

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Republic of Nicaragua

Project: Rio Blanco-Siuna Bridges and National Road Construction Project

Loan Agreement: October 9, 2017

Loan Amount: 4.94 billion Yen

Borrower: The Government of the Republic of Nicaragua

2. Background and Necessity of the Project

(1) Current State and Issues of the Transportation and Traffic Sector in the Republic of Nicaragua

In the Republic of Nicaragua, road transportation accounts for 68% of the total cargo transportation and 98% of the total passenger transportation. It is the core of the transportation and traffic sector. The total length of roads in the country is 24,335 km, the pavement rate is approx. 17%, and the rate of roads passable during the rainy season is only 70% of the total. Infrastructure development lags greatly on the Caribbean side. In particular, the North Caribbean Coast Autonomous Region (hereinafter referred to as “RACCN”) has a high poverty rate and is designated by the Government of the Republic of Nicaragua as a priority region for development. RACCN is second in the country for crop production and number of livestock farmers. National Highway Number 21B which connects RACCN and Managua, the capital city, plays an important role in terms of the export of agricultural and livestock products, and transport of these products to Managua. However, due to the poor pavements, the highway is vulnerable to natural disasters and flooded in the rainy season. In addition, some bridges have deteriorated and are in danger of falling when crossing. These are the bottlenecks for passenger and cargo transportation using the highway.

(2) Development Policies for the Transportation and Traffic Sector in the Republic of Nicaragua and the Priority of the Project

In the “National Human Development Plan 2012–2016” (hereinafter referred to as the “PNDH”) of Japan, the development of transportation and traffic infrastructures is provided as one of the priority fields for development. In the National Transportation Plan developed in February 2014 based on the PNDH and through technical cooperation with JICA, the Rio Blanco-Siuna Bridges and National Road Construction Project (hereinafter referred to as the “Project”) is now positioned as a project to be implemented at top priority.

In the past, many bridges in the country have been damaged due to natural disasters. However, the bridges constructed with the support of Japan continued functioning without any serious damage. This helped the Government of the Republic of Nicaragua develop trust in Japanese technology. The Government strongly desires bridge construction to be part of the Project through a Japanese ODA Loan applying Special Terms for Economic Partnership (STEP). Since Japanese bridge technology is supposed to be used in the Project, the Project will contribute to Japan’s “Strategy to export high-quality infrastructures” and is expected to contribute to the expansion of business opportunities for Japanese enterprises.

(3) Japan and JICA’s Policy and Operations in the Transportation and Infrastructure Sector

In the National Transportation Plan developed through the “National Transportation Plan Project,” which involved technical cooperation implemented from December 2012 to February 2014, the necessity of the Project is confirmed. In addition, Japan has constructed 24 bridges in the Republic of Nicaragua through grant aid.

In the JICA Country Analysis Paper for the Republic of Nicaragua (March 2016), the

development of transportation and traffic infrastructures is specified as one of the major challenges. The Project is positioned as a cooperation program for “Revitalization of regional capacity” in the prioritized field of “Infrastructure development for economic revitalization” provided in the Country Development Cooperation Policy for the Republic of Nicaragua (March 2013).

(4) Other Donors' Activity

The World Bank (hereinafter referred to as “WB”), the Inter-American Development Bank (hereinafter referred to as “IDB”), and the Central American Bank for Economic Integration (hereinafter referred to as “CABEI”) are major donors to the transportation and infrastructure sector in the Republic of Nicaragua. WB carries out road development in rural areas with the aim of improving access to social services and improving social welfare. IDB supports the development of arterial roads, rural roads, and bridges for creating an environment which enables steady access to export markets in the Republic of Nicaragua and other Central American countries, and also supports strengthening the capacity of the Ministry of Transport and Infrastructure (hereinafter referred to as “MTI”) for the maintenance and management of roads and bridges. CABEI carries out the development of roads, bridges, ports, and airports with the aim of strengthening the production infrastructure of the Republic of Nicaragua.

(5) Necessity of the Project

The Project is consistent with the PNDH, National Transportation Plan, and Japan's country development cooperation policy for the Republic of Nicaragua. In addition, contributions to improving the transportation capacity of National Highway Number 21B and reducing poverty in RACCN are also expected. It is therefore considered that the Project will contribute to Japan's “Strategy to export high-quality infrastructures” as well as SDGs 1 and 9, “No Poverty” and “Industry, Innovation, and Infrastructure.” The necessity to support implementation of the Project is high.

3. Project Description

(1) Project Objective(s)

Through the development of a section between Rio Blanco and Siuna along National Highway Number 21B which connects Managua, the capital city, and RACCN, a region which has thriving agricultural and livestock industries, the Project will improve the transportation capacity of the section and contribute to the development of the industries in RACCN.

