Democratic Republic of Timor-Leste

FY2021 Ex-Post Evaluation Report of
Japanese Grant Aid Project
"The Project for Construction of Upriver Comoro Bridge"

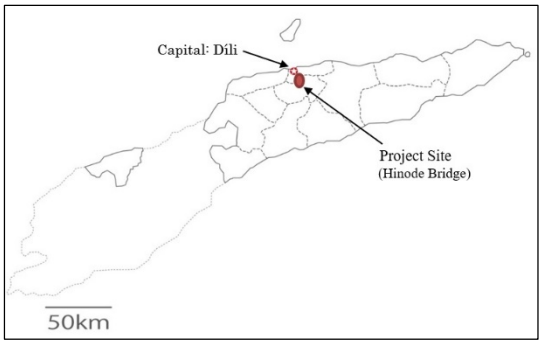
External Evaluator: Kenichi Inazawa, Octavia Japan, Co., Ltd.

0. Summary

The aim of this project was to reduce traffic congestion by decentralizing traffic, improve east-to-west access efficiency, revitalize the economy and strengthen resilience in Dili City by constructing a bridge connecting east and west (hereinafter referred to as "Hinode Bridge") and access roads. In this project, "consistency with the development plan" and "consistency with development needs" were confirmed. Regarding coherence, "consistency with Japan's ODA policy" can be said to be coherent, however "internal coherence" and "external coherence" did not confirm effects from specific collaboration or coordination. Based on the above, relevance/coherence is high. With respect to efficiency, although the outputs were mostly as planned, and the project cost was within the plan, the project duration was significantly longer than the initial plan due to the delay in land acquisition procedures. Therefore, the overall efficiency of the project is moderately low. Regarding the effectiveness/quantitative effects indicators, target 1) "volume of traffic crossing the river" was achieved, and it can be inferred that target 3) "freight traffic" was also achieved. Target 2) "average speed of traffic crossing the river" was not achieved, mainly because of increased traffic using the bridge, with speed curtailed by the large number of vehicles at peak times and during the day. According to the interview survey, the Hinode Bridge and access roads are fully utilized as a means of ensuring safety in the event of a heavy rain disaster, and are playing a role in preventing casualties and reducing economic damage. Therefore, the anticipated effects of the project have been achieved overall; effectiveness and impacts are high. With regard to sustainability, while there seems to be no major concern about the outlook for the sustainability of the effects generated by this project, it is fair to say that there are some problems because the budget for operation and maintenance and the status of some maintenance aspects are not entirely satisfactory. Therefore, sustainability of the project effects is moderately low.

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

1. Project Description



Project Location

Developed Hinode Bridge

1.1 Background

Before this project began, Dili City had limited room for new residential land development, for topographical reasons. The Comoro River flows through the west side of the city in a north-south direction. The city's population was expanding to the west, where the airport is located, and the traffic volume between the east and west of the city was increasing rapidly. However, there was only one bridge crossing the Comoro River, and the concentration of traffic on the bridge caused congestion, paralyzing the city traffic. The government of Timor-Leste started construction work to widen the bridge, from one lane to two lanes on each side, as an emergency measure, with a view to reducing traffic congestion. While the two lanes on each side became operational in June 2013, this measure was not sufficient to cope with subsequent increases in traffic, and there were also concerns from the perspective of disaster prevention and urban development. For these reasons, construction of a new bridge across the Comoro River, connecting the east and west of the city, was needed, and it was necessary to secure an alternative route and decentralize city traffic at an early stage.

1.2 Project Outline

The objective of this project is to reduce traffic congestion by decentralizing city traffic by constructing a bridge and access roads to connect east and west parts of the Dili urban area, thereby contributing to economic revitalization and resilience through improvement of east-west access efficiency and strengthening of the transportation sector.

Grant Limit/Actual Grant Amount	2,605 million yen/2,022 million yen
Exchange of Notes Date/ Grant Agreement Date	November 2015/November 2015
Executing Agency	Directorate of Roads, Bridges and Flood Control

	(hereinafter to as “DRBFC”), Ministry of Public Works
Project Completion	October 2018
Target Area	Comoro District, Dili
Main Contractor	Tobishima Corporation
Main Consultants	INGÉROSEC Corporation, Nippon Engineering Consultants Co., Ltd., IDEA Consultants, Inc. (JV)
Preparatory Survey	June 2013–February 2014
Related Projects	[Technical Cooperation Projects] - “Project for Capacity Development of Road Works” (2010–2013) [Grand Aid Projects] - “Project for Improvement of Roads Between Dili and Cassa” (E/N signed in May 2004) [ODA Loan Projects] - “National Road No.1 Upgrading Project” (L/A signed in 2012) [Others] - Supporting formulation of the “National Road Master Plan for Timor-Leste” (Asian Development Bank (ADB), 2010–2019)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa, Octavia Japan, Co., Ltd.

2.2 Duration of Evaluation Study

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

Duration of the Study: September 2021–November 2022

Duration of the Field Study: No international travel was involved, and surveys were conducted remotely using a field survey assistant.

2.3 Constraints during the Evaluation Study

(Remote Field Survey Utilizing a Field Survey Assistant)

Due to COVID-19, the external evaluator did not travel internationally for this study. Using the local survey assistant, the external evaluator conducted the site visits remotely, collecting

information/data and conducting interviews with the individuals concerned. The external evaluator analyzed the information collated so as to conduct evaluation analyses and make appropriate judgements.

