

## Summary of Terminal Evaluation

<b>I. Outline of the Project</b>	
<b>Country:</b> Royal Government of Cambodia	<b>Project Title:</b> Strengthening of Construction Quality Control Project
<b>Issue/Sector:</b> Transport	<b>Cooperation Scheme:</b> Technical Cooperation Project
<b>Division in Charge:</b> JICA Cambodia Office	<b>Total Cost:</b> 430 million yen (as of Terminal Evaluation)
<b>Period of Cooperation</b>	May 2009 – October 2012 (42 months)
	<b>Partner Country's Implementing Organization:</b> Ministry of Public Works and Transport (MPWT)
	<b>Cooperation Organization (Japanese side):</b> Ministry of Land, Infrastructure, Transport and Tourism
<b>1-1 Background of the Project</b>	
<p>In order to ensure the efficiency and sustainability of social and economic development and poverty reduction, the Ministry of Public Works and Transport (MPWT) has worked intensively on the rehabilitation and reconstruction of infrastructures such as roads and bridges with financial and technical support from development partners and/or national budgets. Regarding the construction projects from the development partners, international consultants have assured quality control by accommodating to the international standard. On the other hand, the national budget construction projects that were implemented by the governmental organizations under MPWT such as the Road Infrastructure Department (RID), Heavy Equipment Center (HEC), and each provincial Department of Public Works and Transport (DPWT) have been inadequate and less effective in terms of quality control of construction. In those national budget projects, material testing and adequate construction procedure seem to be neglected in the development of national road network.</p> <p>Based on the above-mentioned backgrounds, The Royal Government of Cambodia (RGC) requested the implementation of the Technical Cooperation Project (TCP) to the Government of Japan in order to establish an adequate Quality Control and Quality Assurance (QC/QA) system for roads and bridges construction. In response to the request, the government of Japan decided to implement the project for Strengthening of Construction Quality Control (SCQC).</p>	
<b>1-2 Project Overview</b>	
<b>(1) Overall Goal</b>	
Quality and cycle of road and bridge construction and maintenance are improved.	
<b>(2) Project Purpose</b>	
Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standards Guideline, Regulation, Trainings, Standard Drawings).	
<b>(3) Output</b>	
Output 1) Standard Guideline and Regulation for quality control of road and bridge construction and maintenance are established.	
Output 2) Centralized and integrated management system of completion documents such as drawing and reports of construction is established.	
Output 3) Technical trainings are implemented by MPWT lecturers.	
<b>(4) Inputs</b>	
<u>Japanese side</u>	
a) Personnel: Long-term Experts: 2 (75.78MM) Short-Term Experts: 9 areas (72.63MM)	
b) Equipment: US\$ 180,373 c) Training in Japan: 11 CPs d) Local Cost: US\$ 285,000	

Cambodia side

a) Personnel: 16 CPs      b) Office space: Expert office in MPWT      c) Local Cost: US\$ 2.96 million

**II. Evaluation Team**

<b>Members</b>	Leader: Mr. Hitoshi HIRATA (Senior Representative, JICA Cambodia Office) Construction Quality Control: Mr. Hozumi KATSUTA (Senior Advisor, JICA) Evaluation Analysis: Dr. Keiko WATANABE (Senior Researcher, FASID) Evaluation Planning 1: Mr. Masahiko EGAMI (Representative, JICA Cambodia Office) Evaluation Planning 2: Mr. Say BORA (Staff, JICA Cambodia Office)
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<b>Period of Evaluation</b>	20-30 August 2012	<b>Type of Evaluation</b>	Terminal Evaluation
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**III. Results of Evaluation**

**3-1 Achievement of Outputs**

**3-1-1 Output 1: Standard Guideline and Regulations for quality control of road and bridge construction and maintenance are established.**

The Evaluation Team confirmed the level of achievement of Output 1 was high despite some delays in conducting pilot projects. But these delays did not undermine the achievement of Output 1.

<b>Objectively Verifiable Indicators (OVI)</b>	<b>Achievement</b>
By the end of the Project, the second edition of SG and RG are produced after incorporation of the lessons learned from the pilot projects.	<ul style="list-style-type: none"><li>• 5 pilot projects which applied SG/RG have been conducted. One of them (NR71 in Kampong Cham) has experienced all the process of SG and the necessary documents have been compiled as a completion document. Other pilot projects will be completed by the end of December 2012.</li><li>• First edition of SG/RG (both English and Khmer) was formulated in August 2010 and revised 2nd edition was formulated in August 2012 after incorporated lessons learned from the pilot projects. Khmer version of SG/RG was translated by the CPs.</li><li>• Equipment for various kinds of test for construction has been procured and installed in the laboratory.</li></ul>

**3-1-2 Output 2: Centralized and integrated management system of completion documents such as drawing and reports of construction is established.**

The Team confirmed that Output 2 has been achieved with utmost efforts both from Japanese and Cambodia sides. However, further commitment needs to be ensured for sustainable use of database system and library management.

