development and Research Institute (DDRI) of CGETC performs analyses based on these forms and takes actions on a need basis. It tries to improve its overall education and training. |
| Output 2：PCG develops training programs on MARLEN | | |
| Indicator① | Development and strengthening of new courses on MARLEN for junior and mid-career officers | （Achieved） MARLEN component of CGOC (50 persons per year) that CGETC developed in consultation with Coast Guard 12 (CG12) under Output 3 of the Phase I project was revised and developed into CGSCC (40 persons per year). Courses on MARLEN were thus improved. |
| Indicator② | Development and strengthening of new courses on MARLEN for non-officers | （Achieved） MARLEN component of CGMC (400 persons per year) that CGETC developed in consultation with CG12 under Output 3 of the Phase I project was revised and developed into MARSEC (50 persons per year). Courses on MARLEN were thus improved. |
| Indicator③ | Integration of international MARLEN seminars into PCG's training programs | （Achieved） International seminar on MARLEN was held during the first year of the Phase II project. However, it was not held after the second year because PCG thought that it would be difficult for PCG to constantly hold it due to lack of manpower. Meanwhile, contents in the seminar, such as basic knowledge on international law enforcement and techniques of law enforcement, are incorporated into PCG's training plan. Therefore, this indicator is considered to have been achieved. |
| Indicator④ | Provision of training in MARLEN for 6 candidates of concurrent instructors | （Achieved） 10 candidates of instructors undertook training in Japan from 2010 to 2011 and became instructors afterwards. Therefore, this indicator is considered to have been achieved. |
| Output 3：PCG develops and strengthens training programs of ship operations. | | |
| Indicator① | Development of courses certifying ship operations for officers and non-officers | （Achieved）8 courses on ship operations for officers and non-officers (Shipboard Familiarization Course, CGOC Shipboard Module, Junior Ship Operational Level Course, Senior Ship Operational Level Course, Deck Specialization Shipboard Module, Engineering Specialization Shipboard Module, Operation Specialization Shipboard Module, and Navigation Course) were developed. However, the number of participants is unknown. |
| Indicator② | Establishment of PCG's certified courses | （Achieved）Officers and non-officers have to pass the certified exam at the end of the aforementioned courses, and those who pass the exam are given the certification. When these certified courses were developed, they were incorporated by the end of the Phase II project. |
| Indicator③ | Development of standard operation procedures of ships | （Achieved）Guideline on standard ship operations, training evaluation manual, and guide for on-duty officers were developed by the end of the Phase II project and continue to be used. |
| Indicator④ | Development of ship management procedures | （Achieved） The database on ship management including personnel deployment plan, maintenance plan, and procurement plan was developed by the end of the Phase II project and continue to be used. |

Lao People's Democratic Republic

FY2015 Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Expansion of Vientiane International Airport"

External Evaluator: Makiko Soma, Value Frontier Co., Ltd.

## 0. Summary

The project aims to improve the safety and security systems of the Vientiane International Airport and to meet the greater aviation demands expected in the future by expanding the facilities and upgrading the equipment at the airport, thereby contributing to promotion of tourism, improvements of logistics and investment climate to vitalize the economy of Lao People's Democratic Republic (Laos).

The project has been consistent with the development policies and development needs of Laos as well as the Japanese ODA policy toward Laos. Thus, its relevance is high. Both the project cost and period were within the plan. Therefore, efficiency of the project is high. Implementation of the project brought positive effects to Vientiane International Airport as expected. These effects include improved airport security in line with the standard imposed by International Civil Aviation Organization[1] (ICAO), advanced firefighting and rescue operations, and increased capacity to meet the growing demands of air transportation. In addition, some positive impacts such as enhancement of airport reliability, promotion of the air transportation industry and tourism, and improvement of investment climate have been observed. Therefore, effectiveness and impact of the project are high. No major problems have been observed in the institutional and financial aspects of the project. On the other hand, some minor problems are observed in terms of technical aspects of operation and maintenance. The staff of the implementing agency lacks technical skills and knowledge on operating and maintaining some of the provided equipment. They do not have a concrete plan to make improvements yet. Therefore, sustainability of the project effects is fair.

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

[1] ICAO was established as a UN specialized agency at the Convention on International Civil Aviation held in Chicago in 1944. ICAO's international standards and recommendations are summarized in the 18 annexes including rules of air, safety management, entry and departure at the airport, search and rescue, aerodrome, environmental protection, and aviation security. (Source: Website of Ministry of Foreign Affairs, accessed on May 8, 2016, http://www.mofa.go.jp/mofaj/gaiko/icao/kankoku.html)

## 1. Project Description


Project Location
(Source: Ministry of Foreign Affairs, Japan)

Taxiway Extended
(Vientiane International Airport)

### 1.1 Background

Laos is the only landlocked nation among the member countries of Association of South-East Asian Nations (ASEAN) and 80% of the land is mountainous. For Laos, air transportation is important for movement of passengers and cargos, connectivity with neighboring countries, promotion of international tourism, and acquisition of foreign currencies. Vientiane International Airport plays an important role as a gateway of the country and a hub of tourism and other economic activities.

The number of passengers at Vientiane International Airport was increasing by 9%[2] every year between 2000 and 2010. The existing airport facilities at the time of the project planning were not expected to be able to handle the growing aviation demands. The airport was not intended for large aircraft such as B747[3]. The airport needed to have a greater capacity to accommodate landings and departures of large aircraft to meet the growing demand. Also, Laos had an obligation to observe the standards set by ICAO as its member country. However, Vientiane International Airport did not fulfill some of the standards on aerodrome and airport security. Thus the airport received recommendations from ICAO to make improvements. Vientiane International Airport played important roles as a gateway in Laos and as a foothold for economic activities including logistics, tourism, and foreign diplomacy. Improving the airport safety and security standards, in addition to responding to the growing aviation demands, was necessary to maintain these important functions. Under such circumstances, Japanese government conducted a preparatory study of the project. Because the study identified that it was necessary to improve the Vientiane International Airport, Lao government requested the following assistance to Japanese government: expansion of parking apron[4], construction of new taxiways, and improvement of various security equipment.

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[2] JICA Documents

[3] Large aircraft called Boeing 747-400.

[4] The area of an airport where aircraft are parked, refueled, inspected and maintained. Also, passengers and crews board and exit, cargos are loaded and unloaded.

1.2 Project Outline

The Project aims to improve the safety and security systems of Vientiane International Airport and to meet the growing aviation demands expected in the future by expanding the facilities and upgrading the equipment at the airport, thereby contributing to promotion of tourism, improvements of logistics and investment climate to vitalize the economy of Laos.

<Grant Aid Project>

| | |
|---|---|
| E/N Grant Limit or G/A Grant Amount / Actual Grant Amount | 1,935 million Japanese Yen (JPY) / 1,935 million JPY |
| Exchange of Notes Date (/Grant Agreement Date) | August, 2011 / August, 2011 |
| Implementing Agency | Ministry of Public Works and Transport Department of Civil Aviation and Lao Airport Authorities |
| Project Completion Date | March, 2013 |
| Main Contractors | Hazama Ando Corporation (construction), Toyota Tsusho Corporation (security equipment), Sirius Corporation (Fire equipment) |
| Main Consultants | Nippon Koei Co., Ltd. / Azusa Sekkei Co., Ltd. (JV) |
| Basic Design | September 2010 to July 2011 |
| Related Projects | ● Japan International Cooperation Agency (JICA): Vientiane International Airport Terminal Expansion Project (January 2014 -) 9,017 million JPY (loan)<br>● JICA: The Project for Rehabilitation of Vientiane International Airport (1995-1998) 4,464 million JPY (grant aid)<br>● Asian Development Bank(ADB): Airports Improvement Project (1993-2001) 14.35 million USD (loan)<br>● Thai government: The Project for Pavement Improvement of Vientiane International Airport (2005-2006) about 9.6 million USD (30% grant, 70% loan)<br>● The Export-Import Bank of China: Wattay International Airport Upgrading Project (mainly military apron) (2011-2012) Amount unknown. |

## 2. Outline of the Evaluation Study

2.1 External Evaluator

Makiko Soma, Value Frontier, Co. Ltd.,

2.2 Duration of Evaluation Study

Duration of the Study: September 2015 to October 2016

Duration of the Field Study: January 17 to 29, 2016 and April 17 to 22, 2016

## 3. Results of the Evaluation (Overall Rating: A[5])

### 3.1 Relevance (Rating: ③[6])

#### 3.1.1 Relevance to the Development Plan of Laos

Improvement of Vientiane International Airport was a priority of aviation sector in the "Sixth National Socio-Economic Development Plan (2006-2010)" of the government of Laos at the time of the project planning. The airport improvement remained to be important in the public works and transportation sectors of the "Seventh National Socio-Economic Development Plan (2011-2015)" in order to fulfill the demands for aviation in Laos, the Great Mekong Subregion and the ASEAN member states at the time of the ex-post evaluation.

The policy of aviation sector, the "Civil Aviation Master Plan (2004-2013) (CAMP)," suggested the following at the time of the project planning: 1) improvements of taxiways and runways, 2) improvement of apron, 3) upgrading of firefighting and rescue equipment, and 4) expansion of passengers' terminals and other functions. On the other hand, the policy on aviation security, the "National Civil Aviation Security Program First Edition-2009 (Civil Aviation Security Program)", aimed to standardize and improve the airport security screening. The "Strategic Civil Aviation Plan (2012-2020)" continues to emphasize the importance of the above four issues suggested in the CAMP at the time of the ex-post evaluation. The Strategic Civil Aviation Plan has been amended several times since 2012. It was in the process of being approved by the Ministry of Public Works and Transport (MPWT). The Department of Civil Aviation (DCA) still uses the Strategic Civil Aviation Plan as an important plan in the civil aviation sector. Regarding the Civil Aviation Security Program, DCA updates it whenever the ICAO standards are revised so as to further strengthen the security system.

As seen above, improvements of the airport facilities, safety, and security were priority issues in the development plan and aviation sector plans of Laos both at times of the project planning and the ex-post evaluation. Therefore, the project was consistent with the national development policies and aviation sector policies of Laos.

#### 3.1.2 Relevance to the Development Needs of Laos

Vientiane International Airport did not fulfill the ICAO standards on aerodrome or aviation security at the project planning. This was because the parking apron did not have sufficient capacity and because the security equipment such as X-ray machines as well as the firefighting

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

[6] ③: High, ②: Fair, ①: Low

equipment were insufficient, malfunctioning, and too old. There were eight bays in the apron at the time of the project planning but the expansion was needed to meet the increasing aviation demand. It was forecasted[7] that 14 bays would be needed by 2018, and 21 bays by 2023. Lack of capacity of the parking apron significantly limited operations of regular flights of small and medium sized aircraft when large aircraft used the airport. In some cases, boarding of some domestic irregular flights had to be done at the military apron adjacent to the Vientiane International Airport. The fire vehicles needed to be renewed in order to carry out adequate firefighting and rescue activities because the existing fire vehicles and equipment had passed their service lives. Furthermore, Among the ASEAN member states, Laos was one of the few countries where Explosive Testing Device (ETD) had not been deployed. In order to avoid the risks of international terrorism and infiltration of hijack criminals, ETD was needed.

According to DCA, the number of international passengers of Vientiane International Airport increased by 1.5 times from 0.62 million to 0.95 million between 2011 and 2015 while the number of tourists increased by 1.7 times from 2.51 million to 4.33 million between 2010 and 2015. These figures clearly show the increase of aviation demands. From the time of the project planning until the ex-post evaluation, ICAO required DCA to constantly review the safety and security systems in line with the latest ICAO standards and recommendations[8] in order to respond to emerging risks and threats.

As seen above, it has been increasingly necessary to respond to greater aviation demands and to improve safety and security systems of the airport. Therefore, the project has been highly consistent with the development needs of Laos from the project planning until the ex-post evaluation.

### 3.1.3 Relevance to Japan's ODA Policy

The basic policy of the "Japan's Country Assistance Policy for Laos (2006)" was "to support self-help efforts of Laos for the reduction of poverty and for human development, and to support such efforts by Laos for realizing voluntary, independent, and sustainable economic growth, with a view to integration into global and regional economies." Under this basic policy, infrastructure development in Vientiane, the capital city and a center for economy, was particularly important as one of the assistance objectives. Airport improvement was part of the priority areas, "developing socioeconomic infrastructure and effectively utilizing existing infrastructure," under the above-mentioned basic policy and assistance objective. Therefore, the project was consistent with Japanese assistance policy at the time of the project planning.

