Republic of Vanuatu

FY2022 Ex-Post Evaluation Report of
Japanese ODA Loan
"Port Vila Lapetasi International Wharf Development Project"
and
"Port Vila Lapetasi International Multi-Purpose Wharf Development Project (II)[1]"
External Evaluator: Keisuke Nishikawa / Shunya Awamura, QUNIE CORPORATION

0. Summary

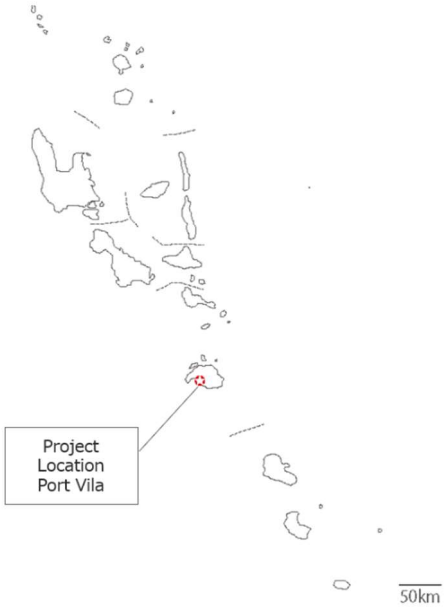
The objective of the Project was to enhance international cargo logistics by upgrading the Lapetasi Wharf in Port Vila, the capital of Vanuatu, as an international multipurpose wharf, thereby contributing to the sustainable economic and social development of the country.

Both at the time of the appraisal and ex-post evaluation stages, the Project has been in line with the development policy and needs of the Government of Vanuatu. The additional ODA loan provided through Phase 2 was deemed necessary to ensure the safety of the wharf. Moreover, the Project was in line with the direction of Japan's development cooperation at the time of the appraisal, and there were indications of coordination and synergies with other JICA projects. Although some coordination with other donors' projects was observed at the planning stage, synergistic effects were limited. Overall, the Project's relevance and consistency are high. The Project's outputs were necessary to fully realize the effects of the wharf, and the inputs were sufficient to achieve the outputs. Although the actual project period exceeded the plan, the total project cost was within the plan, indicating a high level of efficiency. The quantitative and qualitative effects anticipated at the time of the appraisal were confirmed. Although there were significant challenges in terms of the response to coral reef restoration and the recovery assistance could not be implemented due to difficulties in coordinating with local communities, no specific cause-and-effect relationship between the implementation of the Project and the impacts on coral reefs could be confirmed. The Lapetasi Wharf plays a very significant role as a port that handles smooth international logistics in Efate Island, the economic center of Vanuatu. Therefore, the overall effectiveness and impacts of the Project are high. No issues have been observed in the policy/system, institutional/organizational, technical, financial, and environmental and social aspects, including the current status of the operation and maintenance system. Future risks have been well mitigated. Therefore, sustainability of the Project effects is very high.

In light of the above, the Project is evaluated to be highly satisfactory.

[1] "Port Vila Lapetasi International Wharf Development Project" is expressed as "Phase 1" and "Port Vila Lapetasi International Multi-Purpose Wharf Development Project (II)" is expressed as "Phase 2". The overall project combining both phases is denoted as "the Project".

1. Project Description



Project Location
(Source: External Evaluator)

A large cargo ship unloading containers
(Source: External Evaluator)

1.1 Background

Vanuatu's economy had been growing at a high rate of 6-7% per year since 2003, supported by such factors as the expansion of construction-related industries and tourism. The Vanuatu government was progressively upgrading its transportation infrastructure, including ports, roads, and airports. Among the port facilities that play a role in the country's logistics, the Port of Port Vila[2] was the gateway to the country's largest consumption center and the capital city, Port Vila, so there was a need to improve the efficiency of cargo handling and increase the volume of cargo handled through wharf development. Therefore, Japanese Grant Aid "The Project for Improvement of Port Vila Main Wharf" was implemented from 2007 to 2009 to improve the container yard at the main wharf and to provide tugboats. As a result, the wharf was transformed into a structure that can handle not only bulk cargoes but also containerized cargoes. The project has made it possible to efficiently receive imported cargoes. On the other hand, the rapid increase in the number of cargo ships and large tourist vessels entering the Port of Port Vila meant that the wharf still had a condition which forced cargo ships to suspend loading and unloading and wait offshore. In addition, cargo throughput at the Port of Port Vila's main wharf already reached 11,629 TEU per year in 2013 and was expected to exceed the container yard capacity to receive 15,000 TEU by 2016. Furthermore, Vanuatu is an earthquake-prone country where magnitude 6-7 class earthquakes occur. The pier at the main wharf, which is the only wharf at the port that can

[2] The Port of Port Vila handled 86% of total import value in 2009 and 25% of export value in 2009.

accommodate international cargo ships, was aging, and if the wharf were to suffer extensive damage due to a major earthquake, importation of goods, including emergency relief, could have become impossible. Against this backdrop, there was a need for comprehensive development of the Port of Port Vila, such as converting the Lapetasi Wharf, which was adjacent to the main wharf and handled domestic cargo, into a dedicated international cargo terminal and constructing a new wharf to handle domestic cargo as a replacement.

1.2 Project Outline

The objective of the Project is to facilitate international cargo logistics by upgrading the Lapetasi Wharf in Port Vila, the capital of Vanuatu, as an international multipurpose wharf, thereby contributing to the sustainable economic and social development of the country.

<ODA Loan Project>

Loan Approved Amount / Disbursed Amount	Phase 1 4,945 million yen / 4,792 million yen Phase 2 4,598 million yen / 3,451 million yen	
Exchange of Notes Date / Loan Agreement Signing Date	Phase 1 May, 2012 - June, 2012 Phase 2 July, 2015 - July, 2015	
Terms and Conditions	Phase 1	
	Interest Rate	0.55% (for main portion) (0.01% for the consulting service portion) [3]
	Repayment Period	40 years
	(Grace Period	10 years)
	Conditions for Procurement	General Untied
	Phase 2	
	Interest Rate	0.01%
	Repayment Period	40 years
	(Grace Period	10 years)
	Conditions for Procurement	General Untied (Consulting portion: General Untied)
Borrower /	Government of Vanuatu / Ministry of Infrastructure	

[3] Website of the Ministry of Foreign Affairs in Japan
https://www.mofa.go.jp/mofaj/gaiko/oda/data/gaiyou/odaproject/pacific/vanuatu/contents_02.html, accessed on October 11, 2023

Executing Agency	and Public Utilities (Hereafter referred to as MIPU)
Project Completion	February, 2019
Target Area	Port Vila, Shefa Province
Main Contractors (Over 1 billion yen)	TOA CORPORATION (Japan), Portstar Forklifts ltd. (New Zeeland)
Main Consultants (Over 100 million yen)	ECOH CORPORATION / Japan Port Consultants, Ltd. / Oriental Consultants Co., Ltd. (JV)
Related Studies (Feasibility Studies, etc.)	Feasibility Study (F/S), Government of Vanuatu (conducted by the Ministry of Finance and Economic Management with support from Australian AID), 2010 "Preparatory study for the project on international multimodal port at star wharf in Port Vila (review of the quantity survey)," ECOH CORPORATION, 2012, , "Preparatory study for the project on international multi modal port at star wharf in Port Vila in the Republic of Vanuatu (environmental study)," IDEA Consultants, Inc., 2011
Related Projects	<Technical Assistance> "Implementation assistance for the Port Vila Lapetasi international multi-purpose wharf development project in the Republic of Vanuatu," 2014 - 2018 <Grant Aid> "The Project for Improvement of Port Vila Main Wharf," 2007 - 2009 <Other International Organizations> ADB / New Zeeland, "Inter-island Shipping Support Project," 2009 –on going Australia, "Long-term Program of Sector Support in Transport Infrastructure for 2009 - 2011," 2009 – 2011

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa / Shunya Awamura, QUNIE CORPORATION

2.2 Duration of Evaluation Study

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

Duration of the Study: November, 2022 - December, 2023

Duration of the Field Study: February 8, 2023 - February 27, 2023

May 30, 2023 - June 6, 2023

3. Results of the Evaluation (Overall Rating: A[4])

3.1 Relevance/Coherence (Rating: ③[5])

3.1.1. Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Vanuatu

At the time of the appraisal of Phase 1, Vanuatu's national development plan, "Priorities & Action Agenda (PAA)" (2006-2015), included the improvement of domestic maritime transportation and the development of two ports, Port Vila and Luganville, which are international trade hubs, as well as the improvement of safety and security measures.