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance/Coherence (Rating: ③[2])

3.1.1 Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Timor-Leste

Before the start of this project, the government of Timor-Leste formulated the *Strategic Development Plan* (2011–2030). Six economic development areas were designated nationwide in this plan, and provision was made for development of the economic infrastructure of Dili City and its surroundings through road and bridge construction work. The Tibar-Dili-Hera integrated economic region (the region that crosses Dili City and connects the northern coast to the east and west) was of particular importance. This project—construction of a new bridge across the Comoro River, connecting the east and west of Dili City—was aligned with the above plan.

At the time at which the ex-post evaluation was conducted, the above-mentioned *Strategic Development Plan* (2011–2030) was still valid. Aiming to realize a democratic and sustainable social environment, the government of Timor-Leste, in this plan, is continuing to promote infrastructure development such as roads and bridges, as at the time of planning, in order to meet increasing traffic levels in Dili City, which has not changed since the time of planning.

Based on the above, there has been a focus on measures for addressing traffic demand and alleviating congestion in Dili City, prior to the start of this project and at the time of the ex-post evaluation; therefore, the project is consistent with governmental policy and corresponding measures.

3.1.1.2 Consistency with the Development Needs of Timor-Leste

Before this project began, Dili City had limited room for new residential land development, for topographical reasons. The Comoro River flows through the west side of the city in a north-south direction. The city's population was expanding to the west, where the airport is located, and the traffic volume between the east and west of the city was increasing rapidly. However, there was only one bridge crossing the Comoro River, and the concentration of traffic on the bridge caused congestion, paralyzing the city traffic. The government of Timor-Leste started construction work to widen the bridge, from one lane to two lanes on each side, as an emergency measure, with a view to reducing traffic congestion. While the two lanes on each side became operational in June

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[2] ④: Very High、③: High, ②: Moderately Low, ①: Low

2013, this measure was not sufficient to cope with subsequent increases in traffic, and there were also concerns from the perspective of disaster prevention and urban development. For these reasons, construction of a new bridge across the Comoro River, connecting the east and west of the city, was needed, and it was necessary to secure an alternative route and decentralize city traffic at an early stage.

At the time of the ex-post evaluation, construction of the new Tibar Port is close to completion, and logistics and vehicles entering the port are expected to increase significantly. The DRBFC believes that the development of a road connecting this port and the Dili urban area will become even more important. As the traffic volume is expected to increase, construction of the "Hinode Bridge II" is under consideration.[3] In addition, the government of Timor-Leste is working towards achievement of a smooth traffic flow and enhanced transportation capacity through initiatives other than this project, such as the "Road Network Upgrading Sector Project (Tasitolu-Tibar Road Project)" and the "Golgota-Banana Access Road Development Project," for the purpose of decentralizing city traffic, alleviating traffic congestion, disaster prevention measures and developing the city.

Based on the above, the government of Timor-Leste's efforts are observed to work on smooth transportation and capacity enhancement in Dili City, before the start of this project as well as at the time of ex-post evaluation; therefore, this project is consistent with the development needs before the start of this project as well as at the time of ex-post evaluation.

3.1.2 Coherence (Rating: ②)

3.1.2.1 Consistency with Japan's ODA Policy

Before the start of this project, Japan formulated the *Country Assistance Policy for Timor-Leste* (2012), in which "establishing a foundation for promoting economic activities" was listed as one of the priority areas. This policy also stated that Japan would focus on supporting infrastructure development, development of economy-related systems and industrial human resource development, with a view to revitalizing Timor-Leste's economic activities.

This project was designed to contribute to revitalizing economic activities through the development of transportation infrastructure facilities (bridges and roads) in Timor-Leste, so it is consistent with Japan's ODA policy.

3.1.2.2 Internal Coherence

JICA has assisted Timor-Leste's transportation sector through a grant aid project, "Project for Improvement of Roads Between Dili and Cassa" (2004–2006), and a technical cooperation project,

[3] Although specific and clear information has not been obtained about the plan, the DRBFC is discussing the possibility of building a bridge of the same size, to be built with its own funds in the immediate vicinity of the Hinode Bridge constructed by this project.

"Project for Capacity Development of Road Works" (2010–2013). However, since these projects were completed in chronological order before the start of this project, there was no specific and direct collaboration or assumption between these and this project.

3.1.2.3 External Coherence

So far, road maintenance projects in Timor-Leste have been implemented with the support of the World Bank[4] and the ADB.[5] However, there is no specific conflict or crossover with this project. Rather, from the viewpoint of improving and expanding the road network of the country and realizing smooth transportation, it can be said that the objectives of this project have some commonality with and complement previous initiatives supported by the World Bank and the ADB.[6]

<Summary of Relevance/Coherence>

In this project, "Consistency with the development plan" and "consistency with development needs" are confirmed. As for coherence, while this project is "consistent with Japan's ODA policy," no specific collaboration/coordination is identified for "internal coherence." In terms of "external coherence", other donors are also implementing road network improvement/expansion projects to realize smooth transportation, and there is commonality in this perspective. However, no specific collaboration/coordination is identified. Therefore, its relevance and coherence are high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

Table 1 shows the planned and actual outputs of this project.

