Internal Ex-Post Evaluation for Grant Aid Project

conducted by Nepal Office: December. 2018

Country Name	The Project for Countermeasure Construction for the Landslides on Sindhuli Road Section II
Federal Democratic Republic of Nepal	

I. Project Outline

Background	Since roads in Nepal were situated in adverse topographical and geological conditions where sediment-related disasters occurred frequently, the distribution network in the country was weak. Securing stable and reliable routes in the country as well as provision of minimum road access in rural areas was urgently required. Sindhuli Road had been constructed through Grant Aid from the Government of Japan since 1996, and, with full opening[1], it was expected to be an important alternative highway connecting the capital city of Kathmandu with Bardibas in the Eastern Terai Plain, which would contribute to establishment of safe distribution network and development of the eastern region. However, some of the sections along the road were also situated on adverse topographic geological conditions. It was necessary to implement permanent countermeasures in landslide-prone areas to sustain traffic operation after full opening of the road.			
Objectives of the Project	To sustain smooth and safe traffic operation on Sindhuli Road connecting Kathmandu and the Eastern Terai Plain in Nepal, by implementing countermeasure construction works at priority landslide-prone areas in Section II of the road, thereby contributing to development of the eastern region.			
Contents of the Project	1. Project site: Section II of Sindhuli Road (Sindhuli Bazar -Khurkot) in Sindhuli, Nepal 2. Japanese side: provision of grant necessary for landslide measures (ground anchors, crib works F500, crib works F300, shotcrete, and embankment) for Sta.17+600 and road realignment (170m) for Sta.18+200. 3. Nepal side: compensation of using private lands, relocation of water supply facilities, landslides monitoring, environmental monitoring including initial environmental examination, etc.			
Project Period	E/N Date	July 10, 2012	Completion Date	January 9, 2015
	G/A Date	July 10, 2012		
Project Cost	E/N Grant Limit / G/A Grant Limit: 901 million yen, Actual Grant Amount: 898 million yen			
Executing Agency	Department of Roads (DOR), Ministry of Physical Infrastructure and Transport (MOPIT) (Ministry of Physical Planning, Works and Transport Management at the time of ex-ante evaluation)			
Contracted Agencies	Main Contractor: Hazama Ando Corporation (former Hazama Corporation) Main Consultant: Nippon Koei Co., Ltd.			

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

- Observed status of achievement of quantitative and qualitative effects, impacts, and institutional, technical and financial aspects of sustainability include both outcomes/impacts of this project and the grant aid ("The Project for Construction of Sindhuli Road" (Section I, II, III, IV) (1995-2015) (GA-PCSR) and the technical cooperation project ("The Project for the Operation and Maintenance of Sindhuli Road" (2011-2016) (TC-POMSR)) of JICA. It is difficult to separate outcomes/impacts of this project from the above said grant aid and technical cooperation.

1 Relevance

<Consistency with the Development Policy of Nepal at the Time of Ex-Ante and Ex-Post Evaluation>

The project has been consistent with development policy of Nepal to prioritize sustainable and safe road network, including Sindhuli Road, set in policy document such as provisional Three-year Plan of Nepal (2010/11 to 2012/13), Master Plan for Strategic Road Network (2005) and Sector Wide Road Program and the Priority Investment Plan (2007), Three-year Plan of Nepal (2016/17 to-2018/19) and 5 years Strategic Plan of MOPIT (2016-2021).

<Consistency with the Development Needs of Nepal at the Time of Ex-Ante and Ex-Post Evaluation >

This project has been consistent with Nepal's development needs for safe and smooth traffic of Sindhuli Road and development of the eastern region as described in "Background" above and as planned in the above-mentioned development plans and strategies. The needs were also confirmed by DOR at the times of ex-post evaluation.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

One of the priority areas of Country Assistance Policy for Nepal (April 2012) was "Social and economic infrastructure and mechanism development which directly lead to economic growth and the national livelihoods improvement", including "Building of social infrastructure and mechanisms related to transportation".

