Ex-Post Project Evaluation 2013 :

Package II - 7

(Tonga, Vanuatu, Angola)

October 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

JAPAN ECONOMIC RESEARCH INSTITUTE INC.

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2011, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2010. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

October 2014
Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Kingdom of Tonga

Ex-post Evaluation of Japanese Grant Aid Project

"The Project for Construction of the Inter-Islands Vessel"

External Evaluator: Keisuke Nishikawa

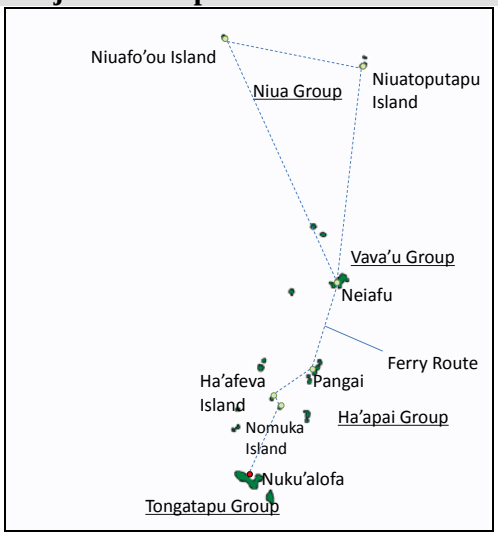
Japan Economic Research Institute Inc.

0. Summary

In this project, a ferry and related equipment were procured to make maritime transportation safer and more reliable for passengers. This project, which supported stable operation between outer islands, was consistent with the development plan and needs of Tonga, as well as the priority areas of Japan's ODA policy. Therefore, the relevance is high. With regard to effectiveness, the project increased capacities and made transport safer for maritime passengers and cargo, which facilitated the smooth flow of goods between the capital and outer islands, meaning that its effectiveness and impact are also high. With respect to the project implementation, while the project components were implemented as planned and the project cost was also mostly as planned, the project period exceeded the plan due to re-tendering procedures following a tender failure. Consequently, efficiency is fair. In terms of sustainability, there were no particular issues in the structure of operation and maintenance as well as operational techniques, coupled with an improvement of financial conditions to a level where the vessel replacement fund was building up. The procured vessel was generally well-maintained, but partial issues were observed, particularly in the electrical repair of some equipment. Therefore, the sustainability of the project was fair.

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

1. Project Description



Project Location

Ferry procured under the project

1.1 Background

In the island nation of Tonga, maritime transportation has become an indispensable element of social infrastructure for transporting people between islands and supplying the goods required for regional development. Regular air and shipping services have been provided between the capital of Nuku'alofa and outer islands, with shipping services accounting for 47% of passenger transportation and almost 100% of cargo transportation at the time of project planning. For the general public of Tonga, economical shipping services were an important means of transport and the Government of Tonga had contracted with the Shipping Corporation of Polynesia (hereinafter referred to as SCP), wholly owned by the government, by leasing the government-owned vessel MV Olovaha (955 gross tons, built in West Germany in 1981) which provided regular services to the islands, including the northernmost Niua Group. However, MV Olovaha had frequent breakdowns due to her old age and repair costs were high, leading to the critical condition where stable and safe operation was difficult. Moreover, despite such deteriorated conditions, MV Olovaha was forced to operate overloaded, exceeding the load line to meet the high transportation demand.

A privately-owned ship MV Pulupaki (675 gross tons, built in Japan in 1989 and sold as a used vessel to Tonga in 2002) was being operated alongside MV Olovaha in the shipping line to the Vava'u Group in the central area of Tonga. While MV Pulupaki had a passenger transportation capacity 1.7 times larger than MV Olovaha, its cargo transportation capacity was half that of MV Olovaha, meaning it was unable to cater to the sufficient maritime transportation demand of the country.

To resolve the critical maritime transportation conditions, which represent a lifeline for the Tongan people as well as regional development, it was essential to construct a new vessel to replace MV Olovaha and procure related cargo handling equipment (e.g. forklifts, containers).

1.2 Project Outline

The objective of this project was to make marine transportation in Tonga's domestic route safer and more reliable by procuring an inter-island vessel and necessary equipment.

Grant Limit / Actual Grant Amount	1,676 million yen / 1,672 million yen
Exchange of Notes Date	June 2008
Implementing Agency	Ministry of Public Enterprises

	(Operation) Friendly Islands Shipping Agency: FISA[1]
Project Completion Date	October 2010
Main Contractor	ISB Co., Ltd.
Main Consultant	Fisheries Engineering Co., Ltd.
Basic Design	December 2007
Detailed Design	None
Related Projects	[Grant Aid] The Project for Provision of a Port Service Vessel (FY1993) [Other Donors] Australia: Pangai Harbour Development (1994 – 1996)

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: September, 2013 – September, 2014

Duration of the Field Study: March 12 – 23, 2014 and May 12 – 17, 2014

3. Results of the Evaluation (Overall Rating: B[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of Tonga

At the time of project planning, Tonga's development plan 'Strategic Development Plan Eight 2006/07 – 2008/09' listed 'Upgrade inter-island sea transport services by introducing a new ferry' as one of the strategies in the 'Goal 3: Promote sustained private sector-led economic growth', out of eight major development goals.

In the 'Tonga Strategic Development Framework (TSDF) 2011-2014', a development plan effective at the time of ex-post evaluation, 'appropriate, well-planned and maintained infrastructure that improves people's everyday lives' was deemed an important 'Outcome Objective 3', with concrete strategies stating improvement in air and sea transport services, both domestically and internationally. Also, in the 'National

[1] The owner of the provided vessel MV 'Otuanga'ofa is the Government of Tonga and the Ministry of Public Enterprises (MPE) is the responsible ministry. However, the 'Implementing Agency' in this evaluation report refers to FISA, under MPE, as it administers overall operation and maintenance.

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

[3] ③: High, ②: Fair, ①: Low

Infrastructure Investment Plan 2013-2023', maritime transport is seen as an indispensable infrastructure and it is explicitly stated that the government prioritises efforts to ensure continuous shipping services. It also refers to the dredging of channels and berths as a priority development area.

Accordingly, development policy has indicated the consistent importance of infrastructure development while improving maritime transportation services has been prioritised. This means that this project can be considered in line with these policies.

3.1.2 Relevance to the Development Needs of Tonga

At the time of planning, shipping services accounted for 47% of passenger transport and almost 100% of cargo transport and represented a daily lifeline for people travelling between the capital and outer islands. They were also an indispensable element of social infrastructure for the regional development of the outer islands. The MV Olovaha, owned by the government at the time, was operating on most of the marine transport routes to outer islands, together with MV Pulupaki, but the vessel experienced frequent delays and cancelations due to breakdowns, given its 25-year age after construction. The private vessel MV Pulupaki originally had half the cargo-carrying capacity of the MV Olovaha. In addition to the shortage of goods transport capacities, continued it was considered that the vessel would not be able to be stably operated sooner or later due to improper maintenance.

Also at the time of ex-post evaluation, the implementing agency and the government ministries concerned (the Ministry of Public Enterprises and the Ministry of Infrastructure) observed the strong needs for maritime transportation in the island nation of Tonga, which handles approximately 49% of passenger transport and almost 100% of cargo transport. Most maritime transport between these islands has been undertaken by MV 'Otuanga'ofa, procured under this project, as well as two private vessels[4]. However, as the private vessels are old, there is a high demand for MV 'Otuanga'ofa's stable operation. In particular, MV Pulupaki has deteriorated much further than the project planning period and is often receiving directions for repairs from the Ministry of Infrastructure due to its safety shortfalls. It has become difficult to operate the vessel stably at all times.

In the beneficiary survey[5] of the passengers of MV 'Otuanga'ofa, it was confirmed that as high as 91% considered the ferry a lifeline for the Tongan people and important

[4] MV Pulupaki and a small cargo vessel, MV Sitka, which came into service in 2010

[5] An interview survey with 100 passengers on MV 'Otuanga'ofa procured under this project was conducted (35 respondents lived in Tongatapu, 12 in Ha'apai, 36 in Vava'u and 16 in Niuas). The interview survey concerned the level of ferry improvement, safety, comfort, reliability, effects on the local economy and society, importance of maritime transportation, etc.

for developing the outer islands.

Based on the above, this project can be considered consistent with the development needs of Tonga; both at the times of project planning and ex-post evaluation, as this project has played a role as core infrastructure underpinning the majority of maritime transportation which is indispensable for Tonga's society and economy.

3.1.3 Relevance to Japan's ODA Policy

Based on the five development priority areas (Economic growth, Sustainable development, Good governance, Security, and People to people communication and exchange) declared at the Fourth Japan-Pacific Islands Forum Summit Meeting held in 2006, Japan positioned 'Economic growth (Infrastructure, etc.)', 'Sustainable development (environment, health and education)' and 'Good governance (enhancement of the administrative capabilities, etc.)' as key cooperation areas for Tonga. As this project was designed to support 'Economic growth', one of Japan's priority areas for the entire Pacific region, and the corresponding cooperation area for Tonga 'Economic growth (Infrastructure, etc.)', it can be considered highly consistent with the ODA policy at the time.

This project was in line with Tonga's development plan during the planning and ex-post evaluation, and maritime transportation needs in the island country of Tonga have also been considerable. In addition, this project, which supported the development of infrastructure spawning economic growth, conformed to Japan's ODA policy at the time. In light of the above, the relevance of this project is high.

3.2 Effectiveness[6] (Rating: ③)

3.2.1 Enhancement of Transportation Capacities

It was expected that services with excessive passenger numbers and/or overloading at the time of planning would be eliminated through this project. The following changes were observed regarding the passenger capacity: changes in cargo-carrying capacities, eliminations of services with excessive passenger numbers and overloading.

[6] Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 1: Changes in Transportation Capacities (MV Olovaha and MV 'Otuanga'ofa)

Indicator	2006 (Plan)	2010 (Target)	At the time of Ex-post Evaluation (Actual)
	MV Olovaha	MV 'Otuanga'ofa	
Passenger Capacity	340	400	400
Number of Services with Excessive Passenger Numbers	4	0	3 (FY2011/12) 3 (FY2012/13)
Cargo Weight	200 tons	400 tons	400 tons
Number of Services with Excessive Cargo Weight	47	0	0 (FY 2011/12) 0 (FY2012/13)
Total Number of Services	53	-	60 (FY2011/12) 62 (FY2012/13)

Source: Data Provided by the Implementing Agency

As shown in Table 1, the passenger capacity increased from 340 to 400 and the cargo-carrying capacity from 200 to 400 tons by implementing this project. However, while the passenger capacity increased to 400, several services still carried excessive passenger numbers during the Christmas season, etc. The main cause is that more passengers than the capacity sometimes board the vessel as a result of the lack of accurate information sharing on passenger numbers due to the insufficiency of coordination between the ticketing agents of the implementing agency in outer islands, and some passengers changing destinations after boarding beyond their original disembarkation point, leading to stretches with excessive passenger numbers on board. Conversely, the cargo-carrying capacities increased substantially and no further cargo overload occurred since the service commenced.

Photo 1: Main Cabin (Economy Class)

The basic operational indicators for passenger numbers and cargo transport volume from the planning period to the post-project period changed as shown in Table 2.

Table 2: Operational Performance (MV Olovaha and MV 'Otuanga'ofa)

		Plan (MV Olovaha)			Ex-post Evaluation (MV 'Otuanga'ofa)		
		2004	2005	2006	FY2010/11	FY2011/12	FY2012/13
Passenger numbers (persons)	Northbound	—	—	—	6,029	15,703	18,801
	Southbound	—	—	—	7,184	19,277	17,740
	Total	7,800	8,980	11,360	13,213	34,980	36,541
Cargo Transport Volume (tons)	Northbound	—	—	—	2,746	9,862	14,814
	Southbound	—	—	—	1,177	7,071	5,349
	Total	10,300	12,500	13,900	3,923	16,933	20,163
Number of return trips		49	50	53	29	60	62

Source: Basic Design Report, Data provided by the Implementing Agency
Note 1: A 'Financial Year' is from July to the following June
Note 2: As the MV 'Otuanga'ofa went into service in December 2010, the data for FY2010/11 is for approximately six months.

As no additional new demand was expected to be generated in this project, the operational record five years after the commencement (in 2015) was considered to be approximately the same as that of 2005. However, as shown in Table 2, it was confirmed that both passenger numbers and cargo transportation volume had already considerably exceeded the 2005 actual values in FY2011/12.