<b>Objectively Verifiable Indicators</b>	<b>Achievements</b>
Database system is completed and information of Database is utilized by MPWT staff by the end of the Project	<ul style="list-style-type: none"><li>• A simple database management system was developed for as-built drawings, standard drawings and books at the library. The database was accessible to MPWT officials through MPWT intranet.</li><li>• As-built drawings were collected as many as possible and converted into electronic format for database use.</li><li>• Standard drawings which were developed and compiled in the Output 3 were also installed into the database.</li></ul>

	<ul style="list-style-type: none"> <li>• Library was renovated twice and completed in April 2012. All necessary books and documents were sorted out with labeling.</li> <li>• Operation and User manuals were developed in July 2012.</li> </ul>
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**3-1-3 Output 3: Technical trainings are implemented by MPWT lecturers.**

The team confirmed that the activities under Output 3 were implemented almost as scheduled and the level of achievement of Output 3 was high.

Objectively Verifiable Indicators	Achievements
Technical training developed by the Project is incorporated into the conventional training program by Department of Personnel & Human Resources.	<ul style="list-style-type: none"> <li>• The training plan was prepared in February 2010 after assessing MPWT capacity needs and current training program.</li> <li>• Two Trainings of Trainers (TOTs) were conducted in 2010 and 2012 for 13 MPWT officials.</li> <li>• QC/QA training subjects were incorporated into the MPWT conventional training course. Trainings have been conducted since November 2011 by MPWT trainers.</li> <li>• As of August 2012, 6 training workshops for provincial DPWT staff have been conducted by trained MPWT trainers other than above conventional trainings.</li> <li>• Altogether 200 DPWT engineers in total have been trained on QC/QA system by the project.</li> </ul>

**3-1-4 Other Activities to Contribute to the Outputs**

The Project conducted several additional activities contributed to strengthen the above three Outputs. Those activities included Technical workshops held by Japanese experts, Joint seminar organized by Japan Society of Civil Engineering and Institute of Technology of Cambodia, Site observation to the on-going Japan's infrastructure project ("Rehabilitation of National Road 1" and "Construction of Neak Loeung Bridge"), and Annual Technical Report and Seminar. These activities stimulated counterparts intellectually.

**3-1-5 Achievement of Project Purpose**

**"Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standard Guideline, Regulation, Trainings, Standard Drawings)"**

Achievement of the project purpose is promising. Throughout the project activities such as formulation of SG/RG, teaching QC/QA system as trainers, and actual implementation of force account projects, the capabilities of MPWT counterparts as well as DPWT engineers especially in the provinces where pilot projects were conducted, have improved in the quality control in road management. In addition, easier access to as-build drawings and standard drawings through database enhanced the QC/QA system in designing and maintenance. In order to make full use of the achievement of the project, it is strongly recommended that MPWT should establish measures to spread the effect to all DPWTs across the country in sustainable manner before the project ends in cooperation with the Japanese experts.

Objectively Verifiable Indicator	Achievement
(1) By the end of the project, the revised SG and RG are applied to at least three force account projects of roads and bridges starting in 2013 (new construction or major rehabilitation under periodical maintenance) in three provinces except in the two pilot provinces.	<ul style="list-style-type: none"> <li>• At the time of the terminal evaluation, the projects which apply SG/RG has not been identified yet. However, the team confirmed MPWT's plan to conduct at least one force account project per each DPWT applying SG/RG and its strong will to implement.</li> </ul>
(2) Trainers received TOT are assessed and trainees who participate the annual technical training in year 2012 improve the knowledge level of quality control and score 70 at the post test.	<ul style="list-style-type: none"> <li>• Through the preparation of teaching materials and actual teaching experiences, the MPWT trainers upgraded their knowledge and skills on SG/RG as well as teaching method, although continuous improvement needs to be made.</li> <li>• The results from the comparison between pre- and post-test showed the positive improvement of the participants. However, the average score has not reached to the target point yet, ranged from 54 to 68 depending on the training sessions.</li> </ul>

### 3-2 Implementation Process

Due to late procurement process of Japanese short-term experts and assignment of CPs, the project structure was established only in January 2010, which made some delays in the activities especially in the initial stage of the project. The commencement of the pilot projects in the 1<sup>st</sup> phase also affected by this together with the long dialogues with MEF and flood. However, it was noted that active involvements in the project activities from CPs especially after the mid-term review made possible to achieve the project purpose despite their heavy workload from other duties. As a result, the Cambodian side increased the ownership of QC/QA system and gained the knowledge and skills for road and bridges.

The communication between CPs and Japanese experts has been made smoothly and information on the Project such as progress and issues was shared at regular meetings and through e-mails.

### 3-3 Evaluation Results by Five Criteria

#### (1) Relevance (High)

The relevance of the project is highly relevant with following points.