Table 1: Planned and Actual Outputs of This Project

At the Time of Planning	Actual
[Planned Inputs of the Japanese Side] 1) Civil engineering work; procurement of equipment: a bridge (one lane on each side; a prestressed concrete (PC) box girder bridge, about 250 m long) and access roads (one	[Actual Inputs of the Japanese Side] 1) Civil engineering work; procurement of equipment: a bridge (one lane on each side; a prestressed concrete (PC) box girder bridge, 250 m long) and access roads (one lane on

[4] These include the following: "Estrada halilaran-balibar, Lot 1," "Dili-Ainaro Road, Namely Aituto-Hatobuilico-Letefoho-Gleno Road (Survey Feasibility and Design)" and "Upgrading and Maintenance of the Dili Ainaro Road, Lot 2, 3, 4, 5."

[5] These include the following: "Dili to Baucau Highway Project, Manatuto-Baucau Section," "Road Network Upgrading Sector Project" and "Upgrading and Maintenance of Baucau to Viqueque Highway Project."

[6] In addition, it can be said that at the time of planning, the contents described were consistent with the international framework. This project is positioned as a transportation infrastructure facility that supports the economic growth and industrial development of east Timor, and it can be said to support stable logistics and transportation, that is, to contribute to the resilience of national power.

lane on each side; maintenance extension of about 3 km); 2) Consulting Services: detailed design and construction supervision.	each side; maintenance extension of 3.76 km) → implemented as planned; 2) Consulting Services: detailed design and construction supervision → implemented as planned.
[Planned Inputs of the Timor-Leste Side] 1) Environmental and social considerations (house relocation and compensation, land acquisition costs, environmental monitoring); 2) Relocation of existing public services (relocation of water pipes, communication lines, electric wires and utility poles); 3) Temporary yard leveling (camp yard leveling before commencement of construction); 4) Others (tax exemption-related cost associated with this project to be borne by the Timor-Leste side etc.).	[Actual Inputs of the Timor-Leste Side] implemented as planned.

Source: documents provided by JICA; answers to the questionnaire

In this project, the outputs of both the Japanese side and the Timor-Leste side were implemented as per the plan.[7]

From March 29th to April 4th, 2021, there was heavy rain across all of Timor-Leste, and although the Hinode Bridge and areas around the access roads were at risk of flooding, there was no direct damage or impact. This will be elaborated on below in 3.3.1.2 Qualitative Effects (Other Effects) under Effectiveness.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total cost of this project was initially planned to be approximately 2,786 million yen (of which 2,164 million yen was to be borne by the Japanese side, and approximately 622 million yen was to be borne by the Timor-Leste side). The actual spend was approximately 2,414 million yen (2,022 million yen borne by the Japanese side and approximately 392 million yen borne by the Timor-Leste side), which was within the plan (approximately 87% of the planned figure). The difference between the planned and actual project costs on the Japanese side was mainly due to realization of efficient bids for the construction works. A key reason for the difference between

[7] Of the actual outputs produced by the Timor-Leste side, 2) Relocation of existing public services (relocation of water pipes, communication lines, electric wires and utility poles) was done by the Departments of Water Supply and the telecommunications department under the Ministry of Transport and Communications.

the planned and actual project costs on the Timor-Leste side was that various costs turned out to be less than originally anticipated, e.g., expenses required for house relocation and compensation; land acquisition costs; environmental monitoring; costs related to tax exemptions associated with the project; and preparation of land for temporary yards etc.

3.2.2.2 Project Period

This project was planned to run from March 2014 to February 2017 (36 months). In reality, it lasted from March 2014 to October 2018 (56 months), which was significantly longer than planned (approximately 156% of the planned timeframe). This was mainly because the land acquisition procedure and other related processes associated with the project sites (compensation cost estimation, communication with related ministries/agencies, securing budgets, explaining the details of the project to target residents and paying compensation, etc.) took time,[8] even though the implementation design (detailed design survey) was carried out mostly as planned. In particular, securing the budget and procedures took considerable time (approximately 3 months) because administrative functions were stagnant in 2015 due to a series of political events, such as establishment of a coalition government and a structural reform of the Cabinet. In November 2015, when there was a good prospect for concluding the land acquisition, the grant agreement (G/A) and the exchange of notes (E/N) were signed, followed by the tendering and construction works.[9] Construction took slightly longer than originally anticipated because the land surveys and construction of pavements, drainage, sidewalks, etc., for the extension airport road in Dili City took longer than expected (approximately 2.5 months). Overall, it was delayed by about a year.

As discussed above, the outputs of this project were mostly as per the plan, and the project cost was within the plan. However, the project period was significantly longer than planned. Therefore, efficiency of the project is moderately low.

3.3 Effectiveness and Impacts[10] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

Table 2 shows the quantitative effect indicators (baseline, target and actual values) for this

[8] The preparatory survey and compensation subject evaluation for the land acquisition began in May 2014, with a different timeline from that of the implementation design (detailed design survey) for this project. The DRBFC side of the process, such as securing budgets, explaining the details of the project to residents and making compensation payments, was completed by December 2015. Acquisition of land took approximately a year and 8 months.

[9] According to JICA's documents, at the time of planning, the period required for the land acquisition procedure was expected to be about a year and a half, from June 2013 to December 2014. In other words, the procedure was expected to be completed in December 2014. Given that it was completed in November 2015, it can be said that the procedure for land acquisition was delayed by about 11 months.

[10] Sub-rating for Effectiveness is to be put with consideration of Impacts.

project. In addition, as reference information, Table 3 shows the changes in number of newly registered vehicles nationwide.