There was an aspect that part of this increase was due to difficulties in private vessels operating almost the same route in providing safe and stable services. In 2009, when MV Princess Ashika, which was operated to replace the MV Olovaha after its decommissioning, sank (as described later in Box 1), demand for the private vessel MV Pulupaki temporarily soared. However, as the government devoted MV Ajang Subuh temporarily and MV 'Otuanga'ofa went into service at the end of 2010, passenger numbers and cargo volume on private vessels, lacking sufficiently safe and stable operations, have been declining. Particularly the heavily deteriorated private vessel MV Pulupaki lost passengers and cargo in 2013[7].

According to the implementing agency and the Ministry of Public Enterprises, etc., it was significant for the government to guarantee stable operations of the state-owned vessel in Tonga, consisting of a number of outer islands. It is also considered important that the government sufficiently secures its own means of transport to provide various public services in the outer islands and undesirable to outsource the operation to a private profit-centred firm. In light of the public nature as a means of transport for the people and the importance of providing public services, it was confirmed that the government had a policy of handling maritime transportation as a minimum. This is considered a pragmatic view, reflecting the need to provide services in a country with a number of small outer islands.

[7] As operational data on private vessels is confidential, only the result of qualitative analysis is described in this report.

Box 1 Sinking Accident of MV Princess Ashika

MV Olovaha was planned to be decommissioned after this project was implemented. However, problems with its electrical and mechanical systems had already intensified and the Government of Tonga deemed it inappropriate in terms of safety and maintenance cost to operate the vessel until MV 'Otuanga'ofa was procured. The government purchased a replacement vessel MV Princess Ashika from Fiji (constructed in Japan in 1972 and serving as Olive-maru in the Setonaikai until being sold to Fiji in 1984) to serve until the procurement, and it started operations in June 2009 on the same route as MV Olovaha. However, on 5 August, only on its 5th voyage, it sank between Nomuka and Ha'afeva islands several hours after departing Nuku'alofa, and 74 passengers, including a JICA Senior Volunteer, lost their lives.

While there were several factors behind the sinking, such as the fact that crew members did not provide adequate evacuation guidance and the difficulty in escaping from the cabins due to the vessel structure, investigative results conducted by the Royal Commission after the accident concluded that the root cause of the accident was the purchase of a deteriorated vessel unsuitable for open sea operations and inadequately maintained, with an initiative led by the Minister of Transport of that time.

This accident considerably shocked the Tongan society and one result saw many passengers preferring to remain outside in the open areas during the voyage. During the voyage from Nuku'alofa to Pangai as part of the ex-post evaluation survey, it was observed that many passengers remained on the outside deck or in the corridors, with few in windowless cabins on lower floors. Both the boarding experience as well as the beneficiary survey seemed to underline acute awareness of the importance of ferry safety following this accident.

MV Princess Ashika before sinking
Source: Webpage of Radio Australia
（http://www.radioaustralia.net.au/international/2010-01-26/tongan-ferry-sets-sail-despite-unseaworthy-declaration/201774）

Aboard MV 'Otuanga'ofa
(Staying along the outside corridor)

3.2.2 Realisation of Safe Operation

At the time of planning, the expectations were that 'Dangerous operations due to overloading would be eliminated, and a safe and smooth means of maritime transportation ensured' by implementing this project.

Since this project was implemented, no cancelations due to sudden breakdowns have

occurred, according to the implementing agency, which shows that scheduled and stable operations have been realised. Also, no overloading cases have occurred, as shown in Table 1. The beneficiary survey indicates that 94% of respondents said that vessel operations became safer and 86% felt that reliable operation had been attained. Accordingly, much higher safety and reliability were perceived compared to MV Olovaha.

An increase in passenger capacity was examined for some time as a measure to counter the issue of excessive passenger overcrowding, and the implementing agency increased the capacity of life rafts and life jackets up to 600. However, the problem was the insufficient width of corridors, since the vessel was designed to accommodate 400 passengers, and it was concluded that increasing the passenger capacity would be difficult due to the vessel structure. In addition, no emergency evacuation measures such as a slider were equipped to enable mass passenger evacuation immediately. The concern was to ensuring sufficient evacuation routes for 600 passengers, and the capacity was eventually brought back to 400. With passenger safety in mind, it is considered necessary to increase the number of services during peak seasons instead of increasing passenger capacity under the current vessel conditions to prevent excessive overcrowding.

3.3 Impact

3.3.1 Intended Impacts

At the time of planning this project, two points were expected; Transportation of goods from the outer islands to urban areas would be promoted, leading to increases in cash income in outer islands as well as the increased inflow of commodities to outer islands to promote tourism development and improve living conditions.

Photo 2: Embarkation / Disembarkation Scene in Lifuka Island

With regard to the transportation of goods between Tongatapu, where the capital Nuku'alofa is located, and the outer islands, stable operations have been realised with the start of services by MV 'Otuanga'ofa, promoting passenger and cargo transportation. An interview survey with commercial facilities in one of the outer islands, Lifuka, during the ex-post evaluation confirmed that many inhabitants were now receiving goods as planned. The beneficiary survey also revealed that 74% of them

perceived socioeconomic changes after the MV ‘Otuanga’ofa came into service. The main responses were that agricultural and marine products of outer islands could be transported stably to Tongatapu, and that stable and regular shipments of imported goods from Tongatapu had become possible.

Conversely, given the lack of substantial change perceived such as a significant cash boost for the outer islands and/or an impact on tourism development, it was difficult to fully identify the macro-level effects. However, this project is considered to have underpinned cash-income opportunities in the outer islands and tourism-related activities.

MV ‘Otuanga’ofa extends its service to cover the Niua Group, in the northern part of Tonga, several times a year, which has become a valuable means of travel and transport for the people of the Group[8]. Some respondents to the beneficiary survey highly appreciated the ensured operations to the Niua Group. The implementing agency provides additional services to meet the needs of outer- island residents on special occasions such as events or church conferences. During the field visit of the ex-post evaluation, a case of flexible response was observed that an original Tongatapu-Vava’u route was extended to the Niua Group, reflecting the high operational demand.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

Preventive measures against marine pollution were planned by installing an oily water separator, a sewage tank and a low-NOx emission engine on the ferry to be procured under this project. The ex-post evaluation confirmed that this equipment had been installed based on the International Convention for the Prevention of Pollution from Ships. No negative impact on the natural environment has been observed as there have been no spillage incidents such as fuel since operation commenced.

Annual fuel consumption of the procured vessel is shown in Table 3, with 11,000–12,500 litres consumed per voyage. As the implementing agency in charge of operation and maintenance was changed, as described later in ‘3.5.1 Institutional Aspects of Operation and Maintenance’, fuel consumption records of MV Olovaha could not be traced, which meant the status of fuel-efficiency improvement could not be assessed.

[8] The operated route is normally between Tongatapu Island (Nuku’alofa) and Vava’u Island (Neiafu).

Table 3: Fuel Consumption of MV ‘Otuanga’ofa

	FY2010/11	FY2011/12	FY2012/13
Amount of fuel (litres)	359,827	680,048	688,252
Number of services	29	60	62
Average fuel consumption per voyage (litres)	12,408	11,334	11,101

Source: Information provided by the Implementing Agency

3.3.2.2 Land Acquisition and Resettlement

In this project, as the ferry was constructed in Japan, before being sailed and handed over to Tonga, it was confirmed that neither land acquisition nor resettlement occurred. The same is true of the port facility MV ‘Otuanga’ofa berths.

3.3.2.3 Other Impacts

As information was obtained prior to the ex-post evaluation survey, suggesting occasional delays in the operation of MV ‘Otuanga’ofa, questions were asked to the implementing agency on punctuality. According to them, operational delays sometimes occurred due to several factors such as: (1) Following delays in the arrival of cargo to be loaded at the ferry wharf and loading work commencing behind schedule, which resulted in departure delays, (2) Considerable time was required to load and unload cargo at outer islands without wharves, and (3) There were cases where the MV ‘Otuanga’ofa could not depart due to the presence of another ship berthed adjacent in the port. Issues with cargo operation have been significant. As some of such factors can be solved by developing wharves, securing an assigned quay with sufficient space and developing wharves in the outer islands seemed a medium- to long-term challenge.

By implementing this project, transportation capacities have been increased in terms of passenger numbers and cargo volume, and no overloading case has ever occurred. While several services a year still carry excessive passenger numbers during peak seasons, it can be judged that the initial objective of this project is generally considered to have been achieved, since such cases only represent a small proportion of the overall project effects. The safety of maritime passenger and cargo transport also improved substantially with this project, and no cancelations due to sudden breakdowns occurred. In addition, interviews and beneficiary surveys confirmed that stable operations had facilitated passenger travel and cargo transportation between the capital and outer islands as planned, helping stabilise the lives of outer island residents.

In light of the above, this project has largely achieved its objectives; therefore, its

effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

In this project, a ferry operating between Tongatapu island and other outer islands was procured. As shown in Table 4, the ferry was constructed mostly in accordance with the plan and self-cruised to arrive in Tonga in October 2010 as scheduled.

Table 4: Comparison of Original and Actual Outputs

	Original	Actual
Passenger capacity	400	400
Cargo weight	400 tons	400 tons
Overall length	53.0m	53.0m
Gross tonnage	1,500 tons	1,534 tons
Main engine	735kW(1,000ps)×2	735kW(1,000ps)×2
(Equipment) Dry container	54	54
(Equipment) Reefer container	8	8
(Equipment) Forklift	2	2

Source: Basic Design Report and Completion Report

At the time of planning, the following elements associated with the implementation of this project were planned to be undertaken by Tonga:

- Enhancing fenders along the Nuku'alofa Wharf
- Widening of wharf ramps at Nuku'alofa, Pangai and Neiafu Wharves
- Dredging of Ha'afeva Wharf (to be examined and determined by the Tongan government)
- Fitting shelves and workbenches at the implementing agency workshop
- Installing electric receptacles at the wharf for reefer containers

Among these items, the field visit revealed that an improvement in Nuku'alofa Wharf (paving of the apron, adding fenders), widening wharf ramps and improving the workshop had been implemented. With respect to the electric receptacles for reefer containers at the wharf, sufficient implementation procedures were not taken during a series of procedures to dismantle SCP following the sinking accident of MV Princess Ashika, and they were ultimately not installed. However, as described later, most of the reefer containers broke down before the electric receptacles had been installedafter that. Therefore, the electrical receptacles were not necessarily required. As non-installation

has a minimal impact on the realisation of project effects, it is not regarded as a seriously negative factor in the evaluation judgement.

Dredging of Ha'afeva Wharf, yet to be decided at the time of planning of this project, was deemed unnecessary following a survey by the Tongan government. Subsequently, the wharf broke after a storm and the port itself is not currently used[9].

3.4.2 Project Inputs

3.4.2.1 Project Cost

The cost of this project to be borne by Japan was planned to be approximately 1,676 million yen, with another 16 million yen planned as implementation expenses to be borne by Tonga.

The following table summarises a breakdown of the planned and actual costs contributed by Japan:

Table 5: Comparison of Original and Actual Project Costs

(Unit: million yen)

Breakdown	Original		Actual	
Vessel Construction	1,549	1,626	1,541	1,621
Cruising	26		29	
Equipment Procurement	51		51	
Designing and Supervision	51		51	
Total	1,677 (E/N amount: 1,676)		1,672	

Source: Basic Design Report and Completion Report

Note: Table 5 is based on the planned costs and a breakdown in the Basic Design Study[10].

The actual project cost was 1,672 million yen (Japanese side), which was confirmed as within the planned amount (100% of the plan). Conversely, the cost borne by Tonga had not been sorted out and remained unclear due to the dismantlement of the implementing agency at the time as well as the reorganisation of government ministries. Consequently, the evaluation of the project cost was based on a comparison of the Japanese portion.

[9] The MV 'Otuanga'ofa anchors off-shore and a small boat carries passengers and cargo.

[10] The planned cost subject to the comparison in the ex-post evaluation is based on the amount described in the Exchange of Notes (hereinafter referred to as E/N). However, as the breakdown of the E/N amount (1,676 million yen) was not confirmed in this project, the amount shown in the Basic Design Report formulated during the project planning is used to compare each cost item. This amount and the E/N amount are both 100% of the plan (rounded to the closest whole number).

3.4.2.2 Project Period

The period of this project was expected to be approximately 20 months (4 months for the detailed design and 16 months for the vessel construction, cruising and equipment procurement). The actual project period was 28.5 months from June 2008 until October 2010, 8.5 months longer than originally planned. The main factor was the initial tendering failure of this project[11], which meant the project cost had to be reviewed again and also prompted adjustment of the re-tendering timing. The actual re-tendering was held nine months later. Therefore, the actual period turned out to be 142% of the plan.

