

## Ex-ante Evaluation

### 1. Name of the Project

Country: The Republic of Paraguay

Project: Eastern Region Export Corridor Improvement Project

Loan Agreement: June 24, 2014

Loan Amount: 17.897 billion yen

Borrower: The Republic of Paraguay

### 2. Background and Necessity of the Project

#### (1) Current state and issues of the road sector in Paraguay

Paraguay is a landlocked country where trading activities are conducted through river transportation (69%) using Parana River and Paraguay River, road transportation (22%) and air transportation (9%). In other words, transportation depends mostly on rivers and roads. Of the total road extension of approximately 62,000km, only 8% (approximately 5,000km) is paved, most of which are trunk roads. Even including boulder pavement, the rate remains at 14% (approximately 9,000km) (as of January 2013). Unpaved roads are often closed to cars when it rains and are vulnerable to heavy vehicles such as trucks, which causes adverse influences including lowering of driving speed, car damages and collapsing load. Agriculture and livestock are major industries in Paraguay's economy, they accounted for approximately 27% of GDP and 85% of export value. Especially soy bean<sup>1</sup> and corn are important crops, contributing 50% of export value. Alto Parana Department and Itapua Department located along Parana River are producing even more of those crops than ever before, reacting to the recently boosted global demands for grains. However, effective road transportation is difficult because most of the roads connecting between the production bases and four of the ports along Parana River are left unpaved. For example, in case of soy beans, although the major production areas are located along Parana River which has export ports as well as capacity, 70% of soy beans are exported from Paraguay River which is far from the production areas while connecting roads are maintained, which requires more time and cost than necessary.

Thus, effective transportation of crops is difficult in Paraguay, and improvement of road infrastructure is an urgent issue in order to activate the country's economy. Under such situation, it is necessary to improve the access from Parana River to trunk roads and ports, and thereby improve the export efficiency from Parana River in the eastern region where major crops are being produced.

#### (2) Development policies for the road sector in Paraguay and the priority of the Project

Paraguay has established the "Infrastructure/Transport Service Master Plan" (FY2012-2032) as a national development policy, in which promotion of infrastructure improvement is emphasized as one of the priority policies in order to achieve the national target of "improvement of every citizen's life". In order to promote this policy, the Ministry of

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<sup>1</sup> Paraguay is the fourth largest soy bean exporter, next to the United States, Brazil and Argentina (as of 2013).

Public Works and Communications (MOPC) has established the Road Sector Ten Year Plan (FY2013-2023), in which priority issues are establishment of trunk road network and improvement of service network for physical and human logistics through expansion of paved road and improvement of unpaved roads, which is the priority of the Project.

### (3) Japan and JICA's policy and operations in the road sector in Paraguay

Japan prioritizes “reducing disparities” and “sustainable economic development” in the Country Assistance Policies for Paraguay, and considers assistance in the road sector as part of “sustainable economic development”. The Project applies in the “Economic Infrastructure Improvement Program” in such prioritized area. In order to increase exports of agricultural products to support Paraguay’s economy, and to improve the logistics in the country, as well as to improve the access of local residents and thereby improve their quality of life, JICA designates “health and medical care”, “agriculture/rural development”, “water resources” and “transport” as four priority issues in JICA Country Analysis Paper, which the Project belongs to “transport”. In the road sector of Paraguay, JICA has provided ODA Loans for “La Colmena-Acahay Road Improvement Project” (loan amount: 1.85 billion yen) in 1977, “The Road Improvement Project” (loan amount: 9.696 billion yen) in 1990, and “Road Improvement Project II” (loan amount: 19.428 billion yen) in 1998. In “Agricultural Sector Strengthening Project II” (loan amount: 15.525 billion yen) in 1998, assistance was provided to improve agricultural roads by boulder pavement. In addition, Loan Agreement was signed for “Rural Roads Improvement Project” (loan amount: 4.822 billion yen) in 2010, which is currently under way. As for grant aid, “The Project for Improving District Road in Itapua” (execution amount: 1.609 billion yen) was performed in 1994.

### (4) Other Donors' Activities

The Inter-American Development Bank (IDB) has approved 18 cases of loan totaling approximately 700 million dollars for improvement of trunk roads and rural roads since 1969. The IDB’s assistance strategy paper for Paraguay states that it is imperative for Paraguay’s economic growth to improve economic infrastructure including roads, water supply and electric power, and especially to put priority on improvement of road network. The IDB also provides support for improvement of road safety facilities and road maintenance.