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Effectiveness>

The project objective of sustaining smooth and safe traffic operation on Sindhuli Road in Nepal has been achieved. As for quantitative effects, running distance of traffic from Kathmandu to Bardibas has been reduced to 189Km as planned (Indicator1). Also, travel time from Kathmandu to Bardibas has been reduced to 5 hours as planned (Indicator 2). Regarding qualitative effects, safe traffic operation of Section II of Sindhuli Road has been secured because there has been no closure due to natural disaster on the road along the facilities constructed under the project and only partial closure for one day (for heavy vehicles) was observed in other locations during the earthquake in April 2015.

[1] Sindhuli Road was fully open in March 2015.

<Impact>

According to DOR, safe distribution network in the eastern region has been established though the project. With full opening, Sindhuli Road is serving as an important alternative highway connecting Kathmandu with Bardibas in the Eastern Terai Plain, especially for light vehicles[2], and the project has smoothened the travel of people and the transport of goods along Sindhuli Road by avoiding possible landslides. For example, even after the earthquake in April 2015 and flooding in August 2017 in the Terai Plain, almost all relief materials were transported to the eastern region through Sindhuli Road. The project has also promoted cultivation of cash crops and has contributed to revitalization of regional economy of rural areas of Sindhuli. Although up-to-date data is not available, the share of agriculture in household income in the rural areas of Sindhuli increased from 26.9% in 2012 to 39.9% in 2015 and the average annual income from Nepal Rupees (NRs.) 119,815 in 2012 to NRs. 244,308 in 2015 according to the survey conducted by TC-POMSR. Gradual increases in the flow of people and goods, and the setup of new shops and, houses are observed and felt by DOR officials who have been regularly passing by Sindhuli Road. In fact, traffic volume increased from 2,754 vehicles per day in2012 to 4,551 vehicles per day in 2017 at Sindhuli madi according to the survey conducted by Japanese experts engaged in this project. Another example is that, near a facility constructed under the project in Dhungrebas, the number of tea shops has increased from 2 to 6 because of the increased number of travelers and safety[3]. Local people (a man and a woman) interviewed by the ex-post evaluator also confirmed that construction of Sindhuli Road had increased economic activities by providing local farmers with opportunities for diversifying cash crops due to better market accessibility, improving accessibility to services, and providing more business opportunities, etc. Similarly, the smooth flow of goods and services along Sindhuli Road is assumed to have promoted the revitalization of the regional development and revitalization of regional economy, especially in the mountain areas where development lagged behind due to civil war, which are linked with Sindhuli Road. However, this could not be verified concretely due to lack of reliable information.

Regarding other positive impacts, the local people stated that the project had contributed to creating employment for some women at the newly opened tea shops in Dhungrebas. They also mentioned that the local men employed by the project could enhance their construction skills and could obtain construction jobs in other areas of Nepal and in other countries (mostly in Arab countries and Southeast Asia like Malaysia).

No negative impacts of the project on natural and social aspects have been observed. It is noted that total of 7,128 m^2 of land was acquired from 22 people through the project. Most of the acquired land was steep, and there were no houses and structures. According to DOR, no disturbances associated with the land acquisition were observed because the affected people were properly compensated, and they were glad to receive compensation for the land vulnerable to landslide. An affected landowner interviewed by the ex-post evaluators confirmed this and even commented that he was happy as the project had a positive impact for protection of his remaining land. He was also constructing a house near the countermeasure facility because it is safer.

<Evaluation Result>

In light of the above, the project objective was achieved, and positive impacts were observed. Therefore, the effectiveness/impact of the project is high.

Quantitative Effects

	Baseline (2011) Baseline Year	Target (2018) 3 Years after Completion	Actual (2016) 1 Year after Completion	Actual (2017) 2 Years after Completion	Actual (2018) At the time of ex-post evaluation
Indicator 1: Running distance of traffic from Kathmandu to Bardibas (Km)	333	189	189	189	189
Indicator 2: Travel time from Kathmandu to Bardibas (hours)	8	5	5	5	5

Source: Ex-ante Evaluation Sheet, DOR.

3 Efficiency

Both the project cost and period were within the plan (ratio against plan: 100%, 97%). The outputs of the project were produced as planned.

