

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.

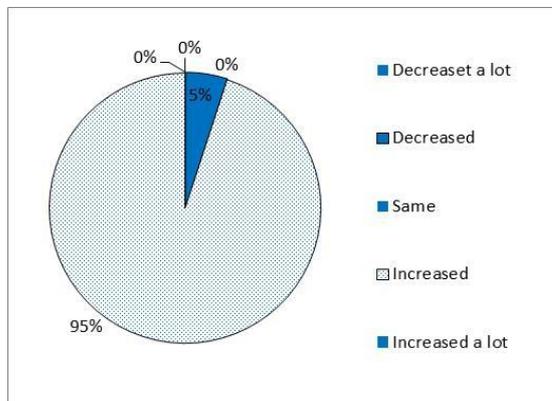


Figure 1 Changes of accidents

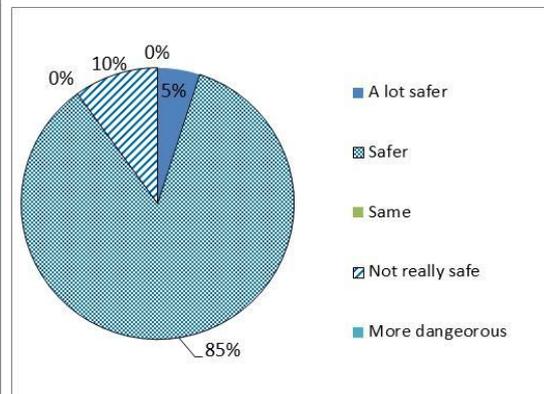


Figure 2 Improvement of safety

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		

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 road 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.

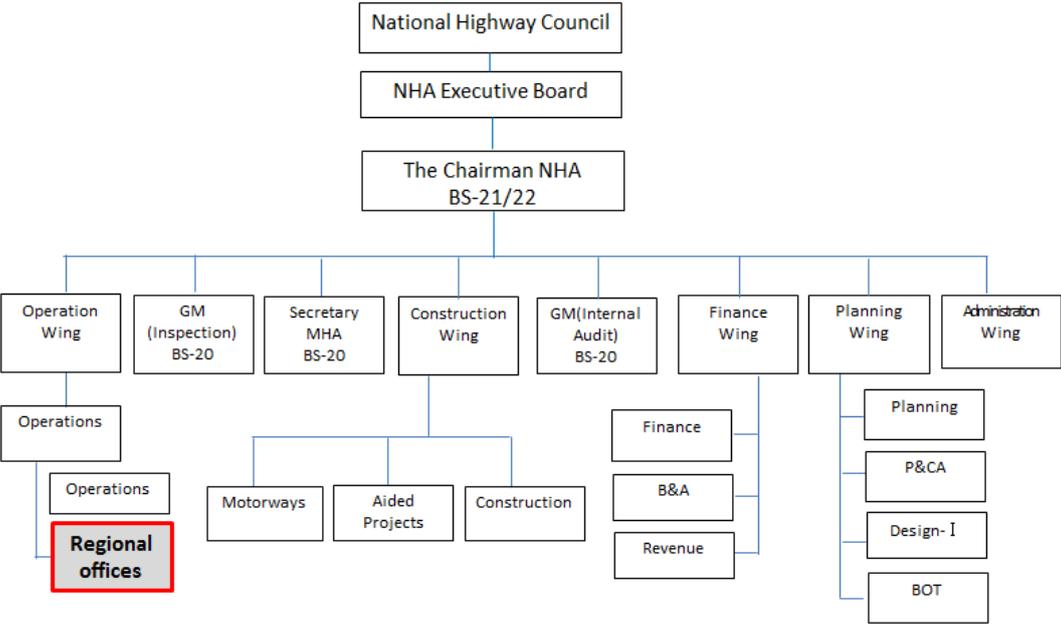


Figure 3 NHA Organizational Structure

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 is 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.