

**Ex-Post Project Evaluation 2014: Package IV-2
(Pakistan, Nepal, Micronesia)**

August 2015

JAPAN INTERNATIONAL COOPERATION AGENCY

JAPAN ECONOMIC RESEARCH INSTITUTE INC.

ERNST & YOUNG SUSTAINABILITY CO., LTD.

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0. Summary

This project was conducted to ensure the smooth and safe transportation in the Kararo-Wadh section of National Highway N-25 in Balochistan Province in Pakistan by rehabilitating the road, and thereby contribute to improve the highway as an arterial road and realize better living conditions for local residents. The project purpose is highly relevant to the national development plan for Pakistan, which has prioritized infrastructure development for the promotion of economic growth and meets the development needs of Pakistan and is consistent with Japanese assistance policy. The efficiency of the project is fair, as both project cost and project period exceeded the plan. After the rehabilitation by the project, hazardous target sections with many steep slopes and bend curves were improved. The planned effects, namely, faster traffic speeds, shortened freight and transportation times, and decreased accidents, have been largely achieved. The evaluation confirmed both the expected impacts, such as improved access to social services (including markets and hospitals) and activation of business, and also unexpected impacts, such as lower maintenance costs for vehicles and a reduced incidence of carjacking. The effectiveness and impacts of the project are therefore rated as high. As for the technical and financial aspects related to the operation and maintenance of the target section, there have been no major concerns. Meanwhile, it was confirmed a lack of staff people in the Khuzdar office, the office responsible for the operation and maintenance of the target section. It was also identified several deteriorated bridges and other flaws that will have to be improved to realize smooth transportation in parts of the target section not covered in the project. Hence, the sustainability of the outcomes of this project is fair.

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

1. Project Description



Project Location



Improved Road

1.1 Background

The transportation sector was one of the important industrial sectors that accounted for 10% of Gross Domestic Product (GDP) and created about 2 millions of employment in Pakistan at the time of project planning. The total length of national highway routes was 9,252 km in Pakistan, only 3.5 % of the national total, while these roads were responsible for 80 % of the total passenger and freight traffic¹. Thus, road was the major means of transportation.

Balochistan Province was a less developed province where 75% of the residents lived in rural areas. The target section of the road of this project (Kararo-Wadh Section)² was a part of National Highway N-25. This highway was growing in importance as the only trunk road passing from north to south in the province of Balochistan and as an international road connecting neighbouring landlocked countries with Karachi port (providing the shortest route to the port on land). However, this section of the road contained narrow lanes, sections with many blind curves, and steep slopes. The situation resulted in frequent accidents due to over-speeding at curves and trying to pass other vehicles. Therefore, the target section has been a bottleneck in enhancing safety and security of transportation. Though National Highway Authority (NHA) had rehabilitated some parts of the target section independently, full-fledged rehabilitation was difficult for NHA both economically and technically. Accordingly, the situation was anticipated to create hindrance to the Kararo-Wadh section of the road and it can eventually cause negative effects on the function of National Highway N-25.

Under these circumstances, the Government of Pakistan requested grant aid assistance from Japan in 2003. The Government of Japan offered grant aid assistance to improve traffic safety in the target road section (96 km) by widening the road to 7.3 meters, ameliorating the sharp curves and steep slopes, and improving the drainage structures³.

1.2 Project Outline

The objective of this project is to secure the smooth and safe transportation in the Kararo-Wadh section of National Highway N-25 by improving the road alignments, pavements, and auxiliary facilities, and thereby helping to improve the highway's function as an arterial road and the living conditions of the local residents.

Grant Limit / Actual Grant Amount	4,052 million yen / 4,038 million yen
Exchange of Notes Date	May, 2006
Implementing Agency	National Highway Authority (NHA)
Project Completion Date	January, 2011
Main Contractor	Taisei Corporation

¹ Source: Documents provided by JICA

² This report describes the target section both as the "Kararo-Wadh Section" (according to the project title) and the "target section" (Kararo-Wadh).

³ Over a 96 km stretch of the target section, the project rehabilitated 44.8 km for road alignments (steep slopes and bend curves) and improved 51.2 km for shoulder grading and line marking.

Main Consultants	INGÉROSEC Corporation / Nippon Koei Co., Ltd. (JV)
Basic Design	September, 2005
Detailed Design	December, 2006
Related Projects	Expert assignment to NHA (2002) (Transportation sector)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Ernst & Young Sustainability Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: October, 2014 – September, 2015

Duration of the Field Study: December 10 – December 20, 2014 and February 25 – March 8, 2015

2.3 Constraints during the Evaluation Study

JICA imposed a travel ban in target area on Japanese nationals, so the evaluator conducted the survey mainly from Islamabad and Karachi without conducting direct field surveys of the project target section. The necessary information for the analysis was collected from questionnaires sent out to NHA. Staff members from the NHA Khuzdar office, the office in charge of the operation and maintenance of the target section, were invited to Karachi to take part in an interview survey. The survey on the current condition of the target section, the interviews with neighbouring residents, and the beneficiary survey were conducted by the local consultant.

3. Results of the Evaluation (Overall Rating: B⁴)

3.1 Relevance (Rating: ③⁵)

3.1.1 Relevance to the Development Plan of Pakistan

In the planning stage, the “Poverty Reduction Strategy Paper (PRSP)” (2003), a document regarded as equivalent to the existing Pakistan five-year plan, demonstrated the need for economic growth as a driver for poverty reduction and positioned infrastructure development as an important factor to accelerate economic growth. Regarding road development, PRSP pointed out the need for measures for appropriate development and maintenance to meet future demand. “VISION 2025” was formulated in 2014 as a long term-plan as of the time of the ex-post evaluation and was structured with seven pillars⁶ to underpin the growth and development of Pakistan. “Modernizing

⁴ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁵ ③: High, ②: Fair, ①: Low

⁶ The seven pillars have been identified as: “Developing human and social capital”, “Achieving sustained, indigenous and inclusive growth”, “Governance, institutional reform and modernization of the public sector”, “Energy, water and food security”, “Private sector & entrepreneurship let growth”, “Developing a competitive knowledge economy through value addition” and “Modernizing transportation infrastructure and greater regional connectivity”.

transportation infrastructure” is presented as one of the seven pillars, as modernization of the transportation infrastructure has an important role for economic development and attracting investment. This pillar sets the following targets: “the establishment of an efficient and integrated system of transport,” “Reduction in transportation,” “Safety in mobility” and “effective connectivity between rural areas and market/urban centres.”

NHA, the institution responsible for managing the entire national highway of Pakistan, formulates an investment plan every five years. The “Five Year Mid-term Investment Plan” (2005/2006~2009/2010) as of the planning prioritized the optimal use of the existing road system by appropriate improvement and maintenance. Therefore, this plan mainly listed the improvement of the existing road. “The Improvement of the Kararo-Wadh Section,” meanwhile, was included in this investment plan as a new project for improving the existing road. The “Five Year Mid-term Investment Plan” (2014/2015~2019/2020)⁷ as of the ex-post evaluation announced the start of improvements of a high-priority highway to establish a road network that will promote economic development and meet future demands. This plan also calls for the improvement of a section of Kararo-Wadh that was not rehabilitated under this project⁸.

As mentioned above, infrastructure development that helps to stimulate economic growth was positioned as a priority area both during the project planning and during the ex-post evaluation in Pakistan. National highway improvement has been designated as an important pillar of the transportation system. Improvement of the national highway network has been prioritized in the mid-term investment plan. Improvement of the Kararo-Wadh section, the project target section, has also been included in these investment plans. It can therefore be concluded that this project, which aimed for smooth and safe transportation service and an improved national highway with upgraded arterial road functions and benefits for the living conditions of local residents, has been consistent with the development policy.

3.1.2 Relevance to the Development Needs of Pakistan

Table 1 shows a summary of roads in Pakistan at the project planning and ex-post evaluation stages. The total national road length in Pakistan as of the project planning was 9,252 km. While this accounted for only 3.5% of total road length (approximately 250,000 km), it reached 80% of the total volume of passenger and freight transportation in the nation’s severely deteriorated railway system. Meanwhile, NHA road condition surveys showed that the 40% of national highway was categorized as “very good,” 11% was categorized as “good,” and 49% was categorized as “bad/very bad.” This means that about a half of the national highway somehow needed to be improved. As of the ex-post evaluation, the total national highway length was 12,131 km, or 4.6% of the total road length (263,415 km), and still accounted for 80% of the total passenger and freight transportation volume. National highway categorized as “bad/very bad,” however, increased to 60%, because some of the

⁷ As of the ex-post evaluation, it was treated as a draft version even though the framework had been devised.

⁸ This section includes “improved road along a 51.2 km section where shoulder grading and line marking were conducted” (as described in footnote 3).

provincial road (mostly categorized as “bad/very bad”) was upgraded to national highway.

Table 1 Total Length of Road and Road Conditions in Pakistan

Total length of road and total length of national highway		As of the planning stage (2001)	2013
Total length of road (km)		250,000	263,415
Total length of national highway (km)		9,252	12,131
Ratio of national highway in total (%)		3.5	4.6
Ratio of national highway in passenger and freight transport (%)		80	80
Road condition			
As of the planning stage	As of the ex-post evaluation	As of the planning stage (2001)	2013
Very good	Good	40 %	15 %
Good		11 %	
—	Fair	—	25 %
Bad • Very bad	Bad	49 %	30 %
	Very bad		30 %

Source: Planning : Documents provided by JICA. Ex-post evaluation: Questionnaire responses and NHA “Annual Maintenance Plan FY 2013-14”

Note: The road condition categories (Very good, Good, Fair, Bad, Very bad) in the documents provided by NHA were different from those used as of the planning stages and as of the ex-post evaluation. The table shows the categories used in the provided documents.

Balochistan Province is a famous area for natural resource and agricultural products that contribute to economic development in Pakistan. The project target section is a part of National Highway N-25, the sole trunk road passing from north to south in Balochistan Province. The improvement of this target section is thus confirmed to be necessary for the efficient transportation of products, and ultimately for the economic development of Pakistan. In addition, National Highway N-25 was growing in importance as an international road connecting Afghanistan, a country in a period of reconstruction as of the project planning, and neighbouring landlocked countries and Karachi port. However, sections of the highway contained narrow lanes and many blind curves and steep slopes, conditions that seriously compromised safe driving. These conditions negatively impact the function of National Highway N-25, redoubling the need for improvement. As of the ex-post evaluation, National Highway N-25 is also important because it connects Quetta, the capital city of Balochistan Province, and National Highway N-40, linking the Iraqi border cities. Thus National Highway N-25 serves as an entry point to Turkey, and ultimately Europe, by the land route.

Thus, the following was confirmed during both the planning and ex-post evaluation stages: 1) more than half of the national highway was in need of improvement, 2) the target highway is a sole trunk road passing from north to south in Balochistan Province, and 3) the target highway plays an important role as an international road. Thus, the needs for improving the target section were confirmed.

3.1.3 Relevance to Japan’s ODA Policy

As of the project planning, the Japanese Country Assistance Strategy for Pakistan stated the overall goal of assistance as “the Establishment and Development of Sustainable Society” and listed three directions for its assistance strategy⁹:

- 1) Ensuring human security and human development
- 2) Developing a healthy market economy
- 3) Developing a balanced regional society and economy

Among these, 2) entails the expansion and development of an economic infrastructure to support poverty reduction, an aim that is confirmed to be consistent with this project.

As described above, this project has been highly relevant to the Pakistan’s development plan and development needs, as well as Japan’s ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The outputs of this project were road improvement, rehabilitation of transversal drainage structures (culverts), and the instalment of auxiliary facilities at Kararo-Wadh section, a part of the National Highway passing from north to south in Balochistan Province. The comparison of planned and actual output is listed in table 2 and table 3.

Table 2 Major Output (Japanese side)

Item	Planned	Actual
1) Road improvement Carriageway and shoulder	44.8 km	Implemented as planned
2) Minor Improvement Shoulder grading, Line marking (Center line and edge line)	51.2 km	Implemented as planned
3) Rehabilitation of transversal drainage structures Reconstruction Extension of width	113 12	Implemented as planned
4) Auxiliary facilities Drainage Retaining wall Traffic sign Guard rail Guard post Edge marker Line marking Km post	Catch basin, Line pipe Stone Masonry, Gabion 103 5,500m 300 191 Center line, edge line 97	Implemented as planned

Source: Documents provided by JICA

⁹ Based on Official Development Assistance (ODA) “Country Specific Data Book (2004)

Table 3 Major Output (Pakistan Side)

Planned	Actual
<ul style="list-style-type: none"> • Acquisition of land for construction and temporary yard • Securing material sources • Opening bank account and payment of A/P(Authority to Pay) cost • Others (Exemption of refunding of customs tariff and taxes, assignment of counterpart personnel) 	Implemented as planned
-	Provision of security for Japanese

Source: Documents provided by JICA and Questionnaire responses

As for the output of the Japanese side, the culvert was changed from a rectangular box culvert to a round pipe culvert based on the on-site conditions. This change in no way detracted from the original intention or changed the overall effect¹⁰. The other output was realized just about as planned.

The Pakistani side handled security at the project site in addition to the planned items. Security escorts for the Japanese experts were judged to be mandatory and unavoidable, in light of the drastic worsening of the security environment in Pakistan.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The planned project cost was set at 4,095 million yen and the actual project cost totalled 4,682 million yen, 114% of the original plan, which was higher than planned. The extra costs went to the provision of security escorts due to the worsening security environment in Pakistan. The costs on the Japanese side, were, however, within the planned range (see table 4). Security escorts at the target site were considered critical for security and were provided through the efforts of the Pakistan side.

Table 4 Planned and Actual Project Cost

	(Unit: Million yen)	
	Planned	Actual
Project cost	4,095	4,682
Japanese side	4,052	4,038
Pakistan side	43	644
Cost in () shows in Rupees (Rs.)	(Approximately 24 million)	(Approximately 443 million)

Note: Exchange rate: Planned, Rs.1 = 1.8 yen (as of February, 2005); Actual, Rs.1 = 1.45 yen (simple average during the project period)

Source: Documents provided by JICA and Questionnaire responses.

¹⁰ Based on Interview survey with the Implementing Agency

3.2.2.2 Project Period

The scheduled project period was 54 months, including a period of detailed design and tendering process. The actual period was 60.7 months (December 23, 2005 – December 6, 2006 for detailed design and May 24, 2006 – January 10, 2011 for tendering, construction and procurement), longer than planned (112% of planned period). The major factors behind this delay were as follows.

- Suspension of construction work due to a delay in payment for security arrangements
After the project commencements, a need for security arrangements for the Japanese experts arose due to the drastic worsening of the security environment in Pakistan. This burden was not included in the plan and was covered by the Pakistan side. Thus, a certain time was needed to make the arrangements for the payment to the security escorts. Construction work had to be delayed because the security escorts for the construction works could not be provided before payments were made. NHA explained that the cost for the security ideally should have been included in the plan and dealt with beforehand¹¹.
- Extended waiting time due to a bomber in a neighbouring city
A suicide bombing struck in a city neighbouring the target section. Construction works at the target section were suspended for safety, and the Japanese experts were evacuated to Karachi. Construction was stopped until safety could be confirmed. The delay after the suicide bombing was unpredictable and unavoidable, and thus was considered an external factor in the analysis of the project period¹².
- Delay related to tenancy for provisional concrete plant land
Balochistan Province is considered a unique area where chiefs of indigenous tribes have powerful influence in governing. In many cases, public tenancy areas are claimed as private land. Under this circumstance, time was presumably required for negotiation and arrangements for the land tenancy issue. It was therefore desirable to make necessary arrangements on land tenancy before the project was commenced, if at all possible¹³.
- Disturbances to construction by local residents
This project team tried its best to cooperate and support the area, for example employed local residents for the construction works, in consideration of the particular features of Balochistan Province. The situation was destabilized, however, when a tribal chief was released from jail. Local residents disrupted the construction and caused a temporary shutdown. NHA held repeated discussions and ceasefire talks to no avail: local residents continued disrupting the project, delaying it for about a month.

As described above, the project cost and project period exceeded the plan. Therefore, the

¹¹ Based on interview survey with NHA staffs

¹² This factor was not considered in the analysis of the project period because it was impossible to calculate the exact number of months of delay.

¹³ Based on interview survey with NHA staffs

efficiency of the project is fair. The increased cost in the project budget resulted from security arrangements due to the worsening security environment, a factor not considered during the budget planning. The increased cost was covered by the Pakistan side. This has to be highly appreciated since the project could not have been implemented without their efforts and arrangements.

3.3 Effectiveness¹⁴ (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

3.3.1.1 Effect Indicators

(1) Reduction of transportation/travel time

The target section of the project includes mountainous and hilly areas. There are about 30 steep slopes and bend curves, requiring a vehicle speed limit of 30 km/hr in the planning stage. Improved road alignments through the project¹⁵ made it possible to increase the speed limit to 70-80 km/hr after the project completion. Therefore, the target travel time has been achieved (See table 5)¹⁶.