Table 2: Quantitative Effect Indicators for This Project (Baseline, Target and Actual)

Indicator	Baseline 2013	Target 2020	Actual 2018	Actual 2020
		3 Years After Project Completion	The Year of Project Completion	2 Years After Project Completion
1) Volume of traffic crossing the river (unit: pcu/day) *Note 1	38,000 *Note 2	57,000 *Note 3 Existing bridge: 43,000 Hinode Bridge: 14,000	51,787 *Note 5 Existing bridge: 36,198 Hinode Bridge: 15,589	92,852 Existing bridge: 58,028 Hinode Bridge: 34,824
2) Average speed of traffic crossing the river (unit: km/h)	40 *Note 2	60	N/A	35-45 *Note 6
3) Freight traffic (unit: vehicle/day) *Note 4	3,400 *Note 2	4,700 *Note 3 Existing bridge: 3,700 Hinode Bridge: 1,000	N/A	No data (*However, it is estimated that more than one in 10 vehicles crossing the river are trucks or trailers.)

Source: JICA's documents, answers to the questionnaire (DRBFC's data) and measurements taken by driving across the bridge in a vehicle
Note 1: pcu stands for passenger car unit.
Note 2: Numbers at the existing bridge.
Note 3: This shows the total traffic volume on the existing bridge and the Hinode Bridge. As for vehicle types, this is the total number of mopeds, passenger cars, buses, trucks and trailers. The actual values are composed likewise.
Note 4: Prior to the start of this project, according to JICA's documents, the annual cargo volume handled at the new Tibar Port was expected to be 100,000 TEU, while the annual cargo volume handled at Dili Port is currently 40,000 TEU. It was anticipated that the new Tibar Port would open in 2017 and that the volume of trucks and trailers driving across the Hinode Bridge and on the access roads constructed by this project would also increase.
Note 5: Taken from JICA's documents.
Note 6: At the time of the field survey for this study (November 2021), we actually got in a vehicle and measured the travel speed on the Hinode Bridge (measured multiple times during the day and at peak times).

(Reference) Table 3:
Number of new vehicle registrations nationwide (changes over 2006–2020)

(Unit: vehicle)

2006	2007	2008	2009	2010	2011	2012	2013
1,441	3,115	5,559	10,216	9,660	9,146	10,556	13,860
2014	2015	2016	2017	2018	2019	2020	
15,850	17,510	19,201	17,253	13,693	18,490	19,533	

Source: National Directorate of Land Transportation (Direção Nacional de Transportes Terrestres)

Regarding the quantitative effect indicators for this project, at the time of planning, three

indicators were set to measure effects: “volume of traffic crossing the river,” “average speed of traffic crossing the river” and “freight traffic.” In this study, actual values were obtained and compared with the target values. Below is an analysis of each indicator.

1) Volume of Traffic Crossing the River

The actual 2020 volume significantly exceeded the target. The reasons are as follows: the traffic volume that used to congest the existing bridge and the arterial road (national road A03) is now being absorbed by the Hinode Bridge developed by this project; the number of vehicles is on the rise,[11] as the table of newly registered vehicles (Table 3) shows; and the population of Dili City is on the increase. The traffic volume is increasing on both the existing bridge and the Hinode Bridge. As shown in Table 2, the traffic volume of the existing bridge (2020) recorded an increase of approximately 1.35 times the target value. However, the traffic volume on the developed Hinode Bridge recorded an increase of approximately 2.5 times, bearing a greater traffic load than the existing bridge. Therefore, it can be concluded that the target has been achieved, with the Hinode Bridge accommodating the initially expected traffic load.

As mentioned earlier, a significant increase in logistics is expected once construction of the new Tibar Port is complete.[12] The DRBFC believes that development of transportation infrastructure connecting the port and Dili urban area will become even more important, further increasing the significance of the Hinode Bridge and access roads.

2) Average Speed of Traffic Crossing the River

In this survey, we actually drove across the Hinode Bridge and measured the speed we were able to travel at; it was about 35 to 45 km per hour.[13] As shown in 1) above (average volume of traffic crossing the river), the originally anticipated speed (60 km/h) has not been achieved because the Hinode Bridge has heavy traffic, which slows down the vehicles regardless of the time of day. In other words, the target has not been achieved. As discussed in Section 3.1.1.2 (Consistency with the Development Needs), the government of Timor-Leste needs to continue implementing transportation measures in anticipation of the opening of the new Tibar Port.

3) Freight Traffic

Although the DRBFC did not have any recorded data, firsthand observations confirmed that more than one in 10 vehicles driving across the Hinode Bridge seemed to be heavy vehicles, such as trucks and trailers. According to the DRBFC, the volume of heavy vehicles has been increasing

[11] It is possible that the increase is due to economic revitalization and an increase in people’s disposable income and purchasing power.
[12] It is scheduled to be completed in 2022.
[13] During the day, we made multiple trips across the Hinode Bridge during peak hours to measure the speed, and we calculated the average value.

on both the Hinode Bridge and the existing bridge in recent years. One of the factors in this is that there is a construction material warehouse (one of the largest in Dili City) situated near both bridges, and gravel, blocks, road pavement materials, etc., are often transported. Based on the above, it can be inferred that the originally anticipated freight traffic load has been sufficiently absorbed, and the target has been achieved.

