

Country Name	<b>The Project for Rehabilitation of Bridges on Highlands Highway</b>
The Independent State of Papua New Guinea	

**I. Project Outline**

Background	The Highlands Highway (hereafter referred to as the “Highway”) is the single most important highway in Papua New Guinea (PNG) and is the economic backbone of PNG in terms of trade volume and value. It is the only direct road link totaling 605 km from Lae where the biggest port in terms of cargo handling volume is located via Mount Hagen to Mendi where the centers of agricultural and mining industries are situated. However, the Highway had frequently been impassable and induced high transportation cost because of deterioration of surface condition caused by improper maintenance, flooded bridges by river bed aggradation, landslide or cut slope failure, and erosion of embankment by flood. Furthermore, the old bridges on the Highway caused a serious interference for the heavy-duty cargo vehicles due to lack of load bearing ability and dangers for pedestrians passing the bridges which were a single lane with narrow carriageway.				
Objectives of the Project	To ensure stable and safe transportation of vehicles and pedestrians passing bridges by the rehabilitation of 12 bridges on the Highlands Highway between Kainantu and Goroka, thereby contributing to improvement of accessibility and mobility of the project areas in 6 Highland Provinces (Morobe, Eastern Highlands, Chimbu, Western Highlands, Southern Highlands, and Enga).				
Outputs of the Project	<ol style="list-style-type: none"> <li>1. Project site: Highlands Highway between Kainantu and Goroka (80 km)</li> <li>2. Japanese side: Rehabilitation of a single lane bridge to a dual lane bridge for 12 bridges on the Highlands Highway between Kainantu and Goroka, refurbishment of road pavement, refurbishment of road drainage structure</li> <li>3. PNG’s side: Provision and clearance for main camp yard and temporary yard at each bridge site, relocation of utility poles affected by the works at the site, complete demolition of the existing Dirty Water Bridge and Bena Bena Bridge, compensation payment for crops affected by the works at the site</li> </ol>				
Ex-Ante Evaluation	2004	E/N Date	9 September 2004 (Phase I) 30 May 2005 (Phase II)	Completion Date	24 May 2006 (Phase I)
Project Cost	E/N Grant Limit: 371 million yen (Phase I) and 861 million yen (Phase II), Actual Grant Amount: 366 million yen (Phase I)				
Implementing Agency	Department of Works (DoW)				
Contracted Agencies	Consultant: Nippon Koei Co., Ltd., Contractor: Fujita Corporation				

**II. Result of the Evaluation**

(Constraint during the Evaluation Study)

Due to an insecure neighborhood around the project site, the field survey including a site visit for the ex-post evaluation was strictly restricted, so the data and information obtained as well as the number of people interviewed for the ex-post evaluation were strictly limited.

(Special perspective to be considered at the Ex-post Evaluation)

The project was planned to be conducted with two phases: Phase I covered 5 bridges of Orompaka, Nonompinka, Honeranka, Ofiga and Umbaka out of 12 bridges and Phase II covered 7 bridges of Kingkio, Dirty Water, Siguya, Yashifo, Parirosay, Bena Bena and Sunufamu. The E/N for Phase II was signed during the implementation of Phase I in order to conduct the 2 phases seamlessly. However, due to the occurrence of land issue and the corresponding case of assault to the contractor by a local resident during the Phase I, the Phase II was cancelled without any actual works conducted. In light of the project objective to help rehabilitating some of the bridges on the Highlands Highway, it is not relevant to evaluate include the Phase II components which were not implemented at all. Thus this ex-post evaluation focuses only on Phase I components.

<b>1 Relevance</b>
<Consistency with development policy of PNG at the time of Ex-ante Evaluation and Ex-post Evaluation> The project has been consistent with the development policy of PNG in that the National Transport Development Plan (2001-2010) prioritized the provision of safe and dependable transport services to all sections of the community in PNG in a cost efficient manner. The current Medium Term Transport Plan (2014-2018) also gives high priority to the development of road network as a driving force for economic growth and places the Highlands Highway including the bridges as the priority No. 1.
<Consistency with development needs of PNG at the time of Ex-ante Evaluation and Ex-post Evaluation> The project has met the development needs of the related agencies, drivers and pedestrians passing the Highway in that all the 12 bridges had a single lane with narrow carriageway and caused inconveniences for drivers and pedestrians. In addition, the agencies are responsible for ensuring the safe and stable transportation of goods and services on the Highway.
<Consistency with Japan’s ODA policy at the time of Ex-ante Evaluation> The project was consistent with the Japan’s ODA policy for PNG of which one of the five priority areas was the assistance for economic and social infrastructure development.
<Evaluation Result> In light of the above, the relevance of this project is high.