The improved traffic speed has reduced the transit time. In the beneficiary survey¹⁷ conducted in the ex-post evaluation, all of the respondents answered that the transit time to their destinations was reduced. The destination differed from respondent to respondent, but the transit from Karachi to Khuzdar (475 km), along the section covered by the largest number of respondents, was reduced from about 10 hours before the project to 5-6 hours after project completion. On the other hand, the deteriorated bridges in the target section were not included in the scope of the project and are still utilized as bridges. Hence, the travel speeds were slightly lower in parts of the target section nearby bridges and in some areas not rehabilitated under the project.

Table 5 Increased Transit Speed and Reduced Transit Time

	Baseline	Target	Actual
	2005	2010	2014
	As of the Planning	Completion Year	3 Years after Completion
Speed limitation at target section	30 km/ hr	60 km/ hr	70—80 km/ hr
Travel time of target section	180 minutes	Reduced	90 minutes

Source: Baseline and Target from documents provided by JICA; Actual from documents provided by NHA and the beneficiary survey

¹⁴ Sub-rating for Effectiveness is to be put with consideration of Impact.

¹⁵ The steepness of the slopes improved from 10.4% at the planning stage to 7%. The minimum curve radius improved from 50 m to 135 m.

¹⁶ Local consultant actually confirmed that the average speed was about 70—80 km/hr at the target site when the field survey was conducted.

¹⁷ During ex-post evaluation, a beneficiary survey was conducted at and nearby the target section to collect supplemental information on quantitative effects. Respondents were 38 bus, truck and car drivers, 38 local residents around the target road, 13 merchants operating along the road shoulder, 7 farmers, and 4 others (total: 100). Due to the particularity of Pakistan and Balochistan Province, it is not common for females to drive cars or walk around alone. Therefore, all of the interview respondents were male.

(2) Decrease in the number of traffic accidents

Thanks to the project, road alignments that disturbed transportation safety have been improved, which has reduced the number of traffic accidents and improved the safety in the target section overall. The annual average number of accidents in the target section decreased from 115 cases (between 1999 and 2004) to 21 cases after the project completion (between 2012 and 2014) (See table 6).

On the other hand, the beneficiary survey results (See to “3.2.2 (Other Effect) Daily Average Traffic Volume”) showed that the traffic volume as of the ex-post evaluation was 35% of that estimated during the project planning stage. Based on this traffic volume, the daily average traffic volume as of the planning stage, 35% of 115 cases, was recalculated as equivalent to 40 accidents.. The number of the traffic accidents after the project completion, therefore, can be judged as improved compared with that as of the planning stage even if the trend in traffic volume are factored in. The major factors behind this improvement were identified as shoulder grading, the installation of traffic signs and guardrails, and improved road alignments. All of these factors helped reduce the incidence of accidents and improved safety in the target section¹⁸.

Table 6 Number of Traffic Accidents in the Target Section (Kararo-Wadh)

(Unit: cases/year)

	Baseline	Target	Actual	Actual	Actual	Actual
	Annual Average from 1999 to 2004	2010 Completion Year	2012 1 year After Completion	2013 2 years After Completion	2014 3 years After Completion	Annual Average from 2012 to 2014
Serious (casualties) accidents	46	Reduced	5	5	6	5
Minor car accidents	68		15	14	19	16
TOTAL	114		20	19	25	21

Source: Baseline and Target: Documents provided by JICA, Actual: Documents provided by NHA Khuzdar Office

On the other hand, 95% of the respondents in the beneficiary survey answered that the number of accidents increased (See Figure 1), stating the opposite of what the statistics showed. No concrete explanation was found when this situation was confirmed with the NHA headquarters and Khuzdar office, but it was assumed that the sensational reporting style of the media and the tendency of people to remember periods when accidents were frequent caused the respondents to overestimate the actual numbers. In fact, 90% of the respondents answered that the safety of the target road had improved, as shown in Figure 2. The 10% of the respondents who answered that safety had not improved cited “speedy driving” and “overloaded vehicles” as the reasons. No one mentioned safety issues related to the road conditions.

Table 7 shows the incidences of accidents at all national highways and at the target section of Kararo-Wadh. The incidence of accidents at the target section was over six times that for all

¹⁸ Based on the interview surveys with NHA headquarter, NHA Khuzdar office and Supreme Council of All Pakistan Transporter.

national roads during the planning stage and decreased to over four times the national average from 2012 to 2014. Furthermore, the actual incidence in the target section decreased to 70% of that during the project planning stage. Hence, road safety in the target section was improved, comparing the situation after the project with that before the project.

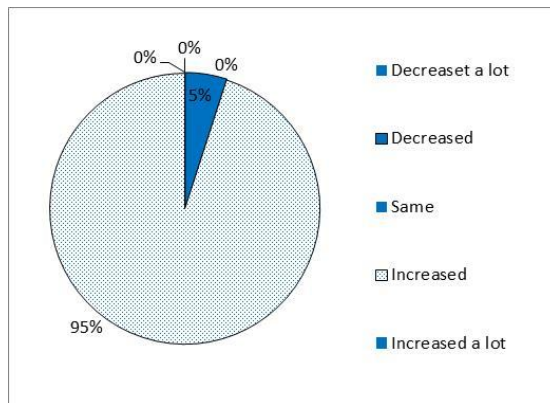


Figure 1 Changes of accidents

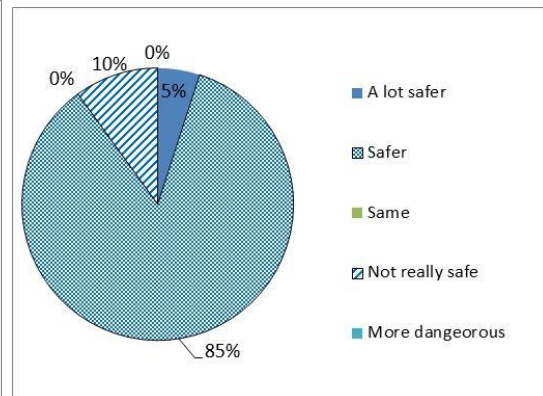


Figure 2 Improvement of safety

Source: Result of the beneficiary survey

Table 7 Comparison of the Incidence of Traffic Accidents

	Road in Pakistan (A)		Kararo – Wadh (B)		Incidence (B)/(A)
	Serious (casualties) accidents	Number of accidents per 1km paved road	Serious (casualties) accidents	Number of accidents per 1km paved road	
Baseline ^{note 1}	11,146	0.074	46	0.48	6.48
Actual ^{note 2}	8,985	0.049	21	0.22	4.49

Note1: Annual average number between 1999 and 2003

Note2: Annual average number between 2012 and 2014

Source: Baseline: Document provided by JICA, Actual: Documents provided by NHA headquarter and NHA Khuzdar Office

3.3.2 Other Effect

(1) Daily average traffic volume at target road

Traffic volume was not included as an effect indicator of this project, so no target was set. Traffic volume is, however, a basic indicator of road function, so attempts were made to collect data in the planning stage and ex-post evaluation. NHA had not conducted any traffic counting survey at the target section, so a traffic counting survey was conducted in the target section to collect reference data. The survey results are shown in table 8.

Table 8 Daily Average Traffic Volume at the Target Road

(Unit: number/day)

	Baseline ^{Note 1}	Target	Actual ^{Note 2}
	2003	—	2015
	As of the planning	—	4 Years after Completion
Motorcycle	954	-	120
Passenger car	903		454
Wagon, Pickup truck	754		94
Bus	346		260
Tractor	74		31
Truck (2 or 3 axel)	980		332
Trailer (4,5or 6 axel)	302		199
Total	4,313		1,490

Source: Baseline and target: Documents provided by JICA, Actual: Traffic counting survey conducted during the ex-post evaluation

Note 1: Document provided by JICA and Survey conducted by JICA at January, 2003.

Note 2: Traffic Counting Survey conducted by local consultant and her assistants at January 2015 during the ex-post evaluation survey.

According to the traffic counting survey, the traffic volume as of the ex-post evaluation was about 35% of that in the planning stage. This reduction was attributed to the worsening security environment in the area around the target section. Protest activities pushing for autonomy have continued in Balochistan Province, where the target section is situated. These activities based in Khuzdar district alongside the Kararo-Wadh section have been getting more active since 2006. The night-time traffic volume is drastically reduced as a result¹⁹. Although official statistics are unavailable, the population in this area has decreased due to the worsening security environment. The traffic volume might also be reduced to 30% of its former level, according to a roadside interview survey at Khuzdar²⁰. The traffic volume in the target section is clearly largely affected by the security conditions. It can be assumed that the traffic volume will increase as a matter of course when the security conditions improve.

3.4 Impacts

3.4.1 Intended Impacts

(1) Reconstruction assistance of Afghanistan

National Highway N-25, which includes the target section, is the national highway that connects the port of Karachi and Afghanistan as well as Central Asia in the shortest way. It was expected that the project eliminates traffic bottlenecks as an international highway by rehabilitating the steep slopes and bend curves, and will subsequently contribute to the reconstruction of Afghanistan that was rapidly underway.

The target section has actually played a vital role as a pipeline for transporting aid goods. It was

¹⁹ According to the local consultant who conducted the site survey, vehicles were rarely confirmed at the target section of Khuzdar after 16:00.

²⁰ NHA questioned the results of the traffic counting survey conducted during the ex-post evaluation. Although the conditions such as the implemented month, time, and day were the same, there might have been some differences in the preconditions between this survey and the one conducted during the project planning.

not possible to measure the impact of the project to the assistance for quantitatively recovering Afghanistan due to the unavailability of related statistical data. However, the project contributes to transport aid goods to Afghanistan more smoothly at a certain level. This was due to the shortened transportation time in the target section after the project completion²¹. It is, however, in order to transport goods from Pakistan to Afghanistan via the National Highway N-25, necessary to pass through Torkham, a town in the Federally Administered Tribal Areas (FATA), and Chaman, a town located at the border of Balochistan Province and Afghanistan. As mentioned above (3.3.2 Other Effect, (1) Daily average traffic volume at target road), the security environment has become worsen in recent years, which decreased the traffic volume for a while, therefore ensuring security is one of the challenges in this area.

(2) Improvement of convenience of local residents including access to social services

One of the intended impacts of the project was that the road improvement improves the local residents' convenience; easier travel to neighbouring major towns, reducing the transportation time to hospitals, increasing employment, etc. Access to social services after the project completion was confirmed through the beneficiary survey, and all the respondents answered that "access to the social services has improved". As shown in table 9, access to markets and hospitals has especially improved for neighbouring local residents of the target road after the road condition was improved.

Table 9 Social Services which Improved Access

Market	100
Hospital	72
Major town	28
School	25

Source: Beneficiary survey

(3) Improvement of living of local residents

Balochistan Province is in the target section and is rich in fruits and vegetables. Accordingly, it was expected as an impact that the project contributed to easier delivery of the agricultural products to Karachi and improved the living of local residents.

Since reliable statistical dates were not available for agricultural products and freight volume of marbles (which are famous in Balochistan) at the time of the ex-post evaluation, the improvement on the economic situation of the local residents was confirmed through a beneficiary survey. The result showed that 99% of the respondents answered that the local economy has changes and their life has also improved. According to the road users, residents and merchants alongside the road, they explained that smoother transportation after the road improvement and opening of shops and restaurants with the road improvement, as well as revitalizing businesses due to the smooth transportation of goods have all contributed. Furthermore, it was explained by interviews with the Supreme Council of All Pakistan Transporters that there were many cases where agricultural products were discarded because of damage during transit because of the bad road conditions in Balochistan, which is famous for fruit and vegetables before the project. After the project, these problems had been solved, thus, it can be said that the road improvement has contributed to reduce

²¹ Interviews with NNA and Supreme Council of All Pakistan Transporters.

the losses of farmers and transporters.

3.4.2 Other Impacts

(1) Saving of operation and maintenance cost

Before the project, the target section contained many steep slopes and bend curves. Thanks to the project, the road alignment was improved, which connected to certain kinds of impacts such as reduction of transportation time and saving on vehicle fuel and maintenance costs. In the beneficiary survey, all respondents answered that vehicle maintenance costs have been largely reduced (70%) or reduced (30%) after the project.

(2) Improvement of Low & Order at target section

At the target section, carjackings frequently happened as of the time of the project planning. Currently, carjacking is still a concern in the target section, however, beneficiary survey results showed 90% of the respondents stated that the situation has been getting better after road improvement. According to interviews with respondents of the beneficiary survey, the project has contributed to measures for carjacking for a certain degree on two aspects as stated below.

- 1) In the area with steep slopes and bend curves, cars had to slow down. However, it is now possible to drive with a certain speed after road alignment improvement. Thus, after the road improvement, carjacking is more difficult and less frequent after the road improvement.
- 2) Thanks to installing the guardrail, the chances of carjacking reduced which was done by jumping from the load side.

(3) Impacts on the Natural Environment

For this project, the Initial Environmental Examination (IEE) was conducted and the Environmental Management Plan (EMP) was prepared. In the course of the project implementation, the project was conducted in line with the EMP and the level of noise, air quality, water quality of sewerage, etc. were confirmed as to whether they were within the certified level. It was also confirmed with NHA that there was no negative impact due to the project implementation.

(4) Land Acquisition and Resettlement

The project rehabilitated the existing road which was national highway owned by NHA, therefore there were no land acquisitions or resettlement. Meanwhile, land tenancy for temporary concrete and asphalt plants (10 acre) was needed. Although a brief delay occurred for the negotiations, NHA and the private land owner made an agreement for the land tenant to pay Rs.1 million for compensation during the project implementation.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

In Pakistan, national highway is operated and maintained under the responsibility of NHA regional (district) offices (see Figure 3), and the NHA Khuzdar office is in charge of the target section. NHA Khuzdar district office is currently operating and maintaining 451 km of the road, including the target section that is part of the entire length of National Highway N-25.

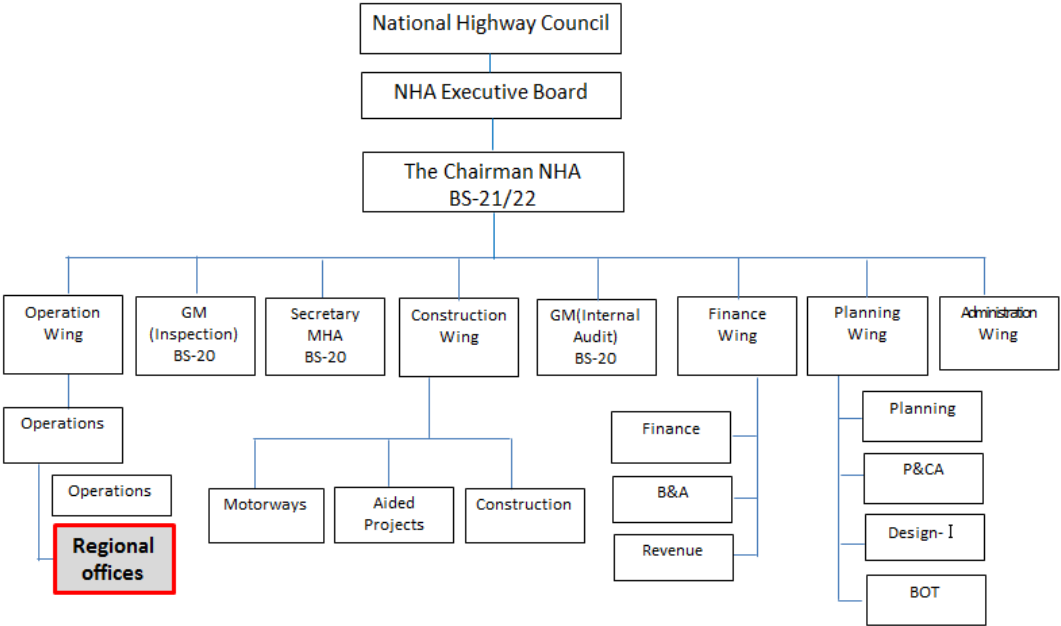


Figure 3 NHA Organizational Structure

Source: NHA Web Site (<http://nha.gov.pk/organisational-structure/>)

As of the ex-post evaluation, NHA headquarters has 2,500 staff members in total, and 55 of them are working on operation and maintenance. According to the staff of NHA headquarter, there is no major concern with the operation and maintenance structure and the number of staff. On the other hand, the NHA Khuzdar office has only 5 staff member, who are all engineers. 2 of them are inspectors who perform operation and maintenance. Therefore, even though it is not in a critical situation, the number of staff of the Khuzdar office shows a tendency to have an insufficient number of staff. According to the NHA headquarter and Khuzdar office, many staffs request to be assigned to Punjab Province and others, while some staffs refuse to work in Balochistan Province, which they regard as continuously unsecured environment. This is why the number of staff has been insufficient. Considering the situation that NHA Khuzdar has responsibility for the operation and maintenance of 451 km of road, which contains a hilly and mountainous area, and the effects from road damage due to overloaded vehicles as described in “3.5.4 Current Status of Operation and Maintenance”, it would

be desirable to increase the number of staff in the Khuzdar office.

