

# **The Evaluation Study on Japan's Assistance to Transport Sector in Cambodia**

## EXECUTIVE SUMMARY

### **1. Background, Purposes and Viewpoints of the Evaluation Study**

Japan's bilateral assistance to Cambodia had been suspended for the period from fiscal year (FY) 1974 to FY 1991 and resumed in FY 1992. This evaluation study was conducted about a decade after the resumption. The target of this evaluation is a series of Official Development Assistance (ODA) projects implemented for the road/bridge sector of Cambodia after FY 1992 (and completed in principle). The road/bridge sector was selected as the target of the evaluation because of a number of ODA projects in the said sector after the resumption. In this study, these projects were presumed to compose a 'program', which intend to achieve a common objective.

The purposes of this study, through reviewing the said program on the road/bridge sector objectively, are as follows:

- 1) To obtain useful lessons and recommendations for the future assistance to the road/ bridge sector of Cambodia,
- 2) To ensure accountability by publicizing evaluation results.

This study adopted comprehensive evaluation methods, which reviewed the target from three viewpoints, namely, 'objectives', 'processes' and 'results'. The study, moreover, tried to evaluate the target as objectively and quantitatively as possible.

The series of Japan's road/bridge sector projects were not implemented under a planned program. The study, however, analyzed for what common objective these projects were implemented, and regarded that the projects were implemented to achieve the common objective. After assuming the objective of the program, the study examined relevance of the program, i.e., whether the objective is consistent with the following superior objectives and needs:

- 1) Japan's ODA policy for Cambodia,
- 2) National and road/bridge sector development plans of Cambodia,
- 3) Needs of Cambodia.

The study also examined appropriateness of the processes in terms of the followings:

- 1) Was the objective/direction of the program of the road/bridge sector established through appropriate processes?
- 2) Were the projects requested, selected and appraised through appropriate processes in coordination with other projects?
- 3) Was the coordination designed at stages of request, selection and appraisal of the projects, actually realized at the time of implementation?

The study collected and analyzed data and information on the results in terms of the followings:

- 1) To what degree was the program objective achieved?
- 2) As a result of the achievement of the objective, what kind of direct and/or ripple effects were

attained?

3) Are the said effects sustainable?

Through the analysis and evaluation, the study tried to obtain lessons and recommendations to improve effectiveness and efficiency of the future assistance to the road/bridge sector of Cambodia.

## 2. Targeted Sector for the Evaluation

### (1) Overview of the Transportation Sector in Cambodia

Transportation infrastructure in Cambodia consists of road network, railways, inland waterways, ports/harbors and airports. Road transportation accounts for 65% of passenger transportation and 70% of cargo transportation.

Road network in Cambodia is comprised of 1) main national roads (total length: about 2,000 km), 2) other national roads (total length: about 2,180 km), 3) provincial roads (total length: about 3,560 km), and 4) rural roads (total length: about 26,000 km). Main national roads radially extend from the Capital City, Phnom Penh, to other development poles in Cambodia.

### (2) Japan's Assistance to the Road/Bridge Sector

Since FY 1992, Japan's assistance to the road/bridge sector in Cambodia has concentrated on rehabilitation/improvement of main national roads, which had been in a state of disrepair due to lack of maintenance and intentional destruction during the two decades of conflicts started in 1970. The assistance has also covered, through technical cooperation, capacity building of the Ministry of Public Works and Transport (MPWT), which is in charge of rehabilitation and maintenance of roads/bridges, under the circumstances where basic functions of justice and administration had been lost because of political disputes after 1970's and of extraordinary Pol Pot regime between 1975 and 1979.

The program contained the following grant aid projects and technical cooperation activities:

#### 1) Grant aid projects

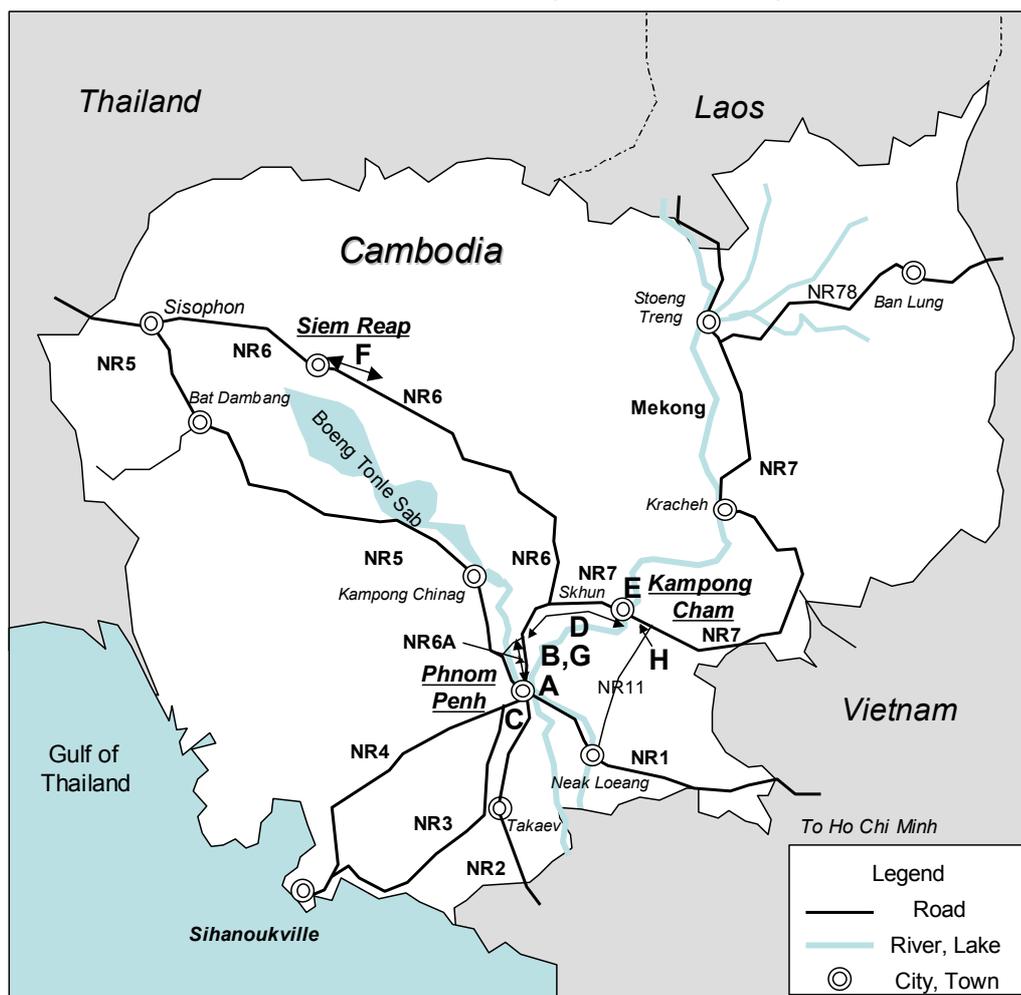
##### General project

- A) Chroy Changwar Bridge Repair (1992 - 1993)<sup>1</sup>
- B) Rehabilitation of National Road Route 6A (1993 - 1994)
- C) Improvement of the Road Construction Center (1992 - 1995)
- D) Rehabilitation of National Road Route 6 and Route 7 (1996 - 1999)
- E) Construction of a Bridge over the Mekong River (1996- 2001)
- F) Improvement of National Road Route 6, Siem Reap Section (1998 - 2001)
- G) Improvement of Bridges on National Road Route 6A (1999 - 2001)
- H) Rehabilitation of National Road Route 7, Kampong Cham Section (2000 - 2003)

---

<sup>1</sup> Figures in parentheses in this list indicate periods of implementation including basic design studies in fiscal years of the Government of Japan.

Location of Grand Aid Project (General Project)



Grassroots project

- Svay Kham Reservoir/Access Road Improvement (2000)

2) Technical Cooperation

- a) Acceptance of technical training participants to courses of Japan International Cooperation Agency (JICA) (1992 – 2002)
- b) Dispatch of technical cooperation experts of JICA (1992 – 2002)
- c) Development Study
  - \* Feasibility Study on Construction of the Mekong Bridge (1994 – 1996)
  - \* Study on the Transport Master Plan of the Phnom Penh Metropolitan Area (2000 – 2001)

(3) Assistance to the Road/Bridge Sector by Other Donors

Since the “Agreements on a Comprehensive Political Settlement of the Cambodia Conflict” in 1991 and Ministerial Conference on the Rehabilitation of Cambodia in 1992, other donors, such as the Asian Development Bank (ADB), the World Bank (WB), the United States Agency for International Development (USAID) and the United Nations Development Program (UNDP), also assisted to rehabilitate main national roads in Cambodia. ADB has assisted for Route 1, 2, 3, 5, 6, and 7, WB for Route 3 and 6 since 1999, USAID for Route 4 completed in 1996, and UNDP mainly for Route 5.

(4) Assumed Objective of the Program

(a) Flow of Program Formation

Cambodian surface transport networks are divided into three parts by the Tonle Sap Lake/River (Tonle Sap Drainage System) and the Mekong River. The national roads connect Phnom Penh, the capital city as the center, with other six development poles of Cambodia.

Although the grant aid projects and technical cooperation for rehabilitation/improvement/construction were not planned and implemented as a program, they appear to have been developed to a certain direction. The development of the program can be analyzed as described below.

First of all, Projects for Chroy Changwar Bridge Repair, over the Tonle Sab River, and for National Road Route 6A Rehabilitation were determined. Then, they were followed by the development study on construction of the Mekong Bridge. In the development study, Kampong Cham route was selected among three candidate routes. Trend of selecting projects for rehabilitation and construction of roads/bridges was decided in this way, following the conclusion of the development study.

In response to the progress of the grant aid projects, technical cooperation projects have emphasized the development of human resources; first, high ranking officials who are in charge of road/bridge affairs and select and request good projects, second, persons in charge of supervision for smooth implementation of the projects, third, persons in charge of maintenance of roads/bridges required after the completion of the projects.

(b) Objective of the Project Group for Rehabilitation/Improvement/Construction of Main National Roads/Bridges (Program Sub-objective 1)

The objective of the project group for rehabilitation/improvement/construction of roads/bridges was assumed as *“to rehabilitate/improve the main national roads which connect Phnom Penh with northeastern development poles and neighboring countries over the Tonle Sab drainage system and the Mekong River and connect the development poles with their hinterlands”*, taking into account of the direction of the program that was gradually formed.

(c) Objective of the Project for Improvement of the Road Construction Center (Program Sub-objective 2)

The project was carried out with the objective of *“to provide road construction machinery/equipment for rehabilitation and repair of main national roads near the capital city and to improve a workshop for maintenance and repair of the machinery/equipment”*. Training rooms were also built taking account of the necessity for training on operation and maintenance of the machinery/equipment and the workshop.

(d) Objective of the Technical Cooperation Projects (Program Sub-objective 3)

The objective of the technical cooperation projects (technical training, dispatch of experts, and development studies) in the program was assumed as *“to train engineers and technicians for rehabilitation/construction/maintenance of national roads/bridges in the Metropolitan area, for public transportation management and for traffic control”*.

(e) Assumed Objective of the Program

The objective of the program, which included the above three sub-objectives, was assumed as *“to rehabilitate/improve and to maintain the main national roads which connect Phnom Penh with*

*northeastern development poles and neighboring countries over the Tonle Sab drainage system and the Mekong River and connect the development poles with their hinterlands as well as main national roads in the Metropolitan area*". As for the grassroots grant aid project, it was not considered as a project within the program because it was implemented after FY 2000 and was a kind of pilot project for rural development.

### **3. Evaluation Results**

#### **3.1. Analysis and Evaluation of the Objectives Tree**

##### **(1) National and the Road/Bridge Sector Development Plans of Cambodia**

National Programme to Rehabilitate and Develop Cambodia (NPRD) of 1994 took 'to rehabilitate and construct infrastructure and facilities' as one of the important approaches to achieve the national goal. The plan for infrastructure development (road/bridge sector) of NPRD put the highest priority on 'to rehabilitate Route 4 to Sihanoukville and Route 6 to Siem Reap (both from Phnom Penh)'. First Socioeconomic Development Plan (SEDP I) employed, as one of the important strategies, 'to substantially invest in upgrading and development of infrastructure, particularly of rural roads'. 'To rehabilitate and reconstruct national roads' and 'to construct Kampong Cham (Mekong) Bridge and to repair ferries' were selected as important projects in the transportation sector program of SEDP I. In road/bridge sector plans after 1992, the priority for rehabilitation of the national road network has always been consistent with the order of main national roads – other national roads – provincial roads – rural roads, which intended to improve access from rural villages to markets.