[7] JICA Documents.

[8] DCA intensified their regulations on safety of airport facilities in response to the recommendations made during the regular inspection by ICAO Coordinated Validation Mission in April 2015.

The project has been highly relevant to the development plan and development needs of Laos as well as Japan's ODA policy. Therefore, its relevance is high.

## 3.2 Efficiency (Rating: ③)

### 3.2.1 Project Outputs

The outputs were produced as planned. Table 1 to 3 show the details.

Table 1 Outline of Facilities

| Facility | Details of the Structure | Description |
|---|---|---|
| New west side apron | Concrete Pavement Area=78,000 m$^2$ (600 m ×130 m)<br>Concrete Pavement Area =7,000 m$^2$<br>Concrete Pavement Area =7,000 m$^2$ | Slab thickness (t) =36cm<br>Base[9] t=36cm |
| Widening of existing apron | | |
| New east side apron | | |
| New taxiway[10] H | Asphalt Pavement Area=6,000 m$^2$<br>Length (L) = 105 m | Surface and base courses[11] =13cm, Base t=107cm |
| Widening of taxiway F&G | Asphalt Pavement Area=2,000 m$^2$ | Surface and base courses =13cm, Base t=107cm |
| New taxiway and apron shoulder | Asphalt Pavement Area=18,000 m$^2$ | Surface[12] t=8cm, Base t=49cm |
| New GSE（Ground Support Equipment）Road | Width (W)=10 m, L =600 m<br>Concrete Pavement Area=6,000 m$^2$ | Slab t=20cm Base t=36cm |
| | W=10m, L=600m<br>Asphalt Pavement Area=6,000 m$^2$ | Surface =10cm, Base t=52cm |
| Widening of east side of existing GSE road | W=10m, Asphalt Pavement Area = 2,000 m$^2$ | Surface =10cm, Base t=52cm |
| Drainage facilities | Under G Taxiway L = 42 m | Box culvert[13] 1.2 m×0.6 m: 1 box |
| | Under F Taxiway L = 95 m | Box culvert 1.5 m×0.4 m: 2 boxes |
| | Under road L for crossing of firetrucks =12m | Box culvert 1.2 m×0.9 m: 3boxes |
| | Under new H Taxiway L = 95 m | Box culvert 1.2 m×0.9m: 3 boxes |
| | Under newly expanded apron L = 36 m | Box culvert 1.2 m×0.9 m: 1 box |
| | U-ditch for GSE L = 636 m | Width 0.6 m,<br>Depth 0.4 m, 0.7 m, 0.9 m |

Source: JICA Documents

[9] Thickness of roadbed (foundation of the pavement such as concrete and asphalt).
[10] A path for aircraft at an airport connecting runways and other facilities.
[11] Asphalt pavement (surface and foundation).
[12] Top layer of asphalt pavement.
[13] A box-shape structure that allows water to flow under the soil.

Table 2　Security Equipment

| Equipment | Usage | Qty. |
|---|---|---|
| X-ray Machine | X-ray inspection of passengers, luggage (check-in and carry-in) of passengers, and cargo | 5 |
| Computer Based Training System (CBT) | Final examination for security staff at the training center | 1 |
| Metal Detector | Screening luggage of the international transit passengers | 2 |
| ETD | Inspection of explosives and hazardous chemicals around international check-in counters | 1 |

Source: JICA Documents

Table 3　Fire Equipment

| Equipment | Usage | Qty. |
|---|---|---|
| Airport Rescue and Fire Fighting (ARFF)Vehicle | Fire extinguishing operations at airport accidents | 3 |
| Rescue Equipment | Rescue operations at airport accidents | 1 |
| Rescue Vehicle | Rescue operations at airport accidents | 1 |

Source: JICA Documents

Table 4 shows the activities planned under the Lao side cost. All were carried out as planned except the construction of an additional parking garage at the fire station.

Table 4　The Lao Side Cost

| Activities | Planned Cost (Million Kip)[14] (2010) | Actual (2015) |
|---|---|---|
| 1. Relocation of meteorological farm | 129.3 | Completed (Amount unknown) |
| 2. Relocation of some facilities in the apron | 12.9 | Completed (Amount unknown) |
| 3. Construction of a new shelter | 49.4 | Completed (Amount unknown) |
| 4. Dismantling and set-up of an existing shelter | 9.9 | Completed (Amount unknown) |
| 5. Rescue equipment (first aid kit) | 21.9 | Completed (Amount unknown) |
| 6. Equipment for rescue vehicle | 87.8 | Completed (Amount unknown) |
| 7. Construction of an additional parking garage at the fire station | 480.8 | Not implemented |
| 8. Bank fees | 100.9 | Completed (Amount unknown) |
| **Total** | **892.9** | **Amount Unknown** |

Source: JICA Documents and Answers to the Questionnaire by DCA

[14] Exchange rate: 1 Kip = 0.0104 yen (as of May 2011). Source: JICA Documents.

Among the activities planned under the Lao side cost, "7. Construction of an additional parking garage at the fire station" was not implemented. The three units of ARFF and one unit of rescue vehicle procured in the project are parked inside the existing garage. However, the four old firetrucks are parked outside because the garage is full. Construction of the additional parking garage was not implemented although the project finished two months earlier than planned. This was because the budget for garage construction was not approved at MPWT despite the request from LAA. As a result, the project finished without implementing this activity that accounted for 54% of the Lao side cost. Absence of this activity, however, was not likely to significantly degrade the efficiency of the project because it was only less than 0.5% of the total project cost. At the time of the ex-post evaluation, LAA prepared a technical drawing for construction of an additional garage to be submitted to MPWT for budget allocation in 2017.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

The planned project cost was 1,944 million JPY (1,935 million JPY was to be provided by Japanese Grant Aid and 9 million JPY was to be provided by the Lao side cost). The actual project cost provided by Japanese Grant Aid was 1,684 million JPY, which was 87% of the plan. The actual project amount by Lao side is unknown.

#### 3.2.2.2 Project Period

The planned project period was 22 months from August 2011 to May 2013. The actual project period was 19.4 months from August 3, 2011 to March 15, 2013, which was 88% of the plan. DCA was able to shorten the project period because they prioritized the construction of airport infrastructure facilities over other tasks to finish it before the Asian-Europe Meeting (ASEM) that was held in November 2012. DCA also cut the time required for administrative procedures.

Both the project cost and project period were within the plan. Therefore, efficiency of the project is high.

## 3.3 Effectiveness[15] (Rating: ③)

### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

The objective of the project was to improve the safety and security systems of Vientiane International Airport and to meet the growing aviation demands. The quantitative indicators 1 to 7[16] and their achievements are shown in Table 5 and 6. For Indicator 2, it seemed that the

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

[16] The indicators 1 to 4 were set at the project planning while 5, 6, and 7 were added by the external evaluator.

baseline and target figures were erroneously set at the time of the project planning. Therefore, the external evaluator revised these figures with the consent of DCA. At the time of the project planning, the number of domestic passengers (the sum of departure and arrival) in 2010 was found to be 354,000. According to DCA, however, this figure might have included the passengers at other domestic airports in Laos. The correct number of domestic passengers at Vientiane International Airport should be 161,000. With this revision of the baseline, the target figure was revised accordingly. The data at the time of project planning identified the growth rate of the number of domestic passengers between 2010 and 2016 to be 1.41. This is because the expected target in 2016 was 502,000 while the baseline in 2010 was 354,000 (502,000 / 354,000 = 1.41). Using 1.41 as a coefficient, the new target was calculated to be 227,000.

Table 5 Quantitative Indicators (Data at Vientiane International Airport)
Target Achievement Ratios (%) are shown in the parenthesis

| | Indicators | Baseline at Ex-ante Evaluation (2010) | Target 3 Years After Completion (2016) | 2013 (Actual) Completion Year | 2014 (Actual) 1 Year After Completion | 2015 (Actual) 2 Years After Completion | 2016 (Estimate) (Note 1) 3 Years After Completion |
|---|---|---|---|---|---|---|---|
| 1 | Number of international flight passengers | 608,000 | 1,019,000 | 559,000 | 748,000 | 1,020,000 (100%) | 1,053,000 (103%) |
| 2 | Number of domestic flight passengers | 161,000 (Note 2) | 227,000 (Note 3) | 203,000 | 304,000 | 370,000 (162%) | 382,000 (168%) |
| 3 | Ratio of transit passengers inspected for security (%) | 0 | 100 | 100 | 100 | 100 (100%) | 100 (100%) |
| 4 | Ratio of random inspection with ETD on baggage (%) | 0 | 2 (Note 4) | 2 | 2 | 2 (100%) | 2 (100%) |
| 5 | (Additional Indicator) Frequency of accidents in runway and taxiways in a year | Unknown | None | 0 | 0 | 1 | 0 |
| 6 | (Additional Indicator) Number of times military area was used by civilian aircraft in a year | Unknown | None | 0 | 0 | 0 | 0 |

Sources: JICA Documents and Answers to the Questionnaire by DCA
Note 1: DCA estimated the 2016 data using the regression line based on the increase rate between 2010 and 2015.
Note 2: The target set at the time of the project planning was 354,000.
Note 3: The target was reset because the baseline was revised as indicated in Note 2. To do this, the rate of increase (141%) that was assumed at the time of the project planning was used.
Note 4: To set the target, the ratio of random inspection in Cambodia at the time of the project planning was applied.

Indicator 5 was set to verify the safety of the aircraft operation. Indicator 6 was set to make sure that there was no use of military apron by civilian aircraft at the time of the ex-post evaluation because this problem was mentioned in the section 3.1.2 Relevance to the Development Needs of Laos. Indicator 7 was set because landing and departing of large aircraft was limited at the time of the project planning. This was an important factor to justify the necessity of expanding apron.

Table 6 Indicator 7 (Additional Indicator) Number of Large Aircraft Accommodated

| Before Project (Before 2010) | Project Completion (After 2013) |
|---|---|
| 7 | 15 |

Source: Answers to the Questionnaire by DCA

At the time of the project planning, the target year was set at 2016. But this ex-post evaluation study was conducted in 2015, thus, the data in 2015 were used to verify the project's achievements. As shown in Table 5, Indicator 1 (number of international flight passengers) achieved the target by 100%. Indicator 2 (number of domestic flight passengers) achieved 370,000 against the revised target of 227,000, exceeding the target by 62%. Indicator 3 (ratio of transit passengers being inspected for security) and Indicator 4 (ratio of random inspection with ETD on baggage) both achieved their targets by 100%.

Indicators 5, 6, and 7 were added by the external evaluator, thus there was no baseline or target for these indicators. For Indicators 5 and 6, the evaluation focused on annual changes from 2013 to 2015. For Indicator 7, the data was compared before and after the project. About Indicator 5, there was a minor accident where aircraft of Lao Skyway, a domestic airline, skid off the runway and caused a minor damage on the body of the aircraft due to pilot error. It was a minor accident and there were no injuries. About Indicator 6, the military area was not used by civilian aircraft. As for Indicator 7, Table 6 compares the numbers of large aircraft that can be accommodated at Vientiane International Airport before and after the project. They increased greatly from 7 in 2010, before the project, to 15 in 2013, after the project.

### 3.3.2 Qualitative Effects

The qualitative effects expected in the project were largely achieved as follows.

(1) Improvement of Airport Security against Illegal Acts

Lao-Japan Airport Terminal Services Co., Ltd. (L-JATS)[17] is in charge of operation and maintenance of the security equipment deployed by the project in the international terminal of Vientiane International Airport. According to the L-JATS staff interviewed, they were able to find very small bullets or packets of illegal drugs that were impossible to find before the project. They thought that it was because of the greater number of security equipment with better precision. They also thought that introduction of ETD strengthened the measures against international terrorism and invasion of hijackers.

[17] A joint venture between Laos and Japan to conduct ground-handling and operations of international passenger terminal at Vientiane International Airport.

(2) Strengthening Emergency Measures against Aircraft Accidents

In the project, three units of ARFF and one unit of rescue vehicle were procured and the requirements of ICAO category 9[18] was fulfilled. Vientiane International Airport fell under category 7 before the project. Therefore, firefighting and rescue operations of the airport became two levels higher than before.