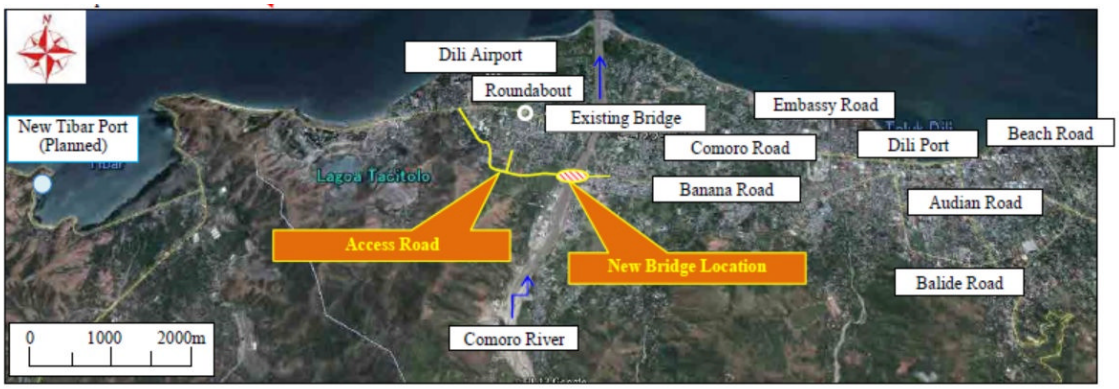


Photo 1: Location of Dili City, the New Tibar Port, Hinode Bridge and Access Road (At the Time of Planning)
*Source: JICA's Preparatory Survey Report (2013)

Photo 2: Around the Planned Construction Site of the Hinode Bridge Before the Start of This Project (2013) (The yellow part is where the Hinode Bridge was to be constructed.) *Source: Google Earth

Photo 3: Area Around the Hinode Bridge at the Time of the Ex-Post Evaluation (2021)
(The yellow line and arrows show the Hinode Bridge and access roads.)
*Source: Google Earth

3.3.1.2 Qualitative Effects (Other Effects)

As Photo 1 shows, the Hinode Bridge was constructed at a key location as a detour/alternative route for the existing bridge and the arterial road (national road A03). Apart from providing connections to different parts of Dili City, to the airport and to the new Tibar Port (under construction), this project is also thought to be contributing to alleviation of traffic congestion and a reduction in traffic accidents.

Traffic congestion is becoming a pressing issue in Dili City, and traffic volume on arterial roads is particularly high and increasing. There have been cases where vehicles that were initially concentrated on the existing bridge along national highway A03 were dispersed in the event of a natural disaster and used the Hinode Bridge to evacuate. Heavy rains continued in Timor-Leste from March 29th to April 4th, 2021, causing flash floods in rivers and landslides in mountainous areas. Damage was confirmed in all 13 municipalities in the country. Dili City and the surrounding area were also severely affected. Different government agencies, including JICA, provided emergency and humanitarian assistance, totaling US $ 19.42 million.[14] At the time of the disaster, the airport roundabout intersection of national highway A03 (Photo 1) passing through the existing bridge (located downstream) was flooded and so were small and medium-sized rivers in

[14] Nationwide, 30,322 households were affected in one way or another, of which 24,816 were in Dili; 4,212 houses were severely damaged; 34 people were dead or missing, 22 of whom were Dili citizens. These numbers are from the "Timor-Leste Floods – Situation Report No. 11" (as of July 16th, 2021).

the city crossing national highway No. 3, creating traffic problems. The Hinode Bridge and the access road located upstream were not flooded, and there was no overflow from the Comoro River or traffic obstruction. Although it is unclear how many vehicles and residents were actually using the Hinode Bridge and access roads at the time of this event, it is an example of how this development functioned as a detour in the case of an emergency. It is presumed that this project is contributing to the prevention of casualties[15] and a reduction in economic damage.[16]

In 2021, the consultants in charge of supervising construction under this project visited Dili to check whether there was road flooding, overflow from the Comoro River and/or any traffic obstructions; they checked for damage to the Hinode Bridge and access roads (resulting from the above-mentioned heavy rain) by talking to local people involved and visiting the sites. According to the consultants, while no direct damage was found, the pillar blocks designed to prevent scouring around the riverbed pier of the Hinode Bridge were destroyed, so they advised the DRBFC to restore the blocks.[17]

Photo 4: Developed Hinode Bridge (1)

[15] For example, it secures time (lead time) for local residents to evacuate, enabling them to do so quickly and safely.
[16] Examples include preventing vehicle submersion, reducing damage, and safeguarding commuter access for work and other purposes.
[17] One of the reasons for the rooting block damage could be that the circular hole dug at the time of gravel collection, near the rooting block, expanded due to the flood flow and reached the rooting block, causing it to slide or run off; the consultants therefore advised the DRBFC that collection of gravel around the rooting block should be restricted.

Photo 5: Developed Hinode Bridge (2)

Photo 6: Developed Access Road

Photo 7: Housing Development Status Along the Access Road

3.3.2 Impacts

3.3.2.1 Intended Impacts

(Contribution to Economic Revitalization and Resilience by Improving East-West Access Efficiency and Strengthening the Transportation Sector)

The aim of this project was to disperse city traffic, thereby reducing traffic congestion in Dili City, by constructing a new bridge that crosses the Comoro River and connects the east and west sides of Dili City. It was anticipated that it would contribute to ensuring logistics punctuality, strengthening the transportation sector and revitalizing the economy, in conjunction with the opening of the new Tibar Port. Table 4 shows the GDP growth rates of Timor-Leste since the start of this project, as reference data.[18] Considering that the rates were negative for 2017–2018 and positive for 2019, it is not easy to talk about the relationship between this project and economic

[18] A large part of the government of Timor-Leste's revenue is gains from the sale of oil and natural gas, but in recent years, it has been aiming to promote sustainable economic growth through economic diversification.

revitalization. However, as mentioned above, the opening of the new Tibar Port and the increase in container cargo transactions are expected to positively impact the economic statistics. Next, Table 5 shows changes in the population of Dili. It has increased significantly over the last 10 years.[19] Had the Hinode Bridge and access roads not been developed amidst the economic revitalization and population growth, it is possible that traffic paralysis would have worsened as city traffic would not have been dispersed. In either case, it is important for the government of Timor-Leste to implement appropriate transportation measures, including construction and renovation of roads and bridges.