(2) Project Site/Target Area

RACCN

(3) Project Component(s)

- 1) Replacement of the superstructures and substructures of major bridges between Rio Blanco and Siuna along National Highway Number 21B, and development of access roads next to these bridges (international competitive bidding (tied))
- 2) Development of the road part (total length: 114.3 km) and replacement of the superstructures and substructures of small bridges between Rio Blanco and Siuna along National Highway Number 21B (not subject to Japanese ODA Loan)
- 3) Consulting services: Detailed design, bidding support, construction supervision, environmental and social consideration, and technology transfer to MTI concerning items provided in 1) (short list method)

(4) Estimated Project Cost (Loan Amount)

20.62 billion Yen (loan amount: 4.94 billion Yen)

(5) Schedule

From July 2017 to June 2023 (72 months in total)

The Project will complete when all the facilities are put into service (June 2022).

(6) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Nicaragua
- 2) Guarantor: None
- 3) Executing Agency: MTI
- 4) Operation and Maintenance System: MTI and Fund of Road Maintenance (FOMAV)

(7) Environmental and Social Considerations/Poverty Reduction/Social Development

1) Environmental and Social Consideration

- i) Category: B
- ii) Reason for Categorization: The Project does not fall under large-scale projects in the road and bridge sector provided in the “JICA Guidelines for Environmental and Social Considerations” (issued in April 2010) (hereinafter referred to as “JICA Environmental Guidelines”), and it is not considered that any undesirable impact on the environment is serious. In addition, the Project does not have any sensitive characteristics and the project target region does not fall under sensitive areas provided in the JICA Environmental Guidelines.
- iii) Environmental Permit: The Environmental Impact Assessment (EIA) Report on replacement of the superstructures and substructures of the Mulukukú, Lisawé, Labú and Prinzapolka Bridges between Rio Blanco and Siuna along National Highway Number 21B, and the development of access roads next to these bridges was approved by the Mulukukú and Siuna municipal offices in December 2016. In addition, the EIA Report on the development of the road part and replacement of the superstructures and substructures of small bridges, which were supported or have been supported by WB, IDB, CABEL, and the Danish International Development Agency (hereinafter referred to as “DANIDA”), was approved by the Paiwas, Mulukukú, Rio Blanco, and Siuna municipal offices and the RACCN government between 2006 and 2015, according to the construction zone.
- iv) Anti-Pollution Measures: Concerning the air pollution and water pollution during construction, values are expected to be at the country’s average level by taking anti-pollution measures, such as watering, separating disposal of petrochemical-derived waste, preventing water contamination by placing sandbags, and purification treatment of construction wastewater, etc. The value of air pollution when the facilities are put into service will be at the country’s average level since the increase in future traffic volume will be moderate.
- v) Natural Environment: The project target region is a buffer zone in the Bosawás Natural Reserve. However, development is permitted and no rare flora and fauna has been confirmed in the zone. With the construction of access roads, trees within approx. 1,455 m² will be cut down. However, by preventing the cutting down of large trees and taking measures to restore the vegetation after cutting, undesirable impact on the surrounding natural environment will be minimized.
- vi) Social Environment: It is estimated that the Project will involve site acquisitions of approx. 14.3 ha and the relocation of 12 households; 66 residents. According to the Abbreviated

Resettlement Action Plan created based on JICA Environmental Guidelines and domestic procedures of the Republic of Nicaragua, compensation will be paid. Resident discussions were held for neighborhood residents including those residents subject to relocation. Currently, no specific objections to the Project have been provided from the project-affected residents.

- vii) Other/Monitoring: Monitoring of air/water quality, noise, and vibration during construction will be implemented by the executing agency and contractor, and monitoring of air quality and noise after site acquisition and while in service will be implemented by the executing agency.

2) Promotion of Poverty Reduction

The poverty rate of RACCN, the project target region, is 70.9% which exceeds the national average (40.5%). Therefore, the Project is placed as a poverty reduction project.

3) Promotion of Social Development (e.g. Gender Perspectives, Measures for Infectious Diseases Including HIV/AIDS, Participatory Development, Considerations for Persons with Disabilities, etc.)

Due to the increase in labor in accordance with the construction work, there is the possibility of an outbreak of HIV/AIDS and other infectious diseases at the project site. Measures for HIV/AIDS are scheduled to be included in the contract with the contractor.

To promote gender equality, the PNDH includes that the number of women employed at a workplace should be at least half of the total employees. This applies to the Project. MTI will implement regular monitoring of the employment of women engaged in construction and supervision of the Project.

(8) Collaboration with Other Donors

There are eight construction zones in the construction project for roads and small bridges between Rio Blanco and Siuna, a project supported by the Project. Of these zones, construction work for five zones will be carried out by CABEL and work for the three other zones will be carried out by WB, IDB, and DANIDA, respectively.