At the time of the ex-post evaluation, *the National Sustainable Development Plan* (2016-2030) had identified infrastructure improvement as one of the economic policies and specified the need to ensure safe and reliable transportation. In addition, *the Vanuatu Infrastructure Strategic Investment Plan (2015-2024)* explicitly states the need to expand and improve ports in the country, including the Port of Port Vila.

The Project is therefore consistent with Vanuatu's development policy, both during the appraisal and ex-post evaluation phases.

3.1.1.2 Consistency with the Development Needs of Vanuatu

At the time of the appraisal of Phase 1, the Port of Port Vila was handling a rapidly increasing volume of international cargo, and the container yard at the main wharf, which was the Port's international wharf, was reaching its capacity limit[6]. Based on the projected economic and population growth, it was predicted that the volume of cargo handled would exceed the capacity of the main wharf by 2016. In addition, the wharf was located in a geographically constrained area and had limited cargo handling machinery available, making it difficult to enhance efficiency

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[5] ④: Very High, ③: High, ②: Moderately Low, ①: Low

[6] In 2006, the cargo volume handled was 5,382 TEU per year, but it was 11,629 TEU per year in 2013.

in cargo handling. Furthermore, the number of visits by large tourist ships from Australia and New Zealand increased rapidly[7], forcing cargo ships to suspend their operation and wait offshore. As of the time of the ex-post evaluation, most of the cargo ship interruptions and offshore waits have been addressed. However, there remains a need for further development, including the construction of a new wharf to handle domestic cargo[8] adjacent to the Lapetasi Wharf and the expansion of facilities at the main wharf where large tourist ships berth.

From the above, it can be said that at both the time of the appraisal and the ex-post evaluation, there has been a need to improve the wharf at the Port of Port Vila, and this project meets the development needs in Vanuatu.

3.1.1.3 Appropriateness of the Project Plan and Approach

After the signing of the Loan Agreement (hereafter referred to as "L/A") for Phase 1, an additional loan was provided for Phase 2 of the Project. This was mainly due to the fact that the originally planned method, which Submerged Strut method[9], was changed to the Steel Pipe Sheet Pile method for construction of the quay[10], and its additional cost had to be accounted for[11]. Initially the F/S for the Lapetasi Wharf development was carried out in 2010 with support from the Government of Australia but its report did not include survey data to verify the results. In 2013, after the signing of the L/A for Phase 1, the construction method was changed following a

[7] The number of vessels per year in 2005 was 34, while in 2013 it was 125 per year.

[8] The domestic wharf is being developed with the support of ADB and New Zealand, but it is not yet completed as of the time of the ex-post evaluation.

[9] This is a method of reinforcing a Rahmen structure consisting of steel pipe piles and steel pipe sheet piles with submerged strut materials in the underwater area.
The submerged strut materials provide high structural strength, reduce the number of piles, and improve economic efficiency through rationalization of pile specifications. In addition, the hinterland of the quay can be utilised during construction to renew the quay structure, increase the depth, and strengthen the quay against earthquakes.

[10] A quay structure in which steel pipe sheet piles cast in front of the quay are connected to the antechamber sheet pile at the rear by tie-lots or tie-ropes to withstand ground pressure. The area between the steel pipe sheet pile and the antechamber sheet pile is paved by reclamation. Suitable when the ground is soft, but more expensive to construct than the Submerged Strut method.

[11] Normally, the Submerged Strut method is a highly economical method because the construction period can be shortened by omitting or reducing the scope of ground improvement. However, in the Project, the ground in the area was softer than assumed in the F/S results conducted by Australia, and if the Submerged Strut method was adopted, there was a risk of future slip failure in the ground in the quay area. In addition, Vanuatu was unwilling to accept the Submerged Strut method because it would require a weight limit on the quay and would limit the storage area for containers. This was a major factor in the change of construction method. Accordingly, after conducting a detailed design, it was decided in 2014 that the whole project site would be constructed using the Steel Pipe Sheet Pile method, instead of using the pile installation method for the quay wall. In addition, the Australian government, which had planned to support the provision of an office and administration building and equipment for the project, changed its aid policy after the country's general election and cancelled most of its support for the project, and the exchange rate also fluctuated significantly during this period (45% depreciation of the yen between April 2012 and December 2014). As a result, the originally anticipated project cost could not accommodate these changes, and additional loans were provided.

more detailed survey and soil investigation than the F/S, which was conducted by a Japanese consultant and which found that the planned method was not suitable due to the softness of the ground at the development site. The F/S had not been reviewed by a third party, and the Japanese consultant was not provided with the survey data on which the F/S results were based due to copyright issues. It would be too much to say, however, that the handling by the Japanese side itself was problematic, and it is judged that the additional loan induced by the method change was a necessary measure to ensure the safety of the wharf. Although the Project was being implemented under the framework of cooperative support with Australia, there was room for improvement in terms of information sharing regarding the division of roles, where Australia was responsible for F/S and Japan was responsible for detailed planning afterwards[12].

According to MIPU, during the implementation of the Project, communication between the Vanuatu government, Ifira Port Development and Services ltd. (IPDS)[13], private contractors and other parties involved in the Project was smooth, and there were no particular problems in this respect.

As a lesson learned from past similar projects[14], it was deemed necessary, during port development, not only to construct facilities such as quays but also to introduce an operational management approach that leverages the characteristics of containers. Therefore, with the support of Australia, an IT-based asset management system has been introduced into the IPDS for the operation and management of the Lapetasi Wharf, enabling centralized management of maintenance plans, procurement and budget management. Another lesson learned was the need to secure access roads into the port, which is now being planned through MIPU's road maintenance budget for "Roads for Development Program". As described above, it was confirmed that measures are being taken to improve the port operation and maintenance system and surrounding infrastructure, fully considering the lessons learned in the past.

Although it can be said that there was space for further improvement in the division of roles for cooperative support with other donors, there was no significant deviation in the actual results from the plan of Phase 2 after the additional loan, and there were no major problems in the design and logic of the plan for this project which aimed to facilitate international cargo logistics and accompanying economic and social development through the development of the Lapetasi Wharf. Overall, the approach of the Project was appropriate.