The NHA Khuzdar office outsources maintenance activities to local contractors and manages their work. Outsourced contractors are selected through competitive bidding. To participate in this bidding, the contractors have to register in the “Pakistan Engineering Council”, which requires prequalification in terms of a certain experience for operation and maintenance work as well as the contractor’s financial condition. In the case of Balochistan Province, however, contractors which join the bidding are currently limited to the ones which are based in Balochistan Province. This is because there are special circumstances for contractors which are not based in Balochistan that are not accepted by local people or residents with influence. In addition, local contractors from other provinces have also tended to avoid undertaking projects in Balochistan Province because of worsening security. This situation results in a lower competitive rate of bidding and limited options, which is one of the concerns of Balochistan Province, because a wider range of choices included in the contractors from other provinces is preferred in terms of promoting price competition and ensuring quality.

3.5.2 Technical Aspects of Operation and Maintenance

NHA is the institution in charge of construction, operation and maintenance for all the roads of Pakistan. They have abundant experience on the operation and maintenance of national highway. It was also analysed at the time of planning that NHA can manage the operation with their technical capacity independently²².

NHA recruits staff based on the criteria assessed by the presence or absence of the performance for certification and experience. NHA regional offices have also hired engineers with extensive experience as staff engaged in operation and maintenance work. Furthermore, needs assessments are conducted on a regular basis and necessary training has been provided for the staff from the time they join NHA. A Highway Research & Training Centre, which was established with the support of JICA, also provides training to technical staff members. As for the outsourced companies, the system is arranged so that only prequalified contractors can technically participate in the bidding. Therefore, it is judged that there are no serious issues which disturb the operation and maintenance in its technical aspect.

3.5.3 Financial Aspects of Operation and Maintenance

As shown in table 10, the NHA budget is increasing yearly. Income in 2013-2014 was Rs. 82,426 million and 20% of this was NHA’s own income from toll fees. According to NHA, their own income was mainly used for maintenance, and its cost in the same year was Rs.15,817 million, which remains mostly at this level in recent years (see table 11). Maintenance costs (about Rs.93 million) in 2013/2014 for the target section largely exceeded the estimated operation and maintenance costs

²² Based on documents provided by JICA

(Rs.4.3 million per year) ²³ at the time of project planning. This was higher than expected because of the maintenance cost of bridges located in the target section or a part of the sections which were not improved by the project. In addition, overlay²⁴ of some sections which were not improved under the project, is planned in 2014/2015. This large increase in the budget needs is anticipated. The amount increased to Rs. 673 million, which will be about 4% of the total NHA operation and maintenance budget, and it is not seen as an unrealistic amount. NHA explained that the maintenance cost cannot be said to be sufficient, however, maintenance has been conducted at the maximum level within the allocated amount, so no major problems have been caused for conducting daily maintenance in the current situation. Conducting repairs to the roadbed and surface re-pavement (overlay) in 2018/19 (8 years after the project completion), which is required at the time of planning as regular maintenance, is estimated to cost about Rs.8.4 million. This amount is considered to be currently viable, compared to the maintenance costs in 2012/13 and 2013/14.

Table 10 NHA Financial and Budget Condition

(Unit :Rs. Million)

Item		2011/12	2012/13	2013/14	
Income	General account budget	Development investment	39,990	50,727	63,038
		Others	1,683	1,772	1,827
	NHA income	Toll income	13,345	13,536	13,990
		Others	3,322	2,800	3,571
	Total	58,340	68,835	82,426	
Expenditure	Development investment		39,900	50,727	63,038
	Maintenance		15,028	15,308	15,817
	Total		54,928	66,035	78,855

Source: Questionnaire responses

Table 11 Maintenance Cost for Target Section (Kararo-Wadh)*

(Unit: Rs. Million)

	2011/12	2012/13	2013/14	2014/15
Routine maintenance	9.2	10.0	24.1	20.4
Periodic maintenance	0	85.0	68.7	653.0
Total	9.2	95.0	92.8	673.4

Note 1: The amounts from 2011/12~2013/14 are actual expenditure while the one of 2014/15 is an estimate.

Source: Questionnaire responses

3.5.4 Current Status of Operation and Maintenance

Road conditions in the target section are largely kept in good condition according to the field survey conducted by local associates. However, some concerns are confirmed in a part of the target section (see table 12).

²³ Based on documents provided by JICA

²⁴ Pavement of the existing asphalt surface. More specifically, rehabilitation works which cover the road surface with more than 3 cm of asphalt paving mixture.

– Damage on the part of the road surface due to heavy loaded vehicles

When local consultant was travelling the target road, heavy loaded vehicles with marbles, agricultural products, etc. were frequently seen. There are motorway police in national highways in Pakistan with more than 4 lanes. Since the target section is a two lane highway, no motorway police are allocated. Therefore, heavy loaded vehicles are not fully controlled,



(Photo) Heavy loaded truck with agricultural products

which caused damage to part of the road surface. In the target section, a weight scale is also not placed, thus measures to control heavy loaded vehicles are considered necessary.

– Dilapidated bridges in the target section

51.2km of the target road and bridges, which are not improved by the project, start to become dilapidated. The road width of both the start and end for old bridges are narrowed and the condition of the road surface of unimproved sections has been relatively worse compared to the improved sections, which have to be steadily improved in order to ensure smooth transportation in the entire section²⁵. The need for improvement of bridges and leftover parts was strongly raised in interview survey with the Supreme Council of All Pakistan Transporters.

Table 12 Condition in the Target Section Confirmed during the Field Survey

	Very good	Good	Fair	Poor	Very poor
Road surface		✓			
	The road surface of the improved section is generally in very good condition. Some parts are damaged because of the heavy loaded vehicles.				
Road shoulder		✓			
	The overall condition of road shoulders are good but at some points need to be improved more, due to hilly areas and the rain water that affects the shoulders' condition.				
Line marking	✓				
	Well maintained and very clear. NHA has also maintained the line marking through their routine maintenance work.				
Drainage			✓		
	Some drainage systems are blocked which need to be improved.				

Source: Field survey conducted by a local consultant

In the planning stage, the following maintenance work is performed to be conducted in the target section²⁶.

- 1) Routine maintenance (every year)

²⁵ NHA provided the information after the site survey that some bridges are being reconstructed and the periodic maintenance for 25km (points from KM285 to 318) is planned.

²⁶ Documents provided by JICA

Patching of the road surface (filling holes), roadbed repairs as required, rebuilding road shoulders and structural repairs

2) Periodic maintenance (every 8 years)

Shoulder repair, overlay and structure repair

In addition to the work listed above, it was confirmed by interviews with NHA Khuzdar staff members that work such as fixing the gabion²⁷, painting of signboard are conducted on a regular basis. Regarding periodic maintenance which is assumed 8 years after the project completion in 2018/19, however, NHA staff members explained that no fixed plan is currently made as a maintenance plan is prepared on an annual basis. But NHA understands that periodic maintenance will be needed every 8 years, hence it is expected to be performed as planned.

As described above, some minor problems have been observed in terms of institutional aspect and current status of operation and maintenance. Therefore sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was conducted to ensure the smooth and safe transportation in the Kararo-Wadh section of National Highway N-25 in Balochistan Province in Pakistan by rehabilitating the road, and thereby contribute to improve the highway as an arterial road and realize better living conditions for local residents. The project purpose is highly relevant to the national development plan for Pakistan, which has prioritized infrastructure development for the promotion of economic growth and meets the development needs of Pakistan and is consistent with Japanese assistance policy. The efficiency of the project is fair, as both project cost and project period exceeded the plan. After the rehabilitation by the project, hazardous target sections with many steep slopes and bend curves were improved. The planned effects, namely, faster traffic speeds, shortened freight and transportation times, and decreased accidents, have been largely achieved. The evaluation confirmed both the expected impacts, such as improved access to social services (including markets and hospitals) and activation of business, and also unexpected impacts, such as lower maintenance costs for vehicles and a reduced incidence of carjacking. The effectiveness and impacts of the project are therefore rated as high. As for the technical and financial aspects related to the operation and maintenance of the target section, there have been no major concerns. Meanwhile, it was confirmed a lack of staff people in the Khuzdar office, the office responsible for the operation and maintenance of the target section. It was also identified several deteriorated bridges and other flaws that will have to be improved to realize smooth transportation in parts of the target section not covered in the project. Hence, the sustainability of the outcomes of this project is fair.

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

²⁷ Method used for construction in rivers or mountains by filling field stones, crushed stones, etc. into metallic gauze. This is basically applied to protect slopes through placement on shallow slopes.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

- Measures for heavy loaded vehicles

Heavy loaded vehicles were occasionally confirmed during the ex-post evaluation. Allowing those vehicles to drive on the roads leads to damage to the road surface, and is not preferable in terms of safety. Heavy loaded vehicles are not controlled in the target section, since motorway police are not allocated to two lane national highway. However, NHA has to deal with heavy loaded vehicles immediately through measures such as placing measuring instruments and awareness activities for drivers coordinated with police.

- Improvement of leftover sections of the project in target section and bridges

The project improved the road alignment and carriageway for 44.8km out of the entire target section of the 96km Kararo-Wadh section. For the remaining 51.2 km, minor improvements such as shoulder grading and line marking were conducted. At the time of ex-post evaluation, it was confirmed that the 51.2 km section had minor improvement conducted and that bridges were starting to become dilapidated. In order to keep securing smooth transportation in the target section and the entire section of National Highway N-25, NHA needs to improve the 51.2 km section and its bridges.

- Securing a sufficient number of staff to conduct appropriate maintenance work

The NHA Khuzdar office, which in charge of operation and maintenance for the target section, has 5 staffs. 2 of these staffs are inspectors who were doing maintenance work at the time of ex-post evaluation. Considering the situation that NHA Khuzdar has responsibility of operation and maintenance for 451 km of road, which contained a hilly and mountain area, and the effect from road damages due to overloaded vehicles, it would be desirable to increase the number of staff in the Khuzdar office.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

- Formulation of the project plan in the light of risks in a politically unstable area

During the project, security escorts for Japanese experts were tightened due to a serious deterioration in the security environment. Costs for the security service were not specified as of the planning time. Therefore it took a certain amount of time to allocate the budget and to arrange payment, which led to project delays. As such, in a politically unstable area, it is necessary to assume risks which may make the security worse during the project, and to examine the countermeasures at the time of planning, including the arrangement of costs which have to cover these countermeasures.

- Examination of precautions to issues which are rooted in the features of an area

The project period was delayed mainly due to the factors rooted in features of Balochistan Province, where a sense of belonging to the area and tribes is strong and influential. This is considered assuming a certain level of risk in this province, for example, one thing to mitigate the level of risks is to take time for land tenants and obtaining understanding and cooperation from the local residents in the process. For similar types of projects in the future which contain these features, it is necessary to examine the measure beforehand based on discussion amongst related people who design the projects and implemented agencies in addition to assume risks during the project planning. For example, if it is assumed that a longer time will be needed for the negotiation with local residents on the land tenant or acquisition, it will be effective to complete the needed land acquisition or tenant before the project begins, and to specify it as mandate, so that it will be possible to respond to the risks.

The Federal Democratic Republic of Nepal

Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for the Improvement of the Kathmandu-Bhaktapur Road in Nepal”

External Evaluator: Hirofumi Azeta, Japan Economic Research Institute Inc.

0. Summary

The objective of this project is to reduce the traffic congestion and traffic accidents on the Kathmandu – Bhaktapur Road, and also to reduce the travel time between the capital city of Kathmandu and the tourist city of Bhaktapur, by expanding the existing road to four lanes, thereby contributing to the industrial and economic development of the regions along the Road. This project has been highly relevant to the country’s development plan and development needs, as well as Japan’s ODA policy. Therefore its relevance is high. Although the project cost was within the plan, the project period exceeded the plan, due to uncertainty in the political situation. Therefore efficiency of the project is fair. The targets for traffic volume and the travel time between Kathmandu-Bhaktapur are achieved and the ratios of traffic accidents and casualties to traffic volume do not show increases, so the effectiveness of the project is high. The construction of the Road led to the industrial development of the region along the Road, as well as activation of the regional economy and improvement in the public transport services. Therefore, this project has largely achieved its objectives, and thus the effectiveness and impact of the project are high. The institutional, technical and financial aspects of operation and maintenance do not have any problems, and the sustainability of the effects achieved by this project is high.

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

1. Project Description



Project location



The road developed in this project

1.1 Background

At the time of the project planning, population concentration towards the Kathmandu Valley, the national center of politics, economy and administration, was remarkable. In the Kathmandu Valley, most of the political, administrative and commercial functions are concentrated in Kathmandu City while residential houses and factories were rapidly increasing at the time of the project planning in Madhyapur Thimi City and Bhaktapur City, located at the east of the Valley.

The Kathmandu-Bhaktapur Road, which was constructed under this project, is a national road which connects Kathmandu City, the Capital of Nepal to Bhaktapur City, a tourist city where a world heritage site is located. At the same time, the Road is a part of the Arniko Highway (Asia Highway No. 42) which leads from Kathmandu to China. Before the project, the Road was heavily congested, not only during peak hours but even during non-peak hours, due to the rapid increase in the number of car registrations in the Kathmandu Valley.

Therefore, the Department of Roads (DOR) of the Ministry of Physical Planning and Works (the Ministry of Physical Infrastructure and Transport at present) regarded the expansion of the Road as a priority project in the Master Plan for a Strategic Road Network.

This project is a grant aid project to widen the existing two lane road between Kathmandu (Tinkune Intersection) and Bhaktapur (Suryabinayak Intersection) to four lanes.

A further increase in traffic volume on the Road was expected as the Road would provide links to the eastern Terai Region when the construction of the Sinduli Road was completed.

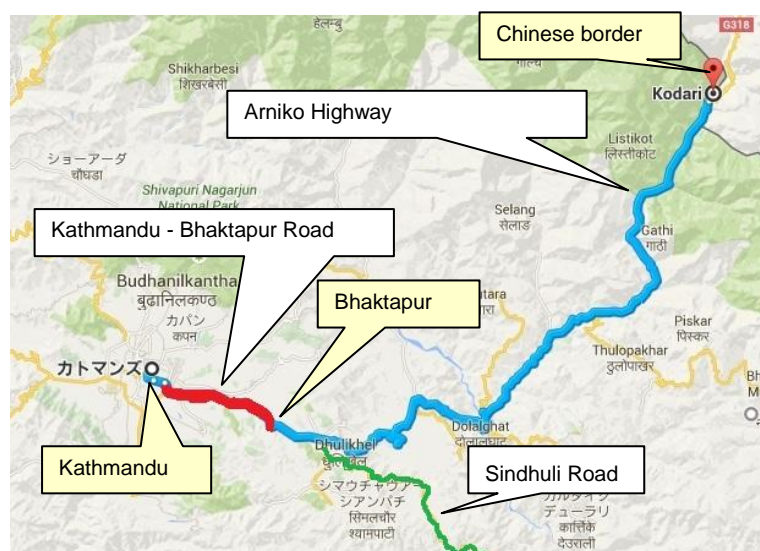


Figure 1. Location of the Arniko Highway and the Road

1.2 Project Outline

The objective of this project is to reduce traffic congestion and traffic accidents on the

Kathmandu – Bhaktapur Road, and also to reduce the travel time between the capital city of Kathmandu and the tourist city Bhaktapur. This was to be done by expanding the existing road to four lanes, thereby contributing to the industrial and economic development of the regions along the Road, improvement in public transport services, and a decrease in the travel time through the Arniko Highway to Kathmandu City.

Grant Limit / Actual Grant Amount	Detailed Design: 48 million yen / 48 million yen Construction: 2,689 million yen / 2,674 million yen
Exchange of Notes Date	Detailed Design: September 2007 Construction: July 2008
Implementing Agency	Ministry of Physical Planning and Works (Ministry of Physical Infrastructure and Transport at present), Department of Roads
Project Completion Date	September, 2011
Main Contractor	Hazama Corporation
Main Consultant	Nippon Koei Co. Ltd.
Basic Design	July, 2007
Detailed Design	March, 2008
Related Projects	<p><u>Technical Cooperation</u></p> <ul style="list-style-type: none"> - The Project for the Operation and Maintenance of Sindhuli Road (2011 –, to be completed in 2015) - Road planning and maintenance adviser (2007-2009, 2009-2011) <p><u>Grant Aid</u></p> <ul style="list-style-type: none"> - Project for construction of the Sindhuli Road Section I (E/N: June 1996) - Project for construction of the Sindhuli Road Section IV (E/N: Phase I: June 1997, Phase II: July 1999) - Project for construction of Sindhuli Road Section II(E/N: Phase I: June 2000, Phase II: August 2001, Phase III: June 2005) - The project for Improvement of Intersections in Kathmandu City (E/N, Detailed design February 2001, Construction: July 2001) - The Project for Emergency Rehabilitation of the Shindhuli Road Section IV (E/N: July 2003)

	<ul style="list-style-type: none"> - Project for construction of the Sindhuli Road Section III (E/N, Phase I: June 2009, Phase II: February 2012) - The Project for Countermeasure Construction against the Landslides on the Sindhuli Road Section II (E/N: June 2012) <p><u>Other international agencies and donors:</u></p> <ul style="list-style-type: none"> - World Bank “Road Sector Development Project” - World Bank “Road Maintenance and Development”
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2. Outline of the Evaluation Study

2.1 External Evaluator

Hirofumi Azeta, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: October 2014 – September 2015

Duration of the Field Study: January 4-16, 2015, April 5-10, 2015

3. Results of the Evaluation (Overall Rating: A¹)

3.1 Relevance (Rating : ③²)

3.1.1 Relevance to the Development Plan of Nepal

At the time of project planning, the 11th Five-Year Plan (July 2007 to July 2012) was the basis of the national planning. Based on the 11th Five-Year Plan, the Department of Roads (DOR) of the Ministry of Physical Planning and Works prepared the Master Plan in December 2005 for the Strategic Road Network, which covers the road development in Nepal for the following 20 years. The Master Plan was focusing on inter-connecting effective, efficient, safe and reliable strategic roads in order to achieve better living standards for the people. This project was also listed as one of the priority projects in the Master Plan³.