(3) Airport Operations with International Standard

The airport operations were improved after the project through satisfaction of ICAO category 9 requirements in firefighting operations, introduction of ETD, and deployment of more advanced security equipment. All of the 35 security inspectors interviewed during the beneficiary survey[19] answered that the security level of Vientiane International Airport was improved after the project as compared with before the project. Ninety percent (31 out of 35) of the respondents answered that the quality of security screening at the airport met the international standard after the project. For this answer, 22 out of the 31 respondents explained the reason as "improvement of precision of the security equipment." Others mentioned "decreased claims from the passengers' arrival airports" (6 respondents) after the project. Before the project, Vientiane International Airport used to receive many claims from the passengers' arrival airports in countries such as Thailand and Viet Nam, blaming an inadequate security screening in Vientiane.

(4) Eliminating Restraining Factors of Processing Performance of the Airport

The project expanded the parking apron and taxiways to more than twice the original areas. The capacity of parking apron also increased by more than two-fold. Therefore, Vientiane International Airport can accommodate a greater number of aircraft. The aircraft are also able to keep wider distance with each other compared to before. At the international terminal, there was only one lane for the security screening due to limited number of security equipment before the project. L-JATS can provide two lanes for screening departing passengers after the project because they have more security equipment. There was a significant increase in the number of international flights compared to before. Thus, it appears that the project certainly contributed to improving the processing ability of the airport by increasing the number of security equipment.

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[18] ICAO defines 11 airport categories according to fuel and passenger capacities of aircraft in service. Each category requires airports' firefighting equipment to have specific capacities of foam load and water emission. The greater number requires higher firefighting capability.

[19] Personal interviews were conducted to 35 security screeners (20 males, 15 females, with response rate of 100%) at international terminal of Vientiane International Airport from January 19 to 25, 2016. This was to survey the status of improvements of airport security and airport processing ability. More than 90% of both male and female respondents answered positively to the questions on the improvements of quality of security screening, security, and safety. Therefore, there was no significant difference between the answers of males and females.

(5) Improving Convenience of Participating Countries to the International Conferences

Vientiane International Airport was able to prepare 15 parking spots for large aircraft at the ASEM in 2012. The ASEAN Summit will be held in Vientiane in September 2016 and more than 10 units of large aircraft are expected to land. DCA thinks that hosting of these international conferences would be much more difficult if the project did not expand the apron and taxiways. Improvement of the security and firefighting equipment also greatly helped the airport to be well prepared for accepting the participants. The above indicates that the project has enhanced convenience of the participating countries to international conferences.

## 3.4 Impacts

### 3.4.1 Intended Impacts

The project was expected to have several impacts: 1) improvement of reliability of the airport functions, 2) promotions of the air transport industry, 3) promotion of tourism, and 4) improvement of investment climate. The achievement status of these impacts at the time of the ex-post evaluation are as follows.

(1) Improvement of Reliability of the Airport Functions

In the beneficiary survey[20], 72 out of 80 passengers (90%) interviewed at the international terminal answered that the security screening at Vientiane International Airport was adequate for an international airport because of several reasons. For example, five respondents said that they did not feel so much difference with the security screening at other airports in Europe or Thailand. Four people said that there was an adequate security equipment. Also, the qualitative effects 1) to 5) described under "3.3.2 Qualitative Effects" were confirmed. Therefore, the project was evaluated to have contributed to improving the airport reliability to a certain extent.

(2) Promotions of the Air Transport Industry

The transaction volume of international air cargos at Vientiane International Airport was increasing from before the project to the time of the ex-post evaluation as shown in Table 7.

Table 7 Annual Transaction Volume of International Air Cargo at Vientiane International Airport

Unit: tons

| 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| 1,692 | 1,882 | 2,008 | 2,939 | 2,698 | 3,034 |

Sources: JICA Documents and Data Provided by L-JATS

[20] The beneficiary survey was implemented at the waiting space of the international terminal of Vientiane International Airport from January 19 to 25, 2016. Personal interviews were conducted to 80 passengers (45 males, 35 females, with response rate of 100%. It should be noted that the survey avoided the members of Asian tour groups because many of them had difficulty in understanding the survey questions in English and Lao). The survey asked the passengers of international flights about their satisfaction in terms of comfortableness, quality of security screening, time required for check-in etc. There was no significant difference in the answers between male and female because more than 80% of both male and female respondents answered positively to these questions.

The project met the growing demands of not only passengers but also air cargos by expanding parking aprons and taxiways. In addition, the project upgraded an old X-ray machine for cargos to enable more precise cargo screening. In sum, the project seems to have contributed to promoting the air transport industry.

(3) Promotion of Tourism

The number of tourists in Laos was 2.51 million in 2010 and increased by 1.7-fold to 4.33 million in 2015. This increase of tourists implies that tourism has been promoted. The number of tourists going through only Vientiane International Airport was not known. Thus, it was difficult to objectively analyze how the project contributed to the tourist increase and to tourism promotion. Nonetheless, the project likely contributed to increasing the airport's capacity to accept the growing number of tourists by improving the largest airport in Laos.

Table 8 Tourists in Laos

Unit: Number of tourists in thousand

| | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** |
|---|---|---|---|---|---|---|
| Number of Tourists | 2,513 | 2,724 | 3,330 | 3,779 | 4,159 | 4,332 |

Source: Answers to the Questionnaire by DCA

(4) Improvement of Investment Climate

Table 9 shows the steady rise in the direct inward investment in Laos during the five years between 2010 and 2014. Through the implementation of the project, Vientiane International Airport was able to respond to the increased passengers and greater demands for air cargo transactions. The above suggests that the project has supported to build the investment climate of Laos.

Table 9 Direct Inward Investment

Unit: 100 Million USD

| **2010** | **2011** | **2012** | **2013** | **2014** |
|---|---|---|---|---|
| 14.2 | 16.2 | 14-16 | 27.0 | 31.6 |

Source: Reports from Japan External Trade Organization (2011-2015)

### 3.4.2 Other Impacts

#### (1) Impacts on the Natural Environment

The project was not required to conduct Environmental Impact Assessment (EIA) or Initial Environmental Evaluation (IEE) for expansion of the parking apron. DCA was monitoring the disposal of wastewater. There was no reported problem of water pollution with chemicals or hazardous substances during the construction. There was no reported problem of noise. DCA checks the noise level in accordance with the ICAO standard by requiring airlines to submit the results of noise screening for all aircraft.

#### (2) Land Acquisition and Resettlement

The project took place inside of the terminal building and airport compound. There was no resettlement or land acquisition in the project.

As seen above, the project improved the airport security and established firefighting and rescue system in accordance with the ICAO standards at Vientiane International Airport. The project also enabled the airport to meet the growing aviation demands. In short, it is judged that the project produced the expected effects as planned. In addition, several impacts, such as improvement of reliability of the airport functions, promotions of the air transport industry and tourism, and improvement of investment climate, were confirmed as mentioned above. There was no negative impact reported with regard to natural environment or resettlement.

In light of the above the project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

## 3.5 Sustainability (Rating: ②)

### 3.5.1. Institutional Aspects of Operation and Maintenance

The institutional arrangement of operation and maintenance both at times of the project planning and the ex-post evaluation is described in Figure 1. There was no change in the arrangement before and after the project.

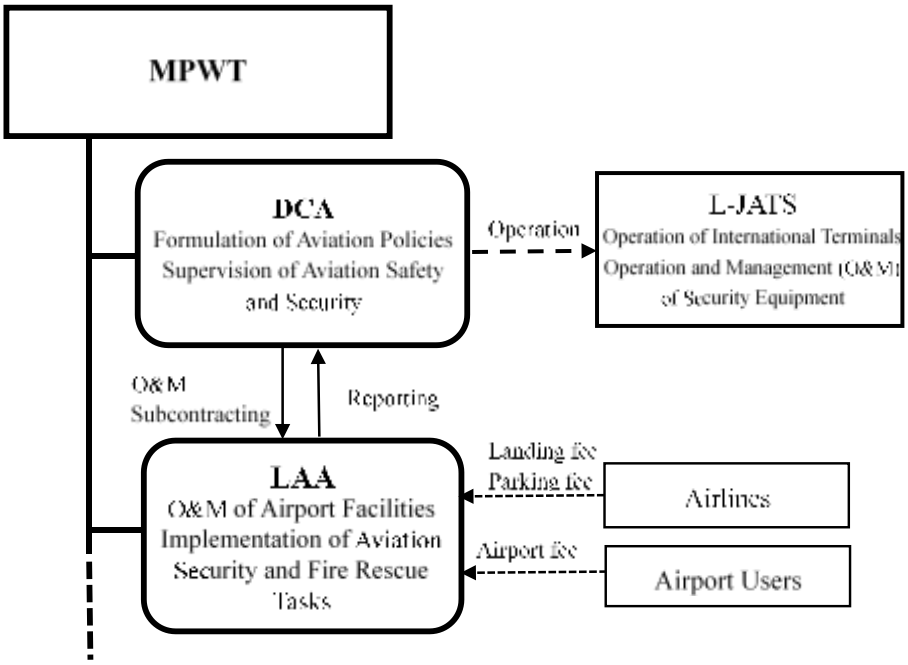



**Figure 1 Operation and Maintenance Structure of the Facilities Constructed and Equipment Deployed by the Project**

Source: Prepared by the Author based on Interviews with Implementing Agencies

There was no change in the actors who are in charge of operations and maintenance of the facilities and equipment.

- ✓ Airport infrastructure facilities (apron, taxiway, and GSE road): LAA assigns twelve staffs to take care of the daily maintenance. LAA outsources the annual maintenance to a private company. DCA is in charge of large scale maintenance to be conducted every 9 and 15 years. LAA and DCA have sufficient manpower to take care of the above tasks.
- ✓ Security equipment (X-ray machine at international terminal, metal detector, ETD): L-JATS is in charge of operation and maintenance. L-JATS outsources their triannual maintenance and inspection to a distributor in Laos. L-JATS does not encounter shortage of manpower in these tasks.
- ✓ Security equipment (X-ray machine at domestic terminal): LAA is in charge of the operation and maintenance. The project replaced an old X-ray machine for cargo with a new one. There is no shortage in manpower because the operators of the old machine took over the operation and maintenance of the new machine.
- ✓ Firefighting equipment (ARFF, rescue vehicle etc.): LAA is in charge of operation and maintenance. There is no shortage in manpower because the operators of the old vehicles took over the operation and maintenance of the new ones. The old vehicles are maintained as backup.

- ✓ CBT: CBT was installed in the training center of DCA. Operation and maintenance is done by DCA with sufficient manpower.

As seen above, with regard to operation and maintenance, there was no change in the assigned responsibility and decision making processes in the organizations from the time of the project planning to that of the ex-post evaluation. DCA, LAA and L-JATS clearly understand their responsibilities and have sufficient manpower for the operation and maintenance of the facilities and equipment.

Therefore, there is no problem in the institutional aspects of operation and maintenance.

### 3.5.2. Technical Aspects of Operation and Maintenance

When the security and firefighting equipment were delivered, the supplier provided trainings on the operation and maintenance. The situation and issues of technical aspects in operation and maintenance of each facility and equipment at the time of the ex-post evaluation are as follows:

- ✓ Airport infrastructure facility (LAA): There is no technical issue because the maintenance work does not require high skills. Annual maintenance is outsourced.
- ✓ X-ray machine at the International terminal, metal detector, and ETD (L-JATS): L-JATS does not have a technical problem because they outsource the tasks to a company specialized in maintenance.
- ✓ X-ray machine for cargo (LAA): There is no technical issue because it was a replacement of an old X-ray machine to a new one.
- ✓ Firefighting equipment (LAA): LAA fire staff have sufficient knowledge and skills of fire extinguishing using the new firefighting equipment. However, they feel that operation and maintenance of the electrical system of the ARFF is too difficult for them because they think it is more complex than the old one. They also have hard time understanding the English manual of the ARFF. Even though there are no serious issues yet, there are minor problems such as slow operation of the monitor screens and directional signals. LAA has not fixed these problems yet. They are considered as minor problems because they do not affect the vehicles' functions such as driving and fire extinguishing. But they should still be fixed. The supplier conducted training at delivery but the LAA fire staff were uncertain if they were able to entirely understand the training contents because it was conducted in English. During the training, an LAA staff had to serve as a translator although he was not fully confident with his English ability. LAA is planning to request for a budget for 2017 to conduct On the Job Training (OJT) to MPWT. There are no technical issues for other equipment except ARFF because they do not require advanced knowledge and skills in operation and maintenance.
- ✓ CBT (DCA): There is no technical problem in maintaining CBT.

Some minor problems have been observed in the operation and maintenance of the electrical system of ARFF. LAA fire staff should undergo trainings to enhance their understanding and to improve the operation and maintenance skills of ARFF. In short, there is no problem in the technical aspects of operation and maintenance except for ARFF.