At the time of the appraisal and ex-post evaluation, the Vanuatu government's development

[12] "4.3 Lessons Learnt" explains more details.
[13] A private company, which is owned 49% of the company's shares by the Vanuatu Government and 51% by Ifira Trustees Limited, is responsible for the management and operation of the Lapetasi Wharf under a concession agreement with the Vanuatu Government.
[14] "Sihanoukville Port Urgent Rehabilitation Project" in Cambodia, "Dumai Port Development Project" in Indonesia.

policy clearly stated the importance of port infrastructure development, which is consistent with the direction of this project's efforts. In addition, there continue to be development needs such as the construction of a new wharf to handle domestic cargo at the Port of Port Vila and the expansion of facilities at the main wharf. Regarding the appropriateness of the Project plan and approach, although the additional loan for Phase 2 was mainly due to the fact that there was not sufficient information about the ground condition at the site in the F/S implemented through Australian support, it was determined that additional measures were unavoidable for ensuring the safety of the wharf.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

At the time of the appraisal, the action plan of the Fifth Pacific Islands Leaders Meeting (PALM5) clearly stated "development of transportation infrastructure" as a measure to support Pacific countries. Additionally, according to *the Official Development Assistance (ODA) Databook by Country in 2012* published by the Ministry of Foreign Affairs, the basic policy for cooperation with Vanuatu explicitly emphasized "support for economic infrastructure, with a focus on enhancing port facilities to expand export and import industries." *The Country Assistance Policy for the Republic of Vanuatu (April 2019)* also clearly outlined a priority objective (1) as "Overcoming vulnerabilities" and highlighted "Support for strengthening economic infrastructure and connectivity, with a focus on transportation infrastructure such as ports and bridges to promote logistics." Support for transportation infrastructure development, including ports, was also included in the ex-post evaluation at that time.

As described above, the Project aligns with the direction of Japan's development cooperation policy.

3.1.2.2 Internal Coherence

The main wharf in the Port of Port Vila, which was rehabilitated through Japanese Grant Aid "The Project for Improvement of Port Vila Main Wharf" (2007-2009) by Japanese Grant Aid, was the only international cargo handling port facility located in the capital city at that time and was facing the challenge of maintaining stable cargo handling due to the wharf's severe ageing. The past rehabilitation project was not designed to increase the volume of cargo handled at the wharf. Rather, the main focus of the past project was to provide stable cargo handling operations until a new, larger international cargo wharf could be built to accommodate the lack of container storage space. The wharf was planned by the Vanuatu government to be used exclusively for cruise ships, which was rapidly increasing at that time. With this background in mind, we can conclude that the main wharf, reinforced by the past rehabilitation project, was responsible for international cargo handling demand until the completion of the Project, and after the Project was successfully

finished, the division of roles that was planned from the beginning was realized. As a result, it has been observed that the Lapetasi Wharf developed under the Project does not need to handle cruise ships and is able to concentrate on handling international freights.

The above shows that the coordination made during the planning of this project to realize an efficient division of roles between each wharf through the implementation of both projects resulted in efficient operation of the entire Port of Port Vila and smooth logistics on Efate Island, where the capital is located. It can therefore be said that sufficient synergies have been developed between the two projects.

3.1.2.3 External Coherence

As the detailed plan for this project was developed based on the results of the F/S supported by Australia, there was cooperation in terms of information exchange and handover. Nevertheless, while serving as a foundational reference, for the Project's execution, the initial F/S lacked detailed information on the site. Consequently, there was a necessity to change the initially planned method. This change led to the additional loan, hampering the efficient implementation of the Project.

The Australian support for the IPDS was provided from the planning phase of the Project, and linkages with the Project were anticipated in advance. The original plan on the Australian side consisted of the construction of an administration building and the introduction of cargo handling equipment, but in reality, an asset management system was introduced and a person from Australia was appointed to the post of Representative Director. As a result, it can be said that while Australia's support contributed to the smooth operation of the port and had a certain degree of synergy, the content of the support from Australia was significantly reduced, which resulted in the form of cooperation being positioned differently from what the Japanese side had originally expected.

The Inter-Island Shipping Support Project, supported by ADB and New Zealand and still underway to develop domestic wharf, was coordinated with the Project designed to develop the international wharf in advance to ensure that there were no substantial discrepancies in the segregation of project targets and the timing of construction. However, the development of the domestic wharf was significantly delayed and was still in progress at the time of the ex-post evaluation, so the results of the collaboration with the domestic wharf project could not be confirmed. From the start of the project to the time of the ex-post evaluation, domestic vessels have been forced to use the temporary wharf to the west of the main wharf, resulting in inefficient cargo and passenger loading and unloading operations.

Under "Port Vila Urban Development Project" by ADB, road improvements around the port were planned, but there were adjustments to the project scope, which resulted in the road improvements not being implemented. Instead, it was confirmed that road improvements in the

city including the area near the port were planned in the budget of MIPU's "Roads for Development Programme". It was confirmed during the site survey that vehicles entering and leaving the Lapetasi Wharf can travel on the road section leading from the Lapetasi Wharf to the city without any problems and that the road around the wharf has one lane in each direction, which means that there should be no problems with container transport at present unless there are traffic accidents.

From the above, it can be concluded that there was a certain degree of collaboration with the other donors' projects, such as information exchange and prior scoping coordination, but the results of such collaboration were limited.

At the time of the appraisal and the ex-post evaluation, the Project was in line with the development policy of the Government of Vanuatu and there was a development need for port improvements. The additional loan for Phase 2 was also a necessary measure to ensure the safety of the wharf and the approach is considered to have been appropriate. In addition, while the Project showed linkages with other donors' projects at the planning stage, no clear effects were observed, but the Project was in line with the direction of Japan's development cooperation at the time of the appraisal and linkages and effects were also observed with other JICA projects.

Therefore, its relevance and coherence are high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

The Project was designed to develop the Lapetasi Wharf at Port of Port Vila into a dedicated international cargo terminal, and the specific plans and actual contents of the project are as follows.

Table 1 Description of Planned and Actual Outputs of the Project

Construction and Facilities	Plan of Phase 1	Plan of Phase 2	Actual Outputs
Marine Works	Construction of piers for containers and cargo ships	Construction of piers for containers and cargo ships (Additional measures to respond to soft ground due to changes in construction methods)	Wharf: Construction with Steel Pipe Sheet Pile method (Diameter) type, L=200m with mooring facilities
	Dredging of anchorages and reclamation of hinterland	Dredging of anchorages and reclamation of hinterland (Additional measures to respond to soft ground due to changes in	East transition and revetment with mooring facilities (sheet pile L=68.5m) East revetment (rock structure) for deposit area West transition and revetment with mooring facilities (sheet pile

Construction and Facilities	Plan of Phase 1	Plan of Phase 2	Actual Outputs
		construction methods)	L=75.3m)
	-	Construction of safety measures to comply with international wharf standards (SOLAS Convention) (for cancelled Australian support)	West revetment (rock structure)
	-	-	Four additional mooring bollards on land (added during the implementation)
Civil Works	Paving of container yards	Paving of container yards	Embarkment filling
			Pavement for container yard (32,661m^2), parking area (1,428m^2) and walkway (397m^2)
			Surface drainage system (L=317m), side ditch drainage system (L=378m)
			Retaining wall
			Line marking for parking area and walkway
Building Works	Construction of workshop buildings for cargo handling facilities and loading and unloading machinery	Construction of workshop buildings for cargo handling facilities and loading and unloading machinery	Container freight station (800m^2)
			Workshop (380m^2)
			Utility shed (400KVA generator, water pump x 2)
			Container wash bay (for 40ft x 4, 20ft x 12)
			Gate house
			Refueling station (45m^2)
			Reefer container tower x 1
	-	-	Refueling station (40m^2) (added during the implementation)
	-	Administration Building (for cancelled Australian support)	Administration building (3 stories, 1,620m^2)
	-	-	Reefer container tower x 2 (added during the implementation)
Security Works	Construction of workshop buildings for cargo handling facilities and loading and unloading machinery	Construction of workshop buildings for cargo handling facilities	Linked fire alarm system (Administration building, Workshop, Container freight station, Gate house)
			Security fence (H=3.0m, L=671m)
			Main entrance gate (automatic, 8m x 2), Boundary gate (manual, 8m x 1), Parking area (automatic, 6m x 1), Electric bar gate
			High mast lighting (30m x 5, 15m x 2)