At the time of the ex-post evaluation, the development plan of Nepal was the 13th Plan (FY 2013/14 - 2015/16). The Plan mentions that the target of the transport sector is “to expand a standard, reliable, affordable and safe transport network to contribute to national integration,

¹ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

² ③: High, ② Fair, ① Low

³ Source: Basic design study report, P1-3

socio-economic development and regional balance”. The strategies for achieving this target are to (i) expand transport access so as to link district headquarters and inter-districts, (ii) expand transport by raising access to agriculture, industries, hydropower, tourism, education and health services, and (iii) prioritize repair and maintenance by safeguarding the network of roads and to assure safe and effective travel⁴.

The transport sector development policy as of the ex-post evaluation is the Priority Investment Plan (2007-2016), which emphasizes the importance of enhancement of road capacity in the Kathmandu Valley in its “Road improvement and new construction” section.⁵

It is therefore concluded that this project is highly consistent with the national development policy and sector development policy.

3.1.2 Relevance to the Development Needs of Nepal

In Nepal, population concentration towards the Kathmandu Valley, which is the national center of politics, economy and administration, was remarkable at the time of the project planning (the population of the Kathmandu Valley was 1.76 million out of a total population of 25.3 million in Nepal). The Kathmandu – Bhaktapur Road, which connects Kathmandu City and Bhaktapur City, was one of the most congested roads among those which were listed in the Master Plan mentioned above. Since the traffic volume on the Road exceeded the road capacity, the Road was chronically congested. In addition, the fact that large-sized vehicles, pedestrians and motorbikes are mixed on the Road was causing not only traffic congestion but traffic accidents as well.

A further increase in traffic volume on the Road was expected because the Kathmandu – Bhaktapur Road is a part of Asian Highway No.42 (Arniko Highway) which connects the capital city of Kathmandu and China, and also because the Road would provide links to the eastern Terai Region when the construction of the Sinduli Road was completed⁶.

By the time of the ex-post evaluation, the population of the Kathmandu Valley increased up to 2.5 million, achieving about a 4% increase per annum⁷. The increase in the population of Kathmandu City and Bhaktapur City was rapid, as the population of Kathmandu City increased from 1.08 million in 2001 to 1.74 million in 2011, and that of Bhaktapur City increased from 0.23 million to 0.30 million during the same period⁸.

Due to the increase in population, the traffic volume of the Kathmandu – Bhaktapur Road jumped by 143% from 2007 to 2013, increasing by 4.56% per annum on average. However, the

⁴ Source: The 13th plan, p104

⁵ Source: Sector wide road program and priority investment plan (2007-2016), p VI-4

⁶ Source: Basic design study report, P4

⁷ Source: World Bank “Urban Growth and Spatial Transition in Nepal”

⁸ Source: National Census 2001 and 2011

road congestion largely decreased and the travel time between the two cities was cut in half after the completion of this project.

As mentioned above, the traffic volume was expected to increase after the completion of the Sindhuli Road, due to incoming transport from eastern Terai region. However, the increase in the incoming transport from Sindhuri Road has not been observed in the ex-post evaluation because the Sindhuli Road is to be completed in 2015 and also because the amount of incoming traffic fluctuates every year as depicted in Table 1.

Table 1 Incoming traffic volume from the Sindhuri Road (traffic volume / day)

2007	2008	2009	2010	2011	2012
1,366	2,338	4,105	2,309	807	1,219

Source: Documents provided by the implementing agency

As mentioned above, the population of the Kathmandu Valley, Kathmandu City and Bhaktapur City is increasing, and the traffic volume of the Kathmadu – Bhaktapur Road is also increasing after the completion of this project. Therefore, it is concluded that this project is consistent with the development needs of Nepal at the time of the project planning and the ex-post evaluation.

3.1.3 Relevance to Japan’s ODA Policy

At the time of the project planning, one of the main agenda items of the Country Assistance Program for Nepal was “Poverty reduction in rural areas”, and “the enhancement of basic infrastructure including roads as a basis for economic development” was one of its action plans. This project was therefore in line with Japan’s ODA policy.

In light of the above, this project has been highly relevant to the country’s development plan and development needs, as well as Japan’s ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating:②)

3.2.1 Project Outputs

The final outputs and the original plans are compared in Table 2 below.

Table 2 Comparison of Original and Actual Outputs

Item		Planned		Actual	
Road	Widening of existing road	Widen 2 lanes to 4 lanes for the road between Tinkune in Kathmandu City and Suryabinayak in Bhaktapur City for a total distance of 9.142 km.		Widen 2 lanes to 4 lanes for the road between Tinkune in Kathmandu City and Suryabinayak in Bhaktapur City for a total distance of 9.142km.	
	Width	Carriageway: (2 x 3.5m = 7.0m) x 2 directions = 14.0m		Carriageway: (2 x 3.5m = 7.0m) x 2 directions = 14.0m	
		Median: 3.0m for normal section except 0.6m New Jersey within Ring Road		Median: 3.0m for normal section except 0.6m New Jersey within Ring Road	
		Side allowance of median: 2 x 0.5m = 1.0m		Side allowance of median: 2 x 0.5m = 1.0m	
	Pavament	Shoulder: 3.0 m (including traffic barrier)		Shoulder: 3.0 m (including traffic barrier)	
Surface (Asphalt Concrete): 5cm Carriageway & Shoulder Binder (Asphalt Concrete): 6cm Carriageway only		Surface (Asphalt Concrete): 5cm Carriageway & Shoulder Binder (Asphalt Concrete): 6cm Carriageway only			
Bridges	Existing	Further use		Further use	
	New	Manohara Bridge	Length 84.04m, width12.5m, PC girder	Manohara Bridge	Length 84.04m, width12.5m, PC girder
Hanumante Bridge		Hanumante Br: Length 50.44m, width12.5m, PC girder	Hanumante Bridge	Hanumante Br: Length 50.44m, width12.5m, PC girder	
Intersection Improvement	5 intersections: Jadibuti, Ghataghar, Thimi, Sallaghari, Suryabinayak		5 intersections: Jadibuti, Ghataghar, Thimi, Sallaghari, Suryabinayak		
	3 signalized: Jadibuti, Ghataghar, Sallaghari		3 signalized: Jadibuti, Ghataghar, Sallaghari		
Median strip	3m wide median (from Koteswore to Suryabinayak)		3m wide median (from Koteswore to Suryabinayak) 3,172m of guard fences		
	60cm wide New Jersey (from Tinkune to Koteswore)		60cm wide New Jersey (from Tinkune to Koteswore)		
Access roads	11 access roads to be connected to the Road other than intersections		11 access roads to be connected to the Road other than intersections		
Bus stops	14 locations		14 locations, four additional access stairs at the Lokanthali bus station		
Road Lighting	At intersections, bridges and bus stops		At intersections, bridges and bus stops		
Drainage	Cross	24 (including 6 involving major drainage)		24 (including 6 involving major drainage)	
	Side	Both sides along the Road		Both sides along the Road	
Traffic barriers	Guardrail type: embankment height of 3m or more		Guardrail type: embankment height of 3m or more		
	Guard-pipe type: embankment height of less than 3m		Guard-pipe type: embankment height of less than 3m		

Source: Basic design study report, and documents provided by JICA

The planned project outputs were mostly achieved, although some minor modifications were made.

The major modification made to the project scope of the Japanese side is the construction of guard fences, and the length of such guard fences is 3,127m in total. The construction of guard fences was focusing on preventing pedestrians to cross the Road especially at places where traffic volume was high. The guard fences were constructed at the sections near Kathmandu City (2,243m) and also at 13 sections of median strips near crossroads and bus stations where more pedestrians tried to cross the Road. In addition, based on discussions with residents, four additional access stairs were constructed at the Lokanthali bus station where access from residential areas was not convenient because of the difference in the level⁹.

The project scope of the Nepali side, which includes the construction of service roads and pedestrian roads along the main road, were implemented almost as planned. Because the number of traffic accidents increased after the Road was partially opened, the Nepali side

⁹ Source: Project completion report, P5

constructed guard fences at the median strips (6km) to cover a whole section of the Road in addition to the original project scope. The Nepali side also constructed 11 overhead bridges and three units of traffic signals¹⁰.



Picture 1 Guard fences at the median strip



Picture 2 Overhead bridge
(Constructed by the Nepali side)

The service road (one lane, 14km in total) was planned to be constructed by the Nepali side along the main road, and the construction was planned to be completed one year after concluding a contract with a construction company by 2012. However, as of early April 2015, the pavement of the service road has not been completed for the 1.5km section. According to the implementing agency, this was because the construction companies had contracts greater than their financial capacities, and they delayed the implementation after they were awarded the contracts¹¹. Most of the remaining pavement work was completed from February to March 2015 according to the requests made by the implementing agency. However, because of the lack of an annual budget of the Project Office of the implementing agency, the pavement work was again suspended as of April 2015. The lack of budget of the Project Office was mainly because the implementing agency constructed additional signals or overhead bridges. As mentioned above, although the service roads are not completed for the 1.5km section, the delay in construction does not affect the operation of the main roads.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The planned and actual project cost is compared in Table 3.

As mentioned above, additional work was implemented, such as the construction of guard

¹⁰ Source: Interviews with the implementing agency

¹¹ According to the implementing agency, many contractors tend to do the same thing.

fences, 11 overhead bridges, and three units of traffic signals, which were not included in the original project scope. This was in reaction to the increase in traffic accidents. In principle, the ex-post evaluation should compare the planned and actual outputs, including the additional outputs. However, as such a comparison is not necessarily easy, the ex-post evaluation regards that the additional outputs were carried out at appropriate project costs, and the evaluation is made based on the comparison between ex-ante and ex-post project costs to produce the original outputs.

Table 3 Comparison of Original and Actual Project Costs

(Unit: million yen)

Item	Planned	Actual
Detailed design	48	48
Construction cost	3,021	2,951
Covered by the Japanese side	2,689	2,674
Covered by the Nepali side	332	340
Total	3,069	3,044

Source: Documents provided by JICA, Answers to the Questionnaire by the implementing agency

The construction cost covered by the Japanese side was within the planned project cost, and the actual project cost in total was 0.2% smaller than planned, excluding the additional construction work made by the Nepali side for traffic safety.

The planned and actual project scope and costs were compared as in the following table. The actual project cost in Nepali Rupee (NR) is 44.1% more than the planned project cost, excluding the costs for additional outputs, such as guard fences, overhead bridges and traffic signals¹². However, because of the changes in the exchange rate during the project implementation, the increase in the project cost of the Nepali side in Japanese Yen was limited to 2.4% as depicted in Table 4.

¹² As mentioned above, because a part of the service roads whose costs were supposed to be covered by the Nepali side are not completed, the cost necessary to complete the service roads was estimated from the construction cost for 1km, which was calculated based on the length of the road completed and its actual expenses.

Table 4 Comparison of Original and Actual Project Costs of the Nepali side
(Unit: thousand NR)

Timing	Classification	Planned	Actual
1. Work before the project	Site clearance in ROW	3600	1,200
	Relocation of monuments, temples, shrines, water fountains	800	791
	Relocation of surface/overhead public utilities	40,500	38,755
	Relocation of underground public utilities	2,700	38,260
2. Works during the project	Bank charge	1,695	2,510
	Traffic control and environment monitoring		800
	Planting of trees & flowers in median strip	3,153	700
	Traffic safety awareness training for bus drivers & passengers	1,134	900
3. Works after the project	Development of service road	114,287	196,000
	Development of walkways	42,991	24,000
	Development of guard fences		10,000
	Development of overhead bridges		50,000
	Development of traffic signals		40,000
Total		210,860	403,916
Total (excluding additional outputs)		210,860	303,916
in JPY (million)		332	340

Source: Answers to the Questionnaire by the implementing agency

The increase in the project costs for relocation of underground public utilities is because the number of relocated underground utilities was more than planned, and also because the information on the location of underground water pipes was not available at the time of project planning.

The project cost for the site clearance in ROW (right of way) areas decreased because only one household was actually relocated while ten households were planned to be relocated. This is going to be explained in the “Impact” section¹³.

3.2.2.2 Project Period

The planned project period was 42 months, and the actual project period was 49 months (116% of the planned project period) from September 2007 to September 2011.

¹³ Source: Interviews with the implementing agency

Table 5 Comparison of Original and Actual Project Periods

Item	Planned	Actual
Detailed design	7 months	-
Bidding	5 months	-
Road improvement construction period	30 months	36 months
Total	42 months	49 months

Source: Basic design study report, Documents provided by JICA

The delay in the construction work is mainly because it was difficult to secure necessary material, equipment and workers due to the uncertainty in the political situation during the project implementation. Therefore, the construction period of the road improvement, which was planned to be 30 months, was actually 36 months. Accordingly, the total project period was 49 months, seven months longer than planned.

The construction of the service road, which was implemented by the Nepali side, has not been completed as of April 2015. However, this is not considered in the evaluation of the project period as the operation of main road has already been started, and the delay in the construction of the service road do not affect the effectiveness of the project.

Similarly, the construction of guard fences, 11 overhead bridges and three units of traffic signals, which were completed after 2012 under the budget by the Nepali side, were not considered in the evaluation of the project period. This is because they were additional project outputs which were not included in the initial project scope.

Based on the result above, although the project cost was within the plan, the project period exceeded the plan. Therefore the efficiency of the project is fair.

3.3 Effectiveness¹⁴ (Rating:③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of the project planning, it was expected that the traffic volume of the Kathmandu – Bhaktapur Road increased and that the travel time and number of traffic accidents decreased. The target year on such indicators was set in 2021, 10 years after the completion of the project. However, because the ex-post evaluation was implemented three years after the project completion, the evaluation judgment on the effectiveness is comprehensively made by comparing the estimated value of 2021 and the actual values as of ex-post evaluation. The following table shows the actual values obtained through the ex-post evaluation, and the level of achievement.

¹⁴ The sub-rating for effectiveness is to be input with consideration of the impact.

The traffic volume between Kathmandu and Bhaktapur has increased by 143% from 2007 to 2013, exceeding the initial target of 100%. Note that the Kathmandu – Bhaktapur Road was partially opened in 2010, and other sections were accordingly opened after the completion.

Table 6 Traffic Volume of the Kathmandu - Bhaktapur Road

	Original 2007	Target 2021	Original 2007	Actual 2010	Actual 2011	Actual 2012	Actual 2013	Estimated 2021
	At the time of project planning	10 years after the completion	(revised)	-	Year of completion	1 year after the completion	2 years after the completion	10 years after the completion
Traffic volume (vehicles / day)	40,000	80,000	21,590	21,060	48,105	49,192	52,595	75,140
% change (from the original)	-	+100%	-	-2%	+123%	+128%	+144%	+248%

Source: Answers to the Questionnaire by the implementing agency

As mentioned in the table above, the “original” traffic volume as of 2007 was revised at the time of ex-post evaluation because the original traffic volume was that of two-way traffic measured between Koteswore and Jaributi, but the information on actual traffic volume at the same section was not available. In the ex-post evaluation, the two-way traffic volume at the Manohara Bridge before and after the project were compared instead. At the time of the project planning, the traffic volume, which was 40,000 vehicles per day (2007) was expected to increase by 100% to 80,000 vehicles per day (2021). In the ex-post evaluation, the targeted and actual percentages of increase (%) in traffic volume are therefore compared.

After the project completion, the traffic volume increased by 4.56% per annum on average from 2011 to 2013. If the traffic volume continues increasing at the same rate, it will reach 75,140 vehicles per day in 2021. Then, the targeted increase rate of traffic volume (100%) is expected to be achieved, as the actual increase rate in traffic volume is estimated to show a 248% from 2007 to 2021.

Table 7 Travel Time between Kathmandu and Bhaktapur

	Original 2006	Target 2021	Original 2007	Actual 2015
	At the time of the project planning	10 years after the completion	Revised	4 years after the completion
Travel Time between Kathmandu and Bhaktapur	48 mins	23 mins		20 mins
(Note) Traffic volume (vehicles / day) ¹⁵	40,000	80,000	21,590	<u>57,498</u>
Increase rate in traffic volume (from original)		+100%		<u>+166%</u>

Source: Basic design study report and answers to the Questionnaire by the Implementing agency

Note: figures underlined are the estimates.