(9) Other Important Issues

- 1) The four target bridges are located about 240 to 300 km from Managua. In terms of reducing the maintenance and management cost, Japanese technology for precast PC slabs and SBHS, which can reduce the maintenance cost and life-cycle cost, will be used. As RACCN has a rainy season that lasts for eight months of the year, anticorrosion steel and a launching erection method which does not require erection in the river during the rainy season will be used. In addition, earthquakes, hurricanes, and other natural disasters frequently occur in the country, and so Japanese technology for sliding base isolating support, bar-like reinforcements, and plate hooks, etc. will be used.
- 2) Construction supervision consultants will conduct training, targeting MTI engineers, on the introduction of the above-described Japanese technology in order to promote proper utilization of the technology.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline	Target (2024) [Expected value 2 years after project completion]
Maximum vehicle weight passable (tons)	32.66	40.82
Annual average daily traffic of passenger vehicles (vehicles/day) (Note 1)	482	878
Annual average daily traffic of cargo vehicles (vehicles/day) (Note 1)	235	342
No. of passengers (people/year) (Note 2)	895,527	1,756,000
Cargo volume (tons/year) (Note 2)	270,100	393,000
Travel time (hours) (Note 3)	1.3	0.8

(Note 1) The baseline is the actual value in 2015 and is based on traffic volume data between Rio Blanco and Mulukukú. Measurement time is from 06:00 to 18:00. Passenger vehicles include motorbikes, passenger cars, small buses, and buses. Cargo vehicles include trucks and trailers.

(Note 2) The number of passengers is calculated by multiplying the "Annual average daily traffic of passenger vehicles" for each category by 365 (days) and by the number of passengers possible to ride (Motorbike: 1.5, Passenger car: 3, Small bus: 20, Bus: 40). The cargo volume is calculated by multiplying the "Annual average daily traffic of cargo vehicles" for each category by 365 (days) and by the maximum loading capacity (tons) (Truck: 3, Trailer: 4). These calculation formulas will also apply to the ex-post evaluation made two years after project completion.

(Note 3) The baseline is the actual value in 2016 and is based on travel time data between Mulukukú and Prinzapolka Bridges. Measurement time is from 13:00 to 19:00.

(2) Qualitative Effects

Development of the agriculture and livestock industries in RACCN, development of commerce in surrounding areas between Rio Blanco and Siuna along National Highway Number 21B, improvement of access to various social services, and securing transportation in case of a disaster.

(3) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) of the Project is 14.9%.

[EIRR]

Cost: Project cost (excluding tax) plus operation and maintenance cost

Benefit: Reduction of travel cost, access time, and economic loss of agricultural and livestock products due to bridge closures

Project Life: 40 years

5. External Factors and Risk Control

(1) Natural disasters (earthquake, hurricane, etc.) in the project target region

(2) Review of construction conditions in two zones financed by CABEL (construction implemented as of September 2017 and planned to be completed in June 2019) of the eight zones for road development in the project target section between Rio Blanco and Siuna along National Highway Number 21B

6. Lessons Learned from Past Projects and Their Application to the Project

(1) Lessons Learned from Past Projects

- 1) In past bridge construction projects implemented in the Republic of Nicaragua using grant aid, effects of the grant aid were further conveyed through coordinating before the project with other donors who were supporting development of the roads on which the bridges were being constructed.
- 2) According to the ex-post evaluation of the "Project for repairing arterial road bridges" for the Republic of the Philippines, the construction period can be reduced and the impact on project implementation caused by natural disasters can be minimized by the executing agency and construction supervision consultants reviewing the validity of the construction schedule in consideration of the rainy and dry seasons.
- 3) In the past, the Government of the Republic of Nicaragua carried out coating of the existing Mulukukú Bridge using its own resources, but the coating affected the durability of the steel. MTI learned that anticorrosion steel and other materials which do not affect the durability of the steel should be used.
- 4) Roads and bridges in the Republic of Nicaragua were seriously damaged by Hurricane Mitch in 1998. MTI learned that preparations for natural disasters should be made and materials resistant to natural disasters should be used.

(2) Application to the Project

- 1) The bridge construction project through a Japanese ODA Loan and the construction project for roads and small bridges between Rio Blanco and Siuna along National Highway Number 21B, a project implemented by other donors, are both considered as one project. Necessary adjustments will be made by keeping track of the project progress through MTI and the other donors.
- 2) Construction schedule considering the rainy season has been developed.
- 3) Anticorrosion steel will be used.
- 4) Materials resistant to natural disasters will be used.

7. Plan for Future Evaluation

(1) Indicators to be Used

As described in 4. Targeted Outcomes (1) Quantitative Effects 1) Performance Indicators (Operation and Effect Indicators)

(2) Timing

Two years after project completion