(Reference) Table 4: GDP Growth Rate of Timor-Leste

(Unit: %)

2015	2016	2017	2018	2019	2020
2.91	3.36	-4.01	-1.05	18.72	-8.70

Source: World Bank

(Reference) Table 5: Changes in the Population of Dili City

(Unit: number)

2010	2015	2021
193,563	222,323	262,530

Source: World Population Review
Note: Timor-Leste has a total population of approximately 1.31 million (source: United Nations, 2021 data)

In addition, as shown in Photos 2 and 3 above, a comparison of the situation before the start of this project (2013) and at the time of the ex-post evaluation (December 2021) shows that development of housing etc. is progressing around the Hinode Bridge and the access road. Land prices around the access road have also risen significantly. Residents who purchased land adjacent to the access road were interviewed as part of the field survey, and the following comment was received: “The price per square meter of land before the construction of Hinode Bridge (around 2014) was about US $ 30, but at the time of the ex-post evaluation (November 2021), it has risen to around US $ 150. I think the benefits (of constructing the Hinode Bridge and access roads) are great for the landowners.”

From the above, it can be inferred that development of the Hinode Bridge and access roads has brought about improved traffic access in Dili City and revitalization of the regional economy by promoting development around the target area.

[19] The factors behind the increase are a greater population influx from rural areas, increased life expectancy and a high birth rate.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Natural Environment

This project does not fall into the large-scale road/bridge sector listed in the Japan International Cooperation Agency Guidelines for Environmental and Social Considerations (promulgated in April 2010), and it was judged that any undesirable impact on the environment would be negligible; therefore, it was classified as category B. Based on the project plan submitted by the DRBFC, the Environment Bureau of the Ministry of Economy and Development of Timor-Leste issued an environmental certificate before the start of this project.

During implementation of this project, the DRBFC was responsible for environmental monitoring, and a construction supervision consultant carried out the actual tasks. This consultant has taken measures in line with the environmental management plan, to minimize the impact on the natural environment by considering noise, vibration, drainage, air pollution, etc., generated by the construction sites. In this survey, site inspections, interviews with DRBFC representatives and answers to the questionnaire confirmed that there was generally no negative impact on the natural environment, e.g., air pollution, noise/vibrations and disturbance of ecosystems. Environmental monitoring after project completion[20] is undertaken by the DRBFC's Department of Training Planning and Cooperation. The Irrigation Facility Department of the Ministry of Agriculture and Fisheries is in charge of water quality and contaminated wastewater. If a negative problem arises, these organizations are supposed to discuss the matter and cooperate with one another to deal with the issue; however, as mentioned above, no serious problems had occurred as of the time at which the ex-post evaluation was conducted.[21]

2) Resettlement and Land Acquisition

Land had to be acquired before the Hinode Bridge and access roads could be constructed. In total, 80 households[22] were targeted, including 40 households for the bridge construction and 40 households for the access road development and widening. The acquisition area was approximately 6.8 ha, and the compensation amount was US $ 452,038.96. For resettlement and land acquisition, the DRBFC was responsible for coordinating actions involving other ministries. According to the DRBFC, "residents who were subject to the resettlement and those involved in the project (the DRBFC, related ministries, project consultants, etc.) shared a common understanding for proceeding with the project through information exchange so as to realize

[20] This includes regular site monitoring, field surveys, discussions and negotiations with landowners.

[21] As a special note, before the start of this project (2014), "the possible impact on the ecosystem due to the improvement of access roads was pointed out because the project area was close to the Tasitolu Important Bird Areas." However, it was decided that this road would not be located near this area, so there was no impact. According to the DRBFC, no particular negative impacts or complaints have been reported.

[22] This comprises the following: 38 households that were "affected because they owned buildings and plants (trees, etc.);" 18 households that "did not own buildings but owned farmland;" and 24 households that "owned buildings" (80 households in total). Of these, 24 households needed to be relocated due to the construction work.

smooth transportation and congestion relief in Dili City. The DRBFC held briefing sessions for the target people (multiple times), and by answering inquiries carefully, they ensured that affected people understood the necessity of developing the Hinode Bridge and access roads, and that they understood that their land would be affected." At the start of the land acquisition procedure, compensation with the reacquisition was paid based on compensation evaluation surveys, interviews and briefing sessions with residents[23]. Given these measures, the DRBFC is of the opinion that the series of processes was in line with the contents of the JICA Guidelines for Environmental and Social Considerations.

3) Gender Equality, Marginalized People, Social Systems and Norms, and People's Well-Being

With respect to the impact on gender equality, marginalized people, social systems and norms, and people's well-being concrete cases could not be confirmed in this survey. However, in Dili City, the increase in traffic volume and the opening of the new Tibar Port will be a trigger, and economic revitalization is expected. It is presumed that the effects of this project, such as alleviating traffic congestion, will have a positive impact on job creation and opportunities for social participation. In other words, improvement of the working environment and the advancement of women into society may be promoted further, and many people and companies may benefit as well.