Construction and Facilities	Plan of Phase 1	Plan of Phase 2	Actual Outputs
	-	Security Fences and Cameras	CCTV cameras
Others	Mobile container cranes, heavy forklift trucks and handlers for empty containers (not covered by ODA loans)	Reach stackers, empty container reach stackers (for cancelled Australian support)	Communication facility (VHF transceiver and Antenna)
			Demolish of existing facilities
			Temporary building (Office for consultant, etc.)
			An aerial work platform mounted on truck and reach stackers, etc.
Consulting Services	Detailed design, bidding assistance, construction supervision, environmental management and environmental monitoring support	Detailed design, bidding assistance, construction supervision, environmental management and environmental monitoring support	Detailed design, bidding assistance, construction supervision, environmental management and environmental monitoring support

Source: External evaluator created the table with the information provided by JICA and executing agency

Compared to Phase 1 plan, the construction of the quay using the Steel Pipe Sheet Pile method , dredging for the wharf construction, as well as the components cancelled by Australia (the construction of the administrative building and provision of equipment) were added at the time of planning Phase 2. In addition, four mooring poles, two reefer container towers, and one fueling station (40m^2) were added as outputs compared at the time of planning Phase 2. These additions are judged to have been necessary to ensure the safety of the wharf, to moor large cargo vessels, and to accommodate the increased cargo handling volume.

Container yard of the wharf
(Source: External Evaluator)

Administration building
(Source: External Evaluator)

3.2.2 Project Inputs

3.2.2.1 Project Cost

The main reason for the additional loan for the plan of Phase 2[15] was a change of the construction method for upgrading the Lapetasi Wharf, which is considered necessary to ensure the safety of the wharf and to achieve adequate functionality. Accordingly, the items of project cost and project period are to be compared with the total amount of Phase 1 and Phase 2 at the time of planning and the actual amount at the time of the ex-post evaluation.

The Project cost was planned to be 10,500 million yen, consisting of 9,543 million yen on the Japanese side and 957 million yen on the Vanuatu side. The actual project cost was 8,243 million yen for the Japanese side and 957 million yen[16] for the Vanuatu side, for a total of 9,200 million yen, within the plan (87% of the plan).

Table 2 The Planned and Actual Project Cost (Unit: Million yen)

Financing Source	Total Planned amount of Phase 1 and Phase 2[17]	Actual cost
Total ODA loan	9,543	8,243
of which Phase 1	4,945	4,792
of which Phase 2	4,598	3,451
Vanuatu side	957	957
Total cost	10,500	9,200

Source: External evaluator created the table with information provided by JICA and executing agency

3.2.2.2 Project Period

The project period was planned to be 6 years and 2 months from June 2012, when the L/A for Phase 1 was signed, to July 2018, after the defects liability period was over. The actual project period was 6 years and 9 months from June 2012 to February 2019, which slightly exceeded the plan (109% of the plan).

According to the implementing agencies and experts, the project site was not directly affected by the Cyclone Pam which occurred in March 2015, but it was occupied due to the increased storage of relief supplies and seasonal container storage volume. There was also insufficient

[15] The total project cost for Phase 1 was initially 6,345 million yen. The total project cost for Phase 1 and Phase 2 was 10,500 million yen, an increase of 165.5%. A breakdown of the increase shows that 138.5% was due to design changes, 112.1% was due to exchange rate fluctuations, and the largest percentage was due to design changes related to changes in construction methods.

[16] The main expenses are for personnel in the Vanuatu Project Management Unit (VPMU), which is responsible for managing domestic infrastructure projects, and tax-exempt expenses for wharf construction, cargo handling, and equipment procurement. Since the exact amount is not known by the executing agency, the originally planned figure of 957 million yen is used for convenience.

[17] The additions in Phase 2 are mainly due to changes in construction methods and do not involve changes in the port facilities themselves, which are outputs of the Project. For this reason, the actual comparisons are to be made with Phase 2 plan.

coordination due to the lack of a shared schedule for the adjacent domestic wharf development project and the government's consensus process was slow.

3.2.3 Results of Calculations for Internal Rates of Return

The Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) for Phase 1 and Phase 2 at the time of the appraisal were as follows.

Table 3 FIRR and EIRR of Phase 1 and Phase 2

	Phase 1	Phase 2
Financial Internal Rate of Return (FIRR)	11.0%	6.6%
Economic Internal Rate of Return (EIRR)	17.0%	12.1%

Source: External Evaluator created the table with the information provided by JICA

The FIRR and EIRR were to be recalculated based on the data at the time of the ex-post evaluation. However, in November 2022, a cyber-attack[18] on the Vanuatu government's computer server resulted in the Ministry of Finance and Economic Management being unable to obtain the necessary data for the recalculation. Since it was difficult for the Ministry to recalculate using the available data, these internal rates of return were unknown at the time of the ex-post evaluation.

Although there were partial additions to the actual output of the Project compared to Phase 2 plan, it is judged that the increase in output was necessary to fully realize the benefits of the wharf improvement from the perspective of accommodating the mooring of large cargo vessels and increased cargo handling volume.

As for inputs relative to outputs, the total project cost was within the plan (87% of the plan). On the other hand, the actual project period of six years and nine months exceeded the plan (109% of the plan).

Therefore, the efficiency of the Project is high.

3.3 Effectiveness and Impacts[19] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

At the time of Phase 1 planning of the Project, the operation and effect indicators were set as

[18] In November 2022, the Vanuatu government's computer server suffered a cyber-attack that rendered all email and payment systems unusable. At the same time, the data stored on what server became inaccessible.
[19] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

the increase in container cargo handling volume at the Port of Port Vila to 17,258 TEUs per year[20] and the decrease in the average number of days of import cargos being stuck to 5 days by two years after the completion of the Project. The actual values of these indicators were confirmed in the ex-post evaluation, and are shown in Table 4.

Table 4 Quantitative Effects of the Project

	Baseline value	Target value*1	Actual value *3		
	2011	2018	2019	2020	2021
		2 Years After Completion	Completion Year	1 Year After Completion	2 Years After Completion
Indicator 1 Container cargo volume handled at the Port of Port Vila (TEU／year) *4	12,426	17,258	15,902	15,362	16,972
Indicator 2 Average number of days that import cargoes are stuck at the Port of Port Vila *2	27	5	According to MIPU, it was usually zero or at most one day after the Project was completed.		

*1：Appraisal report in Phase 1
*2：This means the average number of days from arrival at the wharf to the terminal recipient for cargo handled in the sample month.
*3：The target year in the prior evaluation sheet is 2018 for Phase 1 and 2019 for Phase 2, but two years after the Project is completed is 2021, and the analysis was based on actual results in 2021.
*4：Data provided by IPDS
Source: External Evaluator created the table with the information provided by JICA, executing agency and IPDS.