### 3.5.3. Financial Aspects of Operation and Maintenance

#### (1) Financial Status of LAA and Operation and Maintenance of the Facility and Equipment

Financial status of LAA who is in charge of operation and maintenance of the airport infrastructure facilities and security equipment is shown below. LAA's revenue has increased along with the increased numbers of flights and passengers. Budget allocation is also sufficient. Thus, there is no problem in their financial status.

Table 10 Financial Status of LAA

Unit: Million Kip

| | **2011 Actual** | **2012 Actual** | **2013 Actual** | **2014 Actual** | **2015 Actual** | **2016 Estimate** |
|---|---|---|---|---|---|---|
| Total Revenues | 27,107 | 30,119 | 35,434 | 47,613 | 61,343 | 97,756 |
| Total Expenditures | 25,048 | 38,854 | 30,505 | 32,706 | 53,286 | 64,828 |
| General administrative cost | 6,790 | 20,301 | 18,982 | 19,110 | 29,798 | 31,164 |
| Maintenance cost | 4,593 | 8,883 | 5,264 | 4,297 | 9,868 | 18,514 |
| Others | 13,645 | 9,670 | 6,259 | 9,299 | 14,620 | 15,150 |

Source: Answers to the Questionnaire by LAA

In 2014 and 2016, LAA increased their revenues greatly from the previous years. This is because LAA sharply increased the charges from airlines in 2013 and 2015. The maintenance expenditures of 2012, 2015, and 2016 (estimate) are larger than other years because large-scale maintenance was (is being) carried out in preparation for international conferences in Vientiane; ASEM held in November 2012 and ASEAN Summit to be held in September 2016. In addition to three ARFFs and one rescue vehicle procured by the project, LAA has three old fire vehicles as backup. In total, LAA is operating and maintaining seven units of fire vehicles at Vientiane International Airport. The cost of operation and maintenance are shown in Table 11. Expenditure for spare-parts increased in 2015 because both old and new fire vehicles underwent large-scale maintenance.

Table 11 Maintenance Cost of Fire vehicles

Unit: Million Kip

| | 2013 (Actual) | 2014 (Actual) | 2015 (Actual) |
|---|---|---|---|
| Personnel Cost | 385 | 363 | 380 |
| Fuel, engine oil etc. | 285 | 285 | 278 |
| Spare-parts | 24 | 19 | 189 |

Source: Answers to the Questionnaire by LAA

(2) Operation and Maintenance of Security Equipment by L-JATS

With the increased units of security equipment (five X-ray machines, two metal detectors and one ETD) at the international terminal, the maintenance expense of L-JATS also increased. Meanwhile, Table 12 shows that their revenues including ground-handling charges[21], a main source of revenue, also increased. L-JATS increased their budget allotment for maintenance of all of their security equipment. Therefore, there should be enough fund to cover the maintenance cost of the equipment procured by the project.

Table 12 Financial Status of L-JATS

Unit: Million Kip

| | 2009 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Total Revenues | 39,547 | 60,159 | 65,372 | 64,640 | 74,191 |
| Ground-handling charges | 24,513 | 38,510 | 41,915 | 39,634 | 44,912 |
| Total Expenditures | 24,372 | 34,511 | 36,687 | 41,159 | 50,897 |
| Maintenance of security equipment | No data | 19 | 25 | 34 | 34 |

Source: L-JATS Documents

(3) Operation and Management of CBT by DCA

DCA does not allocate specific budget for operation and maintenance of CBT. This is because their ordinary maintenance budget is sufficient to cover this expense. The software license expired in March 2016. As of April 2016, DCA was trying to obtain the quotation to renew the license as soon as possible.

In sum, LAA and L-JATS do not have particular problems in their financial statuses. DCA maintains CBT using their ordinary maintenance budget without any problem. Therefore, there is no problem in financial aspects of operation and maintenance.

[21] Fees paid by airlines to L-JATS for ground handling operations.

### 3.5.4. Current Status of Operation and Maintenance

The status of operation and maintenance of the airport infrastructure facilities and equipment at the time of the ex-post evaluation is as follows:

- ✓ Apron / Taxiway (LAA): LAA's inspection record shows that there are 22 linear cracks[22] on the taxiways and numerous (uncountable) cracks in the area with 1500 $m^2$ on the apron shoulder. They were found after JICA's defect inspection in 2013. They have not yet fixed these cracks. LAA thinks these are minor cracks that did not reach the layer lower than asphalt. However, in order to prevent rainwater penetration, they should take care of the problem as soon as possible. LAA plans to repair the cracks using the budget allocated for the preparation of ASEAN Summit to be held in September 2016.
- ✓ Security Equipment (L-JATS and LAA): L-JATS and LAA operate and maintain five X-ray machines and two metal detectors in good conditions. ETD has a malfunction since December 2015. L-JATS contacted a distributor to obtain a quotation for repair.
- ✓ Firefighting Equipment (LAA): Two out of three units of ARFF have electrical problems such as slow starting of the monitor screens and directional signals and sensor malfunction. The fire staff and technicians do not have adequate knowledge on electrical system to fix these problems. They also have difficulty understanding the manuals written in English. These problems pose obstacles for LAA to fix the problems. LAA have repeatedly contacted the manufacturer in Italy, however, they have lost touch after the warranty period expired. These problems remain unfixed because LAA cannot find a person who can do the repair in Laos. Although these problems are considered minor and do not affect the driving and fire extinguishing functions as a fire vehicle, LAA should make a clear repair plan. There is no problem in maintenance of their rescue vehicle and rescue equipment.
- ✓ CBT (DCA): The software stopped working since September 2015 due to some problems of network system. Although this problem was fixed in February 2016, the software expired in March 2016. DCA is trying to obtain a quotation to renew the license at the earliest possible time before the end of 2016.

As above, there are, by and large, no particular problems in operation and maintenance of the airport infrastructure facilities and equipment except ARFF at the time of the ex-post evaluation. There are already clear plans for repairing the cracks on the taxiway, malfunctions of ETD, and the software of CBT. However, LAA still has to plan for the repair of the electrical systems of the two units of ARFF. Therefore, current status of operation and maintenance is concluded to have minor problems.

[22] Cracking of a layer of asphalt pavement.

In summary, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. However, some minor problems have been observed in terms of technical aspects and the status of operation and maintenance of ARFF. Therefore, sustainability of the project effects is fair.

CBT installed at DCA's training center

Fire vehicles:
One rescue vehicle (left) and three ARFFs

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

The project aims to improve the safety and security systems of the Vientiane International Airport and to meet the greater aviation demands expected in the future by expanding the facilities and upgrading the equipment at the airport, thereby contributing to promotion of tourism, improvements of logistics and investment climate to vitalize the economy of Laos.

The project has been consistent with the development policies and development needs of Laos as well as Japanese ODA policy toward Laos. Thus, its relevance is high. Both the project cost and period were within the plan. Therefore, efficiency of the project is high. Implementation of the project brought positive effects to Vientiane International Airport as expected. These effects include improved airport security along the standard imposed by ICAO, advanced firefighting and rescue operations, and increased capacity to meet the growing demands of air transportation. In addition, some positive impacts such as enhancement of airport reliability, promotion of the air transportation industry and tourism, and improvement of investment climate have been observed. Therefore, effectiveness and impact of the project are high. No major problems have been observed in the institutional and financial aspects of the project. On the other hand, some minor problems are observed in terms of technical aspects of operation and maintenance. The staff of the implementing agency lacks technical skills and knowledge on operating and maintaining some of the provided equipment. They do not have a concrete plan to make improvements yet. Therefore, sustainability of the project effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agencies

- ✓ There were several fire vehicles parked outside of the parking garage. This is because there were not enough garages, which Lao side was planned to construct under the project plan. LAA should request MWPT a budget for constructing an additional parking garage.
- ✓ LAA should make a budget request to MWPT to conduct OJT on operation and maintenance of the ARFF.
- ✓ DCA should renew the CBT software license as soon as possible.
- ✓ DCA should monitor L-JATS to confirm a prompt repair of the ETD.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

<u>Process of Equipment Selection when the Owner and the Operator Are Different</u>

DCA and LAA might not have had sufficient discussion when selecting the ARFF procured in the project. It belongs to DCA while operation and maintenance are done by LAA. According to DCA, they heard the opinions of LAA. However, LAA staff thought that their opinions were not well reflected on the actual selection. LAA staff pointed out the following two obstacles in maintaining the ARFF. Both of them could have been avoided if they had had enough mutual discussion.

First, LAA staff thought that the electrical systems of the ARFF were too difficult and complicated for the knowledge and technical level of the LAA staff. Second, they could not obtain the spare-parts in the countries within ASEAN. It is costly and time consuming to order the spare-parts from Europe.

If DCA and LAA had had sufficient discussion over the specifications of ARFF including the electrical system, they could have chosen the ARFF with the specifications suitable to the technical capability of LAA. Even if it was difficult to change the specifications, DCA and LAA could have come up with possible solutions if they had discussed well. For example, they could have requested to the Japan side or the Lao side for budget or resources to obtain the manuals written in Lao or conduct trainings to capacitate the fire staff of LAA. Also, they could choose the ARFF whose spare-parts were available in neighboring countries such as ASEAN given that there was a careful discussion at the equipment selection stage.

In short, if the owner and the operator of the equipment belong to different organizations, they should closely collaborate to have sufficient discussion to mutually agree on the specifications. They should carefully compare the advantages and disadvantages of each candidate equipment.

The engaged consultants should make sure that the mutual consensus is built between the two organizations through the above selection processes.

Kingdom of Cambodia

FY 2015 Ex-Post Evaluation of Japanese Grant Aid Project[1]

"Project for Improvement of Equipment for Demining Activities (Phase VI)"

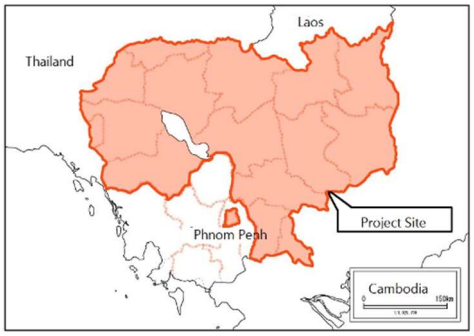
External Evaluator: Yukiko Sueyoshi, Value Frontier Co., Ltd

## 0. Summary

The project was implemented for the purpose of strengthening clearance activities of landmines and unexploded ordnance (UXO) through procurement of necessary equipment for Cambodian Mine Action Centre (CMAC) in Cambodia which faced serious problems with buried landmines/UXO. Relevance is high, because the project was consistent with the development policy and needs of Cambodia and with Japan's ODA policy. Efficiency is also high, since both project cost and period were within the plan. It was confirmed that CMAC's clearance activities of landmines/UXO are improved through appropriate utilization of the procured equipment. In addition, positive impacts of the project, such as securing safe living and improving convenience of life by developing infrastructure such as road, public facilities, and farmland, were confirmed. Therefore, effectiveness and impact of the project are high. The status of operation and maintenance of the equipment was considered as appropriate and no major problems were observed in terms of institutional and technical aspects. On the other hand, the prospects of sufficient budget allocation to CMAC looked unclear. Therefore, sustainability of the project is deemed fair.

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

## 1. Project Description




Project Location

CMAC Staff in front of the Tent
Provided by the Project

### 1.1 Background

The Kingdom of Cambodia (Cambodia) was suffering from the severe contamination of landmines/ UXO as a result of the conflict that lasted for 20 years from the 1970's. In addition,

[1] This ex-post evaluation was carried out by referring to opinions regarding the Project and CMAC's activities from a Japanese researcher, a Japanese NGO and a Cambodian researcher. Selection of the experts was done by the external evaluator, and agreed by JICA.

it was estimated that approximately 30% of UXO dropped by the US Army remained in the eastern area of Cambodia, near the border with Viet Nam, due to the Viet Nam War. Consequently, Cambodia faced serious problems with landmines/UXO buried in the ground of Cambodia. A survey conducted between 2000 and 2002 concluded that a total area of 4,544 $km^2$ in 6,422 villages, or 46% of the entire rural villages of the country, were confirmed or suspected of contamination by landmines/UXO[2]. The annual number of landmines/UXO victims had been decreasing since 1996 when the number of victims was the largest, 4,320 persons. There were, however, still 244 victims in 2009 at the time of the project planning, and thus securing safe living was needed. Also, landmines/UXO clearance was an urgent issue because landmines/UXO that were suspected to be buried mainly in rural areas were preventing the development in the agricultural sector, the major industry of the country. The government of Cambodia ratified "Anti-Personnel Mine Ban Treaty" in 1999, and carried out a landmine contamination survey and clearance activities for 10 years, as required by the Treaty. However, since the total area cleared by 2009 was only 530 $km^2$, the Government applied for an extension of another 10 years and the government needed to enhance efficiency of landmines/UXO clearance activities by the end of 2019 that was set as the new deadline of the Treaty.