##### **(2) ODA Policies and Their Priority Areas of the Government of Japan**

As to ODA policies for Cambodia of the Government of Japan, the Official Development Assistance Charter (ODA Charter, 1992), Medium-Term Policy on ODA (1999) as well as ODA White Books (1992-2001 versions) were analyzed. The policies has coherently emphasized 'to improve transportation infrastructure' and 'to develop human resources to improve the capacity of public administration and of aid acceptance'. Regional cooperation in the Southeast Asian countries has also been given a priority.

##### **(3) Relevance of the Program Objective**

The program objective was checked to see its consistency with the ODA policies of Japan, with the national and road/bridge sector development plans of Cambodia, and with the needs of Cambodia.

###### **(a) Consistency of the Objective with Japan's ODA Policies for Cambodia**

The objective of the program was a part of 'rehabilitation/improvement of transportation infrastructure' and 'human resource development for the capacity improvement of public administration and aid acceptance', which have been coherent priorities of ODA policies of Japan for Cambodia. In addition, most of sections rehabilitated/improved by the program were parts of the Asian Highway routes and related to regional cooperation. Therefore, the program objective has been highly consistent with Japan's ODA policies.

###### **(b) Consistency of the Objective with National and Road/Bridge Sector Development Plans of Cambodia and with the Needs of Cambodia**

The program objective was a part of 'to rehabilitate/reconstruct main national roads' on which the highest priority was placed in road/bridge sector development plans of Cambodia. The program was

implemented ‘to strengthen the linkage between Phnom Penh and Siem Reap’ and contained the objective of ‘to construct a bridge over the Mekong River’. The program objective also corresponded to one of the national development goals of ‘to re-integrate the Cambodian economy to the regional economy’.

Further, the Public Investment Program (PIP) required a large amount of investment in the road/bridge sector and the program objective corresponded to the needs of Cambodia, which relied on foreign assistance to finance public investments. The program objective was highly consistent with the development plans and the needs of Cambodia. Other donors have also placed high priority on rehabilitation of main national roads. The objective accorded to the needs of Cambodia, including those other donors regarded important.

### **3.2. Analysis of and Evaluation on the Processes**

#### **(1) Analysis of the Processes**

Every Japan’s ODA project starts with a request from a recipient country, followed by examination, selection and implementation of the requested project. In case of a grant aid project, after the selection of the requested project, a preparatory study, if necessary, and a basic design study are conducted, followed by appraisal<sup>2</sup> and implementation.

During analysis of the processes, it is found that through the efforts by both Japanese and Cambodian sides, the processes, particularly that start with request of a project and end with its selection, have been improved. The improved processes have assured high consistency of the program objective with the ODA policies of Japan and national and road/bridge sector development plans of Cambodia.

#### **(2) Appropriateness of the Processes**

##### **(a) Appropriateness of the Program Formation Processes**

From the analysis described below, it was evaluated that the program had been formed adequately with enough discussions.

The scope and the direction of the program in the road/bridge sector were determined when the projects for Chroy Changwar Bridge repair and for construction of a bridge over the Mekong River were planned, requested and selected. These projects were listed in Cambodian transportation sector development plans at the times of the requests. Therefore, it could be conceived that before these requests, these projects had been well discussed within the Government of Cambodia.

Before the selection of the Chroy Changwar Bridge repair project and the adoption of the policy emphasizing capacity building, which had close linkage with grant aid projects, the Government of Japan dispatched two missions and the missions consulted with organizations concerned of the Government of Cambodia. Before the request and selection of the project for the construction of the Mekong Bridge, a development study examined routes and analyzed the feasibility. During the development study, steering committee meetings were held five times to discuss with representatives not only from the Ministry of Public Works and Transport (MPWT) but also from the Council for the Development of Cambodia (CDC), which is in charge of coordination in foreign assistance to Cambodia. Study teams for basic designs of grant aid projects also visited related organizations and

---

<sup>2</sup> In the analysis and evaluation on processes of this study, basic design studies, and their preparatory studies, are regarded as parts of appraisal.

other donors, and consulted with and reported to them.

- (b) Appropriateness of the Process of Request, Selection and Appraisal of Each Project under the Program

#### Coordination among Projects

Projects for rehabilitation/improvement/construction of roads/bridges extended from Phnom Penh towards the northeast. It means that the grant aid projects of the road/bridge sector started with more traffic/beneficiaries and gradually expanded to rural areas. The expansion has enhanced the effects of the rehabilitated/improved roads/bridges. As a result, these projects have been implemented in a reasonable manner.

Making the policy emphasizing grant aid projects for rehabilitation/improvement of road infrastructure, the policy, at the same time, emphasized technical cooperation which engaged in capacity building for adequate planning, request and implementation of road/bridge rehabilitation/improvement projects. Within the processes of request, selection and appraisal, a mechanism had been bound, in which coordination between grant aid projects and technical cooperation should be considered.

#### Duplication with Projects of Other Donors

There was no duplication between Japan's projects that constituted the program and other donors' projects. This was the result of enough coordination between Japan and other donors and of establishment of the check system for PIP formulation and project selection for the request by Cambodian side.

#### Examination of Alternatives in Program Formation

In the development of the Mekong Bridge construction, a route was selected among alternative routes in terms of regional development plan in Cambodia, and of economic, financial and technical viability. In other grant aid projects, many options were examined in terms of easy implementation and maintenance, affordable costs, and detailed specifications were determined. As to standards for the road improvement in inter-urban (rural) areas (e.g., whether a road should be widened or not), however, examination on the standards and extension (length) of roads, comparing economic advantage using cost-benefit analysis, would have contributed to more effective and efficient assistance.