The actual result for 2021 is 16,972 TEU/year, which represents 98% of the target set at the time of Phase 1 planning, which was 17,258 TEU/year. Consequently, it can be concluded that the target has been successfully met. Although quantitative data was not available for the average number of days that imported cargoes stay at the Port of Port Vila, according to MIPU, it is usually none, or at most one day, thus the target is considered to have been achieved.

Based on the above, it is determined that each indicator has been mostly achieved, and the anticipated quantitative effects were realized as expected.

3.3.1.2 Qualitative Effects

The implementation of the Project was expected to produce the following five qualitative

[20] The target value for container handling volume was stated as 17,000 TEU/year in the appraisal report at the time of Phase 2 planning due to changes in the demand forecast. However, since the changes in construction methods and the addition of outputs in Phase 2 do not affect the direct outcome expected by the Project, which is the facilitation of international cargo logistics, the target value of Phase 1 was adopted for the operation and effective indicator. There is no difference in the level of achievement of both indicators regardless of which target value is adopted.

effects: (1) improved safety by strengthening the earthquake resistance of the wharf, (2) improved vessel traffic safety by eliminating vessel congestion in the bay, (3) creation of employment opportunities, (4) improving competitiveness as an international port and expand the export and import industries by enhancing cargo handling capacity through expansion and separation from passenger facilities and (5) stimulation of tourism by facilitating the navigation of cruise ships as a result of handling passengers and cargo in separate wharfs. Two of them, (4) and (5), are to be analyzed in "3.3.2 Impacts," because they can be considered as impacts generated through the Project. The status of the effects from (1) to (3), which were confirmed at the time of the ex-post evaluation, was as follows.

(1) Improved safety by strengthening the earthquake resistance of the wharf

It is considered that the transfer of the handling of international cargo from the main wharf, whose pier section has aged, to the Lapetasi Wharf has increased the possibility of securing cargo handling operations even in the event of an earthquake. In addition, the Steel Pipe Sheet Pile method adopted for upgrading the wharf is a method which sufficiently takes seismic risks into consideration as per Japanese port standards under Japanese port standards, and no damage to the wharf or interruption of operations was observed in the event of an earthquake that occurred during or after the completion of this project.

(2) Improved vessel traffic safety by eliminating vessel congestion in the bay

No significant vessel congestion or accidents involving vessels were observed from the completion of the Project to the time of the ex-post evaluation, and there was no congestion of vessels in the bay during the on-site inspection.

(3) Creation of employment opportunities

The Project led to the employment of on-site workers during the Project implementation. The residents were also employed by IPDS as port cargo handling personnel after the Project was completed. An increase in the number of employees of private import traders was also observed.

From the above, it can be said that the qualitative effects expected at the time of the appraisal have been fully realized in all items.

3.3.2 Impacts

3.3.2.1 Intended Impacts

The anticipated impacts assumed at the time of the appraisal were the increased competitiveness as an international wharf and expansion of export and import industries due to the increased scale and improved cargo handling capacity resulting from the passenger-cargo separation. Additionally, there was an expectation of stimulating tourism by facilitating the navigation of cruise ships resulting from the separation of the wharf handling passengers and

cargo. The status of these impacts, which were confirmed at the time of the ex-post evaluation, is outlined below.

(1) Increased competitiveness as an international wharf and expansion of export and import industries due to the increased scale and improved cargo handling capacity resulting from the passenger-cargo separation.

Changes in the values of exports and imports at the Port of Port Vila are shown below. The causal relationship between the development through the Project and changes in the value of exports and imports cannot be clearly identified. However, according to interviews with private traders and home centers, the speed of processing customs procedures and cargo delivery has been improved by the wharf development, and it is believed that the Lapetasi Wharf has contributed to smooth import and export activities at the Port of Port Vila.

Table 5 Changes in the Value of Exports and Imports at the Port of Port Vila (Unit: Million Vatu)

Name of Port	Trade Type	2016	2017	2018	2019	2020	2021
Port Vila	Export	1,506	1,790	1,991	2,098	2,092	2,617
	Import	34,251	33,102	31,391	29,799	24,007	27,561
Reference : Luganville	Export	3,940	4,219	2,850	3,131	2,558	3,028
	Import	5,722	5,957	6,792	6,147	5,940	5,867

Source: External Evaluator created the table with data provided by Vanuatu Bureau of Statistics

(2) Stimulation of tourism by facilitating the navigation of cruise ships resulting from the passenger-cargo separation

For the overall handling of vessels at the Port of Port Vila, prior to the implementation of the Project, the Port of Port Vila handled international cargo vessels, domestic cargo vessels and tourist vessels at only one main wharf, resulting in vessels congestion, and long waiting time offshore. At the time of the ex-post evaluation, it was confirmed through the on-site inspection that international cargo was handled at the Lapetasi Wharf and tourist ships were handled at the Main Wharf as a result of Lapetasi Wharf development. Although no valid quantitative data such as the number of calls by large international tourist vessels could be obtained, and no vessels called at the port during the period when COVID-19 was spreading worldwide, the separation of cargo and passenger traffic between the Lapetasi Wharf and the Main Wharf was established, which is thought to have somewhat contributed to the smooth navigation of tourist vessels.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

The Project was classified as Category A based on the JBIC Guidelines for Confirmation of Environmental and Social Considerations (April, 2020) for sensitive sectors.

No negative environmental impacts caused by the Project were identified during construction or after the wharf was handed over. It was confirmed that community-based efforts were being made to manage marine resources by local residents and to monitor tourists' behavior that may be harmful to the marine ecosystem.

At the project site, it was planned to improve the Lapetasi Wharf by reclaiming the adjacent sea area while utilizing the existing domestic wharf.

Since live corals existed in the area, it was decided to transplant it to another location in Port Vila Bay. This transplantation was actually done prior to the start of offshore construction. Although the environmental impacts of this coral transplantation is described in detail in a later column, the bleaching of most of the corals transplanted under the Project was observed under the influence of the high-water temperatures caused by El Niño phenomenon in January and February 2016. The survival rate of corals after the bleaching event was significantly dropped to 9% in some transplanted sites, but it is not possible to confirm if the reduction in survival rate was caused by the implementation of the Project, and it is considered that the corals of the entire Port Vila Bay were similarly affected by the bleaching event. On the other hand, although an offset program was planned after the bleaching event to recover the lost corals, and an agreement was reached between JICA and the Vanuatu government regarding its implementation, this program was not implemented due to a lack of agreement with the residents. Although the causal relationship is not clear, it is assumed that this is one of the factors that negatively affected coral recovery, in addition to other factors such as changes in natural conditions.

At the time of the ex-post evaluation, a coral planting program in Port Vila Bay has been initiated as a Vanuatu government project, but it is judged that there is an issue in terms of the negative impacts on the environment, considering that the coral recovery was insufficient.

Colum: Analysis of coral transplantation related to the implementation of the Project
1. The planning and implementation of the coral transplantation in the reclaimed sea area The project plan was to reclaim a part of the adjacent sea area while utilizing the project site, Star Wharf (the name of the project site at that time, currently known as Lapetasi Wharf). Since corals were growing on the reclaimed land, coral transplantation was to be conducted in accordance with the environmental management plan formulated in conjunction with the implementation of the Project. Six sites in the Port Vila Bay in addition to three sites outside the bay were considered as potential transplant sites. The southwestern area of Iririki Island was eventually selected because it was relatively close to the proposed reclamation site, had the same water depth, and was inhabited by the same type of corals from the viewpoint of reducing the stress on corals.