Under these circumstances, JICA continuously provided CMAC with assistances of Grant Aid Project for "Improvement of Equipment for Demining Activities Phase I-V (1999-2008)", Technical Cooperation Project for "Strengthening of CMAC's Function for Human Security Realization (2008-2010)" and implemented the project.

### 1.2 Project Outline

The objective of the project was to maintain and improve clearance activities of landmines/UXO through procurement of necessary equipment for CMAC, thereby contributing to securing safe living of residents in rural areas.

[2] Source: Document provided by JICA

<Grant Aid Project>

| | |
|---|---|
| E/N Grant Limit or G/A Limit Amount / Actual Amount | 1,298million yen / 1,298million yen |
| Exchange of Notes Date/Grant Agreement Date | March, 2011 / March, 2011 |
| Implementing Agency | CMAC |
| Project Completion Date | June, 2012 |
| Main Contractor(s) | Sirius Corporation<br>Toyota Tsusho Corporation<br>Itochu Corporation<br>Marubeni Corporation |
| Main Consultant | Ingérosec Corporation |
| Preparatory Survey | March, 2011 |
| Related Projects | (Grand Aid Project) Project for Improvement of Equipment for Demining Activities(Phase I-V:1998-2008)<br><br>(Grand Aid Project) Project for Research and Development of Mine Clearance Related Equipment (2005 – 2007)<br><br>(Grand Aid Project) The Programme for Integrated Mine Clearance and Landmine Victim Assistance (Phase I : 2009, Phase II : 2013)<br><br>(Technical Cooperation Project) Project of Strengthening of CMAC's Function for Human Security Realization (2008 - 2010) |

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Yukiko Sueyoshi, Value Frontier Co., Ltd

### 2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule:

Duration of the Study: September, 2015 – October, 2016

Duration of the Field Study: January 10, 2016 – January 25, 2016

April 23, 2016 – April 28, 2016

### 2.3 Constraints during the Evaluation Study

Considering that the project was a project to procure equipment, the external evaluator should normally check the operational status of all equipment. The equipment provided by the project was, however, installed in six different locations throughout the country and only three branches could be visited due to time constraints for field surveys. Therefore, evaluation of the equipment's operational status was made by examining malfunctioning equipment and the date of breakdown based on the CMAC's equipment data base at the time of the ex-post evaluation.

## 3. Results of the Evaluation (Overall Rating: A[3])

### 3.1 Relevance (Rating: ③[4])

#### 3.1.1 Relevance to the Development Plan of Cambodia

"National Development Strategy 2009-2013", a Cambodian development policy at the time of the project planning, clearly stated that landmines/UXO clearance was an agenda to be tackled to promote people's settlement, agricultural activities, and development programs. It was one of the programs to develop the agricultural sector. Also, "National Mine Action Strategy 2010-2019" was promoting clearance of anti-personnel landmines by the end of 2019 as its goal.

At the time of the ex-post evaluation, activities for landmines/UXO clearance were continuously stated as one of the programs for developing the agricultural sector in "National Development Strategy 2014-2018". Since the Cambodian government needed to implement UXO clearance together with landmine clearance, the Cambodian Mine Action and Victim Assistance Authority (CMAA) implemented a survey for identifying landmines/UXO buried areas, and "National Mine Action Strategy 2017-2025" is being formulated based on the results of the survey.

In conclusion, the project, whose objective was to maintain and improve clearance activities, was consistent with the development policy of the country in both the planning and the ex-post evaluation stages.

#### 3.1.2 Relevance to the Development Needs of Cambodia

The areas cleared of landmines/UXO between 1992 and 2009 were 530km$^2$ in Cambodia. CMAC cleared 263km$^2$ of it, which was approximately half the size.[5] However, according to the study implemented from 2000 to 2002, areas that landmines/UXO were buried in Cambodia totalled 4,544km$^2$. Thus, more efficient clearance activities were required. Also, most of the equipment owned by CMAC was deteriorating due to usage under severe conditions, and a decline of working efficiency was a concern.

The latest results of the study (as of April 2016) implemented by the Cambodian government available at the time of the ex-post evaluation showed that landmines/UXO were buried or suspected to be buried in areas of 1,799km$^2$ [6], and indicated that continuous activities for landmines/UXO clearance would be needed until 2025. However, the majority of the CMAC budget was spent for administration of operations on landmines/UXO clearance activities, and thus it was difficult to purchase or renew equipment required for the activities. Concerning this

[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[4] ③: High, ② Fair, ① Low
[5] Landmines and UXO in other areas were cleared of by the Royal Cambodian Armed Forces and NGOs conducting landmine/UXO clearance activities.
[6] Data provided by CMAA

issue, Mr. Ratha Seng[7] of the University of Batambang pointed out as follows. “Reinforcement of equipment requires a large-scale investment, but it is difficult to say that the Cambodian government holds sufficient funds for landmines/UXO clearance. Thus, the project, which provided equipment, responded to needs on promoting activities for landmines/UXO clearance in Cambodia. CMAC is an organization which cleared the largest area of landmines/UXO. Especially, providing equipment to CMAC would help accelerate landmines/UXO clearance activities in the whole of Cambodia.”

Therefore, from the planning to the ex-post evaluation stage of the project, the necessity of the project providing demining equipment for CMAC was high to maintain and promote activities for landmine/UXO clearance in the country.

#### 3.1.3 Relevance to Japan’s ODA Policy

Japan’s “Country Assistance Policy for Cambodia” (formulated in 2002) stated “comprehensive assistance to anti-personnel mine clearance” as a part of “realization of sustainable growth and stable society”, which was one of the prioritized assistance areas. Also, in the policy, improvement of clearance activities through provision of equipment was clearly stated.

Therefore, the project was consistent with the Japanese assistance policy when it was planned.

The project was highly relevant to the country’s development plan and needs, as well as Japan’s ODA policy. Therefore its relevance is high.

### 3.2 Efficiency (Rating: ③)

#### 3.2.1 Project Outputs

In the project, the following equipment was provided for CMAC because it was considered necessary to renew/reinforce deteriorated equipment and then to maintain CMAC’s clearance activities. All equipment were procured and delivered to CMAC as planned. Then, CMAC transported each equipment to the branches in need.

[7] He is a researcher of Research and Development Center, University of Battambang, specialized in community development/poverty issue. He has research achievement of landmines/UXO issues in Cambodia and community development.

Table 1　List of Equipment Procured

| Mine and UXO Clearance & Survey Equipment | Plan | Actual |
|---|---|---|
| Brush Cutter | 8 | 8 |
| Vehicles-Pick up 4x4 | 50 | 50 |
| Vehicles-Station Wagon 4x4 | 58 | 58 |
| Mine detector | 221 | 221 |
| Mine/UXO detector | 184 | 184 |
| Deep search detector | 87 | 87 |
| Portable GPS receiver | 117 | 117 |
| VHF handheld transceiver | 205 | 205 |
| Generator | 27 | 27 |
| Spare parts for Brush cutter | 1set | 1set |
| Tent | 86 | 86 |
| Spare parts for vehicles | 1set | 1set |
| Spare parts for mine detectors | 1set | 1set |
| Van12 Seats | 7 | 7 |

Source：Document provided by JICA , Questionnaire Survey to CMAC

Removing Weeds by Brush Cutter


Landmine Detection by CMAC Staff

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

The project cost on the Japanese side was 1,298 million yen at the planning stage, but the actual cost was 1,239 million yen, which was within the plan (95% of the plan). This was mainly because bid prices for equipment including vehicles, portable GPS receivers, and handheld VHF transceivers were lower than the bid ceilings. A million yen in bank handling charge was included in the project cost on the Cambodian side, but the actual amount could not be confirmed at the ex-post evaluation. However, it was confirmed that the bank handling charge was paid without problems, according to the Japanese consultant and CMAC.

3.2.2.2 Project Period

The project period was planned as 16 months from March 2011 to June 2012. The actual period was 12 months from March 2011 to February 2012, which was within the planned period (75% of the plan). This was because both Japanese and Cambodian sides closely communicated with each other and completed the mission earlier than the plan to avoid anticipated confusions that might be caused by the local election in Cambodia in the month of project completion, June 2012.

Both the project cost and period were within the plan. Therefore, efficiency of the project is high.

## 3.3 Effectiveness[8] (Rating: ③)

### 3.3.1 Quantitative Effects

To examine effects of the project, 1) Areas cleared of landmines/UXO (cumulative) and 2) Areas released by technical survey[9] (cumulative) were set when the project was planned. In the ex-post evaluation, another indicator, 3) Areas cleared of landmines/UXO (annual), was added to the above indicators to examine if clearance activities were stably curried out. Also, in 3.3.2 Qualitative Effect, additional indicator, 4) Operating status of major equipment, was added to examine if the procured equipment was properly used. But as described in 2.3 Constraints during the Evaluation Study, the examination was made by using the CMAC's equipment data base. The achievement status of each indicator was explained below.

1) Areas cleared of landmines/UXO (Cumulative)

As shown in Table 2, actual areas cleared of landmines/UXO since 1992 (cumulative, $km^2$) were 518.4$km^2$ in 2014, while the target areas for 2014 were 452.1$km^2$, and thus exceeded the planned target (115% of the plan).

[8] Sub-rating for Effectiveness is determined with consideration of Impact.

[9] Technical survey is conducted in area suspected for contamination of landmines. The survey doesn't cover whole area. The area was categorized in accordance with probability of contamination. For the area with low probability of contamination, the survey covers narrower area. For the area with high probability, the survey covers wider area. (Source: document provided by JICA)

Table 2　Areas cleared of landmines/UXO（Cumulative）

Unit : ㎢

| Target 2014 | Baseline 2009 | Actual 2010 | Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Actual 2015 |
|---|---|---|---|---|---|---|---|
| 452.1 | 262.9 | 308.0 | 352.7 | 408.8 | 457.2 | 518.4 | 565.4 |

Source :CMAC OPERATIONAL SUMMARY PROGRESS REPORT　1992-2015

Note : According to CMAC, 'Areas cleared of from Landmines/UXO' includes 1)areas fully cleared in the mapped areas and 2)areas confirmed safety in the surrounding mapped areas. As for the base-line data in 2009, it was 262.9 in the data base of CMAC, while ex-ante evaluation document indicated as 263.0. In this evaluation report, 262.9 was used.

One of the factors for having achieved the target was the contribution of equipment provided by the project. Concerning this issue, Mr. Ratha Seng commented as follows. "The lands where landmines/UXO were buried and abandoned were covered with trees and plants. Thus, CMAC staff had to clear them first by using mowing machines before starting detection work. Their removal work requires many hours, and it was a heavy burden on staff due to long-hours of labour in the sun. However, the introduction of brush cutters improved safety and efficiency of the clearance activities and also contributed to improvement of the labour environment."

In addition to the provision of equipment, improving work efficiency of CMAC staff was also an important factor for the achievement. According to CMAC, work efficiency was improved especially by a new land release method which was fully introduced around 2011. In this method, survey to the residents is carried out at the beginning. Based on the result of the survey, areas are largely divided into three categories, which are 1) areas requiring no clearance because there is no risk of buried landmines/UXO, 2) areas requiring an investigation because there are risks of buried landmines/UXO (subject to technical survey), and 3) areas requiring clearance because there are high risks of buried landmines/UXO (subject to full clearance). Then an appropriate type of clearance activities (using brush cutters or mine detection dogs, and conducting an interview survey, etc) is selected for the area depending on the risk level to improve the efficiency of the land release process. Also, although clearance activities were carried out by multiple technical teams previously, CMAC currently introduced a new method of having each staff learn multiple skills so that clearance activities can be swiftly conducted with a smaller team.

In order to assist this method, a Japanese NGO, the Japan Mine Action Service[10] (JMAS) provided technical guidance for CMAC for improving their clearance abilities. There is a possibility that not only equipment enhancement by the project but also technical assistance from JMAS might have contributed to achieving the target. (Refer to BOX1)

[10] Approved specified nonprofit corporation established with retired officials of Self Defense Force in 2002 for the purpose of contributing to reconstruction of countries suffering from aftereffect of war or civil war by making use of their experience and specialty.