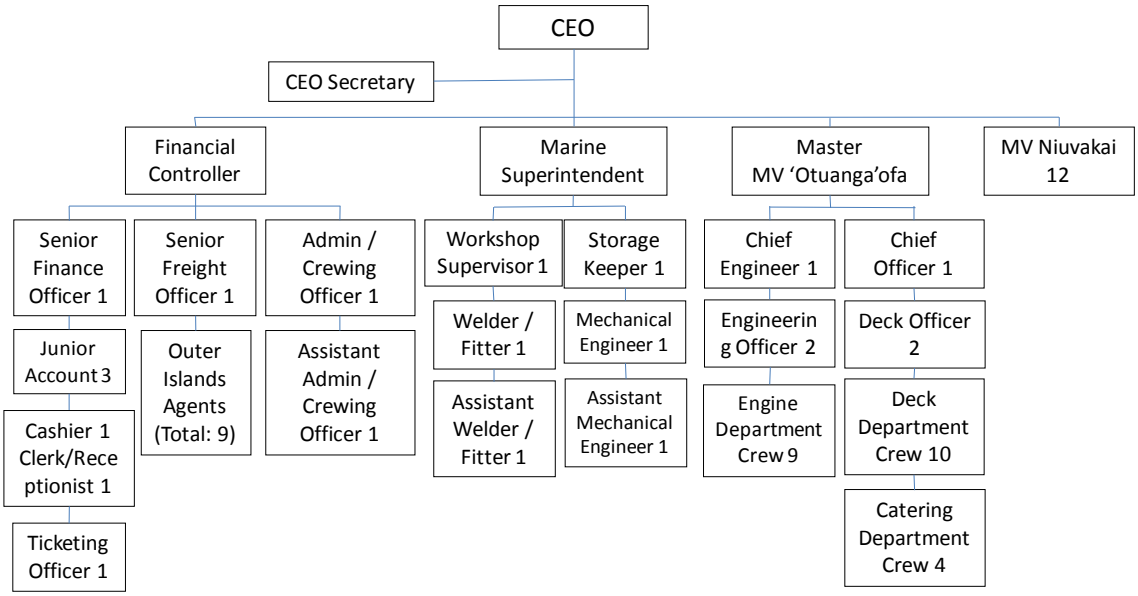
The above results show that while the project cost was within the plan (100% of the plan), the project period exceeded the originally planned period by 8.5 months, given the extra time required to review the project cost and for the re-tendering process following the tender failure (142% of the plan). Therefore, the efficiency of this project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

While the organisation overseeing operations at the time of planning was SCP, it was dismantled in 2010 as part of shouldering responsibilities for the accident in which the MV Princess Ashika sunk, while FISA was established the same year in time for the launch of services by MV 'Otuanga'ofa. FISA was a public enterprise under the jurisdiction of the Ministry of Public Enterprises, and has been positioned as an organisation undertaking the operations of MV 'Otuanga'ofa, as procured under this project. As illustrated in Figure 1, FISA can be broadly divided into an administration department, a workshop department and a department to operate the vessel. It had 71 staff members at the time of ex-post evaluation with an increase of 12 staff members as the operation of domestic cargo vessel MV Niuvakai started in March 2014. Of all the staff, the MV 'Otuanga'ofa's crew numbered 30, and the number of workshop staff was 7. FISA continuously employed three staff – a well-experienced senior freight officer, an administration / crewing officer and a ticketing officer, when SCP was dismantled. According to FISA, the continued employment contributed to the smooth commencement of operations.

[11] The main reason for the tender failure was the indication of possibilities in the construction time schedule submitted by a bidder unable to complete construction within the E/N time limit. During the tendering process of a contractor, factors such as the potential for delay in the delivery date of steel and main engines and scheduling risk for the construction of the vessel to be provided in parallel with another vessel under construction at the time.



Source: Information provided by the Implementing Agency
Note: One position each for the CEO, CEO Secretary, each department manager and Master. Numbers shown after other positions indicate the number of staff in those positions.

Figure 1: Organisation Chart of the Friendly Islands Shipping Agency

On MV 'Otuanga'ofa, seven crew members under the Captain had international qualifications and abundant experience, while FISA's CEO and Marine Superintendent also have a lot of experience in managing international shipping operations. Accordingly, no issues in terms of organisational structure and crew number were observed. MV 'Otuanga'ofa has been operated between the outer islands on the same route and schedule as MV Olovaha by these crew members since it started operations. Also, as described earlier, flexible operations such as increased services during peak seasons or occasional charter operations in response to requests are undertaken. With regard to the structure of FISA, it was confirmed that responsibility to ensure at least maritime transportation would be taken by the government, taking into account the public nature as a means of transport for citizens as well as the importance of public-service provision. This suggests that the position of FISA as a public enterprise to operate MV 'Otuanga'ofa will remain unchanged.

3.5.2 Technical Aspects of Operation and Maintenance

At the time of planning this project, SCP had a small workshop conducting daily maintenance, but advanced repairs of machines and equipment were ordered to Fiji or New Zealand. SCP was planning to introduce the Preventive Maintenance Programme (hereinafter referred to as PMP), a system in which various parts of the vessel would be regularly inspected and certain parts replaced before they broke down, for the vessel to

be procured. It was judged that SCP had sufficient functions and skills to implement the programme as well as the required techniques to handle the vessel.

Although it was not possible to measure the changes in technical capacities for operation and maintenance at the times of planning and ex-post evaluation, as the organisation itself is not the same due to the sinking accident of MV Princess Ashika, the following points were confirmed:

- Three crew members seconded from the navy (navigation officer, electrician and engineer) [12] who were invited to Japan for handling the training of MV 'Otuanga'ofa before its procurement, worked on the vessel for approximately one year after the hand-over then returned to the navy. According to FISA, the handover process to the crew hired by FISA was satisfactory.
- MV 'Otuanga'ofa was operated without major accidents since its operation commenced. Coupled with the lack of any problems that would affect operations, it was considered that FISA has capacities to conduct certain inspections and repairs. When a small accident occurred (collision with a rock underway in the Niua Group in May 2014), FISA reported this to Japan immediately and requested that Nippon Kaiji Kyokai (ClassNK) inspect the damage, which shows that FISA is aware of appropriate countermeasures required when accidents occur.
- Training programmes were regularly provided to staff members. They take training sessions once or twice a year on customer services, accounting, stock management and business administration at the Tonga Business Enterprise Centre (TBEC), which are run by the Tonga Chamber of Commerce and Industry. In addition, the Chief Engineer and crew sometimes take courses on marine engineering and evacuation management in New Zealand. Also, according to FISA, evacuation drills are conducted by the crew basically every Saturday.

Based on the above, it is considered that FISA has a certain maintenance techniques, as exemplified by the lack of any cancelations due to sudden breakdowns, and efforts to improve capacities were observed. However, as described in '3.5.4 Current Status of Operation and Maintenance', technical skills on electrical systems remain insufficient and there is also the issue of an inability to repair breakdowns sufficiently and promptly, apart from the items covered by PMP.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of planning this project, government subsidies to cover operations to the

[12] After the accident of MV Princess Ashika in August 2009, SCP was under the investigation by the Rotal Commission and was not practically structured to run the vessel. Therefore, the naval officers assumed the role in the meantime.

less-populated northern Niua Group were provided, but SCP had an independent accounting system, whereby all other costs, including fuel expenses, would be paid out from vessel operation revenues. SCP's financial conditions at the time were approximately 5% in the red on average between 2004 and 2006, due to the costly maintenance and repair associated with the deterioration of MV Olovaha in addition to fuel costs being the factor for the worsening operating balance.

The operating balance of FISA after the implementation of this project is indicated in Table 6. While 400,000 Tongan Pa'anga was provided from the government as assets in FY 2010/11, there have been no subsidies since then, and FISA has an independent accounting system, similar to SCP.

Table 6: Vessel Operating Balance

(Unit: thousand Tongan Pa'anga)

Financial Year	2010/11	2011/12	2012/13
Revenue			
Sales from freight	687	1,468	1,920
Sales from passengers	994	2,281	2,618
Government subsidy*	80	210	200
Other	59	283	333
Total	1,820	4,242	5,071
Expenditure			
Fuel & lubricants	686	1,315	1,333
Maintenance & repair	18	96	92
Crew cost	355	560	563
General administration	954	1,441	2,880
Other	19	203	44
Total	2,032	3,617	4,914
Balance	-212	625	156
Profit-revenue ratio (balance / revenue)	-11%	14%	3%

Source: Data provided by the Implementing Agency
Note: Subsidies for the operation of the Niua route (40,000 Tongan Pa'anga per voyage), but not for organizational management

Although a deficit in the operating balance was recorded in the first financial year (from December 2010 to June 2011), it subsequently improved substantially and it was confirmed that an accumulation in the fund for future vessel replacement was commenced in FY 2012/13. The major factor contributing to the improvement in the balance compared to the pre-project period was the realisation of significant reduction in the maintenance and repair costs. The proportion of entire expenditure, which used

to be an average of approximately 25% in 2004 – 2006, declined to a very low level at 1.9% in FY 2012/13. The major contributing factor seems to be, as well as the newness of the vessel, the averting of sudden breakdowns and repairs by steadily implementing the PMP.

While Table 5 shows that the general administration costs surged from FY 2011/12 to FY2012/13, this increase includes the amount of 1.2 million Tongan Pa'anga transferred to the vessel replacement fund. At the time of ex-post evaluation, some of the amount accumulated in FY 2013/14 had already been transferred and the fund balance was increased to 2 million Tongan Pa'anga. In the FISA's plan, the fund will be accumulated to 48 million Tongan Pa'anga in twenty years to replace the vessel smoothly. If the accumulation into the fund is implemented as planned, it is expected that in twenty years, the fund will have grown sufficiently to the purchase fund of a vessel similar to the one procured under this project, and a new vessel could actually be purchased before the vessel currently procured reaches the end of its service life in approximately 25 years.

Revenues from vessel operation (sales from freight and passengers) increased stably, supporting the sound management of FISA. However, fares of MV 'Otuanga'ofa were raised once in 2013, reflecting the global surge in fuel prices (an average 11% increase for an economy class ticket departing from Nuku'alofa). The fares are slightly higher than private vessels, but most passengers have been using 'Otuanga'ofa because of the background that, according to the interview survey, MV 'Otuanga'ofa is more comfortable and offers more stable operation.

3.5.4 Current Status of Operation and Maintenance

FISA has a small workshop in the headquarters and has been conducting on-board maintenance except for dry-docking of the keel. In this project, as well as procuring a ferry, containers and forklifts, a PMP was formulated as described in '3.5.2 Technical Aspects of Operation and Maintenance', whereby the items to be implemented to keep the vessel in good condition were specified together with the timeline (daily, weekly, monthly, yearly and every several years), such as greasing the cargo cranes (monthly) and checking the bow thruster shafting condition (yearly). In fact, the PMP was introduced right from the start of operations, with all inspections apart from dry-docking regularly conducted by the workshop staff and crew members and dry-docking in Fiji implemented once every year.

Photo 3: Engine Room maintained in clean condition

Photo 4: Inspection of the Engine Room

The PMP had not been introduced to MV Olovaha, and there were difficulties in addressing breakdowns as the vessel deteriorated. The actual confirmation of MV 'Otuanga'ofa's maintenance status during the ex-post evaluation study showed that the hull, engine, electrical system and equipment remained in good condition and the engine was also inspected and repaired as required. No cancelations due to sudden breakdowns had occurred since it started operation, and it can be said that the vessel has been operated generally in good condition. The workshop, despite its small size, basically seemed to be equipped with tools and equipment required to carry out inspection and repair work of the procured vessel.

However, it emerged that seven out of eight reefer containers, procured with the ferry, had problems, but the repair of the broken motors and the procurement of spare parts had not been independently carried out, rendering FISA unable to handle the breakdown of electrical systems sufficiently. In response, FISA purchased a larger second-hand reefer container to meet the demand. While there was concern over the repairing skills of electrical systems, the PMP implementation scope was limited and this programme has not been applied to electrical systems for which it was difficult to envisage the breakdown timing and to areas where periodical replacement of spare parts was not expected. FISA said that it was difficult to address these areas based on their current repair capacities but it was also very difficult to recruit an electrician domestically who would be capable of analysing the breakdown details correctly, procuring the right spare parts and performing repair work.