<b>2 Effectiveness/Impact</b>
<Effectiveness> The project largely achieved its objective. As one of the quantitative indicators “the number of traffic accidents causing injury or death of pedestrians on the 5 bridges,” no accident has occurred on the 5 bridges covered by Phase I from 2008 to 2015. This was achieved by improved conditions of the 5 bridges in which the walk ways were separated from the carriage ways and the width of bridges was widen from one way to two ways, which allows stable and safe transportation of vehicles and pedestrians. As for another indicator “expected lifetime of 5 bridges,” although the exact numerical data was not available at the ex-post evaluation since it requires very technical

calculation, the 5 bridges covered by Phase I reached the target value of 50 years at the time of project completion in 2006 and these bridges are expected to function for another 40 years given their stable conditions at the ex-post evaluation.

According to interviews with local residents (4 locals) and the Provincial Works Manager of Eastern Highlands Provincial Office of DoW, no damages were reported on vehicle tires when passing over the bridges and the safety of pedestrians and vehicles significantly improved on the 5 bridges.

<Impact>

According to interviews with the Provincial Works Manager of Eastern Highlands Provincial Office and local residents same as above, the accessibility and mobility of life goods and services were improved by the rehabilitation of the 5 bridges, for example, acceleration of agricultural activities as well as expansion of market spheres due to the improvement of transport facilities, stabilization of people's livelihoods due to the improvement of accessibility to educational and medical facilities and improved travel time/safe operation cost due to improved bridge conditions (from one lane to two lanes). On the other hand, as a negative impact of the project, a worker of the project contractor was assaulted by a local during the implementation of the project. The reason why the case occurred consists of several factors, one of which is considered to be the incident that while extra land was acquired by the project, the temporary works on one of the bridges constructed by the project went beyond the Right of Way (ROW) that is 20 meter width from the center of the road to each side and caused a destruction of private coffee gardens. This case was sorted out through the court process of PNG involving police and land officers and the compensation was made in the result. Due to this case, however, Phase II of the project was cancelled.

<Evaluation Result>

The project largely achieved its objective, to ensure stable and safe transportation of vehicles and pedestrians passing bridges on the Highlands Highway by the rehabilitation of 5 bridges on the Highlands Highway between Kainantu and Goroka. Although the project has positive impacts such as improved accessibility and mobility of life goods and services with the improved conditions of the rehabilitated 5 bridges, it experienced a serious negative impact of the case of assault during Phase I, which resulted in the cancellation of Phase II. In light of the above, effectiveness/impact of the project is fair.

<Quantitative Effects>

Indicators	2004 (Before the project) Actual value	2007 (Target year) Target value	2008 - 2015 Actual value
Indicator 1: Number of traffic accidents causing injury or death of pedestrians on the 5 bridges	(1) 1.65 per year	Decrease	0
	(2) 1.31 transportation fatalities per year	Decrease	0
	(3) 7.12 persons injured per year	Decrease	0
Indicator 2: Expected lifetime of 5 bridges	Short lifetime	50 years	-

Note: The above each data on Indicator 1 for Year 2004 is the annual average number for 5 years during 1999-2003.

Source: JICA internal documents, questionnaires/interviews with the Eastern Highlands Provincial Office

3 Efficiency

While the project cost was almost as planned (ratio against the plan: 99%), the project period exceeded the plan (ratio against the plan: 114%) since it took additional time to complete paving work of asphalt surface and lane marking of the bridge roads. Therefore, efficiency of this project is fair.