The Project was well aligned with Cambodian overall development strategy of "Rectangular Strategy II (RSII: 2008) and the national five-year development plan (NSDP 2006-2010). The physical infrastructure development for transport is one of the Cambodia's priority areas stated in both RSII and NSDP. As the increase in the maintenance cost of roads and bridges pressed the national budget, improvement of the capacity of MPWT on quality control was the urgent needs especially for force account projects which the quality control practices have not been made in an appropriate manner. In this regard, the Project met the needs of MPWT. Furthermore, the Project was also in line with the Japan's Assistance Policy for Cambodia (2004) and JICA's Country-specific Implementation Plan (2007).

#### (2) Effectiveness (High)

The achievement of project purpose is promising. In regard to actual application of SG/RG into force account projects, the project made significant difference in QC/QA system. The changes were mainly seen

in three areas, i.e., improvement of pavement design by quality testing before the construction, formulation of the work execution plan, and preparation of record documents of quality control activities. Those practices have not always been done before. In addition the clarification of division of duties among Employer (Party A), Executor (Party B), Supervisor (Party C) and Inspector (Party D) in SG/RG clarified the relationship among them and increased transparency. Additionally, the Team also confirmed by the interview with MPWT CPs that easy access to as-build drawings and standard drawings through database enhanced the effectiveness. Therefore, effectiveness of the project is high.

### **(3) Efficiency (Fair)**

Some factors that affected efficiency were observed, although they did not impair the realization of Outputs. It was regrettable that if the 1<sup>st</sup> phase of pilot projects could have started earlier, all pilot projects would have been completed within the period of project. While sufficient information and lessons learnt were obtained through the current status of pilot projects to revise SG/RG, if the project was implemented as planned, more effectiveness could have realized through OJT at the whole process of all pilot projects.

Most of the inputs from Japanese side including dispatching the experts, procurement of equipment, provision of training in Japan and local cost have been made as planned. However, the initial inputs of short-term experts could have made earlier to produce more fruitful outputs. From the Cambodian side, although main counterparts actively involved in the project, there were some turnover of counterparts especially at the initial stage of the project, which reduced some efficiency.

Therefore, efficiency of the project is fair.

### **(4) Impact (Relatively High)**

It is expected that Overall Goal is likely to be achieved if the strong initiative from MPWT were demonstrated in a sustainable manner even after the project terminates.

On the other hand, some positive impacts were observed. The activities such as technical seminars and giving opportunities for presentation their papers upgraded the skills and knowledge of MPWT/DPWT engineers in the areas other than quality control. Throughout this project, MPWT raised awareness on the roles of counterpart in the technical cooperation project (TCP) since they were used to receive assistance in the form of Grant Aid project and development study and TCP was the first experience for them. In addition, the project built a network among different departments of MPWT by involving various MPWT offices in relation to force account projects. No negative impact has been observed.

### **(5) Sustainability (Relatively High, but some concerns remains in financial aspects)**

Sustainability of the project effect is relatively high, however, some concerns in financial aspects have been observed in terms of library and database management.

The network established among different departments of MPWT by the project will become a foundation of implementation body of quality control. It was confirmed that most of knowledge and skills transferred through the project activities have already been adopted in many CPs. If those trained engineers under the project remained and served to expand the knowledge and skills for all provinces, the technical sustainability will be ensured.

Financial sustainability is ensured to a certain degree to conduct new force account projects applying SG/RG. However, in terms of the management of library and database system, there is some concern in sustainability. It was recommended that necessary budget should be secured for it.

Political aspects are formidable since upgrading physical infrastructure is still one of the high priority areas of RGC.

### **3-4 Conclusion**

The achievement of the project purpose is promising with utmost efforts from both Cambodian side and Japanese experts in good manner. The project is highly relevant with the policies and development needs of RGC, as well as Japan's development assistance policy to the country. Effectiveness and impact of the project are high through the introduction of significant changes in QC/QA system. The changes are mainly seen in three areas, i.e., improvement of pavement design, formulation of the work execution plan, and preparation of record documents of quality control activities. All three areas have not been conducted appropriately before. The efficiency is fair from the timing of the assignment of Cambodian CPs and Japanese short-term experts, as well as delay in commencement of the pilot projects. Sustainability of the project is relatively high with some concerns in financial aspects for library and database system management.

### **3-5 Recommendations**

The following recommendations are made from the terminal evaluation team.

- (1) Prakas (Ministerial ordinance) on SG/RG should be issued and a support mechanism on quality control should be established by the leadership of PWRC within the project period.
- (2) Sustainable management of database system should be ensured.
- (3) Technical training for MPWT/DPWT public work engineers should be enhanced.
- (4) Public relations should be strengthened.

### **3-6 Lessons Learned**

- (1) Efforts to secure sustainability from the viewpoint of finance should be made.
- (2) Ensuring adequate budgetary allocation from Cambodia side
- (3) JICA should consider the timing of procurement of short-term experts and plan well in advance before the project starts.