With regard to the ports in each location, the infrastructure facilities pertinent to this project, the Nuku'alofa Wharf has been developed and administered by the Ports Authority. Other outer island ports meanwhile, (such as Lifuka and Vava'u islands), which are under the jurisdiction of the Ministry of Infrastructure, are experiencing gradually shallower depths given the lack of an adequate dredger in Tonga, meaning ever-increasing amounts of sediment are disturbed at the bottom of harbours. Therefore, it is considered necessary that the Ministry of Infrastructure, as the responsible body, is

tasked with securing a dredger and constantly developing the harbour to facilitate MV ‘Otuanga’ofa’s safe operation.

The private vessel MV Pulupaki is heavily decrepit and its frequency of operation has declined since 2013. It was undergoing through welding repair work and could not be operated at the time of ex-post evaluation. The Ministry of Infrastructure expressed concern over the deterioration and safety of the vessel, and according to the Ministry, their inspectors have recently been pointing out items to be repaired all the time. It is possible that the vessel will not be able to function as a passenger/cargo vessel, and it is expected that a role MV ‘Otuanga’ofa playsin the outer island route will become more important.

As shown in the above analysis, no particular issues were observed in terms of the structure of operation and maintenance as well as the operational techniques of the vessel procured. Financial conditions improved rapidly since the initial deficit and reached a point where an accumulation into the vessel replacement fund could be started. In terms of the operation and maintenance status, the procured vessel was kept in good condition without any particular issues in terms of maintenance techniques of the vessel procured and with the introduction of PMP. However, FISA faces a problem for the repair of electrical systems - some of the equipment remained broken and much time was required for repairs, as seen in the case of reefer containers.

In light of the above, some problems have been observed in terms of technical aspects of operation and maintenance and conditions of electrical systems; therefore, the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, a ferry and related equipment were procured to make maritime transportation safer and more reliable for passengers. This project, which supported stable operation between outer islands, was consistent with the development plan and needs of Tonga, as well as the priority areas of Japan’s ODA policy. Therefore, the relevance is high. With regard to effectiveness, the project increased capacities and made transport safer for maritime passengers and cargo, which facilitated the smooth flow of goods between the capital and outer islands, meaning that its effectiveness and impact are also high. With respect to the project implementation, while the project components were implemented as planned and the project cost was also mostly as planned, the project period exceeded the plan due to re-tendering procedures following a tender failure. Consequently, efficiency is fair. In terms of sustainability, there were no particular issues

in the structure of operation and maintenance as well as operational techniques, coupled with an improvement of financial conditions to a level where the vessel replacement fund was building up. The procured vessel was generally well-maintained, but partial issues were observed, particularly in the electrical repair of some equipment. Therefore, the sustainability of the project was fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Elimination of Services with Excessive Passenger Numbers during Peak Seasons

While the elimination of services with excessive passenger numbers was expected by increasing passenger capacity, such services were still observed during peak seasons such as Christmas. During such seasons, with the vessel's safety in mind, it is vital to take measures to avoid the problem of excessive passenger numbers by increasing the number of services of MV 'Otuanga'ofa or enforcing boarding restrictions.

4.2.1.2 Securing and Training Maintenance Engineers

It was observed that while MV 'Otuanga'ofa was generally maintained in good condition and stable and safe operations were realised, the breakdowns in electrical systems had not been fully addressed. It is desirable that an electrician with high-level expertise be secured and the capacities of existing engineers be developed to help ensure any breakdown can be smoothly repaired.

4.2.1.3 Need to Dredge Outer Island Ports

In the outer islands such as Lifuka and Vava'u, there is concern that the depths of wharves where the ferry berths will become insufficient, which could hamper the operation of MV 'Otuanga'ofa in future. While this is outside FISA's scope of business, it is considered necessary for the Ministry of Infrastructure to take the lead in dredging the harbours of outer islands to ensure safe and stable operation of vessels.

4.2.2 Recommendations to JICA

Although the Implementing Agency has been carrying out as much maintenance work as possible by introducing and implementing the PMP for the vessel procured, maintenance capacities need to be improved, particularly in terms of electrical systems.

Given the need for the implementing agency to secure engineers with high-level expertise by itself and undertake all repair work in the medium- to long-term, an appropriate engineer needs to be hired from outside. In addition, it is considered important for JICA to provide technical guidance to improve the skills of existing engineers in such areas to sustain the effects of this project.

4.3 Lessons Learned

4.3.1 Realisation of Stable Operations and Reduction in Financial Burdens by Introducing the Preventive Maintenance Programme

One of the factors underpinning the stable and safe operation of MV 'Otuanga'ofa is the introduction of a preventive maintenance programme (PMP), which was non-existent for MV Olovaha, to prevent breakdowns before they happen and maintain the vessel in optimal condition at all times. This programme was applied to the ferry procured from Japan to Samoa in 2010 and its introduction was also planned for this project. Implementing the programme steadily is assumed to pave the way; not only for stable and safe operations but also to alleviate financial burdens of this project through a consequent reduction in repair costs. Also, as described in '3.5.2 Technical Aspects of Operation and Maintenance', there are some areas not covered in the PMP where sufficient and prompt action is lacking, underlining the importance of PMP implementation. Therefore, introducing PMP and confirming that the implementing agency is capable of performing the programme when a vessel is procured is crucial.

4.3.2 Procurement of Equipment in Accordance with Repair Capacities and Spare Part Procurement Conditions in Island States

Among the equipment procured in this project, many of the reefer containers were unrepairable after they broke down. While the repair capacities of the implementing agency proved insufficient, the following points were also relevant at the time of planning this project: (1) The usage environment whereby container transportation and handling work would be done on an unpaved wharf and containers used under hot and humid conditions needed to be confirmed, and (2) Under circumstances of limited human resources in island states, when vessel-related equipment with electrical systems was procured, there was a need to determine the nature of detailed processes which would be practical in repairing and procuring spare parts once the equipment broke down. If a similar project is implemented in future, it is hoped that these points will be examined in more detail.

(End)

Republic of Vanuatu

Ex-post Evaluation of Japanese Grant Aid Project

"The Project for Improvement of Port Vila Main Wharf"

External Evaluator: Keisuke Nishikawa

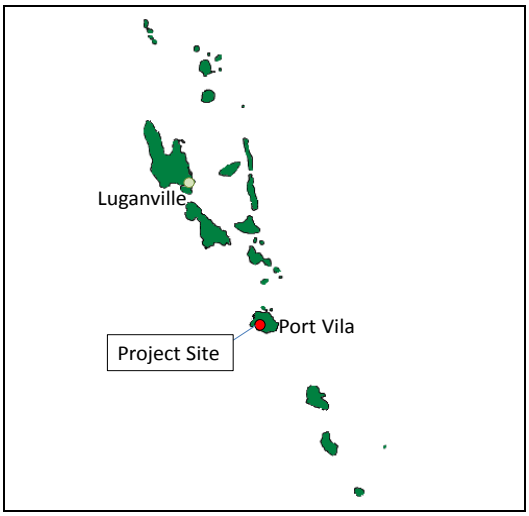
Japan Economic Research Institute Inc.

0. Summary

In this project, the port area of the Port Vila Main Wharf was rehabilitated and tugboat and pilot boat were constructed to improve cargo-handling efficiency and make it safer for ships calling at the port to berth. The relevance of this project was high as it was consistent with the development plan and needs of Vanuatu, both at the times of planning and ex-post evaluation and also consistent with Japan's ODA policy at the time. With regard to the project effects, an achievement of all the indicators expected at the time of planning, such as reducing the container transportation distance and relaxing wind-velocity restrictions on berthing for ships calling helped underpin and support an increased number of cruise ships calling and stabilise goods trade: therefore, the effectiveness and impact of the project was high. The efficiency of the project was fair as while the project period was within the plan, the project cost would have exceeded the original project scope, although the scope was reduced to keep the cost within the planned amount after steel prices surged. The sustainability of the project effect generated by this project was fair, reflecting some problems from technical perspectives and the current status of operation and maintenance in terms of maintenance of port facilities.

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

1. Project Description



Project Location

Main Wharf rehabilitated in this project and a cargo ship calling at the port

1.1 Background

Port Vila Main Wharf was brought into service in 1972 and as the port facilities had been designed for bulk and pallet cargo, they could not respond to cargo containerisation. The most serious issue was the fact that the shed for loose cargo, which occupied 25% of the limited port area, was located centrally in the port area. Therefore, sufficient container area could not be secured and it significantly hindered cargo handling. Under such circumstances, containers were transferred to and stored at the Star Wharf, located approximately 1km east of the Main Wharf and on the road shoulders outside the port area. In addition, the structure of the port facilities meant that considerable time was required to carry containers from the pier, and thus generated a waiting time for cargo to be transferred from container ships, resulting in inefficient cargo-handling operations.

The cargo-handling hours at the Main Wharf were 7:00 - 22:00 daily except Sunday and workers worked in two shifts. Under such conditions, if a freighter arrived outside these hours, it was put on demurrage, awaiting the start time, because no cargo-handling operations were performed. In addition, customs work was performed at the container storage areas on the public road, approximately 200m to 1km from the port area. This was not only very inefficient but also was a serious security issue.

Regarding the navigation of ships calling at the port, the laws of Vanuatu required ships to use pilot and tug boats when entering and leaving the Port Vila Harbour. However, a 24-year-old pilot boat was banned from operating due to unsafe conditions. Accordingly, a flat-bottomed wooden boat with an outboard motor was used as a substitute for the pilot boat. A 34-year-old tugboat, deployed at the Port Vila Harbour, was also taken out of service in 2005 because of aging, and no tugboat support was provided.

1.2 Project Outline

The objective of this project was to improve the cargo-handling and berthing environment for ships calling at the Port Vila Harbour by rehabilitating the Port Vila Main Wharf and constructing a tugboat and a pilot boat.

Grant Limit / Actual Grant Amount	1,707 million yen / 1,707 million yen
Exchange of Notes Date	May, 2008
Implementing Agency	Department of Ports & Marine (DPM), Ministry of Infrastructure and Public Utilities (MIPU)
Project Completion Date	January 2011 (April, 2010 (Facility) / January, 2011 (Equipment))

Main Contractor (Construction)	Penta-Ocean Construction Co., Ltd.
Main Contractor (Equipment Procurement)	Kanagawa Shipyard & Machinery Co., Ltd.
Consultant	The Consortium of ECOH CORPORATION and Japan Marine Science Inc.
Basic Design	December 2007
Detailed Design	December 2008[1]
Related Projects	[ODA Loan Project] Port Vila Lapetasi International Multi-Purpose Wharf Development Project (2012 – 2016 (planned)) [Grant Aid Project] The Project for Rehabilitation of the Wharf in Tanna Island (1998) [Other Donors] Asian Development Bank, Reconstruction of Port Vila Wharf and Fenders (2000 – 2001)

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: September, 2013 – October, 2014

Duration of the Field Study: February 28 – March 12, 2014 and May 18 – 24, 2014

3. Results of the Evaluation (Overall Rating: B[2])

3.1 Relevance (Rating:③[3])

3.1.1 Relevance to the Development Policy of Vanuatu

In Vanuatu, 'The Priorities & Action Agenda 2006 – 2015' (hereinafter referred to as PAA), a medium- to long-term plan, stated the need to improve domestic maritime transportation and take security measures at the two major ports of Luganville and Port Vila. The mid-term plan (2008 – 2011) of PAA more specifically proposed improvements to port facilities, the implementation of the International Ship and Port

[1] Indicating the date when 'a comparison table of basic design and detailed design' (for re-tendering) was submitted

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

[3] ③: High, ②: Fair, ①: Low

Facility Security Code (ISPS Code) [4], improvements to sites including the container area, tugboat replacement and so on.

The PAA was a continuously valid development plan at the time of the ex-post evaluation. The plan was revised in 2012 and the need to improve operational efficiency at ports for international trade was added as a priority agenda. In the PLAS (Planning Long, Acting Short 2013-2016), regarded as a medium-term specific plan to implement PAA, one of the listed strategies was to improve existing maritime infrastructure. Furthermore, the Vanuatu Infrastructure Strategic Investment Plan (VISIP) was being formulated during the ex-post evaluation, in which maintaining and renewing existing port facilities was positioned as one of the strategies. In this plan, the Port Vila Lapetasi International Multi-Purpose Wharf Development Project, implemented adjacent to the site of this project (rehabilitation of the Main Wharf), is considered to be the most important maritime infrastructure project.

Thus, ports have consistently been placed as significantly important infrastructure facilities, from the time of planning until the time of the ex-post evaluation in Vanuatu, underlining the need to maintain and rehabilitate facilities, formulate laws and policies and ensure operational efficiency; all of which are key challenges mentioned in various planning documents. Therefore, as this project planned to rehabilitate the international port for smooth operation of the facilities, it can be said that the project has been highly consistent with the development plan of Vanuatu.