4 Sustainability

<Institutional Aspect>

The Eastern Highlands Provincial Office of DoW is in charge of the operation and maintenance of the bridges rehabilitated by the project. While the operation and maintenance works had been carried out on a force account basis by the Kassam Pass Maintenance Office and the Wabung Maintenance Office which were the sub-offices of Provincial Office at the time of project implementation, both offices were literally closed in 2012 and the key responsibilities were centered back to the Provincial Office. At present the engineering division of Provincial Office consisting of 8 technical staff takes the responsibility for any maintenance works of roads and bridges in the province and 3 qualified staff including 1 project engineer and 2 supervisors have been assigned to supervise maintenance works of the 5 bridges. According to the provincial works manager, the number of staff is sufficient and they all have a background of civil engineering works and maintenances.

<Technical Aspect>

All staff of the engineering division of Provincial Office has an engineering background and is capable of undertaking the planned maintenance activities. They have conducted regular inspections of roads and bridges in the province. In addition, there are ongoing training programs at the Madang Civil Engineering Center in which all staff participate in order to refresh their skills and knowledge to conduct proper maintenance works. DoW also runs refresh courses for culverts, bridges and roads maintenances. There are also the maintenance manuals available for proper maintenance works for roads and bridges in all provincial offices around the country and they have been used at all times for any maintenance works, but their contents are outdated and need to be updated to meet the current standards of appropriate maintenance activities. Though timing is yet to be known, DoW has a plan for updating the contents.

<Financial Aspect>

The annual budget of DoW for infrastructure maintenances (roads and bridges) are allocated yearly and it is parked at the head office of DoW. For the maintenance cost of roads and bridges, the Provincial Office needs to submit a request to the head office and the funds shall be released to the Provincial Office based upon the needs and cost identified. The annual budget of DoW for maintenance of roads and bridges increased from 0.76 million PGK (Kina) in 2012 to 1.63 million PGK in 2014 and 1.49 million PGK in 2015. Although there is no specific allocation for the maintenance of the 5 bridges on the Highlands Highway, according to the interview with the Provincial Office, the maintenance budget of DoW is sufficiently allocated annually to conduct proper maintenance activities of the 5 bridges in order to sustain their functions for the expected lifetime as planned.

<Current Status of O&M>

The 5 bridges rehabilitated by the project have been in good and stable conditions after the project completion. A private company, COVEC Construction Limited has been engaged in conducting the road upgrade and maintenance works between Kainantu and Goroka

including the planned maintenance activities for the 5 bridges. COVEC has been taking care of the operation and maintenance of the 5 bridges and the 3 assigned staff of Provincial Office has been currently engaged in other projects in the province. The procurement of materials for the maintenance and repair works of the 5 bridges has been also outlined in the existing scope of works contracted to COVEC.

<Evaluation Result>

Some problems have been observed in terms of technical aspects of the implementing agency. However they are minor ones. Therefore, the sustainability of the project is high.

5 Summary of the Evaluation

The project largely achieved its objective, to ensure stable and safe transportation of vehicles and pedestrians passing bridges on the Highlands Highway by the rehabilitation of 5 bridges on the Highlands Highway between Kainantu and Goroka. Although the project has positive impacts such as improved accessibility and mobility of life goods and services with the improved 5 bridges, it experienced a serious negative impact of the case of assault during Phase I, which caused the cancellation of Phase II. Regarding the sustainability of the project, some problems have been observed in terms of technical aspects of the implementing agency. However they are minor ones.. While the project cost was almost as planned, the project period exceeded the plan since part of construction works was not able to be completed within the assigned timetable.

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

### III. Recommendations & Lessons Learned

<Recommendations to Implementing Agency>

As mentioned above, the land acquisition by the project as part of the reasons behind the occurrence of case of assault was the major issue during the construction stage. Extra land was acquired by the project's temporary works, which went beyond the ROW (20 meters each side from the center of the road) causing the destruction of local coffee gardens and a worker of the contractor was assaulted by the local. Therefore it is recommended that DoW allocate a community liaison officer to have a close consultation and coordination with stakeholders and local communities in order to fully understand traditional land tenure system and to cope with various problems related with compensation or extra land acquisition for the smooth implementation of future projects.

<Lessons learned for JICA>

More time on land acquisition issues should have been spared for the basic/detailed design study or feasibility study in order to try to understand the local context as fully as possible and make sure that the coordination mechanism in land issues be functional between the implementing agency and local stakeholders.



Ofiga bridge with hand rail and walk way



Orompaka bridge with two-track