#### Flexibility to Changes in the Upper Plans

Japan's ODA policies for Cambodia, as well as the upper plans of Cambodia and policies of other donors, were consistent with the rehabilitation/improvement of the transportation infrastructure. In addition, because of close consultations carried out with Cambodian side and with other donors, there were no significant needs to respond to sudden changes of upper plans.

#### Changes in Circumstances and/or Risks

This study evaluated if possible changes in circumstances and/or risks, caused by the implementation of all projects which constituted the program and by other donors' road/bridge rehabilitation projects implemented in parallel with Japan's projects, were well considered at the time of planning and/or appraisal. More concretely, it evaluated if the measures to respond to possible negative impacts such as shortage of engineers, steep price rise of materials and equipment, caused by the implementation of road/bridge projects in a parallel way, were examined at the time of planning and/or appraisal.

As to engineers, other donors' projects also employed foreign engineers. Procurement plans of construction materials and equipment were carefully drawn up. Especially, the implementation plans of the projects were drawn up in consideration of domestic production capacity of the materials, which should be procured from Cambodian markets, such as macadam, and progress of other donors' similar projects. The study, therefore evaluated that implementation plans were elaborated to avoid unexpected problems, which might be caused by parallel implementation of many road/bridge projects.

### (3) Appropriateness of the Program Implementation

#### (a) Timing and Smoothness of the Program Implementation

After the dispatch of need assessment missions in 1991 and 1992, the basic design study for Chroy Changwar Bridge Repair was promptly conducted. The development study was conducted in the early stage to examine the direction of road/bridge rehabilitation/construction. As a result, rehabilitation works of roads/bridges were gradually completed, first in Phnom Penh area, then in areas distant from Phnom Penh. All projects were completed on schedule despite the hard conditions such as aftereffects of the civil war and lack of skilled labor force especially in early projects. The on-time delivery of the projects meant smooth progress of the program.

#### (b) Coordination among Projects during the Program Implementation

Grant aid projects and technical cooperation were implemented in good coordination. In parallel with the first grant aid project, special road/bridge management courses for Cambodia were prepared and held with twelve participants that included several deputy directors in 1992 and 1993. After the training, these participants worked as counterpart personnel for grant aid projects. After completion of the project for improvement of the Road Construction Center, many Japanese experts were dispatched to the Center and they gave training on operation and maintenance of the construction machinery/equipment. The training by the experts also covered management and supervision of road/bridge provision and repair. The Center has become a core organization for repair and maintenance of national roads/ bridges including those rehabilitated by Japan's grant aid projects.

In the program, a unique method of on-the-job training (OJT) was applied, using construction sites of grant aid projects. It gave opportunities of actual field works to the personnel of MPWT during when they could not have enough experiences due to lack of the budget.

#### (c) Response to the Progress of Other Donors' Projects

Since Japan's grant aid projects had concentrated in the sections between Phnom Penh and Kampong Cham and the sections were rehabilitated/improved by Japan's assistance alone, there was not much necessity for detailed coordination with the progress of other donors' projects. The only exception was the project for improvement of Siem Reap section on the National Road Route 6, because the section was located next to a World Bank road/bridge rehabilitation project. In this case, from the time of request and appraisal, close coordination was made. Although an ancient bridge was located in the section of Japan's project, the bridge was rehabilitated by the World Bank in order to keep unified landscape with other nine ancient bridges. (In exchange, the section to be rehabilitated by the Japan's project was extended to the opposite direction.) At the time of the construction plan formulation, Japan and the World Bank coordinated in detail with each other. Then, no problems took place during the implementation.

(d) Response to Changes in Circumstances and/or Risks during the Program Implementation

Same as in evaluation on appropriateness of request, selection and appraisal processes of projects under the program, response to changes in circumstances and risks that might be caused by parallel implementation of other donors' road/bridge projects was analyzed.

Because the construction/implementation plan of each project was carefully formulated, there was no major problem occurred during parallel implementation of the same kind of projects. No unexpected problems actually occurred in the parallel implementation.

### 3.3. Evaluation on the Results

(1) Attainment of the Program Objective

Although the program objective was assumed at the time of this evaluation study, no numerical targets of the program were set. Attainment of the program, therefore, was analyzed by summarizing the achievements of the sub-programs with sub-objectives of 1) "to rehabilitate/improve the main national roads which connect Phnom Penh with northeastern development poles and neighboring countries over the Tonle Sab drainage system and the Mekong River and connect the development poles with their hinterlands", 2) "to provide road construction machinery/equipment for rehabilitation and repair of main national roads near the capital city and to improve a workshop for maintenance and repair of the machinery/equipment" and 3) "to train engineers and technicians for rehabilitation/construction/maintenance of national roads/bridges in the Metropolitan area, and for management of public transportation and traffic control".

In addition, the study tried qualitative and quantitative analysis on the results of coordination between grant aid projects and technical cooperation projects.

As for sub-program 1, all the projects in the group for rehabilitation/improvement/construction of roads/bridges attained each objective. Total length of about 148.7km of roads was rehabilitated/improved. Two large bridges (Chroy Changwar Bridge (Cambodia-Japan Friendship Bridge or Japan Bridge): 709m, Mekong Bridge (Kizuna Bridge or Spien Kizuna): 1,360m) and three bridges (total length: 300m) on the National Road Route 6A were repaired/improved/constructed. Within road rehabilitation/improvement projects, many bridges and culverts<sup>3</sup> were rehabilitated/improved/constructed.

As for sub-program 2, construction machinery/equipment were provided and the workshop was improved as planned. The Road Construction Center has improved its road rehabilitation/construction capability as planned in terms of facilities and equipment.

As for sub-program 3, results of the technical cooperation were as follows:

---

<sup>3</sup> A conduit or passageway under a road, trail, or other obstruction. A culvert differs from a bridge in that it is usually constructed entirely below the elevation of the traveled way.