BOX1

Activities for improving CMAC's ability in landmines/UXO clearance:
Nagatoshi Sako, Resident Representative, JMAS Cambodia Office

(Summary)

In CMAC, the mechanical team using demining machines and brush cutters and the manpower team are operating separately in mine fields. Each team has strong and weak points depending on land characteristics such as landform, vegetation, and ground surface. The teams were not always able to sufficiently make up for each other's weak points due to a lack of understanding of the mine fields' characteristics and each other's specialties. Based on this, JMAS provides technical assistance for CMAC staff so that they can understand each team's specialties and also perform safer and more prompt clearance work. Therefore, JMAS project transfers knowledge and skills for deploying demining platoons.

*This box was summarized by the external evaluator. The full text is attached at the end of the report.

2) Areas released by technical survey（Cumulative）

As shown in Table 3, the areas released by technical survey show that the actual areas released were 125.6km$^2$, while the planned target areas were 719.4km$^2$, and thus they were lower than the planned target (17% of the plan). CMAC stated that this was because there were cases where landmines/UXO clearance activities were sometimes switched to full clearance work.[11] Field staff considered that full clearance work was more reliable than technical survey that covered only a part of target areas. Therefore, while full clearance areas increased, the planned areas released by technical survey were lower than the planned target. Because a decision on which clearance method to be used was made on site, it can be said that setting goals of "full clearance areas" and "areas released by technical survey" separately was not appropriate to measure the effects of the project. Therefore, although the target was not achieved, it did not affect this evaluation because the indicator setting was considered as inappropriate.

[11] When the result shows that landmines/UXO are highly likely to exist after the technical survey, the area is fully cleared.

Table 3　Areas released by technical survey（Cumulative Figure Until 2014）

Unit：㎢

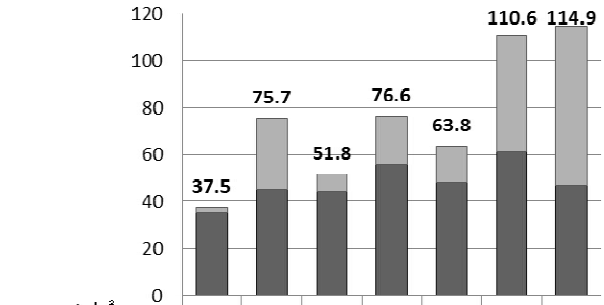
| Target 2014 | Baseline 2009 | Actual 2010 | Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Actual 2015 |
|---|---|---|---|---|---|---|---|
| 719.4 | 0.0 | 32.7 | 40.0 | 60.5 | 76.1 | 125.6 | 193.5 |

Source：CMAC OPERATIONAL SUMMARY PROGRESS REPORT　1992-2015

Note：According to CMAC's definition of "Areas released by technical survey", total released areas include the followings; 1) areas released by technical survey: 2) areas confirmed its safety by hearing survey: 3)　areas confirmed its safety to secure working space or roads to carry out clearance activity.

3) Areas cleared of landmines/UXO (Annual)

The annual areas cleared in 2009 at the time of the project planning were 37.5km$^2$, and the areas were dramatically increased after technical survey was introduced in 2010. The annual area remained high since 2012 when the project was completed, ranging from 60 to 110 km$^2$. There were increases and decreases every year, but it can be considered that clearance activities were by and large conducted in a stable manner.




| Unit:㎢ | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Total | 37.5 | 75.7 | 51.8 | 76.6 | 63.8 | 110.6 | 114.9 |
| Areas released by technical survey | 2.0 | 30.6 | 7.2 | 20.5 | 15.5 | 49.5 | 67.9 |
| Areas cleared | 35.5 | 45.1 | 44.6 | 56.1 | 48.3 | 61.1 | 47.0 |

Source：Data provided by CMAC

Figure 1　Area Cleared from Landmine/UXO（Annual Value）

3.3.2 Qualitative Effects

1) Operating status of major equipment

Operating status of all equipment is recorded and managed in the CMAC's equipment database. According to the database, equipment which was not in operation at the ex-post evaluation is shown in Table 4. All equipment for landmines/UXO clearance are produced in such countries as Austria and Germany, and spare parts are needed to be imported. Since there is a budget limitation for purchasing the spare parts and time is required to procure them from aboard, it was observed that some equipment were not repaired even one year after being broken. However, as soon as the budget was allocated, spare parts were purchased and equipment were repaired. Therefore, there was no problem that was hindering clearance activities from making

progress when the ex-post evaluation was conducted. In addition, “the Project for Improvement of Equipment for Demining Activities Phase VII,” as the next phase of the project, is planning to procure spare parts for clearance.

Table 4 Status of Inactive Equipment as of Ex-post Evaluation

| Name of Equipment | Status | Number of equipment. | Remarks |
|---|---|---|---|
| Mine detector | Under Repair | 13 | Equivalent to 6% of the total number of equipment provided. According to the CMAC database, 11 detectors were broken between April and May 2015, and the rest were broken in 2016. It was planned to be repaired after procurement of spare parts. |
| Deep search detector | Under Repair | 13 | Equivalent to 15% of the total number of equipment provided. According to the CMAC database, 4 detectors were broken between April and May 2015, and the rest were broken in 2016. It was planned to be repaired after procurement of spare parts. |
| Portable GPS receiver | Under Repair | 5 | Equivalent to 4% of the total number of equipment provided. According to the CMAC database, 2 receiver s were broken between April and June 2015, and the rest were broken in 2016. It was planned to be repaired after procurement of spare parts. |
| VHF handheld transceiver | Under Repair | 3 | Equivalent to 1% of the total number of equipment provided. According to the CMAC database, 2 transceiver s were broken between April and December 2015, and the rest were broken in 2016. It was planned to be repaired after procurement of spare parts. |
| | Broken | 5 | Equivalent to 2% of the total number of equipment provided. They were not in use because they were unrepairable. |
| Tent | Under Repair | 6 | Equivalent to 7% of the total number of equipment provided. Almost all equipment were broken in April 2015. It was planned to be repaired after procurement of spare parts. |

Source：Questionnaire Survey to CMAC

## 3.4 Impacts

### 3.4.1 Intended Impacts

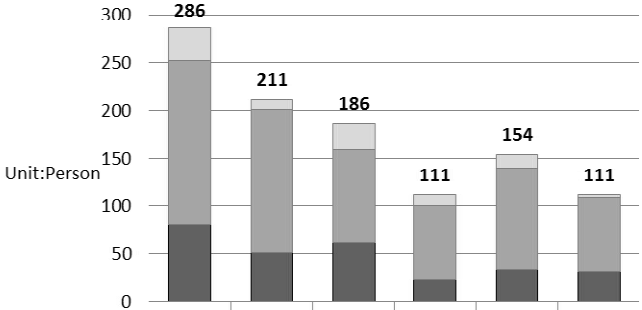
The project was expected to have impacts on securing safe living for residents in rural areas. To measure the impacts, the following points were examined: 1) changes in the number of landmines/UXO victims, 2) condition of land use after landmines/UXO clearance, and 3) changes in the living environment of residents in rural areas.

1) Changes in the number of landmines/UXO victims

As shown in Figure 2, the number of landmines/UXO victims is in a decreasing trend every year from 286 people in 2010 (when the project was planned) to 111 people in 2015. This is the

result of the efforts made by demining operators conducting clearance activities in Cambodia. Especially, CMAC cleared landmines/UXO for approximately 50% of the entire area and is the largest operator in the country, and can be said that it has made great contributions to the decrease of victims.

In addition, this is also the result of Mine Risk Education (MRE) for residents which CMAC and other demining operators provide in conjunction with landmines/UXO clearance activities. Concerning this point, Mr. Sako commented "JMAS implements MRE at schools, administrative offices, and village halls together with landmines/UXO clearance activities by CMAC. Consequently, positive effects such as a better understanding of the risk on landmines/UXO and an increase in the number of information on landmines/UXO locations are seen."




| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Total | 286 | 211 | 186 | 111 | 154 | 111 |
| Adult female | 34 | 10 | 27 | 11 | 15 | 3 |
| Adult male | 172 | 150 | 98 | 77 | 106 | 77 |
| Child | 80 | 51 | 61 | 23 | 33 | 31 |

Source: Data Provided by CMAA
Note: 'Child' is defined as a person below the age of 18.

Figure 2　Number of Landmines/UXO Victims (Annual)

The breakdown of victims shows that the majority were male adults. This was because there were accidents in recent years in which they touched landmines/UXO hidden deep underground at farmlands where they used large-scale agricultural machinery and at construction sites where they used heavy machinery. On the other hand, the number of child victims for the last three years remained almost unchanged. When looking into details of child victims, one can notice that there were many cases where children touched landmines/UXO by themselves or they were involved by being near a person who touched landmines/UXO. Therefore, continuing MRE for children and male adults is necessary.

2) Conditions of land use after landmines/UXO clearance

The major purposes of land use after clearance activities by CMAC after the project completion (2012 to 2015) were "farmland" (approximately 71%) followed by "combined use

of house and a farmland" (approximately 8%). According to CMAC, the number of people who received direct benefits from landmines/UXO clearance is calculated as 55,003 people. Purposes of land use are decided by residents themselves, as beneficiaries. After clearing landmines/UXO, the Mine Action Planning Unit (MAPU) located in each state conducts a monitoring survey to make sure that the land is used for the planned purpose. The monitoring system aims to prevent the land cleared of landmines/UXO from being used against residents' will.

3) Changes in living environment of residents in rural areas

As the result of the beneficiary survey[12] in two villages in which CMAC implemented landmines/UXO clearance, all residents responded as "very satisfied" [13] with the selection process of demining sites and activities conducted by CMAC. According to CMAC, when clearance activities for landmines/UXO just started in the 1990's, there were many residents who were dissatisfied with the clearance activities because each demining operator conducted clearance activities upon request from local authorities. Currently, however, the level of satisfactions of residents is higher because transparent selection process of clearance sites is taken under the participations by administrative personnel at each level, demining operators and residents in accordance with the guideline made by CMAA. Concerning this, Professor Takesada[14] of Hosei University re-verified appropriateness of the selection process for selecting demining sites. And it was confirmed that a clear method for selecting demining sites with local government and demining operators was prescribed and a democratic process was being taken. (Refer to BOX2)

Also, the beneficiary survey shows expansion of farmland and income increase after the project. Farmland per household increased from 2.4 ha to 3.8 ha on average. . Activities for landmines/UXO clearance seem to have made an enormous contribution to this result. Moreover, annual average income increased from US$317 to US$920. However, various factors including expansion of farmland can be considered as reasons for the income increase, so a further survey will be necessary to determine the causality with the project.

As regards to positive effects brought about by landmines/UXO clearance activities, the

[12] The beneficiary survey was done in two villages, namely, O Donpov village and Russie Ro village in Battambang Province. These villages were selected because they had been intervened only by CMAC and also had relatively large areas cleared. In order to examine changes in the living environment after clearance activities by CMAC, 100 residents living near the land with landmine/UXO buried were intentionally extracted, and a face-to-face questionnaire survey was conducted. (Response rate: 100%) (Gender: 60 males, 40 females, Age Group: 10 people in 20's, 20 people in 30's, 24 people in 40's, 31 people in 50's, 15 people in 60's). No major discrepancies were confirmed by villages, gender and by ages.

[13] Five-scale answers, very satisfied, satisfied, neither, dissatisfied, and very dissatisfied

[14] Professor of Faculty of Sustainability Studies, Hosei University; worked at Overseas Economic Cooperation Fund(OECF) and Japan Bank for International Cooperation (JBIC); was a member of JICA Environmental and Social Considerations Committee; his specialty is resettlement issues of ODA projects, and social considerations.

answers that the respondents gave most were “improved safety” (99%), “expansion of farmland” (95%), “infrastructure development (mainly roads)” (92%), and “improved access to public facilities” (91%) (multiple answers). Meanwhile, the residents requested “development of irrigation facility” (42%), “road construction” (31%), and “agricultural training” (19%). Concerning this, Mr. Ratha Seng pointed out “Viewing the landmines/UXO issue in Cambodia from a long-term perspective, CMAC should not only focus on clearance activities but provide multi-faceted assistance in which communities suffering from landmines/UXO can receive benefits. In other words, land with landmines/UXO buried was not in use for many years. Even if landmines/UXO were cleared of, the land was often not used for farming because residents did not have sufficient agricultural tools or skills and also lack irrigation water and roads. Therefore, in addition to clearance activities, medium-to-long term assistance including agricultural assistance and infrastructure development is necessary for the community”. Mr. Sako also considers that implementing landmines/UXO clearance together with infrastructure development[15] is important for residents to live independently.