The travel time from the Tinkune intersection (beginning) in Kathmandu to the Suryabinayak intersection (ending point) in Bhaktapur was measured during the field trip survey. The travel time between these intersections was 20 minutes at maximum, which was shorter than the target value of 23 minutes, although the increase rate in the traffic volume was more than the target in 2015.

Table 8 Actual travel time between Kathmandu and Bhaktapur (Measurement results)

	Weekday		Weekend
	Day	Night	Day
Kathmandu to Bhaktapur	14 mins	<u>20 mins</u>	12 mins
(Reference) Bhaktapur to Kathmandu	17 mins	23 mins	14.5 mins

Source: Measurement by the survey team (measured in January 2015)

If the traffic volume keeps on increasing at the same speed, the travel time would exceed the target of 23 minutes. However, because the traffic volume as of 2012 is expected to be much bigger than the target, in this case, the target on the travel time should also be lifted. Then, the travel time as of 2021 is expected to be less than the revised target.

¹⁵ The original traffic volume in 2006 and the target volume in 2021 are the two-way traffic volumes between Jaributi and Koteswore while the revised original traffic volume in 2007 and the actual volume in 2015 are the two-way traffic volumes on the Manohara bridge.

Table 9 Number of traffic accidents and casualties per annum

	Original	Target	Original	Target	Target	Target
	2006	2021	2010	2011	2012	2013
	At the time of the project planning	10 years after completion	-	Year of completion	1 year after completion	2 years after completion
Annual traffic accidents (vehicles)	340	Decrease	995	790	689	775
Annual traffic casualties (persons)	149	Decrease	674	512	351	461
Traffic accidents / traffic volume	0.016		0.055	0.032	0.033	0.016
Traffic casualties / traffic volume	0.007		0.037	0.021	0.017	0.010

Source: Basic design study report, Answers to the Questionnaire by the implementing agency

At the time of project planning, the traffic accidents due to the mixed traffic of large-sized vehicles, motorbikes and auto- tricycles were expected to decrease, by the expansion of the Road, the improvement in the intersections and the development of bus stops. However, bus riders and surrounding residents crossed the Road in places where there are no traffic signals, although the vehicles were travelling much faster on the Road than on other roads at 60 - 80 kmph. As a result, the number of traffic accidents and casualties rapidly increased when the Road was partially opened in 2010.

It seems to have been difficult to forecast the increase in the number of traffic accidents, which might happen due to people crossing the section of the Road without any traffic signals or crossings, as there had not been any roads in Nepal which allowed high speed traffic like the Kathmandu-Bhaktapur Road.

Since then, in reaction to the increase in the traffic accidents, JICA changed the project scope to construct guard fences at the median strips in 2011, and the Nepali side also constructed additional guard fences and 11 overhead bridges until 2013 by its own budget. As a result, the number of traffic accidents has been decreasing since 2010.

In this project, traffic safety campaigns were organized and posters for traffic safety were put in public spaces by university students hired as volunteers or part-time workers. The DOR also took several actions for traffic safety such as hanging banners for traffic safety and establishing notice boards for safe driving in places where there are more traffic accidents.

When traffic accidents and casualties are analyzed as ratios to the traffic volume, the ratio of traffic accidents was high from 2010 to 2012 as mentioned above. As a result of the

countermeasures explained above, the ratio dropped to 0.016 in 2013, which was as low as the pre-project level.

The information on vehicle operating costs and material transportation costs was not available at the implementing agency, and these pieces of information were examined through the beneficiary survey¹⁶. In the interviews with truck, bus and car drivers, all drivers perceived a decrease in the fuel consumption. The average decrease in the fuel costs answered by interviewees was 31%.

Table 10 Vehicle operating costs and material transportation costs

	Original	Target	Actual
	2006	2021	2015
	At the time of the project planning	10 years after completion	Beneficiary survey result
Vehicle operating costs and material transportation costs	N/A	Decrease	Decreased by about 31%

Source: Beneficiary survey

3.3.2 Qualitative Effects

The Kathmandu-Bhaktapur Road is the first high speed road in Nepal which allows vehicles to run at more than 60km per hour.

The rehabilitation of the Ring Road, which is located around Kathmandu City and Patan City, was designed based on the Kathmandu-Bhaktapur Road. This was because the effectiveness of elements of the project, such as the reduction in travel time, was high. According to the implementing agency, the road design elements, such as the design of the road, safety measures, operation and maintenance, were prepared based on the Kathmandu - Bhaktapur Road.

It is therefore concluded that the effectiveness of the project was high because most of the targets for operation and effect indicators, such as traffic volumes, travel time, vehicle operating costs and material transportation costs, have been achieved. Although the number of traffic accidents and casualties increased, the ratio of traffic accidents in comparison to the traffic volume is at the same level as it was before the project.

¹⁶ About 100 persons including residents in Kathmandu and Bhaktapur, bus users, bus drivers, truck drivers and car drivers, were interviewed to obtain opinions about travelling time, traffic safety, travel costs, satisfactions on the road conditions, environmental and social impacts and maintenance conditions.

3.4 Impact

3.4.1 Intended Impacts

3.4.1.1 Industrial development at the roadside and activation of the regional economy

At the time of the project planning, the commercial, industrial and residential sectors were expected to develop, and the regional economy was also expected to be activated by the improvement in the investment efficiency as a result of the progress in urban-type land utilizations¹⁷.

It was not possible to obtain information on the number of business registrations and households in Kathmandu and Bhaktapur. However, as all the interviewees in the beneficiary survey answered that the number of houses, factories and shops increased after the completion of the Road, it is possible to say that the industry on the roadside was developed after the completion of the project. In addition, stakeholders mentioned in the interviews that the development of the residential areas on and near the Road was continuing, and that the population was also increasing. Therefore, it is concluded that the regional economy had been activated since the completion of the project.

3.4.1.2 Improvement in the public transport services

At the time of the project planning, the public transport services was expected to improve through a decrease in the travel time of the users of large, medium and small buses, and also by enabling safe embarkation and disembarkation through the improvement in the Road and intersections, and construction of bus stops¹⁸.

In the ex-post evaluation, the evaluator interviewed bus riders as a part of the beneficiary survey, and the average reduction in the bus travel time answered by bus riders was 29.1 minutes¹⁹.

Bus stations established on the Road are used as expected, and embarkation and disembarkation of passenger outside of bus stations are hardly observed. However, around the Koteswore bus stop which many buses use, passengers are embarking and disembarking on the traffic lanes outside the bus station. Similarly, the embarkation and disembarkation of passengers were observed at five intersections where there were no traffic signals.

In the beneficiary survey, 95% of interviewees answered that the road safety improved.

¹⁷ Source: Basic design study report, P4

¹⁸ Source: Basic design study report, P4

¹⁹ As the starting point and the destination of bus travels answered by passengers in the interview were not necessarily Kathmandu City and Bhaktapur City, only the reduced travel time on the Road was examined.



Photo 3 Small buses using bus stops



Photo 4 Buses parked in the intersections without traffic signals

3.4.1.3 Decrease in vehicle travel time on the Arniko Highway to Kathmandu

At the time of the project planning, the travel time on the Arniko Highway to Kathmandu was expected to decrease²⁰. In the ex-post evaluation, information on the travel time on the Arniko Highway was not obtained. However, because the Kathmandu-Bhaktapur Road is a part of the Arniko Highway, it is possible to say that the decrease in the travel time of the Road is also decreasing the travel time on Arniko Highway.

3.4.2 Unintended Positive and Negative Impacts

3.4.2.1 Impacts on the Natural Environment

This project was subject to Initial Environmental Examination (IEE)²¹, and therefore the DOR Project Office carried out monthly monitoring during the project implementation. When the Project Office identified any issues, it notified them to the project consultant and contractors in writing. Through such monthly monitoring, the Project Office confirmed that there were not any negative impacts on the natural environment.

When the Project Office received complaints or requests from residents, it took quick actions, including organizing consultation meetings with residents. The project contractor avoided causing serious accidents when continuing construction work during the night by preparing enough lighting. The project contractor also avoided causing dust on temporary roads by spraying water on the roads frequently. Waste soils were disposed only at the designated dumping site near Manohara Bridge, and the Project Office confirmed through its environmental monitoring that waste soils were not dumped at any other places.

²⁰ Source: Basic design study report, P4

²¹ IEE is a study that includes an analysis of alternative plans, a prediction and assessment of environmental impacts, and a preparation of mitigation measures and monitoring plans based on easily available information, including existing data and simple field surveys.

3.4.2.2 Land Acquisition and Resettlement

At the time of the project planning, medium or small size involuntary resettlement and land acquisition were assumed while serious negative impacts on the regional environment and social economy were not expected. Therefore the category based on guidelines for environmental and social considerations by JICA was B. The result of the IEE, which was implemented by the DOR based on Environmental Law in Nepal, was also similar to this²².

The number of the resettled households was expected to be 10 at the time of planning, and the DOR concluded basic agreements on the resettlement with these households when the basic design study was conducted. As the land within the ROW (right of way) belongs to the government, compensation was supposed to be paid only for buildings²³.

Out of the 10 households, only one household actually resettled, and the household received 1.2 million NRs as compensation. The amount of the compensation was determined based on the domestic rules in Nepal (Land Acquisition Act) and payment was made based on the agreement between the DOR and the owner of the house.

The remaining nine households were not satisfied with resettlement itself or the compensation amounts, and they did not agree on resettlement. As a result, they were not resettled. As these buildings are occupying only about 1m of ROW, construction of the main road and service roads were not affected by such buildings. Thus, in order to avoid the delay in the project implementation, the DOR decided not to resettle such buildings. If the houses are re-constructed in the future, such new buildings are not allowed to be constructed within the ROW.

There were several more houses in addition to the 10 buildings mentioned above, which were regarded as squatter buildings. When the DOR sent warnings to the owners of such buildings, they voluntarily removed the buildings without any trouble. The government, which did not have any obligation to pay compensation to such buildings based on domestic rules and regulations, did not pay any compensation to the owners of buildings. The guidelines for environmental and social consideration by JICA as of 2004 specifies that the resettlements and land acquisition are conducted following domestic rules and regulations.

3.4.2.3 Other impacts

At the time of the project planning, there were worries that the number of traffic accidents might increase when temporary roads were used. However, because the temporary roads of different sections were only used for about one month and traffic controls were arranged at the

²² Source: Basic design study report, P2-31

²³ Source: Basic design study report, P2-32, 2-34

temporary roads, the traffic accidents did not increase.

The Road is covered with water near Chundivi intersection several times a year after heavy rainfall mainly because the cross drainage near the intersection is choked by garbage disposed by surrounding residents. In order to prevent such dumping at the cross drainage, notice boards and screen grating covers were installed. However, because some residents continue maliciously disposing waste into the drainage, such floods still happen for a few hours after heavy rainfall. In order to prevent this, the enhancement of maintenance by the implementing agency is needed.

At the time of the ex-post evaluation, it is most likely that the increase in traffic volume, one of the operating indicators, will be achieved by 2021. The effect indicators, including decrease in travel time between Kathmandu and Bhaktapur, vehicle operating costs and material transportation costs, were already achieved in 2015. The number of traffic accidents increased, but the ratio of accidents to traffic volume decreased to the same level before the project as a result of the introduction of safety measures, including construction of guard fences and overhead bridges.

The construction of the Road led to the industrial development of the region along it. It also led to activation of the regional economy, improvement in public transport services, and a decrease in the travel time through the Arniko Highway to Kathmandu City. It was also confirmed that there were not any specific negative impacts on the natural environment, and the resettlement and land acquisition was implemented appropriately.

Based on the result above, it is concluded that this project has largely achieved its objectives. Therefore the effectiveness and impact of the project is high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The operation and maintenance (O&M) of the Road was supposed to be carried out by the Kathmandu - 1 Region Division Road Office and the Bhaktapur Region Division Road Office under the Maintenance Management Department of the DOR (Department of Roads of the Ministry of Physical Planning and Works)²⁴. However, because the construction of the service roads has not been completed as of April 2015, the Road has not been transferred from the Project Office to the Division Road Offices, and the Project Office is carrying out maintenance work.

Due to the structural reforms in the DOR, the Division Road Offices are now under the responsibility of Regional Road Directorates. There are 5 Regional Road Directorates in the country, and the Kathmandu - 1 Division Road Office and the Bhaktapur Division Road Office

²⁴ Source: Basic design study report, P2-2

are under the responsibility of the Central Region Road Directorate.

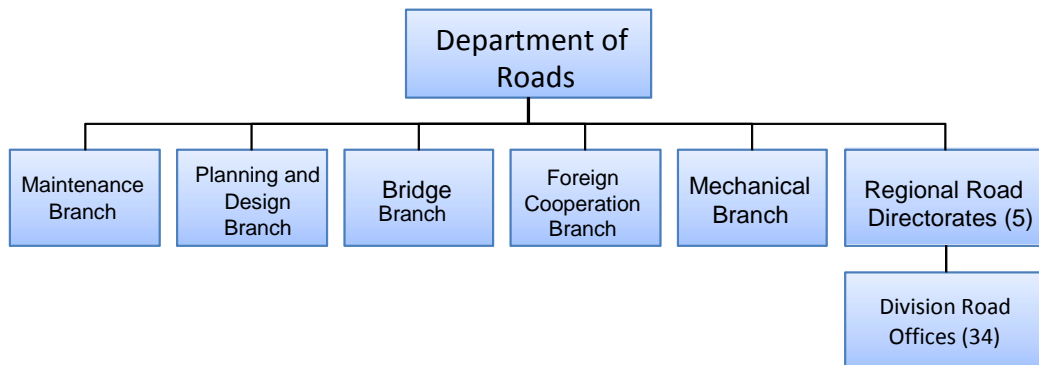


Figure 1 Organization Chart of the DOR

Source: Answers to the Questionnaire by the implementing agency

When the Road is transferred from the Project Office to the Division Road Offices, the Kathmandu - 1 Division Road Office will be responsible for the O&M of the section from Tinkune Intersection to Manohara Bridge while the Bhaktapur Division Road Office will be responsible for the section from Manohara Bridge to Suryabinayak Intersection.

In both the Kathmandu - 1 Region Division Road Office and the Bhaktapur Region Division Road Office, one director, seven engineers and 20 sub-engineers are supposed to be assigned to each office. However, the number of sub-engineers actually assigned as of May 2014 is only six, although seven engineers are fully assigned in both Division Road Offices. This is because all sub-engineers who had been working for a long time were promoted to be engineers in 2013 under instructions by the government. Due to the lack of sub-engineers, the frequency of the monitoring of maintenance work by sub-engineers is getting lower, although there are no delays in the maintenance work.

At the time of ex-post evaluation, the DOR is taking steps for the recruitment of sub-engineers following the regular recruitment schedule. Most of the sub-engineer positions are expected to be filled in July 2015 at the beginning of the fiscal year.

In addition, there are many contract workers for maintenance work at both offices (In urban areas, one worker is hired for one kilometer of road as per the rule).

Based on the above, it is concluded that the institutional aspect of O&M does not have major problems because the lack of sub-engineers observed in the ex-post evaluation are going to be filled soon.

3.5.2 Technical Aspects of Operation and Maintenance

During the ex-post evaluation, it was confirmed that the Project Office, Kathmandu-1

Region Division Road Office, and the Bhaktapur Region Division Road Office received sufficient training and technical instructions, and that technical manuals were placed and utilized by the Project Office. It was also confirmed that there were not any road sections which have not been maintained for a long time due to the lack of technical skills²⁵.

In the DOR, the Road Sector Skill Development Unit (RSSDU) provides regular trainings for maintenance work in order to maintain the current technical level of O&M in the DOR.

The training for recurrent maintenance (annual routine maintenance works) is organized twice a year, in which about 30 trainees participate. The training for periodic maintenance is organized once every other year. Ad-hoc training is also provided, for example when procurement procedures are revised, in which all engineers participate. Newly recruited engineers are supposed to receive orientation trainings for two weeks.

At the time of the ex-post evaluation, it was confirmed that the Project Office, which was responsible for the O&M of the Road, was carrying out recurrent and periodic maintenance work following the O&M manual.

Based on the above, it is concluded that technical aspect of O&M does not have any problems, as the implementing agency organizes training for O&M periodically, and the Project Office which is in charge of O&M is carrying out maintenance work following the manuals provided by the project.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of project planning, the annual average cost for the recurrent maintenance and periodic maintenance (required once every several years) for 20 years after the completion of the project was expected to be 18,841,000 NRs. It was also pointed out that the DOR can cover this cost, as this is equivalent to only 0.5% of the total budget for the O&M at the DOR, which was 3,713,953,000 NRs in FY 2006/2007²⁶.

The total budget and O&M budget of the DOR are as shown in the table below. The proportion of the O&M budget to the total budget of the DOR is gradually increasing from 7.7% in 2007 to 11.3% in 2014.