- \* Acceptance of trainees: In courses in Japan, 42 trainees participated with total training of 1,631 persons•days and average training period per person of 39 days. In addition, nine trainees participated in third-country training<sup>4</sup> courses. According to the questionnaire survey in this study to 14 ex-trainees (33% of all participants trained in Japan), 93% responded that the contents of the training were satisfactory and 85% did that the contents were utilized for their jobs. The trainings obtained excellent results.
- \* Dispatch of experts: Nine long-term experts and 14 short-term experts were dispatched with a total of 167 persons•months and with an average of about 12 months per expert. They provided advices on preparation of standards/guidelines for planning/design/construction/cost estimates and of facility inventory. They also provided guidance on operation and maintenance of construction machinery/equipment, and on survey works, etc. The OJT at the sites of the grant aid projects was also managed by the experts.
- \* Development Studies: Two development studies, namely feasibility study on construction of the Mekong Bridge and study on the transport master plan of the Phnom Penh Metropolitan Area, were conducted. The former was realized as the grant aid project of the Mekong Bridge Construction and some part of a ring road proposed in the latter was constructed with self-finance.

As analyzed below, coordination between grant aid projects and technical cooperation, and among technical cooperation projects have contributed to good results.

- \* Length of road rehabilitated/improved/repared by the Road Construction Center expanded sharply after the OJT, and high operation rates were attained of the equipment/machinery provided by the grant aid project. The coordination between grant aid projects and dispatch of experts contributed to the results. In the recent two years, volume of works by the Center decreased substantially. This decrease, however, can be accounted with budget constraints and not with constraints of human resource development.
- \* According to the questionnaire survey to ex-trainees, 71% (10 respondents) of them took part in grant aid projects. All (100%) of them answered that the training was useful for their works. Half (50%) of ex-trainees (7 respondents) said that the training helped teamwork with Japanese experts. The coordination among technical cooperation schemes had good results.
- \* Japanese experts provided general advice on preparation of planning and design standards/guidelines and of facility inventories, while in development studies, the study teams explained and examined on the survey and planning methods of concrete projects at the time of submission and discussion of the inception report. In fact, they worked for planning with Cambodian counterparts. The two schemes complemented each other for transfer of planning techniques.

---

<sup>4</sup> ‘Third-Country Training’ is a scheme of technical cooperation by the Government of Japan to accept trainees from developing countries to neighboring countries where participants can enjoy common social and cultural circumstances.

## (2) Effects of the Program Implementation

As direct effects of the program implementation, 1) changes in travel time and in transportation costs, and 2) changes in traffic volume caused by the repair/rehabilitation/improvement/construction of roads/bridges were analyzed and evaluated.

### Change in Travel Time and Transportation Costs

Travel time from Phnom Penh to Kampong Cham had decreased from about six hours to about two hours. People can make one-day trip even if they work hours at their destinations. People now can estimate travel time before they make trips. Travel time from Siem Reap to Roluos (ends of the section of the project for improvement of National Road Route 6, Siem Reap section) had decreased from 30 minutes to 15 minutes.

Bus fare from Phnom Penh to Kampong Cham had reduced drastically from US\$7.4-9.3 to US\$1.8. As for travel/transportation costs, which are composed by travel time cost and vehicle operation cost, saving in travel time (average time costs<sup>5</sup>: US\$0.35/hour per traveler in 2001) mentioned above have reduced the travel time cost, and operation cost per vehicle has been saved by 30% - 40%<sup>6</sup>.

### Changes in Traffic Volume

Changes (increases) in traffic volume was analyzed in terms of the followings:

- A: Changes in each section after rehabilitation/improvement of the section,
- B: Changes in previously rehabilitated/improved section after completion of later projects (for example, increase of traffic on National Road Route 6A after completion of the Mekong Bridge construction),
- C: Changes in the volume of some type of vehicles (increase of heavy vehicles).

Vast increases of traffic volume were observed in all sections after the completion of respective rehabilitation/improvement projects. (As to the section rehabilitated by the project of National Road Route 6 and Route 7, effects of the project could not be evaluated individually because there were no data to compare the traffic volume before and after the project.) Corresponding to the development of the program, traffic volume of four-wheel cars, especially heavy vehicles, in previously rehabilitated sections near Phnom Penh had increased. The traffic volume, especially that of heavy vehicles had increased not only by the rehabilitation/improvement of the section but also by completion of following projects. The program as a whole had contributed to the increase in traffic volume and to the efficiency of long-distance transportation.

## (3) Expected Impacts of the Program Implementation (Contribution to Socioeconomic Development of Rural Societies)

Implementation of the program had produced the following positive impacts on the economy and society of rural areas.

---

<sup>5</sup> Income foregone by spending the time for travel and not for work

<sup>6</sup> Estimates by applying the model used in the development study for the Mekong Bridge

- \* *Employment and Income Generation of Residents along Rehabilitated/Improved Roads:* Rehabilitated/improved roads attracted two garment factories, many rubber processing factories, timber factories, etc., and more than 17,000 persons (corresponding to 12% of unemployed people in the country) were newly employed in sections between Phnom Penh and Kampong Cham. As to occupation, more people have engaged in retailing, restaurants or transportation businesses as main jobs. About 13% of the people have found new side jobs after the rehabilitation/improvement.  
The average monthly income of households along the roads rehabilitated/improved by the program increased from Riel 240 thousands in 1992 to Riel 320 thousands (about 30% increase) in 1997 and from 1997 decreased by 1% by 2002<sup>7</sup>. The average income for a labor of the country had decreased by 12% for the period from 1996 to 2000<sup>8</sup>. The increase of the household income occurred in low-income groups. The portion of the households with income less than Riel 200 thousands/month had substantially decreased from 1992 to 1997 and to 2002.
- \* *Change in Living Conditions along Rehabilitated/Improved Roads:* In the questionnaire survey by Infrastructure Development Institute (IDI) of Japan, answers, such as ‘easier travel to Phnom Penh’, ‘better access to markets’, were very frequent. Answers of ‘better security or order’, ‘easier carry of patients to hospitals in Phnom Penh’, ‘more availability of various commodities in shops’ and ‘better transport’ were also frequent. Many officers admitted the effects of provision of evacuation routes or places by the rehabilitation/improvements.
- \* *Numbers of Shops and Restaurants along Rehabilitated/Improved Roads:* No statistical data were available. However, according to the reports<sup>9</sup>, field reconnaissance and interviews, the number of shops and restaurants had largely increased. The areas along National Road Route 6A had changed from ordinary villages to the area where a line of large restaurants with parking lots were built. In weekends, particularly, citizens of Phnom Penh as well as foreigners frequently visit the area and enjoy the restaurants.
- \* *Agricultural Production along Rehabilitated/Improved Roads:* National level of rubber, soybeans and tobacco production, majority of which are produced in Kampong Cham Province, was analyzed. Large increase in production of these crops occurred when the rehabilitation/improvement of some sections was completed. Implementation of the program possibly contributed to the increase. Agricultural production, however, could be much influenced by other factors, such as natural conditions like floods, or implementation of agricultural development projects. Therefore, no numerical analysis on the contribution by the program could be done.