Therefore, the efficiency of the project is high.

4 Sustainability

<Institutional Aspect>

DOR is in charge of maintenance of road in Nepal. During the project implementation, the Project Office (PO) of GA-PCSR, established under Foreign Cooperation Branch of DOR, was responsible for maintenance of Sindhuli Road. After completion of GA-PCSR in 2015, it has been transformed to the PO of the Nepalese project, "Suryabinayak-Dhulikhel, Dhulikhel Sindhuli Bardibas Project (SDDSBP)[4]", which is continuously responsible for maintenance of Sindhuli Road constructed under GA-PCSR (i.e. the road between Dhulikhel Sindhuli Bardibas). For maintenance of Sindhuli Road, DOR allocates 25 officers at central level, including one sub-engineer dedicated to Section II, and 60 staff members (i.e. 9 supervisors and 51 length workers) at field level. DOR considers the number of staff is appropriate because the maintenance work has been implemented smoothly. In addition, according to DOR, maintenance works can be outsourced if

[2] Heavy vehicles were prohibited to use this road until August 2018.

[3] According to DOR, the countermeasure construction work is first of its kind in Nepal so that people would take a break for photo taking and enjoying the scene, which has also contributed to the increment of visitors to the tea shops. The place is famous for taking selfie and is known as "selfie danda (selfie hill)".

[4] There is no definite timeline for the duration of SDDBSP. According to DOR, SDDBSP will be continued as long as there is cooperation of JICA, expected to start in Japanese Fiscal Year 2018 (i.e. a technical cooperation "Project for Operation and Maintenance of Sindhuli Road (Phase 2)" and a grant aid "Sindhuli Road Earthquake rehabilitation").

necessary. Major changes in the organizational structure for the maintenance is not planned at the time of ex-post evaluation.

<Technical Aspect>

Regarding Sindhuli Road in general, the staff of DOR has acquired basic skills and knowledge to plan and implement maintenance works based on various experience and achievement through the past cooperation of JICA such as GA-PCSR and TC-POMSR. Further, Road Sector Skill Development Unit under DOR provides staff training including maintenance of road. According to DOR, it can also outsource the maintenance if necessary. As for the facilities constructed under the project, they do not require maintenance activities other than cleaning of road and drainage as well as landslide monitoring (i.e. measurement using load meter of anchor, and visual inspection of crib works, anchor works and rock bolt works). DOR has necessary capacity to conduct these activities in general. However, DOR does not have adequate knowledge of how to repair a malfunctioned load meter procured in Japan because it is not stated in the maintenance manual prepared by the experts. Technical instruction on recalibration of the load meter was not given to DOR, either. DOR also commented that, since the technologies applied to the facilities are complex, it would need support from international experts if major maintenance should be required due to unexpected reasons.

<Financial Aspect>

Budget for maintenance of Sindhuli Road is prepared based on the maintenance plan and provided by Roads Board Nepal (RBN). Annual budget increased from about NRs. 68 million in Nepal Fiscal Year (NFY) 2015/2016 to about NRs. 136 million in 2016/17, and annual expenditure was within the budget in 2015/16 and 2016/17. It is noted the annual expenditure in 2016/17 was only one-third of the budget. In addition, although the total budget in 2016/17 increased more than two-fold compared to the previous year, the expenditure decreased by more than 20% due to sharp drop of the expenditure for periodic maintenance (from NRs. 30.8 million to NRs. 8.4 million). According to DOR, a big chunk of the budget was allocated only later on and not in the beginning of NFY 2016/17. Therefore, the procurement of the contractors for periodic maintenance was delayed. This led to the lower level of expenditure.