²⁵ Source: Interviews with the project consultant, project contractor, and the implementing agency

²⁶ Source: Basic design study report, P3-48

Table 11 Yearly changes in the total budget and O&M Budget of the DOR

(Unit: thousand NR)

	Total budget of the DOR	O&M budget of the DOR	Proportion of the O&M budget
2009	16,989,400	1,314,500	7.7%
2010	22,162,500	1,932,400	8.7%
2011	30,884,500	2,868,000	9.3%
2012	33,922,000	3,920,000	11.6%
2013	32,939,400	4,000,000	12.1%
2014	37,419,300	4,238,600	11.3%

Source: Answers to the Questionnaire by the implementing agency

The O&M manual mentions that the necessary cost for O&M for cleaning of road surface, electricity costs for traffic lighting and signals is 27,728,000 NRs, the cost for asphalt overlay is 246,000 NRs for every ten years, the cost for bridge repair is 785,000 NRs for every ten years, the cost for bus station repair is 1,100,000 NRs for every five years, and the cost for the repair of traffic safety equipment is 1,535,000 NRs for every five years²⁷.

The annual average O&M cost, including such costs required for every 5 and 10 years, is 28,358,000 NRs. This is equivalent to 0.67% of the total O&M budget of the DOR as of 2013. As this is almost at the same level as that of the basic design survey, it is possible to say that the DOR can cover the O&M cost for the Road even at the time of the ex-post evaluation.

The maintenance budgets excluding recurrent maintenance (e.g. periodic maintenance) are distributed to Division Road Offices, based on their budget proposals and the priorities set by the DOR. In general, the priority of the budget allocation for the high speed roads, including the Road, is higher than others.

On the other hand, the budget execution of the O&M at the DOR is only 80 – 85%, and therefore all the budget allocations are not executed within a fiscal year due to the delays in the payments to contractors. Payments to contractors are delayed because the contractors do not complete their work as planned. Because the Public Procurement Act in Nepal specifies that the lowest bidder is awarded for a bidding, it is not possible to exclude bidders from it even though they have more contracts than they can handle. It is also pointed out that it is difficult to cancel contracts with contractors who failed to deliver the services on time, as the DOR has to go through lawsuits in order to cancel such contracts. In response to these problems, the DOR started taking actions by requesting bidders to submit lists of all projects that the bidders are implementing so that the DOR can check whether the bidders are implementing more projects

²⁷ Source: Documents provided by JICA

than they can handle.

Based on the above, it is concluded that financial aspect of O&M does not have any problems.

3.5.4 Current Status of Operation and Maintenance

The current status of the O&M of the Road developed by this project is generally good. Out of the necessary maintenance work mentioned in the basic design survey, there are 1) cleaning of road surface, 2) O&M of street lighting and traffic signals (electricity for traffic signals, and replacement of bulbs for street lighting), 3) grass cutting work for median strips have been carried out every year since 2011 while 4) patching work for asphalt pavement has been implemented whenever the problems are identified. Any problems in the maintenance in these aspects were not identified during the field survey.

It was also confirmed during the field survey that grass cutting and cleanings work of the road surface and drainage were carried out by the cleaning staff hired by the implementing agency.

Most of the periodic maintenance work has not been implemented because such maintenance work is not necessary as only a few years have passed since the project completion. Lane marking has been implemented about once a year. Monitoring of distilled water in lead storage batteries for traffic signals has been implemented once every two months by inspection staff hired by the implementing agency. The inspection staff make reports whenever they identify problems in lead storage batteries.

The Project Office, which is in charge of maintenance work at the time of the ex-post evaluation, is carrying out maintenance work following the O&M manual, although it does not have an annual O&M plan.

Although the implementing agency does drainage cleaning periodically, the cross drainage near the Chundivi intersection is choked by the illegal dumping by nearby residents, and the Road is covered with water for a few times a year after heavy rainfall (Such a flood continues for a few hours though vehicles can drive through the section). One of the main reasons is that Bhaktapur City does not collect garbage from citizens properly.

Based on the above, it is concluded that the current status of O&M does not have any serious problems, as the maintenance conditions are generally good. Although a section of the Road is covered with water from time to time, this is an exceptional problem due to illegal dumping from nearby citizens.

Based on the above findings, it is concluded that the institutional, technical and financial aspects of O&M do not have any problems, and the sustainability of the effects achieved by this

project is high.

4 Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to reduce the traffic congestion and traffic accidents on the Kathmandu – Bhaktapur Road, and also to reduce the travel time between the capital city of Kathmandu and the tourist city of Bhaktapur, by expanding the existing road to four lanes, thereby contributing to the industrial and economic development of the regions along the Road. This project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high. Although the project cost was within the plan, the project period exceeded the plan, due to uncertainty in the political situation. Therefore efficiency of the project is fair. The targets for traffic volume and the travel time between Kathmandu-Bhaktapur are achieved and the ratios of traffic accidents and casualties to traffic volume do not show increases, so the effectiveness of the project is high. The construction of the Road led to the industrial development of the region along the Road, as well as activation of the regional economy and improvement in the public transport services. Therefore, this project has largely achieved its objectives, and thus the effectiveness and impact of the project are high. The institutional, technical and financial aspects of operation and maintenance do not have any problems, and the sustainability of the effects achieved by this project is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Enhancement of the traffic safety measures

Although bus stations on the Road are properly operated in general, some buses load and unload passengers at intersections without traffic signals, and such embarkation and disembarkation is not necessarily safe. Therefore, it is recommended that the implementing agency enhance collaboration with the Traffic Police to strengthen the traffic safety measures at such intersections. (For example, the Traffic Police is recommended to prohibit buses to load and unload passengers outside bus lanes. The Traffic Police is also recommended to instruct bus passengers to use bus stops).

Enhancement of maintenance work

The maintenance work of the Road is currently under the responsibility of the Project Office, and is going to be transferred to the Division Road Offices, when service roads are

completed. Therefore, the Project Office is recommended to transfer the O&M manuals prepared by the project consultant to the Division Road Offices in a precise manner and also complete technical transfers when the service roads are completed.

The cross drainage near Chundivi intersection is choked by the garbage dumped by nearby residents and the road is covered with water after heavy rainfall. The implementing agency is therefore recommended to take further actions to prevent the cross drainage from being choked by garbage, by cleaning the drainage with high pressure water pumps periodically as depicted in the O&M manuals.

Improvement in contractor selection

The road pavement works commissioned to contractors were delayed in this project, and the road maintenance works commissioned to contractors are delayed in many cases. Therefore, there is some room for improvement in the selection of contractors. In order to address this issue, the DOR is currently requesting bidders to submit lists of all projects the bidders are implementing. It is then recommended that all divisions in the DOR, including Division Road Offices, take the same actions to exclude the contractors which are implementing construction works that are greater than their financial capacities.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Traffic safety measures soon after the road opening

In this project, the number of traffic accidents due to the mixed transport of large sized vehicles, motorbikes and auto- tricycles was expected to decrease by improving intersections and bus stations. However, the number of traffic accidents increased because the bus riders and residents started crossing the Road, although the traffic speed increased when the Road was opened to traffic.

In reaction to this, JICA changed the project design to construct the road fences at median strips, and the implementing agency constructed several overhead bridges and additional road fences. As a result, the number of traffic accidents started decreasing. Therefore, it is recommended to carefully consider road safety issues from the project planning stage, and to take sufficient road safety measures as soon as roads are opened to traffic, especially where there are many residential houses.

It is also recommended to carefully consider road safety measures when constructing high speed roads in countries where such roads are not very common, so that the increase in traffic

accidents after the road opening can be avoided.

(End)

Federated States of Micronesia

Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Improvement of Pohnpei International Airport”

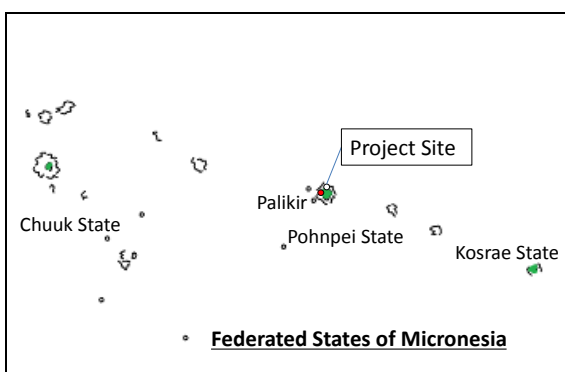
External Evaluator: Keisuke Nishikawa, Japan Economic Research Institute Inc.

0. Summary

In this project, a runway was rehabilitated and extended and a terminal building was expanded and renovated to improve the safety of airplanes at the time of takeoff and landing while increasing the capacity of passenger handling. This project was consistent with the development plan and needs of the Federated States of Micronesia (hereinafter referred to as ‘FSM’), as well as the priority areas of Japan’s ODA policy. Therefore, the relevance of this project is high. With regard to project implementation, the project components were implemented mostly as planned and the project cost was within the planned amount. However, the efficiency was judged to be fair as the project period exceeded the plan. With respect to project effectiveness, it was confirmed that the quantitative targets, such as easing of payload and time required for various inspections expected at the time of planning, were mostly achieved, and safety at the time of takeoff and landing, a qualitative effect, also improved. As to the impact of the project, it was confirmed that the stress on pilots during takeoff and landing was reduced, and the service level of the airport was improved. Therefore, the effectiveness and impact of this project are high. Regarding sustainability, there were no particular issues in terms of all institutional, technical and financial aspects, and operation and maintenance status. The project effects generated in this project are considered to be sustained in the future.

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

1. Project Description



Project Location



Runway extended in this project

1.1 Background

The Pohnpei International Airport is the capital airport of FSM and the only airport on Pohnpei Island with a 6,022ft (1,836m)-long runway. But the airport had problems of utmost urgency and importance including the following: facilities related to the runway were not in compliance with safety standards, runway length was not sufficient, and capacity of the passenger terminal building was not sufficient. Specifically, the distance from the end of the runway to the seawall at that time was only about 90ft (29m), and the runway was not equipped with a blast pad (200ft long) and a runway safety area beyond it, though they were required to do so according to the standard of the Federal Aviation Administration (hereinafter referred to as 'FAA'). The runway of 6,022ft was not long enough for takeoff of a B737 with full payload, and a weight restriction was imposed for its operation. Moreover, the apron could not accommodate aircrafts larger than B737-class aircraft. The passenger terminal building did not have sufficient capacity to handle passengers at peak-hour in the departure lounge nor the immigration control area for arrivals, leading to severe congestion.

Based on this background, a request was made by the FSM Government to Japan in 2004 for the development of a study for the improvement of Pohnpei International Airport, and the study was conducted from 2005 to 2006. A mid-term development plan was devised in the study as an airport development master plan, and urgent tasks were extracted as the Urgent Improvement Plan. Responding to this plan, a request for grant aid was submitted to Japan for a runway extension at the Pohnpei International Airport¹ in September 2005. An additional request for expansion of the terminal building was made in March 2006, and it was decided to implement the project.

1.2 Project Outline

The objective of this project is to improve the safety of airplanes at the time of takeoff and landing by rehabilitating and extending the runway and to increase the capacity of passenger handling by expanding and renovating the terminal building.

¹ The main items requested were as follows: Reclamation for runway extension, Construction of runway, shoulder and turn pad, Expansion of taxiway fillet, Expansion of apron, Installation of airfield lighting (for the extended runway area), procurement of ground service equipment and other miscellaneous works.

Grant Limit / Actual Grant Amount	2,913 million yen / 2,790 million yen
Exchange of Notes Date	September, 2008
Implementing Agency	Department of Transportation, Communication and Infrastructure / Pohnpei Port Authority
Project Completion Date	August, 2011
Main Contractor	Construction: Penta-Ocean Construction Co., Ltd.
Main Consultants	The Consortium of Nippon Koei Co., Ltd. and Japan Airport Consultants, Inc.
Basic Design	January, 2008 (Implementation Review: February, 2009)
Detailed Design	June, 2008 (Detailed Design after Implementation Review: April, 2009)
Related Projects	[Grant Aid] (Preparatory Study) The Preparatory Study on the Improvement of Pohnpei International Airport (FY 2004) (Development Study) The study on the Improvement of Pohnpei International Airport (FY 2005 – 2006) [Other Donors] US Federal Aviation Administration: Rehabilitation of Runway, Taxiway and Apron (2007 – 2011, Grant)

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa (Japan Economic Research Institute Inc.)

2.2 Duration of Evaluation Study

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

Duration of the Study: October, 2014 – September, 2015

Duration of the Field Study: December 8 – 20, 2014 and March 23 – 26, 2015

3. Results of the Evaluation (Overall Rating: A²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of FSM

Following the revision of the Compact of Free Association⁴ with the United States in 2003, FSM formulated the ‘Strategic Development Plan’ (hereinafter referred to as ‘SDP’) in 2004, aiming to achieve stable economic development in the country.

The ‘Infrastructure Development Plan 2004-2023’ (hereinafter referred to as ‘IDP’), formulated based on the SDP, listed an investment plan for infrastructure development in 10 sectors over the following 20 years. The plan included air transportation with investments of 68.4 million dollars, comprising 9% of the entire amount. Regarding airport development in the plan, pavement and rehabilitation of the runway, taxiway, and apron at Pohnpei International Airport were listed as some of the short-term goals for existing facilities, and the extension of the airport’s runway was also listed as a mid to long-term goal.

The above goals had already been set at the time of planning this project. As the SDP and the IDP were both long-term development plans from 2004 to 2023, these priorities remained unchanged at the time of ex-post evaluation, and the aviation sector was positioned as core infrastructure for both points of time in the island nation of FSM. No new overarching plans had been formulated at the national level or the aviation sector level.

Under FSM’s Mori administration, priority areas promoting economic growth were agriculture, fisheries, tourism and energy, and the transportation sector was regarded as key infrastructure underpinning those areas. Therefore, the importance of this project at a policy-level had remained high.

Based on the above, the policy-level importance of the aviation sector in FSM was high and it was confirmed that the sector was positioned as core infrastructure in terms of infrastructure development, both at the time of planning and ex-post evaluation. Therefore, this project can be judged highly consistent with the development plan.

3.1.2 Relevance to the Development Needs of FSM

For the island country of FSM, air transportation is an essential means of transport connecting FSM with neighboring countries as well as the islands of each state scattered

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

³ ③: High, ②: Fair, ①: Low

⁴ Compact of Free Association: A bilateral agreement signed between FSM and the United States on political, defense, and economic cooperation. The current agreement will come to an end in 2023, when financial assistance from the United States is expected to be terminated.

within the country. While Pohnpei International Airport is positioned as the capital airport of the country, the distance between the end of the runway and the seawall was shorter than 30m and the blast pad was less than half the length (61m) required by the international standard at the time of planning. In other words, a safety area for any overrun cases at the time of aircraft takeoff and landing was not sufficiently secured. As the runway length was insufficient in this way, there was a need to reduce the loading weight of passengers and cargo by 20% for takeoff and landing of the operating B737s. Regarding the structure of the runway, the central area of the existing runway had continued to subside due to loose ground, but no fundamental improvement was made though temporary measures were taken by overlaying works. Moreover, not only the runway but also the facilities of the terminal building such as the departure lounge, were not large enough for the number passengers the B737s were carrying.

At the time of ex-post evaluation, the ‘Island-hopper’ route⁵ connecting Guam, Chuuk State, Pohnpei State, Kosrae State, then Hawaii through the Marshall Islands, was not only indispensable for FSM domestic travelers but served as the only international air route of the nation.

Key air transportation data at Pohnpei International Airport in recent years are shown below.

Table 1: Key Air Transportation Data

(Unit: Number of landing – actual number, Passenger numbers – person, Cargo volume – thousand pounds)

	2008 (Plan)	2009	2010	2011 (Completion)	2012	2013	2014
Number of landing (Passenger plane)	362	366	365	367	367	364	369
Number of landing (Cargo plane)	245	262	131	105	105	106	91
Departing passenger numbers	18,738	19,003	21,136	21,149	20,920	20,115	18,658
Arriving passenger numbers	17,951	18,352	20,909	21,240	19,272	18,923	18,195
Departing cargo volume	3,555	4,344	2,626	1,744	1,194	702	584
Arriving cargo volume	326	201	205	178	202	138	131

Source: Data provided by the Implementing Agency

From Table 1, it can be observed that the numbers for cargo planes and cargo volume have been on a declining trend since the time this project was completed. According to the Implementing Agency, the main reason was the migration in recent years of tuna from fishing grounds around Micronesia to the waters off of the Marshall Islands. On

⁵ Operated by the United Airlines

the other hand, while the number of passengers declined slightly over the last few years due to higher air ticket prices, it has stayed around 20,000 annually for both departure and arrival, and it can be said that there has been a generally firm demand for passenger transport.

After the implementation of this project, and while no further development needs had particularly arisen at Pohnpei International Airport through the completion of it, the airport has played a role as a core infrastructural facility both at the time of planning and ex-post evaluation, being the only airport in Pohnpei State not only to enable air travel for people and cargo but also serve as the airport of FSM's capital. In addition, the needs to improve safety such as rehabilitation of the runway including measures against ground settlement and the development of an area for cases of overruns, which were the objectives of this project, was high both at the time of planning and ex-post evaluation, meaning that this project was consistent with the development needs.