3.1.2 Relevance to the Development Needs of Vanuatu

During the project planning, the Port Vila Harbour, the largest port in Vanuatu, was unable to respond to the international containerisation of cargo, exposing issues in handling operations. One particular problem was the small space for handling yard and container storage and the fact that containers were transported to the shoulders of the public road outside the port area before customs clearance. Moreover, tug and pilot boats were not deployed in the port, hampering berthing operations when ships called at the port.

At the time of the ex-post evaluation, the Port Vila Harbour played a major role as a gateway to domestic and international maritime transport and a port of call for cruise ships. Calls of cruise ships and volumes of international containers in recent years are shown in Tables 1 and 2.

[4] Special measures to strengthen maritime security, comprising part of 'The International Convention for the Safety of Life at Sea' (The SOLAS Convention)

Table 1: Number of Calls to Vanuatu Ports by International Cruise Ships

Port of Calls	2009	2010	2011	2012	2013	2014
Port Vila	50	57	73	111	124	138
Mystery Island	23	21	57	55	67	76
Wala	9	11	15	18	19	11
Champaign Beach	6	4	13	17	20	16
Pentecost	3	5	5	3	3	3
Luganville	2	2	6	15	19	29
Total	93	100	169	219	252	273

Source: Data provided by South Sea Shipping Ltd.
Note: Calls in 2014 are planned numbers.

Table 2: Volume of International Containers Handled at Port Vila Wharf

(Unit: TEU)

FY	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Imports	5,320	5,886	5,656	5,628	6,084	5,877	5,949
Exports	3,891	5,909	5,313	4,585	6,342	5,512	5,793
Total	9,211	11,795	10,969	10,213	12,426	11,389	11,742

Source: Data provided by Ifira Port Development Services
Note: The financial year for the data provided is from June to May.

The Port Vila Main Wharf was rehabilitated when this project was implemented. While operational efficiency improved as described later, the number of cruise ships calling at the Main Wharf soared by 70% in the two years since 2011, when this project was completed to 2013, as shown in Table 1. The volume of international containers increased by 27% between the time of planning (FY2006/07) and ex-post evaluation (FY2012/13), showing a steady demand for cargo after the completion of the project. Consequently, the increasing number of calls by cruise ships were hampering the entries of cargo ships into the port and handling operations[5].

Although the Main Wharf was accepting all calls by international cargo ships and cruise ships in Port Vila, expanding the wharf was impossible due to the topographical conditions. Accordingly, to respond to the tight demand-supply situations stated above and increase the international cargo-handling capacity as well as making the handling more efficient, a wharf to handle international cargo was being developed at the time of the ex-post evaluation as an ODA loan project 'Port Vila Lapetasi International Multi-Purpose Wharf Development Project'[6]. In addition, the development of a 46m x 132m domestic wharf with three berths and one landing ramp is planned to the east of Lapetasi Wharf; assisted by the Asian Development Bank and New Zealand.

As stated above, a significant increase in cruise ship calls and a steady movement of

[5] As cruise ships are normally berthed from the early morning to evening the same day, cargo ships are on demurrage inside the harbor or offshore in the meantime.
[6] After the completion of Lapetasi Wharf, international cargo will basically be handled at this wharf and the Main Wharf is planned to be mainly used for cruise ships. However, if two cargo ships arrive at the same time, some of the cargo will be handled at the Main Wharf as required.

cargo handled have been seen in recent years, and the needs for port development can be considered high; both at the times of planning and ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

At the time of planning, in consideration of the five priority areas of Japanese assistance (Economic growth, Sustainable development, Good governance, Security and People to people communication and exchange) declared at 'The Fourth Japan-Pacific Islands Forum Summit Meeting (PALM 4)' between Japan and the leaders of the Pacific Island Governments, cooperation in 'Economic Growth: Infrastructure, etc.' was one of the key areas of cooperation for Vanuatu (according to the Ministry of Foreign Affairs 'Japan's ODA Data by Country 2007'). Therefore, as this project is in line with the five priority areas indicated at the PALM at the time and with assistance for economic growth, one of the key cooperation areas for Vanuatu, this project can be considered highly consistent with Japan's ODA policy.

This project is consistent with the development policy and strategies of Vanuatu at the times of planning and ex-post evaluation. The development needs for ports have always been high, as reflected in the increase in cruise ships and steady volume of cargo handled. Moreover, this project, which supported infrastructure development spawning economic growth, is in line with Japan's ODA policy at the time. In light of the above, the relevance of this project is high.

3.2 Effectiveness[7] (Rating:③)

3.2.1 Quantitative Effects

3.2.1.1 Improvements in Cargo-handling and Berthing Environment

When the project was planned, reduced container cargo transportation distance, cycle time and berthing (mooring) time of vessels were expected, as well as realising a smaller water area for turning ships calling at the port, and a higher wind velocity for berthing operations as quantitative effects by implementing the project.

[7] Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 3: Changes in Cargo-handling and Berthing Environment

Indicator	2006 (Plan)	2011 (Project completion)		2014 (Ex-post evaluation)
	Actual	Target	Actual	Actual
Transportation distance	200m~1km	50~100m	50m~100m	50~100m
Cycle time	13 minutes	9.6 minutes	9.6 minutes	7 minutes
Mooring time	11.3 hours	7 hours	4 hours	4 hours
Water area required for turning ships	3~4 times the ship's length	1~1.5 times the ship's length	1~1.5 times the ship's length	1~1.2 times the ship's length
Wind velocity for berthing operations	Less than 10m/s	Less than 15m/s	Less than 20m/s	Less than 20m/s

Source: Basic Design Study Report and data provided by the Department of Ports & Marine

With the development of container placement yard within the port area, it became possible to conduct customs clearance within the Main Wharf, as opposed to on a public road outside the area after transporting the containers, and the transportation distance was substantially reduced. Issues of container placement on a public road prior to project implementation were solved. The 'cycle time' indicates the length of time after a container is discharged, placed on the container yard and the transporting equipment returns to the side of the ship and was observed to have shortened in line with the plan upon project completion. At the time of the ex-post evaluation, the cycle time was shortened further from 9.6 to 7 minutes as the operation became more efficient, thanks to accumulated container transportation experience. Through this reduced cycle time, the mooring time per ship was also reduced beyond the target to 4 hours; both at the time of completion and ex-post evaluation. Deploying a tugboat has enabled the water area required for turning ships to be reduced from 3~4 times to 1~1.5 times the ship's length, and further down to 1~1.2 times at the time of the ex-post evaluation due to more efficient tugboat operation. In addition, while the ships calling at the port could berth only when the wind velocity was less than 10m per second before the project, deploying a tugboat has enabled berthing at wind speeds of up to 20m per second, which was also beyond the targeted figures.

Accordingly, the expected indicators during the planning stage had already been achieved by the target year 2011, and further improvements were observed in cycle time, mooring time and water area required for turning ships at the time of the ex-post evaluation.

Additionally, while no specific quantitative indicators were set at the time of planning, reduced berthing time and damage to the wharf were expected with the deployment of a tugboat. While the time required was unknown, since it was not measured, after berthing support with the tugboat was provided, the tolerable wind

velocity for berthing operations increased and the water area required for turning ships became smaller, which implies that the berthing operations became more efficient. Since the project was completed, no wharf-damage accidents have occurred and it can be judged that there is no problem. However, there are periods when the tugboat is outside the Port Vila Harbour due to dry docking as part of maintenance, whereupon berthing operations take longer. Given the potential for an accident to occur, it is considered necessary to take responses and measures in the absence of the tugboat.

3.2.1.2 Other Quantitative Indicators

While these indicators were not expected in this project, Table 4 shows the number of all calling ships and the number of cruise ship passengers at the Port Vila Main Wharf as the main indicators of port development.

Table 4: Number of Calling Ships and Cruise Ship Passengers at the Port Vila Wharf

	2009	2010	2011	2012	2013
Number of all calling ships (including cruise ships)	181	167	193	231	228
(Cruise ships)	50	57	73	111	124
Number of cruise ship passengers (persons)	124,818	140,468	154,938	213,243	242,646

Source: Data provided by the Department of Ports & Marine, South Sea Shipping Ltd., Vanuatu National Statistics Office

Increases in the number of calling ships are mostly due to the increased number of cruise ships, and the associated number of cruise ship passengers increased to 240,000, a level equivalent to the population of Vanuatu itself, as seen in Table 4. The role in promoting cruise ship tourism has become increasingly important.

In this survey, as the Department of Ports and Marine (hereinafter referred to as DPM) has not developed sufficient data, no other port-related data could be obtained. Information on cruise ships and the cargo volume were provided by private operators.

Photo 1: Cruise ship berthed at the wharf

3.2.2 Qualitative Effects

At the time of planning, the following qualitative effects were expected by implementing this project:

- Port service functions would improve by enabling firefighting responses to fires on ships and at coastal facilities.
- Greater security would be ensured by improving lighting facilities within the port premises.
- The cargo-handling machinery would not run on general public roads, thereby easing traffic congestion of general vehicles on public roads.

Photo 2: Tugboat provided under this project

A fire extinguishing device for other boats was installed on a tugboat to deal with fire accidents at sea and on land facilities. While there have been no cases where firefighting actions were required using the tugboat, port service functions are considered to have improved as it became possible to respond to fires with the procurement of the tugboat though there were no equipment to respond to the occurrence of fires on a boat in the harbour and near the wharf. According to the implementing agency, fire drills are implemented by the crew on a quarterly basis.

With regard to security within the port premises, according to DPM and handling / shipping agents, it was confirmed that improvements in lighting facilities within the port had ensured greater security at night and facilitated night handling operations after cruise ships departed in the evening. The expected effects are thus considered to have been realised[8].

As for the status of general public roads around the port, circumstances where containers are piled up on public roads were eliminated after implementing this project, and there were no operations involving cargo-handling equipment such as forklifts or top lifters. This elimination has also eased traffic congestion with general vehicles on public roads.

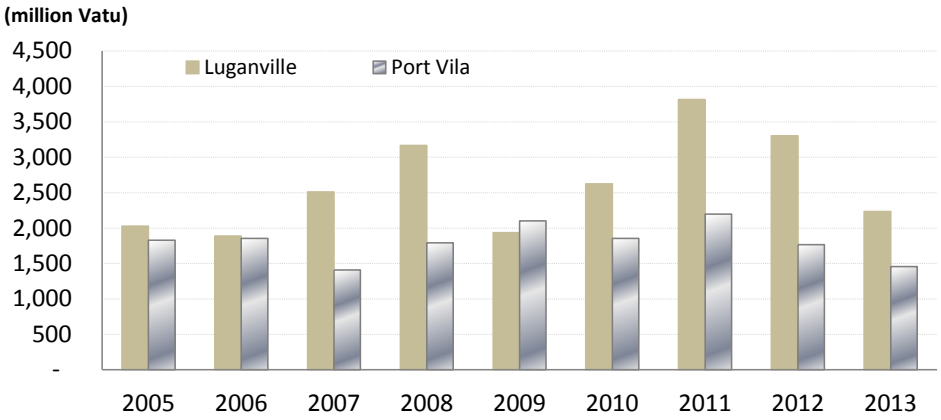
[8] At the time of ex-post evaluation, when a cruise ship is berthed during the daytime, no cargo handling operation can be performed on a cargo ship having arrived at the same time. However, as the cruise ship leaves in the evening, unloading operations can be performed afterward. There was no problem of permanent offshore demurrage of cargo ships.

3.3 Impact

3.3.1 Intended Impacts

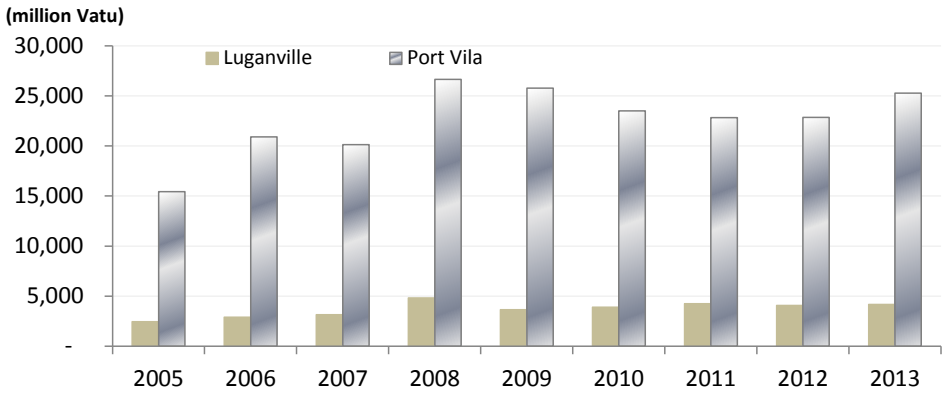
As an impact of this project, it was expected at the planning stage that the safety for ships calling at the port and the shorter cargo handling time would stabilise maritime transportation and goods distribution. In the ex-post evaluation, the export and import values of international cargo were captured and the stabilisation of goods distribution was confirmed following interviews with port handling and shipping agents.