The coral transplantation method used, in accordance with the Project's environmental management and monitoring plan, was to separate the coral inhabiting the proposed reclamation site from the substrate using an air breaker, place it in a cage, move it underwater, and bolt it to the substrate of the seafloor where it would be transplanted. The Vanuatu Fisheries Department provided on-site supervision of the transplantation process, which was completed in December 2015, before the actual offshore work began. The timing of the coral transplantation did not affect the port construction work and was conducted at the appropriate time.

2. Monitoring the survival of transplanted corals

Beginning in May of the following year (2016), the Vanuatu Fisheries Department monitored the transplanted corals and natural corals in the bay twice a year until October 2017. A monitoring results report was then submitted again in October 2018, but the figures were for March 2017 and the results for 2018 were unknown. The final monitoring report was submitted in January 2020 (with December 2019 survey results). Those results are shown in the table below.

Table 6 Survival Rates of Transplanted Corals*3

	Point	May, 2016	November, 2016	May, 2017	October, 2017 *1	December, 2019
Survival rate of transplanted corals through the Project	Reef 1	67%	47%	33%	58%	5%
	Reef 2	62%	38%	38%	73%	6%
	Reef 3	82%	53%	45%	45%	10%
	Reef 4	64%	62%	60%	Measurements could not be made *2	Measurements could not be made *2
Survival of natural corals in the bay	Vatumaru Bay	21%	25%	19%	20%	Not implemented
	East of Ifira Island	19%	17%	22%	9%	Not implemented
	Northern East of Iririki Island	6%	17%	8%	13%	Not implemented

*1 : The survival rates of transplanted corals seem to have increased. This may be due to the fact that not only transplanted corals but also newly grown natural corals at the same site were counted together since it is difficult to distinguish between transplanted and natural corals.
*2 : The tags indicating transplanted corals were no longer visible, making it difficult to determine their exact location.
*3 : The percentage of live coral on the seabed surface measured visually by divers. In Vanuatu, this is called the Coral Lukluk Method, a survey method to measure coral abundance.
Source: Monitoring report which executing agency submitted to JICA.

In early 2016, shortly after transplantation, El Niño phenomenon occurred, resulting in high seawater temperatures. As a result, coral bleaching occurred and survival rates continued to decline. A year later, in November 2016, the rate almost halved. Although natural corals showed a recovery trend in the same area in 2017, thereafter, the rate dropped to 5%-10% in December 2019, when the last monitoring was conducted, due to the effects of large outbreaks of starfish and sediment influx into the bay after heavy rains. Survival rates after 2020 are not known because no monitoring was conducted at coral transplant sites after 2020 and only an entire ecological survey in Port Vila Bay was conducted in 2021. The coral survival rate for the entire bay in 2021 was 19.9%. According to the Vanuatu Fisheries Department, coral survival at the transplant sites is expected to be about the same, but the details of the situation cannot be determined.

3. Offset program planning

In response to the large-scale coral bleaching in Port Vila Bay that significantly reduced the survival rate of transplanted corals, JICA dispatched an Environmental and Social Consideration Mission to the bay in March 2017. As a result of discussions with the Vanuatu government, it was agreed that the executing agency would implement an offset program[21] to help restore as much as possible of the coral lost through transplantation in the bay.

Following the agreement, discussions were held with communities surrounding Port Vila Bay during the planning phase of the offset program, 2017-2018, and three sites on Ifira Island and one site in Vatumaru Bay were selected as candidate sites for the program. In the process of considering the implementation of the program, it was expected that the program would be included in the management plan for the Community Conservation Area (CCA). However, some communities strongly demanded that entry fees be charged to boats entering the targeted areas, and the management plan for CCA was not finalized. As a result, the program did not materialize and the implementation did not take place.

However, after an ecological survey in 2021, the Vanuatu Fisheries Department secured a government budget and began a program to plant corals in Port Vila Bay in 2022.The program is not limited to the southwestern waters of Iririki Island, where the corals were to be transplanted, and it rather targets the entire bay.

【Key Points】

- Although there was no guarantee that the coral transplantation would result in high survival rates, an environmental management plan was developed from a realistic

[21] The idea is to restore the natural environment by managing and protecting an area equal to the area of the corals that have been lost or damaged by development activities, in another area where human impacts are observed.

perspective.

- The transplantation work was conducted before the Project was finalized and marine construction began, and monitoring activities were then conducted as planned until 2018. After that, monitoring was only conducted once.
- Although an offset program was planned to address the continued decline in coral survival rates, no effective action was taken to address the declining, and the offset program agreed with JICA was not implemented due to difficulties in coordinating with the community.
- At the time of the ex-post evaluation, a coral planting program in Port Vila Bay is underway as a Vanuatu government project, and it is expected that corals will gradually recover.
- The decline in survival rates of corals transplanted under the Project was more likely due to bleaching and starfish outbreaks that affected the entire Port Vila Bay rather than the transplants themselves, but it was difficult to make a clear determination.

2) Resettlement and Land Acquisition

According to MIPU, the project site was originally used as a domestic wharf, neither resettlement nor land acquisition have occurred, and no particular problems have been identified.

3) Gender Equality

According to IPDS, HIV/AIDS awareness-raising activities were conducted for IPDS employees during the project implementation, but changes in awareness and behavior were not tracked afterwards. During the site survey, it was confirmed that toilets for women have been installed in the administration building.

4) Marginalized People

During the on-site inspection, it was confirmed that the administration building of IPDS provides barrier-free access with an entrance ramp, restrooms for the physically challenged, and an elevator.

5) Social Systems and Norms, Human Well-being and Human Rights

According to an interview with a private trading company in Port Vila, the wharf development has improved the speed and safety of cargo handling and contributed to the smooth processing of operations by port users.

Some said that although the time and cost of the cargo handling process itself seem to have been reduced by the wharf improvement, it has not resulted in a reduction in the final price burden for the cargo pickers. According to interviews with some major supermarkets, there has been no

particular change in the variety of imported products since the completion of the Project, as people's economic conditions and preferences also affect the variety of imported products.

Overall, there was an issue with the restoration of coral reefs, but the Lapetasi Wharf plays an extremely important role as a port that handles smooth international logistics in Efate Island, the economic center of Vanuatu, and the overall impacts of the Project are judged to be generally high.

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

3.4 Sustainability (Rating: ④)

3.4.1 Policy and System

At the time of the ex-post evaluation, there are no particular concerns about the sustainability of the Project in the future because the importance of safe and reliable transport infrastructure, including ports, is clearly stated in the NSDP (2016-2030) and the VISIP (2015-2024). Thus, the overall policy and system sustainability of the Project is judged to be high.

3.4.2 Institutional/Organizational Aspect

The management and operation of the Lapetasi Wharf is based on a concession agreement between the Government of Vanuatu and IPDS, with IPDS being exclusively responsible for the operation and maintenance while MIPU provides supervision and oversight. At the time of the ex-post evaluation, IPDS had a total of 99 employees, including 10 engineers, 3 of whom are highly skilled engineers, so there are no particular concerns about the number of staff. In addition, an IT asset management tool has been installed in IPDS with the support of Australia, which has improved the efficiency of equipment maintenance, procurement, and budget management. Thus, it is judged to be highly sustainable in terms of its institutional and organizational aspect.