Budget and expenditure of DOR for maintenance of Sindhuli Road (Unit: NRs. 1,000)

NFY (Mid July-Mid July)	2015/16	2016/17	2017/18
(1) Total budget approved/allocated	**67,993**	**141,800**	**135,572**
(2) Total expenditures	**59,611**	**46,924**	**(Ongoing)**
-Routine maintenance	9,990	13,101	
-Recurrent maintenance (annual repair)	10,874	14,108	
- Specific maintenance (preventive works)	7.912	11,306	
-Periodic maintenance (once in five years)	30,835	8,400	

Source: Red Book 2015/2016, 2016/2017, and 2017/2018DOR

Overall, necessary budget is considered to have been secured because smooth and safe traffic operation has been sustained as shown in "Effectiveness/Impact". According to DOR, the budget for routine, recurrent, and specific maintenance of Sindhuli Road is sufficient; however, delay of budget allocation stated above has resulted in postponement of some of the scheduled periodic maintenance, which may affect smooth and safe traffic operation of Sindhuli Road in the long term. Meanwhile, budget for maintenance of the facilities constructed under this project has been secured since cleaning of road and drainage is conducted as part of routine maintenance. Specific budget for landslide monitoring is not required because it is implemented by the regular staff of the PO, who does not need to be paid extra.

<Current Status of Operation and Maintenance of the Constructed Facilities>

Maintenance plan of Sindhuli Road has been developed, which also covers the facilities constructed under the project. Cleaning as well as landslide monitoring by visual inspection has been conducted based on the plan. However, landslide monitoring by load meter has not been implemented by DOR for more than 2 years because calibration of the load meter procured under the project in Japan has been disturbed since its battery was changed in around 6 to 7 months after the project completion. DOR has sought general advice from Japanese experts involved in the project, who were in the country on other assignment, because troubleshooting method for this problem was not stated in the maintenance manual. The advice has been carried out, but the disturbance has not been fixed. In the meantime, the Japanese experts have informally supported DOR in monitoring with their own load meter on an occasional basis and have confirmed that land mass movement is not observed[5]. It is not clear if DOR plans to outsource recalibration or to purchase a new one. According to DOR, the load meter is not available in the local market. The constructed facilities were observed to be in good condition. However, drainage was not as clean as road and some dirt was observed. According to a DOR engineer accompanying the ex-post evaluator, instruction to the length workers in charge of cleaning may not have been clear enough so that they do not clean the drainage as often as the road, and he mentioned that he would see to it. A small void was also observed in the area leading to the drainage just under a constructed facility for Sta. 17+600. Based on a general observation by the DOR engineer, it seems to be a local void which would not cause a big problem but needs investigation just in case.

<Evaluation Result>

In light of the above, slight problems have been observed in terms of technical and financial aspects. Therefore, the sustainability of the project effect is fair.

5 Summary of the Evaluation

The project achieved its objective of sustaining smooth and safe traffic operation on Sindhuli Road in Nepal and the expected impact of developing the eastern region has been observed to some extent. Regarding the sustainability, slight problems have been observed in terms of technical aspect (i.e. lack of adequate knowledge of DOR to recalibrate and repair the load meter used for landslide monitoring) and financial aspect (i.e. delay of allocation of budget for periodic maintenance of Sindhuli Road, which may affect smooth and safe traffic operation in the long term) but there is no major problem in institutional aspect.

Considering all of the above points, this project is evaluated to be highly satisfactory.

[5] According to DOR, last measurement was conducted in December 2017.

III. Recommendations & Lessons Learned

Recommendations to Implementing Agency:

- It is recommended that DOR recalibrate the load meter by outsourcing or purchase a new one as soon as possible so that landslide monitoring using the load meter can be resumed.
- It is recommended that DOR continue to lobby to RBN to allocate the adequate budget for periodic maintenance of Sindhuli Road in time to ensure smooth and safe traffic operation in the long term.
- It is recommended that DOR instruct the length workers to clean the drainage more frequently, especially before and during the rainy season and have its experts investigate a void area observed just below the constructed facility for 17+600, where the collection of water leading to the drain is situated, as soon as possible.

Lessons Learned for JICA:

- JICA should ensure that experts give adequate technical instruction on maintenance and repair of the equipment procured in the projects, especially in the case of the equipment from overseas, to implementation agencies during implementation of the projects.

STA 18+200
(Retaining wall crib work, rock bolt and pavement all are intact)

Dhungrebas (new houses and shops are growing day by day)