The World Bank has provided loans for 10 projects totaling approximately 300 million dollars. The World Bank’s country assistance strategy for Paraguay points out that the insufficiency of economic and social infrastructure bottlenecks promotion of export competitiveness and that it is important to improve road network that connects the member states of Mercosur that are active in trading. Under such situation, the World Bank has established a performance-based system (Gestión y Mantenimiento de Carreteras Pavimentadas por Niveles de Servicio, referred to as “GMANS<sup>2</sup>” hereinafter) in

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<sup>2</sup> A private company selected by international competitive bidding and the MOPC sign a long-term contract of five years to repair roads in the first fiscal year and then provide repairing and maintenance regularly. For the repairing in the first fiscal year, monthly payment is made depending on the construction progress. As for repairing and maintenance, standards of maintenance are defined for each item such as conditions of pavement surface,

collaboration with the IDB, in which road maintenance is commissioned to the private sector in order to improve the pavement of National Highways #1 - #8 to a certain level and maintain such level, and supports the MOPC for operations.

#### (5) Necessity of the Project

As stated above, in the eastern region of Paraguay, most of the roads connecting the crop production bases and the export ports along Parana River are yet to be paved, and it is imperative to improve the eastern region export corridor consisting of trunk roads along Parana River and the road network connecting the export ports in order to improve the country's export efficiency and promote export. Especially it is the top priority to improve the trunk roads with poor pavement as well as the access roads to the four export ports and Campichuelo Port. The Project is consistent with Paraguay's national development policy prioritizing promotion of road infrastructure improvement, Japan's assistance policy for Paraguay and JICA Country Analysis Paper for Paraguay. Therefore, it is highly necessary and relevant for JICA to execute the Project.

### **3. Project Description**

#### (1) Project Objective

The objective of the Project is to improve Paraguay's transport efficiency and, in turn, export competitiveness by improving the eastern region export corridor (asphalt pavement, boulder pavement, bridge widening, bridge replacement), and thereby activate the country's economy.

#### (2) Project Site/Target Area

Alto Parana Department, Itapua Department

#### (3) Project Component(s)

The Project performs asphalt pavement, boulder pavement, bridge widening and bridge replacement for the existing roads along Parana River (approximately 260km in total) in Alto Parana Department and Itapua Department.

- 1) Improvement (asphalt pavement, boulder pavement, bridge widening, bridge replacement) of the rural roads (along Parana River) between Presidente Franco and Natalio (approximately 150km)
- 2) Improvement of National Highway #6 and the roads connecting to roads along the river between Naranjito and the left bank of Parana River (approximately 60km in total) (excluded from ODA Loan)
- 3) Improvement of port access roads (all 5 ports) (approximately 60km in total) (excluded from ODA Loan)
- 4) Consulting service

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drainage construction and safety, and the MOPC confirms the performance and pays to the private company based on the contract. In case of failing to meet the required standards the payment is reduced. Subject to the GMANS are National Highways, currently National Highways #1 to #8.

Out of the above, applicable to ODA Loan are 1) and 4).

(4) Estimated Project Cost (Loan Amount)

25.810 billion yen (ODA Loan Amount: 17.897 billion yen)

(5) Schedule/Cooperation Period

ODA Loan: April 2014-April 2021 (85 months). The project will be considered to be complete upon start of operation.

(6) Project Implementation Structure

1) Borrower: The Republic of Paraguay

2) Executing Agency: Ministerio de Obras Públicas y Comunicaciones: MOPC

3) Operation and Maintenance System: MOPC

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

1) Environmental and Social Considerations

① Category: B

② Reason for Categorization: The Project is not considered to be a large-scale road project, is not located in sensitive area, and has none of the sensitive characteristics under the JICA Guidelines for Environmental and Social Considerations (April 2010, to be referred to as “Guidelines” hereinafter), It is not likely to have a significant adverse impacts on the environment.

③ Environmental Permit: The Environmental Impact Assessment (EIA) report concerning the project was approved by the Ministry of the Environment on October 16, 2012.

④ Anti-Pollution Measures : As the project mainly involves asphalt pavement of the existing roads (unpaved or boulder pavement), it is expected to mitigate the ongoing issues of dust and noise. Concerning impacts of water pollution during construction, measures such as regulations for washing equipment in neighboring rivers will be taken according to Paraguay’s technical specifications on the environment in general.