3.4.3 Technical Aspect

Of the 99 IPDS employees, 10 are engineers, including 3 skilled engineers, and 75% of the employees are engaged in port operation and maintenance work. Daily operations, inspections, and maintenance have been performed without delay as described below, and there appear to be no operations and maintenance tasks that were not being performed due to technical factors. Thus, the sustainability of the technical aspects is judged to be high.

3.4.4 Financial Aspect

The budget and expenditure of MIPU, responsible for the supervision and oversight of the port, for the last three fiscal years are as follows, and expenses related to port maintenance and management are accounted for.

Table 7 The Budget and Actual Expenditure of Finances of MIPU (Unit: Million Vatu)

		FY2020	FY2021	FY2022
Total of MIPU	Budget	1,739	4,205*2	3,337
	Actual Expenditure	1,638	4,340	3,231
Ports and Marine *1	Budget	284	274	286
	Actual Expenditure	287	274	312

*1 Ports and Marine section includes the costs of ports management, tag boats maintenance, maritime regulator.
*2 In FY2021, the budget and actual expenditure for the development for airports increased.
*3 Each fiscal year closes in December
*4 It can be that the actual expenditure exceeds the budget.
Source: Financial data provided by MIPU

The IPDS, the entity responsible for the port's operations, disclosed financial information for the most recent three years as follows. Although financial information for FY2022 is not available because the audit report is not yet issued, the IPDS has been profitable for all three years from FY 2019 to FY 2021 and has generated cash flow sufficient to cover both debt and dividend payments. According to MIPU and IPDS, the concession agreement between the Vanuatu government and IPDS requires IPDS to make a certain amount of monthly payments to the government, and the payments have been made without delay.

Table 8 Financial Statements of IPDS (Unit: Million Vatu)

		FY2019	FY2020	FY2021
Income Statement	Sales	911	950	926
	Operating Income	337	378	278
	Net Income	88	178	56
Balance Sheet	Assets	10,560	9,506	9,417
	Liabilities	10,189	8,981	8.865
	Net Assets	371	525	552
Cash Flow Statement	Cash Flow from Operations	301	375	257
	Cash Flow from Investing	-9,802	-37	-5
	Cash Flow from Financing	9,912	-86	-89
	Of which Payment of Dividends	-25	-25	-30
	Of which Repayment of Debts	-96	-86	-100
	Net Cash Flow	411	251	163

*1 Each fiscal year closes in May
Source: Financial data provided by IPDS

The budget of MIPU, which is in charge of the port's management and supervision, includes various expenses related to port's maintenance and management, and thus there are no particular concerns regarding future budget measures. The financial condition of IPDS, which is responsible

for port operations, is sound, and there are no particular problems with its ability to generate cash flow to cover debt and dividend payments. There are no particular financial difficulties in the management, supervision, and operation of the port. Thus, the sustainability of the financial aspect of the Project is judged to be high.

3.4.5 Environmental and Social Aspect

Although corals were transplanted before the area adjacent to the project site was reclaimed, the survival rate of transplanted corals turned to be low. On the other hand, it is expected that the corals would be gradually restored since another transplantation program in the Port Vila Bay has been implemented as a project of the Vanuatu government. Regarding other items, no specific negative environmental impacts have been identified during construction and after the wharf was in service. Based on the use of the wharf, no particular environmental and social concerns are anticipated unless a ship accident occurs. Thus, there are no sustainability issues in terms of environmental and social aspects.

3.4.6 Preventative Measures to Risks

According to MIPU and IPDS, no particularly significant risks are assumed at the time of the ex-post evaluation. Thus, the sustainability of the risk response is not considered to be a problem.

3.4.7 Status of Operation and Maintenance

IPDS is responsible for the daily maintenance and management of the port. Maintenance plans, inspection records, procurement plans, budget management, etc. for port facilities are centrally managed by an IT-based asset management system introduced with the support of Australia. In addition, when equipment replacement becomes necessary, it can be procured from Australia and New Zealand, and no problems have been observed in terms of equipment procurement. Thus, the sustainability of the status of operation and maintenance is judged to be high.

The operation and maintenance of the Project demonstrate no problems in terms of related policies and systems, institutional and organizational aspect, technical aspect and financial aspect, and its sustainability is ensured. In addition, there are no particular concerns regarding environmental and social aspect and preventative measures to risks. Therefore, the sustainability of the project effects is very high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of the Project was to enhance international cargo logistics by upgrading the Lapetasi Wharf in Port Vila, the capital of Vanuatu, as an international multipurpose wharf, thereby contributing to the sustainable economic and social development of the country.

Both at the time of the appraisal and ex-post evaluation stages, the Project has been in line with the development policy and needs of the Government of Vanuatu. The additional ODA loan provided through Phase 2 was deemed necessary to ensure the safety of the wharf. Moreover, the Project was in line with the direction of Japan's development cooperation at the time of the appraisal, and there were indications of coordination and synergies with other JICA projects. Although some coordination with other donors' projects was observed at the planning stage, synergistic effects were limited. Overall, the Project's relevance and consistency are high. The Project's outputs were necessary to fully realize the effects of the wharf, and the inputs were sufficient to achieve the outputs. Although the actual project period exceeded the plan, the total project cost was within the plan, indicating a high level of efficiency. The quantitative and qualitative effects anticipated at the time of the appraisal were confirmed. Although there were significant challenges in terms of the response to coral reef restoration and the recovery assistance could not be implemented due to difficulties in coordinating with local communities, no specific cause-and-effect relationship between the implementation of the Project and the impacts on coral reefs could be confirmed. The Lapetasi Wharf plays a very significant role as a port that handles smooth international logistics in Efate Island, the economic center of Vanuatu. Therefore, the overall effectiveness and impacts of the Project are high. No issues have been observed in the policy/system, institutional/organizational, technical, financial, and environmental and social aspects, including the current status of the operation and maintenance system. Future risks have been well mitigated. Therefore, sustainability of the Project effects is very high.

In light of the above, the Project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Although there were major changes in the planning stage of the Project, IPDS has been smoothly managing the port after the completion of the Project. On the other hand, the domestic wharf improvement project, which was planned at the same time as the Project, is still under construction at the time of the ex-post evaluation, and domestic vessels continue to be forced to depart from and berth at temporary wharf. Since passenger onboarding and offboarding as well as cargo handling operations are extremely inefficient, it is important to steadily complete the ongoing domestic wharf project to improve the safety of domestic vessel transportation and realize efficient logistics through segregation of international and domestic cargoes.

Coral transplantation in the project area was executed as part of the project scope but the survival rate of the transplanted corals substantially dropped due to coral bleaching in the entire Port Vila Bay. The offset program agreed upon between JICA and the executing agency was not carried out but the government's own program to plant corals throughout the bay has been initiated starting in 2022. It is important that this program be steadily pursued in order to increase coral survival.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

<u>The necessity to sufficiently verify the accuracy of analytical information in the detailed design and project planning using the results of surveys conducted by other donors</u>

The F/S for the Lapetasi Wharf development was conducted in 2010 with the support of Australia. After the signing of L/A for Phase 1 in 2013, a basic survey was conducted with Japanese cooperation, including a soil investigation and a depth survey, for the detailed design of the wharf. At that time, it was found that the construction method, Submerged Strut method, which was planned to be adopted based on the results of F/S earlier conducted by Australia, had an extremely high possibility of causing a slip failure due to the structure of the ground at the site to be developed. Subsequently, a safer method, the Steel Pipe Sheet Pile method which could be applied on the planned site, was adopted for the construction of the quay, requiring additional borrowing for Phase 2, resulting in a significant increase in project costs from the initial plan. The F/S by Australia did not include detailed descriptions of the ground conditions, and the technical information on which the survey results were based, soil investigation, depth and surface survey, land survey, was not disclosed due to the copyright of the company who carried out the F/S, hence the potential problems could not be identified until the basic survey was conducted with Japanese cooperation. Normally, a third-party peer review should be conducted for the technical aspects of the F/S. In this case, however, it appears that the review of the F/S was not conducted thoroughly enough. In addition, the fact that the technical information on which the F/S was based could not be verified is considered to have been a factor in the significant additional project cost.