[15] JMAS conducts road, well, and elementary school building projects jointly with CMAC.

BOX2

Appropriateness of Land Application after Demining and UXO Clearance

Naruhiko Takesada, Professor of Faculty of Sustainability Studies, Hosei University

(Summary)

CMAC understands from their experiences that clearance activities generate usable land, in other word "resources", in the past emergency phase. The selection process of sites for demining activities was developed and operated by reflecting the will of the residents. CMAC secured transparency of the process by establishing MAPU and PMAC[16] and also by having participations of demining operators and development partners in the process.

Also, a monitoring system after landmines/UXO clearance was established. The monitoring report requires to identify the land use status after clearance (13 categories including farmland and schools) and the number of beneficiaries. It is expected to provide useful lessons for the future selection of clearance sites by utilizing the data.

Meanwhile, the prioritization of selecting clearance sites still seems to have issues. Specifically, the following points were pointed out during the interview survey of the ex-post evaluation: i) priority setting between large-scale land-owner and poor families; ii) prioritization of national projects that was not in the original plan; iii) land is not used as expected after the demining activities. As for CMAC's issues related to their priority (and effective use of limited resources), it is expected that CMAC's confusion regarding priority setting will be solved by sharing criteria of priority with international aid agencies.

*This box was summarized by the external evaluator. The full text is attached at the end of the report.

### 3.4.2 Other Impacts

A series of cooperation including the project that JICA provided for CMAC has contributed not only to securing safe living of residents, but to maintaining and improving CMAC's ability in landmines/UXO clearance as described below.

[16] Abbreviation of Provincial Mine Action Committee; MAPU conducts demining planning, monitoring, evaluation, a series of social and economical surveys; PMAC conducts supervision, approval, and decision.

1) Expansion of CMAC's South-South Cooperation

Under the JICA's South-South Cooperation scheme[17], CMAC has been a recipient organization of the Third Country Training Program[18] since 2012 for Laos, Angola, and Iraq which have similar landmine/UXO issues with Cambodia. CMAC has been providing technical guidance related to landmine/UXO clearance activities for those countries by utilizing equipment provided by the project.

2) CMAC's contribution to Japanese ODA projects/Japanese companies' branching out in Cambodia

CMCA's proper landmines/UXO clearance activities contributed to smooth implementations of constructions of the Neak Leoung Bridge which opened in April 2015 and National Highway I and V in Cambodia. Also, there were two cases where CMAC cleared landmines/UXO before Japanese companies constructed their factories in 2015. CMAC contributed to securing the safety of Japanese companies when they branched out in Cambodia.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

Operation system of CMAC has not greatly changed from the time of the planning to the ex-post evaluation. The number of staff was approximately 2,100 at the time of the planning, but it was approximately 1,600 at the time of the ex-post evaluation. According to CMAC, the major reason for the reduction of staff was retirement and job switching. It was also because of downsizing that CMAC implemented as a part of its organizational reform. Regardless of the reduction of staff, CMAC has been able to maintain and increase annual areas cleared of landmines/UXO in recent years because it has concentrated on capacity building of its staff. Specifically, CMAC promotes work efficiency through 1) providing training for its staff to acquire multiple skills in a way that they can work as a small team, instead of working with several specialized teams as previously practiced, and 2) increasing welfare benefit per person to raise motivations of its staff.

CMAC is currently drafting a strategic plan for the coming 10 years (2015-2025)[19]. The draft estimates areas that need to be cleared by each demining operator by 2025. Based on the assumption that CMAC can secure budget and human resource needed, it plans to accelerate

[17] Scheme that a developing country which has advancement in a specific area assists other developing countries by sharing their experiences.
[18] Program for a qualified developing country to provide technical assistance to officers gathered from other developing countries.
[19] Source: "CMAC TEN-YEAR STRATEGIC PLAN CONCEPT" DRAFT2016-2025

activities for landmines/UXO clearance in the first five years and then to reduce the activity scale in the latter five years (after 2020). It also states that CMAC will continue activities as a governmental agency to work on agendas that are necessary for poverty reduction and economic growth in the country. Also, CMAC has a conceptual plan to transform to as an agency which promotes activities related to landmines/UXO not only in the ASEAN region but also in other regions in cooperation with the ASEAN Regional Mine Action Center (ARMAC)[20] established in 2012 in Cambodia.

### 3.5.2 Technical Aspects of Operation and Maintenance

Technical Institute for Mine Action (TIMA), CMAC's training centre, has more than 30 training programs annually including refresh training that is to retrain staff who are engaged in landmines/UXO clearance activities, and provides the training system to maintain and improve skills for CMAC staff. Each staff member who conducts landmines/UXO clearance has his/her own equipment and keeps an instruction manual. When staff cannot handle the situation by referring to the manual, they contact the Central Workshop in Battambang Province. In case where the Central Workshop cannot handle the situation, it contacts the manufacturer to repair equipment. Most equipment provided by the project were being utilized by CMAC even before the project started, so there are no technical problems in the aspects of operation and maintenance.

When an equipment malfunction occurs on the landmines/UXO clearance site and if there is a need for urgency, a special vehicle for repair goes to the site for repair. A monitoring team deployed at each branch visits clearance sites and monitors equipment and their activity.

### 3.5.3 Financial Aspects of Operation and Maintenance

The breakdown of CMAC's operating budget mainly consists of: 1) financial assistance from international aid agencies, 2) subcontracting fees from companies and NGOs, and 3) budget from the Cambodian government. CMAC depends more than 80% of its budget on international aid agencies[21] at the time of the ex-post evaluation. CMAC was making efforts to increase its budget by: 1) requesting the Cambodian government to increase its budget and 2) expanding affiliated projects with companies and private organizations.

[20] Training centre mainly provides technical training related to clearance for trainees from the ASEAN countries
[21] Major international aid agencies are UNDP, American, Germany, and Japanese government.

Table 5　Operational Budget of CMAC（Annual）

Unite：1,000USD

| Item | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| International Donors | Actual | 11,405 | 10,402 | 10,898 | 9,472 | 11,725 | 10,182 |
| | % | 92.4% | 94.2% | 82.3% | 80.7% | 95.9% | 82.5% |
| Subcontracting Fees | Actual | 349 | 210 | 496 | 1,028 | 117 | 1,761 |
| | % | 2.8% | 1.9% | 3.7% | 8.8% | 1.0% | 14.3% |
| Cambodian Government | Actual | 594 | 434 | 1,848 | 1,242 | 378 | 400 |
| | % | 4.8% | 3.9% | 14.0% | 10.6% | 3.1% | 3.2% |
| Total | | 12,349 | 11,046 | 13,242 | 11,743 | 12,221 | 12,343 |

Source: Questionnaire survey to CMAC

Note 1：Total cost is different from the sum of each item because each amount in this table was rounded down to the 1,000USD.

Note 2：The reason of an increase of the government budget between 2012 and 2013 was that CMAC was commissioned in clearance activities in the areas with political priority.

Table 6　Operation/Maintenance Cost and Total Expenditure of CMAC（Annual）

Unite 1,000USD

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Consumables procurement costs（A） | 400 | 358 | 404 | 453 | 405 | 400 |
| Equipment Maintenance Cost（B） | 1,048 | 1,580 | 1,308 | 1,196 | 960 | 1,048 |
| Miscellaneous（C） | 43 | 39 | 48 | 85 | 87 | 43 |
| Total O&M Cost（A+B+C） | 1,492 | 1,979 | 1,761 | 1,734 | 1,452 | 1,492 |
| Total Expenditure(D) | 11,429 | 9,585 | 13,899 | 13,776 | 15,510 | 14,452 |
| Total O&M Cost / Total Expenditure (%) | 13.1% | 20.6% | 12.7% | 12.6% | 9.4% | 10.3% |

Source: Questionnaire survey to CMAC

Note:　Total cost is different from the sum of each item because each amount in this table was rounded down to the 1,000USD.

Maintenance cost for the last four years from 2012 when the project completed to 2015 accounted for 9 to 12% of the total expenditure, and the percentage increased compared to the five years before the project planning between 2005 and 2009, which was 6 to 11%[22]. The background of this increase is assumed that maintenance cost increased due to deterioration of the equipment.

Concerning the recent financial situations of CMAC, expenses exceed revenues. CMAC requests for budget increases whenever a deficit occurs, but the budget is not always promptly allocated from the government. Therefore, it is assumed that upgrading landmines/UXO clearance equipment on a large scale will be difficult for CMAC. It is undeniable that CMAC's heavy dependence on the international aid agencies is a risk to their activities. In this regard, Mr. Sako, commented "Due to decrease or termination of financial sources by international aid

[22] Data provided by JICA

agencies, clearance activities sometimes have to be stopped on site. Therefore, it is important to create a framework where the Cambodian government can allocate budgets to CMAC or a framework to help CMAC's self-sustaining efforts in the financial aspect." CMAC implements landmines/UXO clearance activities as its most important duty, but there are concerns of stagnation of other activities such as MRE and landmine dog training due to budget cuts or withdrawal by the international aid agencies.

#### 3.5.4 Current Status of Operation and Maintenance

Serial numbers are given to all equipment used at each branch, and information including operation hours, fuel costs, and places used are summarized in the monthly report. The equipment database is maintained based on the reports so that operating conditions and repair records can be immediately checked at the CMAC headquarters. List of equipment which was out of order at the time of the ex-post evaluation are described in Table 4. All spare parts provided under the project were in use. There are some cases where spare parts need to be imported and may not be able to be promptly purchased due to the budget limitation. So far, most spare parts have been properly procured with their own funds. As for special equipment such as mine detectors, CMAC confirms the equipment performance and durability in advance, and then requests the Japanese side to provide them. Therefore, it is considered that CMAC properly operates and maintains the provided equipment.

Although there are no problems with the institutional and technical aspects, some minor problems have been observed in terms of financial aspect. Therefore, sustainability of the project effects is fair.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

The project was implemented for the purpose of improving clearance activities of landmines/UXO through procurement of necessary equipment for CMAC in Cambodia which faced serious problems with buried landmines/UXO. Relevance is high, because the project was consistent with the development policy and needs of Cambodia and with Japan's ODA policy. Efficiency is also high, since both project cost and period were within the plan. It was confirmed that CMAC's clearance activities of landmines/UXO are improved through appropriate utilization of the procured equipment. In addition, positive impacts of the project, such as securing safe living and improving convenience of living by developing infrastructure such as road, public facilities, and farmland, were confirmed. Therefore, effectiveness and impact of the project are high. The status of operation and maintenance of the equipment was considered as appropriate and no major problems were observed in terms of institutional and technical aspects.

On the other hand, the prospects of sufficient budget allocation to CMAC looked unclear. Therefore, sustainability of the project is deemed fair.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Implementing Agency

CMAC is in the process of drafting a strategy for landmines/UXO clearance activities by 2025. It is important for CMAC to present a specific plan about financial sources, purchase and renewal of equipment, clearance technology, and manpower required for activities for landmines/UXO clearance to the Cambodian government and the international aid agencies. Currently, activities for landmines/UXO clearance are expected to slow down around 2020. Therefore, it is recommended that CMAC should present its exit strategy on how CMAC will evolve after 2020.

### 4.2.2 Recommendations to JICA

CMAC has a plan to accelerate activities for landmines/UXO clearance until around 2020 and then to reduce the activity scale. Because landmines/UXO clearance activities heavily rely on equipment, needs to upgrade deteriorated equipment will be continuously high. Therefore, it is desirable for JICA to continue assistance in procuring equipment for CMAC until around 2020 when CMAC activities for landmines/UXO clearance are planned to be reduced. After that, it is also recommended to consider assistance in improving financial situations of CMAC that depends on the international aid agencies. Based on the exit strategy for the future organization which will be clearly stated in the 10 year plan being made by CMAC, it is desirable that JICA discuss new assistance direction. For example, expansion of South-South Cooperation to other countries and regions which have landmines and UXO issues like Cambodia, assistance in landmines/UXO victims in the country, capacity building as an organization that implements community development are some options.