3.1.3 Relevance to Japan's ODA Policy

In the leader's declaration adopted at the Fourth Japan-Pacific Islands Forum Summit Meeting held in 2006, Japan presented to the Pacific Islands five areas of priority – economic growth, sustainable development, good governance, security, and people-to-people communication and exchange. In light of one of the priorities, 'Economic growth: cooperation in such areas as trade, investment, infrastructure, fisheries and tourism' and the items agreed upon at the Japan-FSM policy consultation in February 2006, Japan prioritized infrastructure development, education, environmental conservation, administrative service function strengthening, and health in its ODA policy for FSM.

This project improved the airport which was the core infrastructure of FSM and was in conformity with the priority area to support infrastructure development. Therefore, this project was highly consistent with Japan's ODA policy at that time.

3.1.4 Appropriateness of Project Planning and Approach

This project comprised part of the overall improvement of Pohnpei International Airport, and was implemented almost at the same time as the US-assisted Airport Improvement Program (hereinafter referred to as 'AIP'). As a result of consultations with FSM's Department of Transportation, Communication and Infrastructure, and FAA, development items regarding the runway, apron, airfield lighting, etc., were shared to develop airport facilities with safety as a whole. When the entire airport was checked at the time of ex-post evaluation, no negative influences on project effectiveness were observed and it can be said that role-sharing was appropriately planned.

In this project, it was expected that ground settlement would occur in one part of the extended runway with knowledge of an old existing survey map for seabed topography having been used. As a consequence, subsidence status was monitored for a certain period of time, and the extended runway became open for use in June 2012 after the subsidence stopped. At the time of ex-post evaluation, it was confirmed that no largely influential subsidence had actually been occurring and there were no problems for runway operations. According to the interviews with the flight control room and United Airlines (including pilots), installation of airfield lights on the eastern end of the reclaimed and extended runway was delayed but it was not a major problem as most landings were made from the western side of the existing runway and few from the eastern side at night due to not only wind direction but also the pilot's awareness of the lack of airfield lights. The airfield lights were installed in February 2014 and a flight check was conducted after that in November 2014.

Based on the above, it can be judged that there are no negative influences on project effectiveness and no particular issues are identified in terms of the appropriateness of the project planning and approach.

This project can be said to have been in line with FSM's development plans and needs as the airport has played an indispensable role in the air transportation of this island nation, at the time of planning and ex-post evaluation. It has also served as a project to support infrastructure development, which was a priority area for Japan in the Pacific islands and FSM at the time of planning, and was highly consistent.

In light of the above, the implementation of this project is consistent with FSM's development plan, development needs and Japan's ODA policy. Therefore, the relevance of this project is high.

3.2 Efficiency (Rating:②)

3.2.1 Project Outputs

In this project, it was planned to extend the runway, expand the terminal building and procure necessary equipment at Pohnpei International Airport. Table 2 shows original and actual outputs of this project.

Table 2: Original and Actual Outputs of This Project

Facilities and Equipment	Original (as of Basic Design)	Actual
Construction of the extended runway (including reclamation and seawall, etc.)	Length: 228m Width: 152 – 198m Seawall length: 650m Reclaimed area: 36,500m ² Reclamation soil volume: 208,000m ³	Length: 232m Width: 152m Seawall length: 660m Reclaimed area: 36,500m ² Reclamation soil volume: 329,000m ³
Construction of runway and shoulder	Runway: Length 176m, Width: 45.7m Shoulder: Width 7.5m Blast pad: Length 60.9m, Width 60.9m	Runway: Length 176m, Width: 45.7m Shoulder: Width 7.6m Blast pad: Length 60.9m, Width 60.9m
Construction of turn pad	Area for mid-sized aircraft: Approx. 3,700m ²	Area for mid-sized aircraft: Approx. 3,700m ²
Airfield lighting system	Runway edge light: 6 Precision Approach Path Indicator (PAPI): 4 Runway End Identification Light (REIL): 2 Distance remaining sign: 1 set	Runway edge light: 6 Precision Approach Path Indicator (PAPI): Foundation only Runway End Identification Light (REIL): Foundation only Distance remaining sign: 1 set
Expansion of Apron	Area 1,790m ²	Area 1,790m ²
Construction of other facilities	Security fence: 802m Perimeter road: 650m Road and parking: 1,160m ² etc.	Security fence: 800m Perimeter road: 660m Road and parking: 1,160m ²
Expansion of passenger terminal building	Additional building: 1,288m ² Renovation: 1,079m ² (out of 1,870m ² existing terminal building)	Additional building: 1,365m ² Renovation: 1,040m ²
Procurement of equipment for the terminal building	X-ray screening device: 1 Baggage handling system: 2 Baggage trolley: 30	X-ray screening device: 1 Baggage handling system: 2 Baggage trolley: 30

Source: Basic Design Study Report, Information provided by the project consultant, and Information provided by JICA

As indicated in Table 2, more reclamation soil needed to be used than originally planned due to the ground for the extended runway being softer than expected, but it was confirmed during the site survey of the ex-post evaluation that other facilities and equipment were constructed and procured mostly as originally planned and were all being utilized. No facilities or equipment had troubles⁶. In this project, as the project consultant that worked on the basic design study was changed⁷ after the Exchange of Note was signed, an implementation review study was conducted to check the survey and design details undertaken until then and to re-estimate the approximate project cost and review the implementation process. As a consequence, slight changes were made, such as the shape of the seawall in the extended runway area, further expansion of the

⁶ Since originally installed air conditioners had broken down, the implementing agency purchased alternative air conditioners and were operating them. There were deemed to be no problems.

⁷ As Pacific Consultants International (PCI) declined bidding assistance and construction management after the company was found to have been conducting fraud and corruption activities in other ODA projects, an alternative consultant needed to be selected to conduct an implementation review study.

terminal building, and a reduction in the number of sprinklers. However, all of these changes did not negatively affect the project effectiveness, and it can be said that these changes did not cause any problems as a whole.

As stated above, this project shared development items with US-assisted AIP, and Table 3 shows the summary of those shared items.

Table 3: Components Shared between this Project and the Airport Improvement Project Supported by the United States

Facility	This Project	AIP
Runway	Reclamation for runway extension Construction of runway and shoulder Construction of turn pad	[Existing runway] Overlay pavement Construction of shoulder Improvement of settlement portion
Taxiway and apron	Construction of partial apron shoulder	Widening of taxiway fillet Taxiway resurfacing Taxiway shoulder pavement Construction of concrete hardstand Resurfacing of apron
Airfield lighting	<u>[Installation in the extended area]</u> a) Runway edge light (New installation) b) Turn pad edge light (New installation) c) Runway threshold light / Runway end light (Relocation)	<u>[Installation in the extended area]</u> a) Runway edge light (New installation) b) Taxiway (Turn pad) edge light (New installation) c) Runway threshold light / runway end light (New installation)
	<u>[Installation over the entire runway]</u> e) Illuminated distance marker (Relocation 9, new installation 1)	d) Apron edge light (New installation) f) Apron floodlight (New installation. One of them relocated in accordance with apron shoulder expansion in this project)
	h) Runway end identification light (Foundation only) i) Precision approach path indicator (Foundation only)	h) Runway end identification light (Procurement and installation) i) Precision approach path indicator (Procurement and installation)
Miscellaneous work	Other miscellaneous work (Fence, drainage etc.)	Construction of perimeter fence and road around the existing runway strip
Terminal building	Expansion of terminal building (additional building) and renovation of existing building Security equipment Baggage handling equipment	
Fire Station		Construction of Aircraft Rescue & Fire-Fighting (ARFF) building

Source: Basic Design Study Report and Information provided by the project consultant

With regard to the relationship between this project and AIP, it can be said that role-sharing was appropriately planned as referred to in ‘3.1.4 Appropriateness of Project Planning and Approach’.

In addition to the development supported by Japan and the US, FSM Government was expected to undertake some tasks. Major tasks are shown as follows.

[Pre-construction Preparation]

- To provide necessary data and information to implement the project
- To secure land necessary to implement the project
- To remove existing structures and to clear and level the site
- To coordinate with persons concerned at the airport and with the AIP project

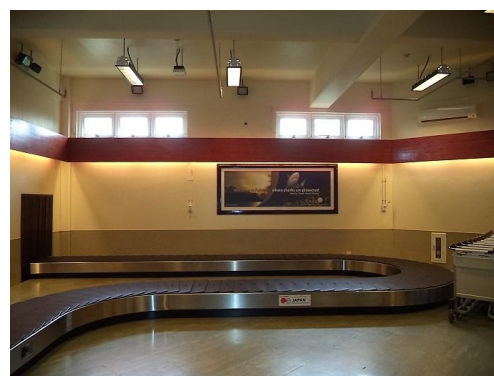
[During the Construction]

- To coordinate with the AIP project
- To implement the flight check for the runway and airfield lights
- To issue necessary NOTAM (information for aircrafts)

According to the Implementing Agency, items to be borne by FSM before and during the construction were all implemented. Airfield lights, whose installation was delayed, were also installed in 2014 and a flight check was conducted in the same year. While the commencement of the runway with the airfield lights installed in the extended area was delayed until 2014, no problems were actually caused as all aircraft⁸ pilots using the runway were aware that lights had yet to be installed. In fact, no problems were identified in the ex-post evaluation as the extended runway was always being utilized with all the facilities developed and operational after the installation of airfield lights and the flight check in 2014. While it is considered to have been more desirable to have the airfield lights installed much earlier, there were no issues in practice at actual takeoffs and landings as the airport and United Airlines staff had sufficient understanding of the status of the runway.



X-ray Screening Device



Carousel for Checked-in Baggage

⁸ Mainly Boeing-737 operated by the United Airlines

3.2.2 Project Inputs

3.2.2.1 Project Cost

The approximate cost of this project to be borne by Japan was planned at 2,913 million yen, with approximately 3 million yen (25,000 dollars) planned as banking fees to be borne by FSM.

Table 4 summarizes the actual costs contributed by Japan.

Table 4: Actual Project Cost

(Unit: million yen)

	Local currency (Locally procured)	Foreign currency (Procured from Japan)	Foreign currency (Procured from a third country)	Total
Facility construction	1,272.0	1,272.0	62.6	2,606.6
Direct construction	1,055.7	1,058.3	62.6	2,176.5
Other construction	216.3	213.7	0	430.1
Equipment procurement and installation	15.8	27.9	1.6	45.3
Design and supervision	23.9	115.1	0	139.0
Total	1,311.7	1,415.0	64.2	2,790.9

Source: Data provided by the project consultant

While the original approximate project cost was calculated at the time of basic design study, it was recalculated in the implementation review study conducted after the signing of Exchange of Note to be 2,860 million yen due to fluctuation of the exchange rate. While the expenses increased and decreased due to the changes in detailed design and selection of construction items, the actual resulting cost of 2,790 million yen was within the plan (96% of the plan). Even in comparison to the amount recalculated in the implementation review study, it was confirmed to be within the planned amount.

On the other hand, it was not possible to obtain the accurate input amount by the FSM Government as the data on expenses specific to this project had not been sorted and stored. Consequently, the evaluation of the project cost was based on a comparison of the Japanese portion.

3.2.2.2 Project Period

The period of this project was expected to be 28 months including detailed design and bidding periods. However, the actual period was 37.5 months from September 2008 to October 2011, exceeding the planned period (134% of the plan).

As the project consultant was changed and the implementation review study was

conducted after the Exchange of Notes was signed, there was a delay of approximately 6 months⁹ until the actual detailed design and bidding process started. There was a need to extend the period by another 2 months due to design change procedures conducted during the final stage of this project¹⁰ on a request received from the FSM Government to exclude the installation of markers on the extended runway area. These were the main factors for a longer project period.

In this project, outputs necessary to generate project effectiveness were achieved though there were slight changes to detailed components. The project cost for outputs was within the planned amount but the project period exceeded the plan by 34%. Therefore, the efficiency of the project is fair.

3.3 Effectiveness¹¹ (Rating:③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of project planning, it was expected that an easing of weight restrictions and a shortened immigration and customs clearance time through the implementation of this project would be operation indicators.

Table 5: Operation Indicators of this Project

Indicator	Baseline (2007)	Target (2012)	Actual			
			2011	2012	2013	2014
	Planning	1 year after completion	Completion year	1 year after completion	2 years after completion	3 years after completion
Easing of payload	Reduced by approx. 20%	Eased (increase by 12% (cargo arrival) / by 20 seats)	No data (However, no weight restriction is imposed)			
Time required for immigration	9.5 minutes	5 minutes	5 minutes	5 minutes	4 minutes	3 minutes
Time required for customs clearance	2.6 minutes	1.6 minutes	2 minutes	2 minutes	2 minutes	2 minutes

Source: Basic Design Study Report and Data provided by the Implementing Agency

Note: According to the Implementing Agency, the length of time required for immigration and customs clearance is approximate.

The effect of this project (operation indicator) was expected to be seen soon after the inauguration of the facilities. As the completion of the terminal building was March

⁹ A contract with a new consultant was signed in March 2009.

¹⁰ The main construction for this project was divided into three terms (Term 1: July 2009 – March 2011, Term 2: January 2010 – March 2011, Term 3: March 2011 – August 2011). Term 3 itself was completed by the end of the contract (August 2011).

¹¹ Sub-rating for Effectiveness is to be put together with consideration of Impact.

2011 and the completion of runway-related works was August 2011, this evaluation was based on 2012 data.

With regard to weight restriction, while detailed weight data could not be obtained from United Airlines, their regional director and Pohnpei International Airport manager commented that they had not imposed any particular restrictions on the weight nor the number of passengers due to the length of the runway after the implementation of this project. There were also comments obtained from their pilots that there had not been any special restrictions imposed. As shown in Table 1, one factor is that the gross weight of the aircraft was lessened due to a reduction in the cargo volume, but the extension of the runway to 2,068m has enabled the level of loading originally targeted. Therefore, it is considered that the original target has been virtually achieved¹².

With regard to the length of time required for immigration and customs clearance and according to the Implementing Agency, shorter inspections became possible as the immigration booths increased from 3 in the past to 6 after the project implementation and the customs and quarantine areas were expanded substantially from prior to implementation. The length of time required for immigration and customs clearance cannot be generalized as items to be inspected could vary at each time, but they became 5 minutes and 2 minutes respectively in the target year of 2012, indicating that the time was clearly shortened. No congestion due to insufficient capacity of facilities has occurred after the project implementation, and it can be said that the target has generally been achieved.

Since then, the time for immigration became even shorter at 4 minutes in 2013 and 3 minutes in 2014 as the officers became more experienced. It was heard that immigration check items had not been changed in particular before or after the project.

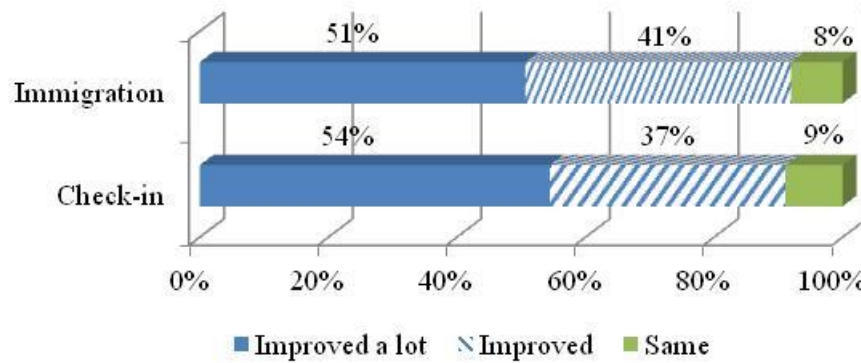
It was also heard from the Implementing Agency and the airline that, in addition to the reduction in time for immigration, set as an indicator, the inspection of check-in baggage became efficient as an X-ray screening device and baggage handling equipment were introduced to the departure process.

In the ex-post evaluation, a beneficiary survey¹³ targeting airport users was

¹² The length of the runway is 1,831m at Chuuk Airport and 1,753m at Kosrae Airport, both of which are connected with Pohnpei Airport on the Island-hopper Route. While it is possible to make landings at these airports even if the aircrafts from Pohnpei International Airport are on full payload, takeoffs from these airports with full payload are still difficult as the runways are short. Therefore, under the current condition where only the Island-hopper Route is operating, it is difficult to say that the merit of runway extension at Pohnpei International Airport has been fully utilized. However, as it was outside the scope of this project that the runways at Chuuk and Kosrae airports have not been extended, this point was not included in evaluation judgment.

¹³ An interview survey with 103 departing passengers who have used Pohnpei International Airport before and after the implementation of this project was randomly conducted mainly in the airport departure lounge. The survey mainly concerned the change in check-in process and immigration check, satisfaction with the improvement of the terminal facilities and auxiliary facilities, maintenance status, etc.

conducted to gather opinions on the improvement status of immigration checks and the check-in process. More than 90% of the users responded that the procedures ‘improved a lot’ or ‘improved’, indicating an effect of the project implementation.