---

<sup>7</sup> Analysis on Impacts of Infrastructure Projects (Interim Reports on summary of questionnaire survey results), Infrastructure Development Institute (IDI) of Japan

<sup>8</sup> Data provided by Cambodia Development Resources Institute

<sup>9</sup> Basic Design Report of Project for Rehabilitation of National Road 6A, 1993, and Report on the Baseline Survey for Impacts of Route No 6A, 1994, Ministry of Planning, Ministry of Agriculture, Forestry and Fisheries and MPWT

- \* *Numbers of Factories and Their Employees, and Total Capital in Related Provinces:* Data on the number of small enterprises, amount of the capital and number of employees of those enterprises in 2001 and 2002 could be collected. Numbers of the enterprises, total amount of the capital and numbers of employees in the northeastern provinces, such as Kratie, Mondolkiri, Rattanakiri and Stung Treng, increased in 2002 with high rates. It is estimated that commissioning of the Mekong Bridge stimulated the industrial activities in the northeastern provinces. The numbers of the enterprises and the employees, and the total amount of the capital in those provinces, however, were very small and the increase does not seem to correspond to the scale of the investment for road/bridge rehabilitation/construction. Completion of works for rehabilitation of further northeastern sections, such as the Kampong Cham section on National Road Route 7 and ADB projects, might be required for the effects that correspond to the scale of investment in the Mekong Bridge to appear.
- \* *Numbers of Hotels and Bedrooms in Siem Reap:* Numbers of hotels/guesthouses and their bedrooms in Siem Reap in 1998-2002 were analyzed. From those data, no large effects were found on tourism facilities by the completion of the project for improvements of Siem Reap section of National Road Route 6 in 2002. However, the results of the traffic survey show the considerable increase in the number of large tourist buses and indicate some contribution to tourism development in the area.
- \* *Value (Price) of Lands along Rehabilitated/Improved Roads:* Land prices of the areas along the rehabilitated/improved sections of National Road Route 6A, Route 6 and Route 7 have risen about four to a hundred times during the period from 1992/93 to 2002/3. The higher rate of price escalation occurred where the land prices in 1992/93 were lower. It is evaluated that the land price escalation occurred because the program has made agricultural lands or wastelands possible to be used for other purposes.
- \* *Recognition of the Program by Cambodian People:* Considering the following facts, the program was highly recognized by the Cambodian people.
  - 1) 97.5% of the residents living along sections rehabilitated/improved by the program knew that the program was implemented by Japan (Questionnaire survey by IDI).
  - 2) In the recent five years, Rasmei Kampuchea, a daily newspaper of the largest circulation in Cambodia (20 thousand copies), carried 70 articles on Japan's assistance to the road/bridge sector.
  - 3) Numerous break-ground ceremonies and those to celebrate the completion, with attendance of the Prime Minister, were reported through TV, radio and newspapers.
  - 4) Since December 1999, 1,000-Riel bank notes with a drawing of construction site of the project for National Road Route 6 and Route 7 have been issued and circulated. The drawing catches eyes of Cambodian people.

(4) Contribution to the Macro Economy

The overall goal of the program was assumed as 'rehabilitation/improvement and maintenance of transportation infrastructure', in which 'maintenance' of the rehabilitated/improved infrastructure was added to 'rehabilitation/improvement of transportation infrastructure', which has been a part of Japan's ODA Policy for Cambodia. The study analyzed, as the effect of the program implementation, the change in the number of passenger and cargo transportation in the country. Then, collecting

information about how the increase of passenger and cargo transportation might contribute to macroeconomic development in general, it analyzed to what degree the implementation of the program contributed to the development of indicators.

As a result of the analysis, the development of macroeconomic indicators positively correlates with the progress of the program. The study, however, could not reach econometric analysis.

- \* *Passenger and Cargo Transportation*: During the period from 1987 to 1995-99, passenger transportation had increased 1.38 times by 63 million person • kilometer and cargo transportation had increased 3.71 times by 290 million ton • kilometer. As for road transportation, passenger transportation had increased 1.46 times by 46 million person • kilometer (70% of the increase in the whole passenger transportation) and cargo transportation had increased 6.14 times by 230 million ton • kilometer (80% of the increase in the whole cargo transportation). Cargo transportation on roads increased a lot in 1994 – 1996 and in 1999. The years of large increase in cargo transportation corresponds to the years of completion of Chroy Changwer Bridge repair, rehabilitation of National Road Route 6A, and rehabilitation/improvement of National Road Route 6 and Route 7. However, numerical contribution rate by the program could not be calculated.
- \* *Gross Domestic Products (GDP)*: Cargo transportation on roads increased largely between 1994 and 1996 and in 1999, and economic growth (real term) in these years showed considerably high rates. There found high correlation between cargo transportation and economic growth. Rehabilitation/improvement of roads/bridges might have contributed to the economic growth, considering that poor economic infrastructure, such as transportation, electric power and telecommunication infrastructures, were regarded as the bottleneck for economic recovery at the early stage of the reconstruction. Econometric analysis, however, could not be undertaken because the economic growth is determined with many factors, including agricultural production, which might be influenced by natural conditions.
- \* *Exports and Imports*: Exports of timber and rubber account for some part of total export increase in 1994 and 1995. It is highly possible that implementation of the program promoted the exports of these commodities. Because the program implementation attracted two large garment factories along the rehabilitated/improved National Road Route 7, the program contributed to development of garment industry and the increase of exports to some extent in 1999 and 2000. Level of the contribution could not be estimated.
- \* *Prices*: Although other reasons were raised for calming down the inflation, such as reduced money supply for 1994-1995, and reduced money supply, stable Riel and lowered price of rice in the international market for 1999, there might be some possibility for increased cargo transportation or the program implementation to contribute to settling down the inflation.
- \* *Numbers of Visitors to Cambodia*: Sharp increase of visitors occurred in 1994, 1995 and 1999. Although program might contribute to the increase, other reasons, such as better security conditions, might be a major cause of the increase.