Regarding consideration of marginalized people, as discussed in 2) above (resettlement and land acquisition), the DRBFC and other project personnel carefully explained the government's land guidelines, the basis for estimating compensation costs, the procedure for remittance of compensation costs, and the relocation grace period for target households, before seeking their agreement to the land acquisition. It can be concluded that the appropriate process was carried out carefully. In addition, as shown in Photo 5, pedestrians can walk safely and comfortably on the Hinode Bridge. Lighting has also been installed at regular intervals, providing good visibility at night. An easy-to-use, fair and versatile design was adopted in this project, which has also benefited pedestrians crossing the Hinode Bridge.

This project has mostly achieved its objectives. Therefore, effectiveness and impacts of the project are high.

[23] There was no particular impact on the livelihoods of the target people as a result of the land acquisition and resettlement. No complaints were also received at the time of the ex-post evaluation.

3.4 Sustainability (Rating: ②)

3.4.1 Policy and System

According to the *Strategic Development Plan* (2011–2030) formulated by the government of Timor-Leste, sustainable social environment development is a policy goal, in line with infrastructure development such as roads and bridges, to respond to the increase in traffic around Dili City. This project is contributing to the country's transportation sector measures by addressing the issue of increasing traffic demand; therefore, it can be said to be in line with governmental policies and directions at the time of the ex-post evaluation.

3.4.2 Institutional/Organizational Aspect

The executing agency is the DRBFC at the time of the ex-post evaluation, and its Dili office (a local office) is in charge of operations and maintenance. The number of staff in the office is 356 (including 324 technical engineering staff), and there are 22 people in charge of bridges and roads developed by this project (data as of the end of 2020). The actual maintenance work is to be carried out by an outsourcer (private company) once the office has signed a contract. The Hinode Bridge and access roads had just been completed at the time of the ex-post evaluation, and according to the DRBFC, there are currently no problems with the output status. Routine and regular maintenance has not yet begun, and expenditure has yet to be defrayed. When maintenance is carried out in the future, this office will supervise and inspect outsourced works via its established system. Feedback from the questionnaire and interviews with staff in the DRBFC Dili office indicates that the number of staff responsible for maintenance of the Hinode Bridge and access roads developed seems to be sufficient. However, as the outsourcing contract has not been concluded at the time of the ex-post evaluation and actual maintenance work has yet to be carried out, it is difficult to evaluate, make judgements or examine the actual operation and maintenance system. On the other hand, as will be discussed in Section 3.4.7 (Status of Operation and Maintenance), it is necessary to carry out regular inspections, cleaning, road repairs, etc., more thoroughly; and it is also necessary to formulate a maintenance plan.

3.4.3 Technical Aspect

The DRBFC gained knowledge pertaining to "creating a database of maintenance of roads and bridges," "creating a checklist for construction work," a "case study of emergency and flood control on the Roes River" and a "case study of the Sahen Bridge and the Hinode Bridge" through JICA's "Project for Capacity Development of Road Works" (2010–2013). According to the DRBFC, the content of the abovementioned project was useful for maintenance of the Hinode Bridge and access roads. On the other hand, no specific training has been conducted since completion of the project, according to the DRBFC. As the developed Hinode Bridge and access

roads have only just been completed, the need for maintenance had not yet arisen as of the time at which the ex-post evaluation was conducted. It was also indicated that maintenance manuals are not particularly utilized. Although no major problems have been observed, it would be prudent to continue work on the training plans and utilization of the manuals. As an OJT for new employees of the DRBFC, technical training on roads, bridges and flood control is being conducted.

3.4.4 Financial Aspect

In recent years, regular and daily operation and maintenance budgets for the Hinode Bridge and access roads have not been allocated. According to the DRBFC, its policy is to allocate a budget for the Hinode Bridge and access roads after assessment of the need for repairs or construction in the event of serious damage occurring (e.g., obstruction of the passage of vehicles).[24] As a matter of fact, there are no particular obstacles for vehicles to pass, and no problems have occurred. Nevertheless, budget allocations and expenditure should be made with due consideration of responses to the traffic demand of Dili City. It would be advisable for the DRBFC to establish such a system and work on budget allocation and expenditure.[25]

3.4.5 Environmental and Social Aspect

Feedback from the DRBFC questionnaire and site inspection interviews indicated that no special environmental and social mitigation measures were being taken at the time of the ex-post evaluation; nor is any impact currently expected. As discussed in Section 3.3.2.2 (Other Positive and Negative Impacts), it is thought that as of the time at which the ex-post evaluation was conducted, no significant negative impact had occurred.

3.4.6 Preventative Measures to Risk

When the ex-post evaluation was conducted, the political situation and security had not deteriorated in Timor-Leste. There were no major changes in the national development plans and policies concerning roads and bridges. As discussed in Section 3.1.1.2 (Consistency with the Development Needs of Timor-Leste), considering that the number of vehicles driving across the Hinode Bridge is expected to increase in the wake of the opening of the new Tibar Port, and that

[24] It was confirmed that US $ 240,000 has been secured as a daily maintenance budget for the entire east-west city road in Dili City.