Source: Result of the Beneficiary Survey

Figure 1: Satisfaction Level with Immigration and Check-in Procedures

3.3.2 Qualitative Effects (Other Effects)

At the time of project planning, safety of the runway was not secured at Pohnpei International Airport as the distance between the end of the runway and the seawall was only 29m. However, it was expected that safety at the time of takeoff and landing was expected to improve with the construction of a blast pad (61m) and runway safety area (24m) in this project. In 2008, when this project was being planned, Asia Pacific Airlines, operating cargo services, caused an overrun accident at Pohnpei International Airport, and one of the factors was said to be the short runway.

According to the Implementing Agency and the airline (United Airlines), sufficient safety has been secured for airplane takeoff and landing after the implementation of this project.

Based on the above, it can be judged that sufficient safety has been secured, as planned, with a sufficient distance from the end of the runway to the coast line.

3.4 Impacts

3.4.1 Intended Impacts

At the time of project planning, the following impacts of the project implementation were expected.

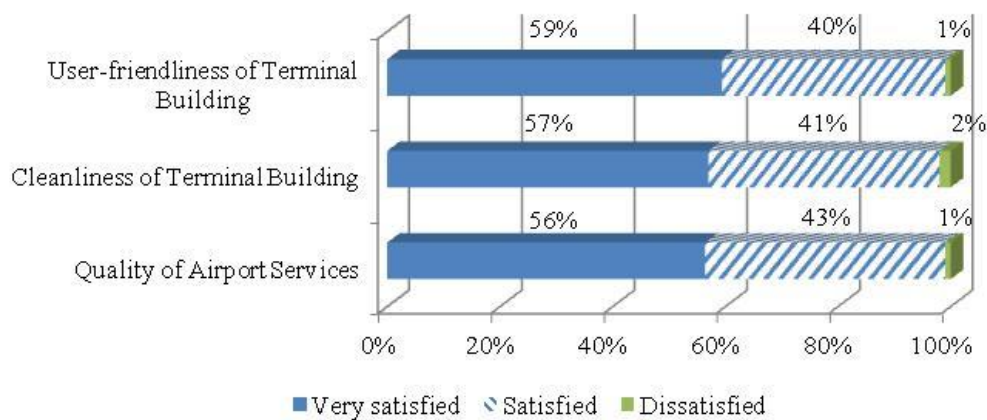
- (I) Medium-sized aircraft Boeing-767 can make a landing in the event of emergency.
- (II) The stress on pilots during takeoff and landing will be reduced.

(III) The service level as an international airport for passengers including foreign tourists will be improved.

With regard to (I), it is only the B-737 or B-727, smaller than the B-767, that are making takeoffs and landings at Pohnpei International Airport after the implementation of this project, and no takeoff or landing by a B-767 has actually been performed. Even if it were to actually land, Pohnpei International Airport would not have equipment such as boarding steps for passengers for the B-767. However, as a result of the runway extension, ‘emergency landing’ has become possible as a B-767 can technically perform takeoffs and landings.

Concerning (II), the reduction of the psychological burden of pilots at the time of takeoff and landing, pilots on United Airlines B-737s commented that the operation itself had not changed before or after the project, but their psychological burden was significantly reduced as there is a sufficient distance from the end of the runway. Therefore, an expected impact has clearly been generated.

Regarding (III), the improvement of services as an international airport, the following is a result of the beneficiary survey on satisfaction of the airport and the extent of service improvement.



Source: Result of the Beneficiary Survey

Figure 2: Satisfaction Level of Airport Users

As in Figure 2, it has become clear that satisfaction was high for airport facilities such as the ease of use and cleanliness of the terminal building, and almost all the respondents were satisfied with the quality of airport services. As to the question on whether airport services improved after the airport improvement was implemented, 62% replied that they ‘Improved a lot’ and 31% answered ‘Improved’, while the remaining

7% responded 'Same', showing that the service improved with the implementation of this project and users were satisfied with the service. As the largest changes felt by airport users were the easing of congestion and the improvement of comfort of the terminal building, it is thought that this project made a large contribution to the impact expected in (III).

While no induced effect of this project on the local economy was confirmed, Pohnpei International Airport has been receiving nearly 20,000 visitors annually as indicated in Table 1, and the quality of services provided to these airport users is higher than before. Consequently, it is clear that airport users have been highly satisfied.

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

In the development study conducted before the implementation of this project, the Environmental Impact Assessment (EIA) was conducted regarding the impact of this project on the natural environment. It was confirmed as a result that undesirable environmental impacts would be very minor and the EIA was approved in April 2006 by the Environmental Protection Agency of the Pohnpei State.

When concrete project details were discussed, it was necessary to take appropriate measures such as installing contamination prevention film during construction as water contamination could have occurred when the land was reclaimed. With these measures, it was believed that negative environmental impact would be prevented.

According to the Implementing Agency and beneficiary survey, no negative impact on the natural environment was observed during or after the project when checked during the ex-post evaluation study. According to the EPA of Pohnpei State, installation of the contamination prevention film, monthly monitoring of water quality, and waste disposals were all conducted appropriately during the project. The soil for reclamation of the extended runway was dredged from a nearby island and all the requirements by EPA were observed. A survey was conducted on the impact of the extended runway reclamation on the ocean's current, and no problems have been reported in all fields even after the completion of the project.

As shown above, the use of contamination prevention film, monitoring of water quality, waste disposal, etc., were all conducted without problem, and no negative impact on the natural environment has occurred during or after the project. Therefore, no problems are observed.

3.4.2.2 Land Acquisition and Resettlement

According to the Implementing Agency and EPA of Pohnpei State, this project was

implemented within the existing land area, no fishermen were active in the reclaimed area as their main fishing ground, and no complaints had been received from residents. It can be judged that there were no problems as no resettlement and land acquisition cases occurred.

With regard to effectiveness, it was confirmed that no restrictions on the payload of airplanes had been imposed in practice after the implementation of this project, though concrete data on weight restrictions were not provided and the demand for cargo decreased. It can also be said that the target figures of other indicators were generally achieved. The safety of airplane takeoff and landing improved with the runway extension satisfying the international standards, and the effect of eliminating the psychological burden of pilots at takeoff and landing was seen. Furthermore, the airport's handling capacity and service level also improved with the expansion of the terminal building. Regarding the impact on the natural environment, there were no negative impacts as sufficient countermeasures were taken, and neither resident resettlement nor land acquisition cases occurred.

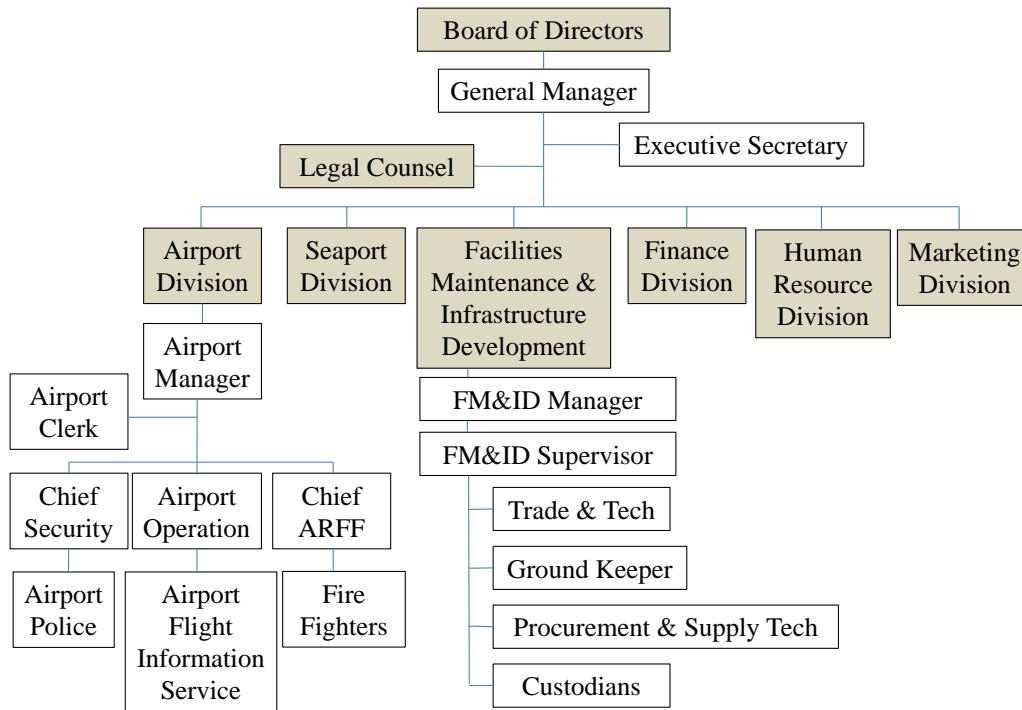
In light of the above, the effectiveness and impact of this project are high.

3.5 Sustainability (Rating:③)

3.5.1 Institutional Aspects of Operation and Maintenance

This project was implemented with Pohnpei Port Authority (hereinafter referred to as 'PPA') as the implementing agency and the Department of Transportation, Communication and Infrastructure (DOTC&I) as the governmental department in charge. DOTC&I was responsible for policy planning at the FSM national level, and port authorities in each state were in charge of actual operations and management of airports. This structure remained the same at the time of ex-post evaluation.

PPA, managing Pohnpei International Airport, consists of 6 divisions under a general manager with a total of 82 members at the time of ex-post evaluation. The divisions are Airport Division, Facilities Maintenance & Infrastructure Development Division, Seaport Division, Finance Division, Human Resource Division, and Marketing Division. The Airport Division is operating the airport, and the Facilities Maintenance & Infrastructure Development Division is undertaking the maintenance of facilities. No issues were observed in terms of organizational structure and the number of staff members.



Source: Prepared based on the information provided by PPA

Figure 3: Organization Chart of Pohnpei Port Authority (Simplified version)

FAA has been the safety administrator of FSM airports since the days of Trust Territory of the Pacific Islands, before FSM became independent, and has set all the regulations pertaining to airport administration. In terms of equipment maintenance, it was confirmed that FAA was directly operating and maintaining the Runway End Identification Light (hereinafter referred to as ‘REIL’) and the Precision Approach Path Indicator (hereinafter referred to as ‘PAPI’) at the time of ex-post evaluation¹⁴.

3.5.2 Technical Aspects of Operation and Maintenance

According to the Implementing Agency, there were no technical problems with maintaining the facilities and equipment at Pohnpei International Airport. When the actual operation and maintenance status was checked during the site surveys in the ex-post evaluation, no technical issues were found in particular, and it was thought that there were no technical problems as a whole.

However, as stated above, FAA has been maintaining REIL and PAPI among all airfield lights even during at the time of ex-post evaluation since PPA does not possess qualifications or capacities to implement it. Therefore, FAA is scheduled to continue operation and maintenance. It can be judged however; there are no concerns in terms of

¹⁴ Technicians based in Guam undertake maintenance activities by visiting Pohnpei International Airport every month. All expenses are borne by FAA.

the technical aspect of airport operations and management as FAA has set and administered the regulations on airport safety management due to historical background, and it is expected that this policy will be sustained.

With regard to training on technical capacity improvement, a training program has been carried out every year mainly by FAA for airport staff in the field of rescue, firefighting, and airport security. Two Micronesian air traffic controllers are on duty after obtaining and renewing their qualifications with the support of FAA. It was thought that there were no problems with the overall training system.

3.5.3 Financial Aspects of Operation and Maintenance

The financial statement of PPA has not been sorted by division and the operation and maintenance expenses for airport and seaport are integrally processed. Therefore, it was not possible to obtain the expense reports specific to the airport.

Much of PPA's revenues come from the seaport such as through port charges and airport-related revenues which are relatively small. However, the entire authority has been recording a surplus in recent years except the Financial Year (FY) 2011. In particular, a large surplus was recorded in FY2013 due to a significant increase in port revenues.

No financial problems in relation to sustainability were observed as it was heard that a necessary amount had been spent for operation and maintenance of the airport.

Table 6: Statement of Revenues and Expenses

(Unit: thousand dollars)

FY (October - September)	FY2009	FY2010	FY2011	FY2012	FY2013
[Operating Revenues]					
Departure fees	176	196	192	183	224
Land leases and space rentals	358	442	414	418	457
Landing fees	98	103	88	87	91
Other	52	13	33	30	145
Seaport charges	2,000	2,036	1,600	1,753	2,724
Less allowance for doubtful debts	-287	-165	-67	-9	160
Net operating revenues	2,396	2,624	2,260	2,463	3,800
[Operating Expenses]					
Salaries and benefits	972	1,003	1,101	1,050	1,070
Depreciation and Amortization	562	469	406	428	424
Utilities	113	113	174	244	291
Travel	111	118	92	118	101
Maintenance	188	197	260	197	266
Other	145	234	242	196	490
Total operating expenses	2,091	2,063	2,276	2,234	2,642
Earnings from operations	305	561	-16	229	1,158
Non-operating revenues (net)	16	0	9	6	175
Change in net assets	321	561	-8	234	1,334

Source: Prepared from PPA Annual Reports

While it does not appear on PPA's financial statement, FAA has supported some expenses for maintenance and training (details could not be obtained) in addition to the training and maintenance expenses provided by PPA. After the Compact of Free Association between FSM and the US comes to an end in 2023, it is not clear if sufficient support at the current level will be provided. As it is possible that the amount of support will be slashed, it is considered to be necessary to continue the efforts to secure and expand their own revenue source by 2023.

3.5.4 Current Status of Operation and Maintenance

In this project, subsidence of the extended runway area continued to occur since the construction period, as already stated. However, it was confirmed that the subsidence had almost stopped 6 months after the completion of construction, and the extended area was put to use in June 2012. According to PPA and the project consultant, as this subsidence was expected to last for some time right from the beginning, the subsidence level was surveyed monthly after the construction was completed to record the subsidence status of the entire reclaimed area. No further subsidence had occurred to the time of ex-post evaluation, and there seems to be no problems to keep using the runway.

It was additionally confirmed that the facilities and equipment developed in this project were generally managed in good condition. In PPA's Facilities Maintenance & Infrastructure Development Division, a maintenance plan defining the inspection items and frequencies of checks of airport facilities and equipment such as those for the terminal building, rescue and firefighting, runway fence, runway lights and markings were prepared and operated, and inspected using a worksheet. Regarding the procurement of spare parts, it was heard that while transportation after placement of order could require some time, there were generally no problems including the budget.

Overall, there are no major issues in terms of operation and maintenance as PPA had formulated a maintenance plan and the facilities and equipment were generally in good condition.

In light of the above, there are no particular concerns on the institutional, technical and financial aspects as well as operation and maintenance status. Therefore, the sustainability of the project effects is high.

4. Conclusion, Recommendations and Lessons Learned

4.1 Conclusion

In this project, a runway was rehabilitated and extended and a terminal building was expanded and renovated to improve the safety of airplanes at the time of takeoff and landing while increasing the capacity of passenger handling. This project was consistent with the development plan and needs of the Federated States of Micronesia (hereinafter referred to as 'FSM'), as well as the priority areas of Japan's ODA policy. Therefore, the relevance of this project is high. With regard to project implementation, the project components were implemented mostly as planned and the project cost was within the planned amount. However, the efficiency was judged to be fair as the project period exceeded the plan. With respect to project effectiveness, it was confirmed that the quantitative targets, such as easing of payload and time required for various inspections expected at the time of planning, were mostly achieved, and safety at the time of takeoff and landing, a qualitative effect, also improved. As to the impact of the project, it was confirmed that the stress on pilots during takeoff and landing was reduced, and the service level of the airport was improved. Therefore, the effectiveness and impact of this project are high. Regarding sustainability, there were no particular issues in terms of all institutional, technical and financial aspects, and operation and maintenance status. The project effects generated in this project are considered to be sustained in the future.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Strengthening of Operation and Maintenance Structure

Airport facilities and equipment were generally operated and maintained in good condition, partly with technical support from FAA at the time of ex-post evaluation. However, it is said that financial assistance to FSM may drop sharply after the Compact of Free Association with the US comes to an end in 2023. Therefore, it is difficult to judge in the ex-post evaluation whether the FSM Government will be able to allocate a sufficient budget independently to conduct operation and maintenance at the same level after such time. It will be important to further strengthen the operation and maintenance structure including independent maintenance of airfield lighting while putting in perspective a possibility of a significant decline in the financial and technical support level.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Project Implementation based on Sufficient Coordination with Organizations Concerned

This project was implemented in parallel with the US-assisted AIP. As a result of consultations with DOTC&I and FAA under the coordination of the FSM Government, development items such as runway, apron and airfield lighting were shared and the project was implemented without particular delay during the construction period. At an airport in FSM administered by FAA, information was shared from the development study stage among the organizations concerned including DOTC&I and Pohnpei State Government (including PPA), and sufficient consultations and coordination were made when this project was designed, all of which are considered to have led to smooth implementation of the entire plan including this project. Therefore, in a project supported by several donor agencies, it will be important to ensure sufficient information sharing and coordination from the initial stage of the plan among the related parties including governments of the recipient countries.

(End)