## (5) Negative Impacts Caused by Program Implementation

Negative impacts of the program, such as 1) Increase in traffic accidents caused by increased traffic volume and faster speeds of vehicles, and 2) damages to roads/bridges by overloaded trucks induced by increased traffic volume of heavy vehicles, were reported in interviews of this study and the IDI questionnaire survey. Some respondents pointed out that some people could not have their house due to escalated land prices.

\* *Traffic Accidents:* According to the data on the death toll from traffic accidents over the country after 1994, number of the dead as well as the dead per hundred thousands persons have sharply increased in 1999, 2000 and 2002. Since no data by Province/Route were obtained, relation of the program implementation with number of the dead by traffic accidents could not be analyzed. In interviews of this study and the IDI questionnaire survey, many people and officers referred to the increase of traffic accidents as negative impacts of road/bridge rehabilitation/improvement. Countermeasures against traffic accidents are necessary to be taken.

\* *Damages on Roads/Bridges by Overloaded Vehicles:* Despite many answers about this negative impact, no data could be collected on overloaded trucks or damages caused by them. Countermeasures against overloading have gradually been taken particularly as a result of the requests by the embassy of Japan in Cambodia.

## (6) Sustainability

### (a) Current Road/Bridge Maintenance Conditions

In the field reconnaissance of this study in February 2003, no remarkable damages were found throughout roads/bridges rehabilitated/improved by the program. Since the projects for rehabilitation/improvement of National Road Route 6 and Rout 7 and Siem Reap section of National Road Route 6 completed quite recently, it would be natural that there were no major damages in these sections. According to the results of vehicle speed survey by JICA and IDI questionnaire survey, however, there were cases where some damages were not repaired soon and interfered the traffic in the past.

### (b) Prospects for Future Maintenance

Prospects for future maintenance of roads/bridges rehabilitated/improved by the program were analyzed in terms of 'person (capability of engineers and technician), material (facility and machinery/equipment), and money (budget allocation)' of MPWT, focusing on those of the Road Construction Center.

As for 'person', in the field of operation and maintenance of construction machinery/equipment, and of construction, supervision and maintenance of roads/bridges, many trainees were accepted and trained in Japan at one hand. On the other hand, many Japanese experts in these fields were dispatched to Cambodia. These two schemes were coordinated well. Therefore, human resources have been developed in the MPWT headquarters. As for 'materials' (facilities and machinery/equipment), no major problems will be anticipated in the near future, because techniques of construction machinery maintenance were transferred and in fact, capability for inspection and maintenance of the machinery/equipment provided to the Road Construction Center has been upgraded.

From the above consideration, future maintenance will depend on ‘money (budget allocation)’. Future budget allocation will relate to the future budget conditions of the whole Government, and it would be very difficult to foresee. Recently, the Government of Cambodia has started to take steps to secure own fund sources for road maintenance, such as establishing road maintenance fund and collection of additional tax on sales of gasoline and diesel oil and transfer the additional tax to the fund. Despite of these measures, budget allocation for road maintenance has not been improved yet. To foresee sufficient future budget allocation for road maintenance is quite difficult.

Routine inspection, cleaning and early repair are important for effective and efficient road maintenance with limited budget. Capacity building of the provincial departments in charge will be the issue from now on.

(c) Potential for Implementation of Similar Projects by Cambodian Resources

Same as prospects of the future maintenance, budget constraints will be the main factor. Rehabilitation of main national roads has come near to the end through past and planned foreign assistance. Future similar projects will be rehabilitation of other national roads, and of provincial and rural roads, or construction of by-pass or ring roads in the Metropolitan area or other large cities. Due to vast length of the roads to be rehabilitated, foreign financial assistance will still be necessary.

## **4. Lessons and Recommendations**

### **4.1. Lessons and Recommendations Obtained through Evaluation**

(1) Lessons and Recommendations Obtained through Evaluation on Objectives and Processes

Application of Well-established Processes to Other Countries

Request, selection, appraisal and implementation processes of grant aid and technical cooperation projects for the road/bridge sector of Cambodia have been well established to assure consistency with objectives of superior policies. Particularly, processes for preparation and prioritization of requests are well organized, through accumulated efforts by concerned entities of Japan and Cambodia, with mutual understanding on each other’s policies and plans and with close coordination. In addition, projects were well coordinated each other to enhance the effects of the whole program. In particular, as soon as the road/bridge sector was selected as a priority area, many trainees in the field were accepted and trained in Japan. This contributed to smooth implementation of the following grant aid projects. There would be many good practices applicable in the assistance to other countries.

(2) Lessons and Recommendations Obtained through Evaluation on Results

Accumulation of Data on Effects of Assistance through Baseline Survey<sup>10</sup> and Monitoring

This evaluation study faced difficulties in obtaining data on indicators for evaluation. In some cases, old data were missing, and in other cases, effects of recently completed parts of the program have not yet significantly appeared. There was only one baseline survey conducted with sponsorship by JICA in 1993 before the project for rehabilitation of National Road Route 6A.

---

<sup>10</sup> A survey conducted before implementation of a project/program to compile and analyze data and information regarding socioeconomic indicators that the project/program implementation may change in order to make post-evaluation more objective.

Recently, verifiable indicators as well as means of verification have been set in many basic design studies of grant aid projects. All basic design studies for the projects included in the program analyzed expected effects. Even the latest study, however, did not report project design matrix (PDM) or logical framework, which normally shows inputs, activities, objectives (outputs, purpose and overall goal), important assumptions, and logical relationship among them, as well as objectively verifiable indicators on attainment of objectives and means of verification on the indicators, or records of discussion on means of verification with Cambodian counterpart.

At program level, common indicators and means of verification, for example in traffic survey, such as location, timing, time band, vehicle classification, should be taken in projects of the same sector.