[25] As a side note, the financial resources of the government of Timor-Leste have been somewhat limited in recent years. Financial resources are allocated to each ministry and agency in the form of budgets, and each ministry and agency prepares a budget for operation and infrastructure development within the set limits. The government documents consulted indicated that the maintenance budget for existing infrastructure facilities tends to be limited. It seems that budgets for development and expansion of infrastructure facilities are prioritized, and maintenance budgets are not of high priority (source: Budget Overview 2021, Timor-Leste). As discussed above, a daily maintenance budget of US $ 240,000 is secured, which is thought to be utilized when and as needed.

construction of the “Hinode Bridge II” is under consideration in response to likely future increases in traffic volume in Dili City, there have been no policy changes concerning roads and bridges. In addition, no particular risks, external conditions or events needing to be controlled (either at present or in the future) have been identified.

3.4.7 Status of Operation and Maintenance

There are no major problems with the developed Hinode Bridge and access roads at present, although, as shown in Photos 8 and 9, some maintenance and repairs were necessary for a part of the access roads. (NB. the DRBFC plans to use the maintenance budget of the “Dili Western City Road” project for repairs to relevant parts.) In any case, the outsourced company which is expected to carry out onsite maintenance needs to work diligently on regular inspections, cleaning, road repairs, etc., and the DRBFC’s Dili office should formulate the maintenance plans and duly conduct the supervision and monitoring.[26] Regarding the spare parts, as the Hinode Bridge and access roads have just been completed, there is no need for these yet. Nevertheless, it is necessary to identify the situation, and work on securing and storing spare parts.

Some minor issues have been observed in terms of the institutional/organizational, financial, and current status of the operation and maintenance system. It is not expected to be improved/settled. Therefore, sustainability of the project effects is moderately low.

(Reference) Photo 8: Uneven Spots Near the Connection Between the Hinode Bridge and the Access Road (Sand lodged in the dent)
(Photograph taken in October 2021)

[26] According to the construction supervision consultant who visited Timor-Leste for a status survey during 2021, when heavy rain damage occurred, “many parts of the drainage of the access road on both sides were clogged with dirt and sand. The consultant requested that the DRBFC handle the matter properly, as there was a need to carry out inspections and cleaning on a daily basis.”

(Reference) Photo 9: Uneven Spots on the Access Road
(Dent occurred) (Photograph taken in October 2021)

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The aim of this project was to reduce traffic congestion by decentralizing traffic, improve east-to-west access efficiency, revitalize the economy and strengthen resilience in Dili City by constructing Hinode Bridge and access roads. In this project, “consistency with the development plan” and “consistency with development needs” were confirmed. Regarding coherence, “consistency with Japan's ODA policy” can be said to be coherent, however “internal coherence” and “external coherence” did not confirm effects from specific collaboration or coordination. Based on the above, relevance/coherence is high. With respect to efficiency, although the outputs were mostly as planned, and the project cost was within the plan, the project duration was significantly longer than the initial plan due to the delay in land acquisition procedures. Therefore, the overall efficiency of the project is moderately low. Regarding the effectiveness/quantitative effects indicators, target 1) “volume of traffic crossing the river” was achieved, and it can be inferred that target 3) “freight traffic” was also achieved. Target 2) “average speed of traffic crossing the river” was not achieved, mainly because of increased traffic using the bridge, with speed curtailed by the large number of vehicles at peak times and during the day. According to the interview survey, the Hinode Bridge and access roads are fully utilized as a means of ensuring safety in the event of a heavy rain disaster, and are playing a role in preventing casualties and reducing economic damage. Therefore, the anticipated effects of the project have been achieved overall; effectiveness and impacts are high. With regard to sustainability, while there seems to be no major concern about the outlook for the sustainability of the effects generated by this project, it is fair to say that there are some problems because the budget for operation and maintenance

and the status of some maintenance aspects are not entirely satisfactory. Therefore, sustainability of the project effects is moderately low.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

At the time of the ex-post evaluation, there are thought to be no serious problems with the condition of the Hinode Bridge and access roads constructed. However, in recent years, the operation and maintenance budget has not been allocated as it should have been, and maintenance under a clear plan has not been carried out. Especially in the future, with the opening of the new Tibar Port, the traffic volume (mainly freight carriers) in Dili City is expected to increase. It would be advisable for the Timor-Leste government to identify the traffic demand and work to improve the transportation infrastructure so as to keep traffic running smoothly. At the same time, the DRBFC should work on regular and routine maintenance of the Hinode Bridge and access roads.

Although there was no direct damage to the Hinode Bridge during the heavy rain that occurred in 2021, it was confirmed that the rooting block that prevents scouring around the riverbed pier was affected. The construction supervision consultant for this project, who checked the current situation, has advised the DRBFC to restore the block. It would be a good idea for the DRBFC to act promptly with regard to implementing measures to address issues with the rooting block, based on the recommendation.

4.2.2 Recommendations to JICA

As discussed above, the construction supervision consultant for this project has advised the DRBFC to restore the block, pointing out the “impact on the rooting block designed to prevent scouring around the riverbed pier.” JICA should monitor the progress as much as possible and make a request as needed so that the measures are taken promptly.

4.3 Lessons Learned

<u>Importance of Steady Allocation of the Operation and Maintenance Budget</u>

There are no significant maintenance-related problems, but there has been a lack of regular and adequate allocation of the operational and maintenance budget for the developed Hinode Bridge and access roads. The assistance provider and recipient country should have taken steps to allocate necessary budgets at appropriate points, based on what was agreed before the start of the project or during the project implementation, through discussions about disbursement of maintenance budgets after project completion. When formulating a similar project in the future, it would be desirable for both the assistance provider and the recipient country to discuss and agree a budget

for maintenance and how this should be used, at the earliest possible stage.

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

None.

5.1. Additionality

None.

(end)