## 4.3 Lessons Learned

Notes for projects to procure equipment

At the time of the ex-post evaluation, it was confirmed that most equipment provided by the project were by and large operated and maintained well. The reasons are as follows： 1) most equipment that the project provided had been utilized by CMAC even before the project. 2) as for special equipment such as mine detectors, CMAC purchased it with its funds and confirmed the equipment's performance and durability in advance, and then requested the Japanese side to provide them. This process lead to CMAC's operation and maintenance of provided equipment in good conditions.

In this way, for similar projects to procure equipment, it is important to select equipment after fully understanding the conditions of the equipment and operational and maintenance ability of the recipient organization.

In the project, spare parts were provided together with the equipment. At the time of the ex-post evaluation, all parts were used, and purchase of some spare parts were delayed due to the limited budget. Therefore, for similar projects to procure equipment, it is desirable to consider not only operation and maintenance ability of the recipient organization but also possibility to continuously purchase spare parts in the medium and long term.

Notes for Grant Aid Projects that are implemented for multiple years to the same organization

The project was implemented as the sixth phase of "the Project for Improvement of Equipment for Demining Activities" of the Japanese Grant Aid Projects that has been implemented for CMAC since 1998. The reason why these projects have been implemented for many years is that the complete clearance of landmines/UXO from the whole country is still in its half way. Also, its budget for updating equipment for clearance activities was not sufficiently secured.

The project has assisted the same organization for many years from the urgent assistance phase to the reconstruction assistance phase. For similar projects, especially in the reconstruction assistance phase, it is important to discuss if the organization can independently procure equipment and secure necessary budgets for maintenance in the future. Also, if necessary, incorporating assistance and suggestions to secure financial resources into the project design can be effective in order to secure sustainability of the organization.

JICA Evaluation Department

On Views of Experts

This ex-post evaluation was carried out by referring to views of experts (universities and NGOs) to reflect more specialized and diverse views, in addition to evaluation based on the DAC five evaluation criteria by the external evaluator. The external evaluator selected experts, and gained cooperation from three experts: Naruhiko Takesada, Professor of Faculty of Sustainability Studies, Hosei University; Nagatoshi Sako, Resident Representative, Japan Mine Action Service (JMAS) Cambodia Office; and Ratha Seng, a researcher at the Research and Development Center, University of Battambang.

Professor Takesada of Hosei University specializes in the issues of resettlement and social consideration in ODA projects, and has visited CMAC with university staff in the past. For these reasons, the external evaluator asked him to share his views based on his expertise and experience. Specifically, the external evaluator made a questionnaire that incorporated his comments, provided Professor Takesada with answers of the questionnaire and the evaluation report, so that he can make comments based on theoretical assessment.

Nagatoshi Sako, Resident Representative of the JMAS Cambodia office, has been engaging with activities in collaboration with CMAC in the same field as this project. He received information on this project and results of the field survey from the external evaluator, and gave his comments based on his knowledge of CMAC's activities and its capacities. It should be noted, however, that JMAS activities were not implemented in a direct collaboration with this project.

Ratha Seng, a researcher at the University of Battambang's Research and Development Center, specializes in community development and poverty issues, and has made comments on CMAC's contributions to peace building in Cambodia.

The external evaluator introduced the views of these three experts by citing them or summarizing them into boxes in the evaluation report. The essays of Nagatoshi Sako and Professor Takesada were appended to the evaluation report as attachments.

End

JMAS's Operation in Cambodia

JMAS Cambodia Office

Nagatoshi SAKO, Resident Representative

1. Introduction of JMAS

Japan Mine Action Service (JMAS) consists of mainly retired officials of the Self Defence Force. It was established to contribute to the reconstruction of countries suffering from the after-effects of war or civil war by using its experience and specialities. Due to characteristics of JMAS, it was natural to implement its activities in Cambodia, the first overseas country where the Self Defence Force was dispatched. It was in 2002 that JMAS started UXO clearance activities in collaboration with CMAC. Since then, JMAS has been undertaking demining projects, mine risk education, and local reconstruction assistance projects. Major projects that JMAS is currently implementing are described below.

2. Landmines/UXO clearance activity

JMAS gives CMAC's demining staff on-site instructions on "integrated demining" which is a combined use of anti-personnel demining machines or brush cutters and human power so that they can work safer and more efficiently. While JICA projects are to provide equipment, JMAS projects are to provide (transfer) knowledge and skills for deploying demining platoons. Therefore, I consider myself that JMAS projects bring about synergies to JICA projects. Also, JMAS provides CMAC's UXO clearance staff with guidance through on-the-job training and lectures on safe and proper clearance of Explosive Remnants of War (ERW), so that they can build capacities as clearance teams. In addition to technical education, furthermore, JMAS provides CMAC's team leaders with training on planning, appropriate chain of command, and safety management, which was not clear to them when they worked as teams. JMAS also highlights the importance of observing rules, reporting, and recording to team staff.

3. Mine Risk Education

One of the efforts that JMAS makes together with CMAC is the mine risk education to residents living in areas where landmines/UXO clearance activities are implemented. This education is given at local elementary schools, administrative agencies, and local resident assemblies. Although CMAC has its mine risk education teams, they rarely visit the actual demining site and schools. Therefore, JMAS implements demining work and mine risk education together. Since residents' awareness clearly differ after the education at interviews and surveys, I believe that the education was effective. Also, I believe that this has indirect effects in that JMAS has started receiving more information on landmines and UXO locations and victims have been decreasing.

4. Local reconstruction assistance project

JMAS has a philosophy; i.e., “For full reconstruction, especially for independent livings for villagers, what is important is not only landmines/UXO clearance but also developing infrastructures.” Since 2008, JMAS has been getting supports for the local reconstruction assistance project as a joint project between JMAS and CMAC from Komatsu Ltd, a construction machinery manufacturer. The contents of the project are varied. The project has constructed new roads (approximately 28.2km), conduits (63 places), reservoirs (43 places), wells (13 wells), elementary schools (6 schools, though school constructions themselves were done not by CMAC staff but by construction companies), and 500 lots of residential land development for settlers (100m$^2$ per household). In the Province Demining Meeting held at the Governor’s official residence in Battambang Province, the Vice Governor expressed his appreciations as follows. “We greatly appreciate JMAS activities not only for conducting landmines/UXO clearance, but for contributing to the improvement in the residents’ lives by means of developing infrastructures on safe land.”

5. Issues in the future

CMAC has cleared most landmines together with the Royal Cambodian Armed Forces, and thus I consider that CMAC is an indispensable organization for the development of Cambodia. However, it is said that more than 90% of CMAC’s budget relies on international aid agencies. If international aid agencies significantly reduced or stopped their financial assistance to CMAC, CMAC’s activities maintained by them would be suspended. Therefore, in order to continue their activities, Japan (JICA) should play active roles in providing not only financial assistance (for procuring demining equipment) but also other forms of assistance, such as developing a framework where the Cambodian government allocates national budget to CMAC or a framework to promote CMAC’s self-sustaining efforts like provision of construction equipment or agricultural machinery, conducting demining services as business for construction of industrial complex or farmland development.

Technical guidance to the demining platoon on site

Appropriateness of Land Application after Demining and UXO Clearance

Naruhiko Takesada
Professor of Faculty of Sustainability Studies
Hosei University

Demining activities (including UXO clearance) in Cambodia are very important efforts to get rid of dangers to local lives, secure safety in local social economy, and create a foundation for development. Because of its importance, JICA (Japan International Cooperation Agency) has continued its assistance in demining activities to the Cambodian government for many years. The ex-post evaluation survey shows, as the result of demining activities, that the numbers of casualties and accidents by landmines/UXO have been steadily decreasing, and the areas cleared of landmines/UXO have been steadily expanding. Therefore, there is no doubt that demining activities have been enhancing safety in Cambodia.

Here, I would like to bring another aspect to the evaluation as a third person. It is about the land use after demining. Land after demining is assumed to be used for agricultural activities and development of infrastructures such as roads. The land after demining is expected to serve as the base of social economic activities. In other words, demining activities intend to expand usable land. If it is expressed in an abstract way, demining activity is an activity for generating new “resources.” Resources cannot be resources when they simply exist in the nature. It is said that they become resources when human intervenes. For example, crude oil is buried in the ground as a “natural minerals,” and it becomes a “resource” when it is drilled out by human. As the drilling technology progresses, the amount of accessible oil reserve increases, which is what makes “resources” worthy of the name. Land containing landmines/UXO or land with the risk of landmines/UXO are unusable. However, such land becomes usable again or it can be said that it becomes a new “resource” when human intervenes for demining activities.

It is necessary to recognize that resource generation is one of the characteristics of demining activities. This characteristic is important when we take into account the changes in the communities where demining activities were implemented, more specifically, when considering the relationship between demining activities and widening disparities within the communities. In general, the community where resources are newly generated face the following two issues. One is how a new “resource” or the benefits derived from the “resource” are distributed in the community. For example, suppose that demining activities were implemented in accordance with requests or priorities of a local authority like a land-owner. Even if large land becomes usable as a result of demining activities, the benefits from the land use may be enjoyed only by the local authority that has access to the land. Another issue is how a new “resource” affects the power structure in the community. For example, when emergency relief supplies are distributed

to tsunami stricken areas, if there is a person who can speak English in the community, the members in the community are more likely to receive relief supplies from international aid agencies earlier than the members in other communities that have no English speaker. Emergence of a new "resource" possibly creates a new channel for resource distribution that is different from existing channels. This might dilute the authority of influential people. Thus, while demining activities provide safety for people, they entail risks of causing changes or widening disparities in the community through generation of new "resource". Moreover, there is possibility that unfair resource allocation and widening disparities may become a new cause of dispute in the future.

Focusing on this characteristic of demining activities, which is to generate "resources," the following three points were pointed out by reviewing the information gathered during the ex-post evaluation.

(1) CMAC understands from their experiences that demining activities generate usable land, in other word "resources" (which can also expand disparity), in the past emergency phase. The selection process of sites for demining activities was developed and operated by reflecting the will of the residents.

(2) A monitoring system of land use after demining activity is established.

(3) Concerning the priority of demining sites selection, further adjustment is needed among the international aid agencies, demining operators, and Cambodian government.

Concerning (1), CMAC recognized that demining activities resulted to be in favour of some of the local authority in the emergency phase. It is worth mentioning that CMAC made reforms in the operations and the system so as to further value opinions at the grass-roots level. More specifically, MAPU and PMAC were established, and more transparent processes for site selection were applied. Especially, community opinions were reflected to the processes of site selection, and other demining operators and development partners were able to participate in the processes. In this way, this operational system is effective to secure transparency in the process of site selections.

Concerning (2), detailed monitoring system was established. In the monitoring report, land use status after demining (13 categories such as farmland and school) and the number of beneficiaries are summarised. It is expected that useful lessons can be obtained for future site selection by using the data. However, at present, it is not clear how much data have been compiled, how the data are actually used, or what feedbacks are given. More consideration will be needed on these matters.

Concerning (3), as a result of the interviews with CMAC, I understand that CMAC (both central and operational sites) recognizes that they still have unresolved issues. Specifically, CMAC suggested the following: i) priority setting between large-scale land-owner and poor families; ii) prioritization of national projects that was not in the original plan; iii) land is not used as expected after the demining activities. (e.g., expected infrastructure construction was not carried out). Concerning i), the current Cambodian government's guidelines stipulate that demining activities will be implemented in areas with high potential for agricultural and infrastructure development. It is assumed that land productivity (as "resources") is mainly prioritized. Therefore, it is not possible to find a clear standard emphasizing on benefit to poor families as international aid agencies expect. Meanwhile, it is not necessarily appropriate to

give a lower priority to large-scale land-owners, because there might be beneficiaries such as tenant farmers who make livings on the owner's land. It is desirable that current land use is shared with international aid agencies. In the future, purposes of land use might change as the economy grows. For example, the land intended for farming might be converted to the land for commercial development (including residential areas). Therefore, it is necessary to have straightforward communication on how such changes will be evaluated subsequently by international aid agencies. Looking at the interview results and keeping situations like ii) and iii) in mind, especially at CMAC's branch offices, prioritization is required in daily operation while dealing with local residents, and I have a sense that they have actual difficulties in facing these issues.

Regarding CMAC's issues related to priority (and effective use of limited resources), it is expected that CMAC's confusion regarding priority setting will be solved by sharing criteria of priority with international aid agencies. Moreover, demining operators and international development agencies need to become clearly aware of the fact that demining activities influence the community through newly generated resources and their allocation. Then they should share efforts to produce projects by enhancing understanding of the project effects and enriching project design. In this way, new disputes such as disparities in communities will be eliminated.