When a project takes over the results of a survey conducted by another donor, it is necessary to confirm that the content of the survey meets the standards required by the Japanese side and that it has been verified by a third party. In addition, since there is a possibility that the survey results may be judged to be related to confidential matters for the private companies that conducted the survey, it should be thoroughly confirmed through the government of the country concerned whether or not official data can be obtained, and if necessary, methods such as facilitating the acquisition of detailed data with support from the government should be

considered. It is also necessary to consider starting the detailed design without delay after the completion of F/S so that there will be no discrepancy between what is described in the F/S and the current status of the site to be developed at the time of detailed design.

The Importance of thorough monitoring of the program agreed upon during the project implementation

In the Project, corals that had been living in the project area were transplanted. Immediately thereafter, an external factor known as coral bleaching occurred throughout Port Vila Bay and affected a large portion of the transplanted corals. In response, JICA and the executing agency agreed to implement an offset program.

From the appraisal stage, it was assumed that the environmental impacts of the Project would be significant, and steady implementation of the agreements between the two countries was important to minimize the negative impacts of the Project. However, the program was not implemented due to difficulties in coordination with the communities in the target waters. JICA's monitoring was not conducted thereafter, partly because the two-year monitoring period, which is set out by JICA in the JICA Guidelines for Environmental and Social Considerations, had expired, and also because of the temporary evacuation of relevant persons due to the COVID-19. Although there were external factors which partially explain why proper monitoring was not continued in the Project, steady monitoring and constant encouragement of program implementation by the executing agency is generally crucial for reducing negative impacts on the environment. For similar projects to be implemented in the future, it can be useful to consider, if necessary, at the agreement stage of program implementation, not only defining what the implementing agencies should do, but also developing a specific work plan, such as how JICA will regularly check the progress of the program by the implementing agencies.

5. Non-Score Criteria

5.1 Performance

5.1.1 Objective Perspective

None.

5.1.2 Subjective Perspective

As previously mentioned, the Project required additional loans, mostly due to changes in the construction method of the port facilities. According to information provided by JICA, as this was the first ODA loan project for Vanuatu, JICA provided an Implementation Assistance in addition to the consultant for the Project to facilitate technical understanding and quick decision-making on the part of the Vanuatu Government, Vanuatu government officials were provided with the opportunity to obtain third-party opinions on the consultant’s technical views. Although an

additional loan equivalent to the initial loan amount was required for the implementation of Phase 2, the execution of the Implementation Assistance helped foster an understanding of the importance of safe port facilities for long term use and the consideration of life cycle costs. The technical assistance experts also provided technical assistance and advice on port operations and supervision, contributing to the smooth implementation of the Project.

Another major contributing factor to the successful implementation of the Project was that IPDS, which Australia continued to support, was familiar with the way in which international cargo should be handled at the Port of Port Vila and insisted that strong facilities using the Steel Pipe Sheet Pile method were essential. In addition, factors such as the desire of the Vanuatu Government itself for a strong port facility, even in consideration of additional borrowing, and JICA's acceptance of the request, and its efficient procedures for additional loans without halting the ongoing project in the process, also contributed significantly to advancing the Project.

5.2 Additionality

None.

End

Comparison of the Original and Actual Scope of the Project

Item	Phase 1 Plan	Phase 2 Plan	Actual
1. Project Outputs	・Construction of piers for containers and cargo ships ・Dredging of anchorages and reclamation of hinterland ・Paving of container yards ・Construction of workshop buildings for cargo handling facilities and loading and unloading machinery ・Construction of workshop buildings for cargo handling facilities and loading and unloading machinery ・Mobile container cranes, heavy forklift trucks and handlers for empty containers (not covered by ODA loans) ・Detailed design, bidding assistance, construction supervision, environmental management and environmental monitoring support	・Construction of piers for containers and cargo ships (Additional measures to respond to soft ground due to changes in construction methods) ・Dredging of anchorages and reclamation of hinterland (Additional measures to respond to soft ground due to changes in construction methods) ・Construction of safety measures to comply with international wharf standards (SOLAS Convention) (for cancelled Australian support) ・Paving of container yards ・Construction of workshop buildings for cargo handling facilities and loading and unloading machinery ・Administration Building (for cancelled Australian support) ・Construction of workshop buildings for cargo handling facilities ・Security Fences and Cameras ・Reach stackers, empty container reach stackers (for cancelled Australian	・Wharf: Construction with Steel Pipe Sheet Pile method (Diameter) type, L=200m with mooring facilities ・East transition and revetment with mooring facilities (sheet pile L=68.5m) ・East revetment (rock structure) for deposit area ・West transition and revetment with mooring facilities (sheet pile L=75.3m) ・West revetment (rock structure) ・Four additional mooring bollards on land ・Embarkment filling Pavement for container yard (32,661m2), parking area (1,428m2) and walkway (397m2) ・Surface drainage system (L=317m), side ditch drainage system (L=378m) ・Retaining wall ・Line marking for parking area and walkway ・Container freight station (800m2) ・Workshop (380m2) ・Utility shed (400KVA

		support) ・Detailed design, bidding assistance, construction supervision, environmental management and environmental monitoring support	generator, water pump x 2） ・Container wash bay (for 40ft x 4, 20ft x 12) ・Gate house ・Refueling stations x 2 (45m^2, 40m^2) ・Reefer container tower x 1 ・Refueling station (40m^2) ・Administration building (3 stories, 1,620m2) ・Reefer container tower x 3 ・Linked fire alarm system (Administration building, Workshop, Container freight station, Gate house) ・Security fence (H=3.0m, L=671m) ・Main entrance gate (automatic, 8m x 2), Boundary gate (manual, 8m x 1), Parking area (automatic, 6m x 1), Electric bar gate ・High mast lighting (30m x 5, 15m x 2) ・CCTV cameras ・Communication facility (VHF transceiver and Antenna) ・Demolish of existing facilities ・Temporary building

			(Office for consultant, etc.) ・An aerial work platform mounted on truck and reach stackers, etc. ・Detailed design, bidding assistance, construction supervision, environmental management and environmental monitoring support
2. Project Period	June 2012-June 2016 (49 months)	June 2012-July 2018 (74 months)	June 2012-February 2019 (81 months)
3. Project Cost			
Amount Paid in Foreign Currency	4,945 million yen	4,598 million yen	8,243 million yen
Amount Paid in Local Currency	1,400 million yen (1,538 million VUV)	-443million yen[*1] (759 million VUV)	957 million yen (759 million VUV)
Total	6,345 million yen	4,155 million yen	9,200 million yen
Exchange Rate	1VUV = 0.91 yen (As of April 2012)	1VUV = 1.26 yen (As of January 2015)	1VUV = 1.26 yen (As of January 2015)
4. Final Disbursement	December 2020		

*1：Adjusted downwards from the amount for Phase 1.