Export and import values by port in Vanuatu are as shown in Figures 1 and 2.



Source: Data provided by the Vanuatu National Statistics Office

Figure 1: Export Values by Port



Source: Data provided by the Vanuatu National Statistics Office

Figure 2: Import Values by Port

The Port Vila Harbour is one of two international ports in Vanuatu, and is more prominent as a consumption point for imported goods as it is the largest city in the country. It handled 39% of all exports by value and 86% of all imports by value in 2013,

making it a facility particularly crucial for imports. The project rehabilitated the only international cargo wharf in Port Vila to reinforce the structure and facilitate cargo handling operations. It is assumed that this project has secured national goods distribution of goods in the country through stable and efficient use of by using the country's largest port stably and efficiently.

It was also confirmed through interviews with the agents using the port (cargo-handling and shipping agents) that cargo-handling operations had been made more efficient and imports proceeded far more smoothly thanks to the improved port facilities. As understood in '3.2 Effectiveness', the Port Vila Harbour is a port of call for approximately half the cruise ships visiting Vanuatu and is used by 240,000 cruise ship passengers, roughly equivalent to the national population. While the existence of survey results on cruise ship tourism revenues was unconfirmed, it can be inferred that this project also contributes significantly to promoting cruise ship tourism.

Based on the above, the stable use of the port and substantially improved logistical efficiency were confirmed, and the expected impact, stabilisation of maritime transportation and goods distribution are considered to have been sufficiently realised.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

It was judged not necessary to implement an environmental impact assessment at the planning stage as this project involved rehabilitation of existing port facilities and minimal environmental impact was expected. Measures such as disposing of construction debris appropriately and preventing the spread of dirty water by installing coating films, installing an oily-water separator and a sewage-treatment unit on the boats were planned during the construction.

According to DPM and project consultants, the actual measures were as follows:

- Most of the construction materials were used and a small amount of debris was appropriately disposed of at a disposal site. There was little dust but sprinkling of water was properly implemented.
- The coating film was not installed because the spreading of turbidity was seldom seen. This was because the stones cast were limestone with little soil attached and the casting point featured deep terrain. There was no problem of turbidity caused by non-installation.
- An oily-water separator and a sewage-treatment unit were both installed based on the International Convention for the Prevention of Pollution from Ships, and there was no discharge of oil and dirty water that would adversely affect the environment.

In terms of comparing the plan and actual result, the coating film was not installed following examination and discussions by DPM and project consultants, but no particular issues emerged, including the disposal of construction debris and dust-prevention measures. No other environmentally negative effects were seen in particular, during and after the implementation of this project; therefore, it can be said that there was no problem overall.

3.3.2.2 Land Acquisition and Resettlement

It was confirmed that there was no land acquisition and no resettlement cases as this project involved rehabilitation of existing port facilities and the procurement of boats. There was no problem during and after the project implementation.

3.3.2.3 Other Impacts

(1) Rescue Activities of Other Boats

The tugboat procured in this project was used in four cases to rescue boats that could not be operated in outer seas in 2011[9], as well as tugging cargo and cruise ships, contributing significantly from a life-saving perspective. When conducting rescues, the tugboat travels on its own.

(2) Simultaneous Implementation of Facility Development and Equipment Procurement

This project involved developing port facilities and procuring a tugboat and pilot boat, and as described above, it was a project to solve various issues of the Port Vila Main Wharf as a whole. The comprehensive achievement of the project objective was confirmed, with cargo-handling operations made more efficient through redeveloped port facilities and berthing and departing operations made safer for ships by procuring a tugboat and pilot boat. Consolidating the development of port facilities and procuring boats is considered to have contributed substantially to realising the effects of the project.

By implementing this project, the target figures of all indicators such as container transportation distance, cycle time and wind velocity allowing berthing and departing operations were achieved. The port facilities developed and the tugboat and pilot boat procured under this project can be said to have underpinned the increased number of cruise ships calling at the port as well as exports and imports of a number of goods. Moreover, greater security thanks to lighting facilities installed within the port,

[9] According to DPM, there were no rescue cases in other years.

fire-fighting facilities via the tugboat, and eliminating the need to handle cargo-handling operations on public roads were realised. There were no specific negative impacts during and after the project implementation in terms of the impact on the natural environment, nor was any land acquisition or resettlement observed. Therefore, the effectiveness and impact of the project is high.

3.4 Efficiency (Rating:②)

3.4.1 Project Outputs

This project was intended to improve port facilities at the Port Vila Harbour and procure workboats (tugboat and pilot boat). The output was planned as shown in Table 5.

Table 5: Planned Details of Port Facilities and Workboats

Civil Engineering Facilities		Workboats	
Concrete deck	1,013m^2	Tugboat	Length overall: approx. 31m
Pavement of cargo-handling yard	8,620m^2		Gross tonnage: approx. 250 tons
Drainage facilities	1 Set		
Shore protection	West: 50m East: 66.6m		Main engine horse power: 1,600ps x 2
Lighting facilities	4	Pilot boat	Length overall: approx. 12m
Light buoy	2		Gross tonnage: approx. 11 tons
Construction Facilities			Main engine horse power: 180ps x 2
Rehabilitation of loose cargo shed	1,045m^2		
Administration building	2 storeys 560m^2		

Source: Basic Design Study Report

While both the tugboat and pilot boat were constructed as planned, some of the planned outputs were changed for port facilities as indicated in Table 6.

Table 6: Changes from the Planned Outputs

Item Changed	Details of Changes
Alterations to the structural foundation of the administration building	Concrete pile foundation → Concrete mat foundation
Reduction of the concrete pavement area in the cargo-handling yard following the tender failure	8,620m^2 → 7,000m^2
Changes to the pavement shape of the cargo-handling yard	Keep the western side of port premises unpaved → Keep the dead space in the east unpaved
Reduction in the size of administration building following the tender failure	Two storeys, 560m^2 → Single storey, 280m^2
Excavation of the protected shore in the east due to the emergence of a rock and changes in the shape of cubic blocks	Depth of excavation: 6m → 3.5m Cubic blocks: 14 on the upper level + 13 on the lower level → 28 on one level and changes in size
Changes to the shape of the loose cargo shed	Total roof : 1,423m^2 → 1,155m^2 + installation of gutters
Changes of soil in the excavation area for the foundation of the administration building and the foundation for the septic tank due to the emergence of a rock	Excavation of soil → excavation of a rock

Source: Completion Report

As tender failure occurred due to a surge in steel materials and a rock found during the construction stage, slight changes were added to the construction details, but no particular inconveniences emerged, according to confirmations with DPM and port-related agents.

While most of the changes shown in Table 6 were minor, steel prices surged during the period between the Basic Design Survey and the main construction work tender, which resulted in the occurrence of tender failure. Consequently, the administration building, which was planned as a two-storey structure, ultimately became a single-storey building. Due to the reduction in size of the new administration building, the old administration building was left unchanged and not demolished. At the time of ex-post evaluation, the customs office and quarantine office were housed in the new administration building, while DPM was performing its duties in the old administration building. DPM said that no major problems had arisen in terms of the implementation of DPM's routine work in the old administration building at the time of ex-post evaluation, but that the building had deteriorated significantly and its office space was expected to be small, given the need to additionally hire a port security administration officer and a port facilities security administration officer to fully implement the ISPS Code. In response, the Ministry of Infrastructure & Public Utilities (hereinafter referred to as MIPU), to which DPM belongs, plans to transform the administration building to two storeys by 2015 in its Mid-term Action Plan. However, no concrete budget

arrangement has been made.

The following items were planned to be undertaken by the Vanuatu side in association with this project:

- Securing a construction yard (temporary) with an area exceeding 2,500m^2
- Partial removal of the loose cargo shed
- Removal of the old administration building after the completion of the new one
- Removal of an outside toilet and septic tank
- Construction of a drainage channel, catch basin and conduit
- Relocation of surveillance cameras

It was confirmed during the ex-post evaluation that the above items had been implemented as planned except for the removal of the old administration building.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The cost of this project was planned to be approximately 1,707 million yen to be borne by Japan, and another 12 million Vatu (approximately 15 million yen) to be borne by Vanuatu to implement its own items.

Table 7 compares the breakdown of planned and actual costs borne by the Japanese side.

Table 7: Breakdown of Planned and Actual Project Costs

(Unit: million yen)

Breakdown	Plan	Actual
Construction	1,002	1,013.05
(Engineering work at the port)	(673)	(732.42)
(Construction work at the port)	(329)	(280.63)
Equipment (boats)	617	616.00
Designing and Supervision	135	77.91
Total	1,754	1,706.96

Source: Basic Design Survey and Completion Reports

Note: As the planned amount is approximate as of the time of the basic design survey, it differs from the E/N amount.

The cost borne by the Vanuatu side was 16.5 million Vatu (approximately 14.85 million yen).

The project cost was within the E/N limit amount (100% of the plan) as the sizes of some facilities were reduced due to tender failure and price escalations. However, the project outputs were reduced from the original plan such as the administration

building area, and the project cost would have exceeded the originally planned amount had the reduced outputs been implemented. Therefore, the project cost can be said to have exceeded the planned amount in practice.

With regard to the cost borne by the Vanuatu side, the actual cost exceeded the planned amount in local currency though it was within the plan in Japanese yen. As the cost did not include removing the old administration building, the Vanuatu side cost would also have exceeded the planned amount in reality, if the removal had been taken into account.

3.4.2.2 Project Period

The period of this project was planned to be approximately 35 months, including the period for detailed designing and tender processes.

The actual project period was respectively as follows:

[Facilities] May, 2008 ~ April, 2010 (24 months)
[Equipment] May, 2008 ~ January 2011 (32 months)

The period from the E/N signing date (May, 2008) to the handover date was 32 months, which was within the planned period (91% of the plan). There was an initial delay of 4.5 months as the port construction work had a tender failure once followed by re-tendering, but this did not lead to any overall delay, as the construction work itself was completed in 15 months against the planned 18 months, thanks to efforts to expedite the construction. It was also because the construction period of the two boats had been planned to be longer than the period for the construction of port facilities.

While the tender failure of the port facilities works was attributable to a surge in steel material prices, the decision was made not to increase the project cost but implement the project within the initial budget. As measures were taken to reduce the project scope slightly, the project cost remained on budget (100% of the plan) after the project had been scaled back. Port operations were not hindered in particular by the change in scope and said changes were agreed between the two countries. However, steel material prices escalated, and it can be judged that the project cost would have exceeded the planned amount in its original scope. The project period was within the plan overall (91% of the plan). Although a tender failure occurred, this is because the facility works were implemented smoothly and the construction period for the two boats was planned to be longer than the period of port facilities development. Therefore, the efficiency of the

project is fair.

3.5 Sustainability (Rating:②)

3.5.1 Institutional Aspects of Operation and Maintenance

The implementing agency of this project is MIPU and the daily administration of port facilities and boats was undertaken by DPM. DPM is staffed with 55 members: 37 of whom assigned at the Port Vila Wharf and 18 at the Luganville Wharf. Maintenance of the Port Vila Wharf is the responsibility of the Operations Department (5 staff) of DPM, tasked with keeping the facilities in optimal conditions. 2 crew members are assigned to the pilot boat procured in this project and 4 crew members to the tugboat, tasked with basic maintenance as well as operating the boats.

MIPU also has the Public Works Department (hereinafter referred to as PWD), structured with the Head Office with 28 staff members and other sections in 6 provinces. This department performs work at the request of DPM when port facility repairs exceeding a certain scale are required. It does not normally undertake direct operation and maintenance.

Cargo-handling services at the Port Vila Wharf are provided by the Ifira Port Development & Services (IPDS) under a concession agreement with the Government of Vanuatu. All the cargo handling equipment is owned by IPDS.

As described above, a total of 11 staff members were assigned at DPM to operate and maintain the facilities and two boats, and there is a system in which PWD will respond to the cases after being contacted by DPM, if large-scale repairs of port facilities are required. No particular shortage of staff numbers or shortfall in the organisational structure was observed.

3.5.2 Technical Aspects of Operation and Maintenance

The system to maintain port facilities involves DPM contacting PWD to request repair work when something goes wrong with the port facilities as stated above. However, at the time of ex-post evaluation, it emerged that regular inspections were not being systematically conducted by DPM, nor had any inspection and recording methods been developed. Port-related data were not consolidated, and it emerged that the capacities to manage operations within the port premises were insufficient.