⑤ Natural Environment: In the vicinity of some roads relevant to the Project, it is planned to expand the area of Nacunday National Park. The project will incorporate environmental considerations and use detours in order to minimize the impacts to the park even after it is expanded.

⑥ Social Environment : The Project will involve land acquisition of 1,200ha maximum and involuntary resettlement of 18 households (approximately 140 residents) maximum in order to secure the sufficient road width. A bill of land acquisition law will be developed and approved, based on which appropriate procedures will be taken to transfer the land ownerships.

⑦ Monitoring etc: In the Project, the contractor and a construction consultant monitor concerning air, noise, water quality and land acquisition under the supervision of the MOPC.

2) Promotion of Poverty Reduction

Improved access to the market is expected to contribute to improvement of farmers’ standard of living.

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

Under the current situation, the transportation from the local communities to their neighboring cities is cut off when it rains.

Therefore, it is expected that the health conditions of the local residents including women's medical examination and childbirth can be improved if the access to the medical facilities is improved by this project.

(8) Collaboration with Other Donors

The World Bank and the IDB are currently executing a project to improve maintenance of paved roads (GMANS) by commissioning to the private sector, and the same framework is applied to the Project after its completion.

(9) Other Important Issues

There are Japanese colonies along Parana River such as Iguazu Colony, La Paz Colony and Pirapo Colony, and many of the immigrants are engaged in soy bean production.

<b>4. Targeted Outcomes</b>
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(1) Quantitative Effects

1) Operation and Effect Indicators

Indicator	Baseline (Actual Value in 2014)	Target Value(2022) 【2 years after project completion】
<b>① Annual average of traffic volume (vehicles/day)</b>		
Rural roads (along Parana River) *1	110-1,180	790-2,280
National Highway #6 and connecting roads along the river *2	20-360	490-920
Access roads to the ports *3	90-760	380-1,070
<b>② Shortened travel time (hour)</b>		
Departure	Destination	
Ciudad del Este	Yatytay	3.2      2.2
	Mayor Otano	3.9      1.4
	Nacunday	2.3      1.1
	Domingo Martínez de Irala	1.6      1.1
Encarnación	Yatytay	1.7      1.5
	Mayor Otano	4.2      2.3
	Nacunday	4.1      2.6
	Domingo Martínez de Irala	4.3      3.3
<b>③ Improvement of speed (km/hour)</b>		

Rural roads (along Parana River) *1	30-80	100
National Highway #6 and connecting roads along the river *2	25-40	80
Access roads to the ports *3	35-40	50

※1 : Divided into 7 sections to set annual average traffic volume, standard value of running speed and target value

※2 : Divided into 2 sections to set annual average traffic volume, standard value of running speed and target value

※3 : Annual average traffic volume, standard value of running speed and target value are set for the 5 access roads connecting to ports

## 2) Internal Rate of Return

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) of the Project is 25.3%. Financial Internal Rate of Return (FIRR) is not calculated because the Project does not involve toll roads.

### 【EIRR】

Cost: Project cost (excluding tax), operation and maintenance expenses

Benefits: Reduction of travelling time/costs and costs for maintaining soil roads

Project life: 25 years

## (2) Qualitative Effects

Activation of regional economy by improving efficiency of exporting crops

## 5. External Factors and Risk Control

Natural disasters at the construction sites

## 6. Results of Evaluations and Lessons Learned from the Similar Projects

### (1) Evaluation of Similar Projects

In case of the ODA Loan project of “Rural Road Improvement Project II” executed by the MOPC, the construction was delayed due to the weather factor (rain) and also because one of the companies constituting the consortium neglected their duties due to financial deterioration. The lesson learned from there is that it is necessary to incorporate potential impacts of rains into the schedule, and consider not only experience and scale but also financial condition in selecting the contractor.

### (2) Lessons applicable to the Project

Based on the above lesson, the Project will carefully take the rainy season into consideration when establishing the schedule and select the contractor by international competitive bidding with prequalification including strict financial assessment.

## 7. Plans for Future Evaluation

### (1) Indicators to be Used in Future Evaluations

See the above 4. Targeted Outcomes (1) Quantitative Effects 1) Operation and Effect Indicators

### (2) Timing of Future Evaluation

Two years after project completion