At the time of ex post evaluation, it is often the case that the evaluator on donor's side cannot collect necessary data and information. It is recommendable for Cambodian side to undertake baseline surveys and monitoring. Sometimes the donor's sponsorship might be necessary when the data collection and analysis require substantial costs. However, the collaboration will help to show effects of the project/program objectively and will bring in more effective and efficient use of inputs or resources provided through assistance and in better requests in the future.

#### Assistance to Institutional Set-up and Management to Secure Road/Bridge Maintenance Budget

Considerable efforts have been made for maintenance of roads/bridges rehabilitated/improved by the program mainly by the Road Construction Center, which was improved by the grand aid project included in the program. However, the maintenance works have not been undertaken sufficiently all the time after the rehabilitation/improvement. Bottleneck for enough maintenance is budget allocation to the road/bridge sector.

The Government of Cambodia and MPWT have planned to collect charges such as vehicle registration charges (including annual ones), international transit charges and fuel levies, to maintain roads/bridges. As to dedicated funds, however, the establishment of a road maintenance fund by collection of additional tax on sales of gasoline and diesel oil, and its transfer to the fund have just started. As for vehicle registration, although registration is made when an owner acquires a vehicle, systems for annual or periodical registration or inspection as well as collection of annual registration charges, such as automobile weight tax, have yet to be institutionalized<sup>11</sup>.

Since weight of an automobile is a load on roads, tax on vehicle weight can be a rational source of the road maintenance fund. This study recommends that Japan would support Cambodia for improvement and maintenance system, utilizing Japan's experiences. Japan has experiences in establishment and management of automobile inspection institution and the special account for road maintenance. Examining applicability of the experiences in the country, Japan could use those experiences to assist Cambodia effectively.

#### Routine Inspections, Cleanings and Early Repairs

Routine inspections, cleanings and early repairs are the best ways for road maintenance with limited budget. This study recommends to the Cambodian side to follow the above-mentioned ways soon and steadily.

---

<sup>11</sup> Report of the Study on the Transport Master Plan of the Phnom Penh Metropolitan Area, 2001, Katahira & Engineers International

To carry out routine inspections, cleanings and early repairs, the MPWT headquarters should set up a structure for operation and prepare manuals and forms (including those for recording, reporting and requesting major repairs). Moreover, in each provincial department of MPWT and its local offices, capacity building of the officers in charge is necessary.

MPWT intends to develop and enhance training system in the ministry. Routine inspections, cleanings and early repairs are good topics for the internal training system. Although seminars by Japanese experts might be necessary at early stages, the study recommends assistance to be done for developing curriculum and teaching materials and for training lecturers in order to enable the staff of the headquarters to hold seminars as lecturers with participation of personnel from provincial departments and local offices.

#### **4.2. Recommendations for Future Assistance for Rehabilitation/Improvement of the Road Network in Cambodia**

##### **(1) Master Plan**

###### Assistance for Formulation of a Master Plan Based on the Ground Design of the Country

Future assistance will be required for rehabilitation/improvement of various levels of roads, such as national roads other than main ones, provincial and rural roads. Priorities as well as required levels of rehabilitation/improvement may differ according to the direction of each area's socioeconomic development. A national master plan of road rehabilitation/improvement is necessary for the optimal use of the limited resources. What is important is that the master plan would be effective when the plan is formulated under a ground design of the country such as the Comprehensive National Development Plan of Japan. (The most determinant factor in the selection of the route for the Mekong Bridge seems to be this point.) The study recommends technical cooperation, making use of this experience of Japan.

##### **(2) Assistance for Rehabilitation of Other National/Provincial/Rural Roads**

Owing to international cooperation, such as that by Japan, Asian Development Bank and World Bank, most of the main national roads have been or are planned to be rehabilitated/improved. Further improvement of main national roads, such as expansion of road width for construction of additional lanes, and construction of by-pass or ring roads in large urban areas would be invested mainly with cost recovery paid by users rather than foreign assistance.

Besides, rehabilitation/improvement of main national roads is just the beginning or prerequisite to achieve better access from rural areas to cities/towns, which have markets or other economic opportunities, as emphasized in the First and Second Socioeconomic Development Plans (SEDP I-II) and the National Poverty Reduction Strategy (NPRS) of Cambodia. Therefore, further Japan's assistance to the road/bridge sector will be necessary, targeting the roads of the following two levels.

###### Assistance for Rehabilitation of Other National and Provincial Roads

The total length of other national roads and provincial road is more than double of the total length of main national roads. The issues will be identifying priority sections or areas and examining level of rehabilitation/improvement according to the master plan as mentioned above and further use of local contractors or subcontractors.

Levels of rehabilitation/improvement are in inverse relation to lengths of roads to be rehabilitated in case of the limited availability for financial resources, including those from donors. The study recommends levels and lengths should be determined with close discussion between donors and the Cambodian counterpart after socioeconomic examination, including cost-benefit analysis.

#### Assistance for Rehabilitation of Rural Roads

For rehabilitation of rural roads, participatory approaches will be preferable with planning, requesting, rehabilitation and maintenance by communities as main role players. For rehabilitation by communities throughout the country, it would be necessary to build a new scheme for the assistance.

Generally, in road construction/rehabilitation, except highway or expressway with toll collection, it is difficult to identify beneficiaries and to get ownership of residents. Besides, routine maintenance of rural roads should be undertaken by rural communities due to their vast lengths of around 26,000 km in total, although rehabilitation and major repair works require substantial assistance from the Ministry of Rural Development and each Provincial Rural Development Department as well as Provincial Public Works and Transport Departments (for technical supports). The grassroots grant aid project for reservoir/access road improvement might be a good model, in which a rural community planned and participated in construction works and routine maintenance.

In rural communities, road rehabilitation is closely related to irrigation or social infrastructure rehabilitation/construction. In construction/rehabilitation of schools or rural clinics/health posts, for example, site selection and access to the facilities through roads relate each other. For infrastructure development in rural areas, multi-sector approaches managed by community-based organizations would be successful rather than approaches to the individual sector. This approach would require setting up a combination of technical cooperation and financial assistance for planning and implementation of projects by rural communities such as Communes, and for design and appraisal of plans by the Ministry of Rural Development (at central, provincial and district level). The study recommends establishing a new scheme, so as to expand projects like 'the grassroot grant aid project for reservoir/access road improvement' nation-wide.