Some of the tugboat and pilot boat crew members have qualifications based on the ‘International Convention on Standards of Training, Certification and Watchkeeping for Seafarers’ (STCW Treaty.) As no accidents have occurred to date, it is believed that they have sufficient operational skills. As for maintenance, the engine rooms of the two boats have inspection items specified on a daily, monthly, quarterly, biannual and

annual basis and inspections are conducted in accordance with the same. In addition, the boats are dry-docked[10] generally once every year. It is considered that the work items and techniques of regular inspections by the DPM crew as well as dry-docking by private businesses are not subject to any particular issues.

According to DPM, regarding training programmes for the staff operating and maintaining the facilities and boats, while no training was provided for port facilities, fire-fighting drills are implemented on a quarterly basis for the tugboat.

Based on the above, no technical issues emerged in terms of the qualifications owned, operational techniques and regular inspections for the boats. However, administrative capacities are judged to have some issues and there were no inspections and recording of port facilities, particularly the pier deck, nor any consolidation of port-related data.

3.5.3 Financial Aspects of Operation and Maintenance

DPM is not financially independent and receives a government budget allocated as a department of the Ministry of Infrastructure & Public Utilities. Table 8 shows the budget and expenditure of DPM since 2007.

Table 8: Budget and Expenditure of DPM

(Unit: million Vatu)

	2007	2008	2009	2010	2011	2012	2013
Budget	86.3	142.3	111.2	110.0	121.9	138.8	154.9
Expenditure	82.9	140.7	109.9	108.3	108.4	138.0	134.7

Source: Data provided by MIPU

Although DPM invoices ships for berthing fees and tugboat services, revenue management, including the collection of port fees, is not conducted by DPM and the private businesses invoiced make all direct payments to the Ministry of Finance and Economic Management.

Port revenues from the Port Vila Wharf based on the issuance of invoices from DPM are as shown in Table 9.

[10] A dry-docking of the tug boat is conducted in Fiji or New Caledonia, and a dry-docking of the pilot boat is conducted at a slipway of a private business inside the Port Vila Harbour.

Table 9: Revenues Related to the Port Vila Harbour

(Unit: million Vatu)

	2008	2009	2010	2011	2012	2013
Landing fees	63.0	60.6	58.1	86.0	98.1	117.3
Port dues	120.0	121.3	106.0	137.3	161.3	189.3
Wharfage	26.9	28.9	14.3	32.4	89.5	41.5
Other charges	34.3	9.1	6.9	10.4	14.8	13.5
Total	244.2	219.8	185.2	266.0	363.7	361.6

Source: Data provided by the Ministry of Finance and Economic Management

The budget allocated to DPM has remained at around 40% of the port-related revenues based on the invoices issued by DPM and paid to the Ministry of Finance and Economic Management. DPM cannot manage port revenues directly as it is not a financially independent organisation, and is in a situation where the amounts smaller than port revenues are received in the form of government budget. Regarding this level, DPM says that managing port facilities such as the pier deck and container yards[11] sufficiently is not possible due to the budget shortfall. However, as described in '3.5.4 Current Status of Operation and Maintenance', daily management of port facilities is inadequate and the lack of budget to inspect port facilities on a daily basis had not been confirmed.

The actual expenditures incurred for operating and maintaining a tugboat and pilot boat in 2012 and 2013 were provided by DPM. In 2013, since the pilot boat was not dry-docked, the total operation and maintenance cost of the two boats was not captured. It was a total of 20,443 thousand Vatu in 2012. It was kept under the planned amount since an annual cost of 29,320 thousand Vatu had been anticipated at the planning stage of this project.

Table 10: Operation and Maintenance Costs of the Tugboat and Pilot Boat

(Unit: thousand Vatu)

	2012	2013
Tugboat	18,219	14,932
Pilot Boat	2,224	Not implemented
Total	20,443	14,932

Source: Data provided by DPM

The financial conditions of DPM are not structured to receive all of revenues for the services it provides, and it receives all its allocation from the government budget.

[11] The central role of DPM is to supervise cargo-handling operators, inspect facilities and conduct daily management, including small-scale repairs. When large-scale trouble occurs to the facility, DPM requests PWD within MIPU for the repair.

According to DPM, this budget was insufficient to manage daily port facilities, but the issue of insufficient management of port facilities involves operational maintenance and no precise picture of budget shortfall was identified. However, as no source of revenue in the form of replacement investment was given either, the need to appropriate budget by the government will emerge when the facilities need to be rehabilitated in future.

3.5.4 Current Status of Operation and Maintenance

The pier-deck area of the Main Wharf was reinforced by a rehabilitation project supported by ADB in 2000 – 2001. While this area was excluded from the project scope, it needs to be inspected regularly and repaired as needed, as it is relatively old and getting deteriorated. However, there is no maintenance plan for port facilities and regular inspections have seldom been performed. Consequently, the deteriorated conditions of the piles under the pier deck are unknown, and unrepaired partial damage was confirmed on the concrete area above ground in the container yard.

To prevent further deterioration of the pier deck area, DPM considers it necessary to avoid the use of any large forklift on the pier deck, hence this has been prohibited. However, since it has been used occasionally on the pier deck in fact during container transportation, but as the supervision and guidance by DPM about its use is insufficient, there is a concern that damage may occur sooner in future[12].

A checklist of regular inspection items was specified for a tugboat and pilot boat, based on which it was confirmed that inspections were conducted. No breakdowns that would have hindered tugging operations had occurred on either boats, but merely minor troubles, such as a meter failure and water leakage from pipes, etc. There also seem to have been some cases where it was difficult to smoothly procure spare parts from overseas. Also, as described above, the tugboat undergoes dry-docking once a year in Fiji or New Caledonia, and the pilot boat in a private boat yard near the Port Vila Main Wharf. Accordingly, the two boats are largely maintained and tugging operations are also implemented smoothly. However, one of the boats is away during the dry-docking period, resulting in circumstances whereby safe berthing and departure operations for ships calling at the port cannot be fully ensured.

No particular issues were found in terms of the institutional aspects of operation and maintenance, and the operational techniques and maintenance conditions were also good. However, there was concern over the capacities and techniques used to fully record the

[12] However, once the Lapetasi International Multi-Purpose Wharf comes into operation, cargo-handling operations are expected to become rare and use by cruise ships will prevail. This may significantly alleviate burdens on the pier deck structure.

precise situations, given the lack of maintenance of port facilities in practice and the lack of consolidated port-related data. With regard to finance, under circumstances where no authorities were assigned to manage port-related revenues and the budget allocation was received as a government department, DPM considers the budget insufficient to operate and maintain the port facilities and equipment sufficiently. However, the fact that the inspections and routine management of port facilities were insufficient represented more of an operational issue, and the budget shortfalls were unconfirmed. With respect to the operation and maintenance conditions, it was judged that while the boats had been properly operated and maintained, facility maintenance was insufficient.

In light of the above, some problems have been observed in terms of technical aspects, as well as maintenance statuses, in the operation and maintenance of this project. Therefore, the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, the port area of the Port Vila Main Wharf was rehabilitated and tugboat and pilot boat were constructed to improve cargo-handling efficiency and make it safer for ships calling at the port to berth. The relevance of this project was high as it was consistent with the development plan and needs of Vanuatu, both at the times of planning and ex-post evaluation and also consistent with Japan's ODA policy at the time. With regard to the project effects, an achievement of all the indicators expected at the time of planning, such as reducing the container transportation distance and relaxing wind-velocity restrictions on berthing for ships calling helped underpin and support an increased number of cruise ships calling and stabilise goods trade: therefore, the effectiveness and impact of the project was high. The efficiency of the project was fair as while the project period was within the plan, the project cost would have exceeded the original project scope, although the scope was reduced to keep the cost within the planned amount after steel prices surged. The sustainability of the project effect generated by this project was fair, reflecting some problems from technical perspectives and the current status of operation and maintenance in terms of maintenance of port facilities.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Consolidation of Port-related Data

In implementing the ex-post evaluation study, as the port-related data were not sufficiently consolidated by DPM, basic data such as the number of calls by cruise

ships and the container handling volume were obtained from private operators. As it is very fundamental and important for DPM as a port administrator to get a true picture of port operations to manage the port appropriately, it is essential to enhance the capacities to consolidate major indicators.

4.2.1.2 Regular Inspection of the Existing Pier Deck Area

While the existing pier deck area of the Main Wharf was outside the development scope of this project, it is indispensable for the trade and economic activities of Vanuatu to maintain its durability. No regular inspections of the port facilities were conducted after the project had been implemented, and it is necessary to inspect them regularly, including the pier deck area, to prevent deterioration as much as possible. Moreover, DPM's constant supervision of cargo-handling operations while cargo ships berth will be important so that heavy machinery will not unload cargo on the pier deck.

4.2.1.3 Security of Berthing and Departing Operations by Adding a Tugboat

A tugboat was procured in this project to ensure safe berthing and departing operations of the ships calling at the port, but the Port Vila Harbour has only one such boat. As it is not available in the port for several weeks during annual dry-docking, there is concern during this period over the need to ensure safe berthing and departing operations of the ships calling at the port. Once the international multi-purpose terminal is completed at the Lapetasi Wharf, Port Vila Wharf will have two berths instead of the current one. Therefore, it is desirable that another tugboat be added to ensure berthing and departing operations proceed safely at all times.

4.2.2 Recommendations to JICA

The DPM, which is tasked with daily operation and maintenance of the Main Wharf, is not conducting regular inspections or repairing the port facilities sufficiently, and the consolidation of major port-related data also proved problematic. At the time of the ex-post evaluation, the International Multi-purpose Wharf Development Project was being implemented in the Lapetasi Wharf, adjacent to the Main Wharf, and a response to the increased demand by cruise ships to call at the port and realisation of efficient handling of international cargoes are expected. Upon completion of the project, it is anticipated that the overall DPM workload will increase. Therefore, it is important to continue cooperation by senior volunteers and/or experts to enhance the port management capacities of DPM so that the effects of both projects on wharf development are sustained.

4.3 Lessons Learned

4.3.1 Strengthening the Operation and Maintenance Structure and Implementing Capacities

In terms of the operation and maintenance of this project, issues were found in the areas of consolidation of port-related data, particularly by the Department of Ports and Marine (DPM), inspections of port facilities and supervision of cargo-handling operations. In managing the wharf being developed in the adjacent area as an ODA loan project or implementing other similar projects, it will be important to specify the roles and responsibilities of stakeholders in operating and maintaining the port, for the administrator to implement maintenance activities with sufficient authorities, responsibilities and budget, and to enhance capacities of implementing operation and maintenance for that purpose.

4.3.2 Effective Combination of Facilities Development and Equipment Procurement

In this project, project effects were confirmed in the sense of streamlined cargo-handling operations by integrally implementing port development (facility development) and tugboat / pilot boat procurement (equipment procurement), and further that berthing and departing operations were made safer by procuring equipment. While developing facilities, e.g. at the port, and procuring equipment such as tugboat / pilot boat were often implemented as separate JICA projects beforehand, integrating them in this project boosted effectiveness and helped achieve the project objective comprehensively. When implementing similar projects, it is desirable that an optimal combination of facility development and equipment procurement be investigated to achieve the project objective.

(End)

Republic of Angola

Ex-Post Evaluation of Japanese Grant Aid Project
"The Project for Emergency Rehabilitation of Port Facilities
at the Port of Lobito and the Port of Namibe"

External Evaluator: Masayuki Kawabata,
Japan Economic Research Institute Inc.

0. Summary

In this project, port facilities were rehabilitated and cargo handling equipment was provided in a major regional port of Angola in order to ensure safe cargo handling and improve handling efficiency. The implementation of this project was consistent with the development policy and needs both during the planning phase and ex-post evaluation, also conforming to Japanese aid policy at the time. It can be judged that there was no problem with the implementation approach, though there were problems seen in terms of the measures taken by the Angolan side regarding the exclusion of Lobito Port. Therefore, the relevance of this project was high. The project largely achieved the planned results. In the Port of Namibe, the safety, the container handling cycle, and the dust produced during port work are all confirmed to have improved. Also, port rehabilitation work in the project has reduced distribution costs by streamlining mooring and reducing warehousing costs and business expenses. Thus, the effectiveness and impact of the project was high. In terms of project implementation, the efficiency of the project was fair; project cost was kept within the plan, but the project period was longer than the plan. The sustainability of the project was also fair due to operation and maintenance issues with pier fenders and financial issues with the Namibe Port Authority (EPN[1]) administration.

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

1. Project Description

Project Location Map

Project Area of Namibe Port

[1] Empresa Portuária do Namibe

1.1 Background

Since gaining its independence from Portugal in 1975, Angola was in a state of civil war between the government and rebel forces for 27 years. Angola transport networks were ravaged in the war, greatly hindering the recovery and development of the Angolan domestic economy. To improve these circumstances, the Angolan government formulated the Priority Phase Multi-sector Rehabilitation and Reconstruction Program for 2003-07 (PPMRRP)[2], with servicing of the major ports and other transport infrastructure positioned as key issues.

To advance this program, the Angolan government requested a development study from Japan to determine an emergency rehabilitation plan for its four main ports. As a result, the Japan International Cooperation Agency (JICA) conducted a development study for the Project for Emergency Rehabilitation of Port Facilities at the Port of Lobito and the Port of Namibe from January 2005 to August 2006.

The development study predicted that freight handled in each port would more than double from 2004 to 2010, resulting in the formulation of a shortened rehabilitation plan to restore port functions by improving existing facilities by the target year of 2010. This plan included a proposal to focus on two of the four main ports: Lobito and Namibe. The project was to restore the piers which saw frequent use and had the greatest damage, the backing yard, as well as repair of refueling and water supply facilities, and to provide cargo handling equipment.

Under these circumstances, emergency rehabilitation of port facilities for the ports of Lobito and Namibe came to be implemented with Japanese grant aid.

1.2 Project Outline

The objective of this project was to ensure safe cargo handling and improve handling efficiency by rehabilitating facilities at major regional Angolan ports and providing port equipment.

Grant Limit / Actual Grant Amount		3,932million yen / 1,932million yen
Exchange of Notes Date		May, 2008
Implementing Agency		Institute of Maritime and Ports in Angola (IMPA), Ministry of Transport
Project Completion Date		March, 2011
Project Contractors	Main Contractor	TOA Corporation
	Main Consultant	ECOH Corporation

[2] Priority Phase Multi-sector Rehabilitation and Reconstruction Program: A program formed by the Angolan government in 2002 with aid from the World Bank as a plan to rebuild following the civil war.

Basic Design	December, 2007
Detailed Design	April, 2008
Related Projects	**Technical Cooperation**: Development Study Project for Emergency Reconstruction of Ports in Angola (2005-2006) Accepted Trainees Port Planning and Management (C/P training, 2006) Individual Experts Dispatch Port Administration Advisor, Port Facilities and Equipment Management Advisor (2007, 2010) **Grant Aid**: Project for Improvement of the Road Network in Luanda (1998-1999) **Other Donors**: Transport sector financing by the Export-Import Bank of China (Mossamedes Railway restoration, etc.)

2. Outline of the Evaluation Study

2.1 External Evaluator

Masayuki Kawabata (Japan Economic Research Institute Inc.)[3]

2.2 Duration of Evaluation Study

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

Duration of the Study: September, 2013 – October, 2014

Duration of the Field Study: January 27 – February 13, 2014 / May 12 – May 21, 2014

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

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance to the Development Plan of Angola

In January 2004, the Angolan government formulated a poverty reduction strategy

[3] Joined the evaluation team from RECS International Inc.
[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[5] ③: High, ②: Fair, ①: Low

(ECP[6]) to stimulate both economic recovery and medium-term economic growth, planning to invest $3.17 billion over five years. In addition, they created the PPMRRP 2003-2007 alongside the ECP as a national reconstruction program, with the servicing of the major ports and other transport infrastructure positioned as key issues. The government also formulated a National Strategy for Transportation in Angola (ENTA[7]) as a longer term guideline for the transportation sector. The first action plan (2000-2005) of this strategy covered emergency transport sector needs, including the rehabilitation of ports and navigational aids.

It was confirmed that the ECP was revised in February 2010 to continue economic recovery and medium-term economic growth, during the ex-post evaluation.

The Priority Reconstruction Program 2008-2012 (PRP[8]) was picked up where the PPMRRP left off, continuing the reconstruction program, which in turn was succeeded by the PRP 2013-2017. During ex-post evaluation, it was confirmed through interviews with the Ministry of Transport (MOT) that servicing of the major ports and other transport infrastructure remains a key issue.

ENTA 2000-2015, the long-term guidelines for the transportation sector, also covers medium-term, short-term, and emergency needs in the transportation sector. A second (2005-2010) and third action plan (2010-2015) have been determined and implemented to succeed the first ENTA action plan. Formulated in December 2012 by MOT, the Transport Sector Development Strategy and Policy 2013-2017 gives 5-year development strategies and programs for each transport sector: railways, air routes, maritime/ports, and roads. In terms of maritime/ports, this strategy sets forth rehabilitation and expansion of the ports of Lobito and Namibe in its development program. It also looks to 1) reduce regional disparities, improve mobility and regional incomes, and reduce poverty, and to this end, to 2) restore, expand, and completely modernize the existing ports.

It has been confirmed that, continuing with the long-term guidelines for the transportation sector in ENTA, the Transport Sector Development Strategy and Policy also positions servicing of the main ports and other transportation infrastructure as key issues to economic growth and poverty reduction in Angola.

As illustrated above, while this project was consistent with the Angolan policy during the planning phase and ex-post evaluation, plans to develop both ports of Lobito and Namibe were substantially altered. Specifically, given that rehabilitation work for Lobito Port was transferred under the framework of rushed Chinese financing after the exchange of notes (E/N) was concluded, this project targeted only Namibe Port. Thus, while the relevance for

[6] Estratégia de Combate a Pobreza

[7] Estratégia Nacional de Transportes em Angola

[8] Priority Reconstruction Program: Formulated by the Angolan government as a continuation of the rehabilitation programs in the PPMRRP.

this evaluation study was judged for both ports, the effectiveness, impact, and sustainability were analyzed only for Namibe Port, as Lobito Port was removed from the project scope.

3.1.2 Appropriateness of the Implementation Approach

Specific reasons for excluding Lobito Port from the project scope are given below. In 2008, financing for public works, including the financing from China (excluding grant aid projects), was centrally managed by the National Reconstruction Office (GRN[9]). Chinese financing was handled with a dual-structured system; financing consisted of bilateral financing from the Export-Import Bank of China via the Angolan Ministry of Finance (MOF) as well as private financing from the China International Fund (CIF[10]), with CIF financing for the GRN outside of MOF jurisdiction. CIF financing extended to the area inside Lobito Port, which was the origin point of the Benguela Railway Rehabilitation Project[11], and private Chinese companies had already started rehabilitating port facilities in the area neighboring the design area for this project. GRN suddenly shifted plans to have all port facilities in Lobito adjoining the Benguela Railway serviced together and decided in September 2008 to include the project area in with the CIF-funded area. With the GRN being an upper ministry[12] under direct control of the President, it was pushed through from the top down, leaving MOT, the Maritime and Port Institute of Angola (IMPA[13]), and the Port Authority with no voice in the decision.

The lack of transparency with capital flowing from CIF to GRN being outside of MOF jurisdiction and GRN centrally managing project funding has since been a source of internal issues[14] within the Angolan government. With the large CIF-funded public works projects completed, CIF-funded projects have since dropped off precipitously, and the overall project budget for GRN-managed public works projects has been drastically cut. GRN has effectively been dismantled with no project budget to manage, thus restoring the Ministry of External Affairs (MEA) to its original status as coordinator within the foreign aid system[15].

[9] Gabinete de Reconstrução Nacional: Established in 2005. An organization under direct control of the President, GRN decision-making mechanisms and activity are not transparent. GRN is actually controlled by the President's military advisor, General Kopelipa.

[10] China International Fund: A private Chinese fund based out of Hong Kong, CIF had given a total of $2.9 billion to fund Angola reconstruction as of 2008.

[11] Project funded by CIF. The Benguela Railway starts in Lobito Port, crosses into DR Congo at Luau and connects to Tanzania. It plays a pivotal role in transport for central Angola and the southern African region.

[12] The Ministry of National Defense (MND) and MOF are upper ministries, while the MEA and MOT are lower ministries.

[13] Instituto Maritimo e Portuario de Angola

[14] Source: "Chinese Foreign Aid," Japan Institute of International Affairs (March 2012)

[15] For foreign aid, MEA coordinates requests and approvals, and then financing for projects set for implementation is passed through MOF.

The exclusion of rehabilitation work for Lobito Port from the project was due to a drastic mid-project change. Against the Japanese government foreign policy to promptly support Angola's recovery, issues with governance of the Angolan government at that time and a lack of understanding regarding the project process by the Angolan side were likely factors[16]. However, it was judged that there were no issues in terms of planning and implementation approach of the project, as there was no problem with the selection of aid modality by the Japanese government.

3.1.3 Relevance to the Development Needs of Angola

During the project planning phase, the ports were desperately in need of servicing. The transport and port sectors were extremely worn down from longstanding civil war, and the state of the main ports were a great detriment to economic growth and development given how much the import of grains, building materials and other materials depended upon them.

Following the transport sector development strategy, a number of projects have been completed to strengthen transport capacity to Benguela, Namibe, and inland provinces to increase income and reduce poverty in inland and rural areas. These include: the development of trunk roads from Benguela and Namibe provinces to inland areas; a rehabilitation project for the Benguela Railway, running a total of 1,547 km from Lobito Port; and a rehabilitation project for the Mossamedes Railway[17] (completed on February 13, 2014), running a total of 1,003 km from Namibe Port. Severed during the civil war with absolutely no freight being transported, the Benguela and Mossamedes Railways are estimated to transport 2.16 million tons and 603,450 tons respectively in freight annually in 2015 after rehabilitation work is complete[18]. At Namibe Port, a container cargo pier has been connected directly to the railway. The improved efficiency from this is expected to increase the amounts handled for granite and marble, two mineral resources which remain key exports today.

Annual cargo handling volumes in Lobito and Namibe Ports as provided in the ex-post evaluation are given below.

[16] The changes to the Lobito Port rehabilitation project were detected after the E/N was concluded. In all likelihood, regardless of any attempts by the Japanese side at diplomatic consultations, given the top-down action of GRN, the fragile governance of an Angolan government a mere six years removed from civil war, as well as the ODA project implementation process and importance of bilateral agreement, were not fully understood by Angolan side.

[17] Extending from Namibe Port through Lubango in Huila Province to Menongue in the inland Cuando Cubango Province, this railway is expected to help economic growth in southern Angola by increasing transport of granite, marble and other mineral resources; increase inland transport of daily goods and building materials; and increase transport capacity of the Namibe coast and inland areas.

[18] In the basic design reports from 2007, both the Benguela and Mossamedes Railways were scheduled for completion in 2009, with cargo handling volumes expected to increase in 2010. Projects for both railways were greatly delayed, however, with the projects being completed in 2014. Thus, estimated volume increases now use 2015 as their reference year.

Table 1　Cargo Handling Volume in Angola

(ton/year)

Cargo Handling Volume	2010	2011	2012	2013
Port of Luanda	9,157,534	9,825,670	10,244,540	11,259,574
Port of Lobito	**2,368,384**	**2,792,054**	**2,900,646**	**2,984,220**
Port of Namibe	**929,744**	**971,925**	**1,381,730**	**1,615,341**
Other Ports	325,482	449,498	731,906	1,256,939
Whole Angola	12,781,144	14,039,147	15,258,822	17,116,074

Source：Data provided by IMPA and EPN

Annual cargo handling volumes for both Lobito and Namibe Ports—the ports carrying cargo demand for southern coastal Angola and inland areas—are strong, increasing in tonnage every year. As shown in Table 3, container handling volumes for Namibe Port are also trending upward. The port is currently pressed to meet demands. The MOT plans to rehabilitate and expand both Lobito and Namibe Ports in the Transport Sector Development Strategy and Policy 2013-2017.

Thus, the relevance of this project was high both during the planning phase and at ex-post evaluation with regards to the development needs for major southern rural ports.

Photo 1　Highway to Inland in Namibe

Photo 2　Mossamedes Railway

3.1.4　Relevance to Japan's ODA Policy

In the consultations on economic cooperation policy with the Angolan government held in August 2006, Japan had recognition that Angola was in a transitional period from its phase of recovery and decided to provide support for economic and social development in

three priority areas: 1) economic development, 2) peace consolidation, and 3) human security. Among these, development of basic infrastructure, including ports, is vital to economic development. Thus, this project was highly consistent with Japan's ODA policy at that time.

The implementation of this project was consistent with the development policy and needs both during the planning phase and ex-post evaluation, also conforming to Japanese aid policy at the time. It can be judged that there was no problem with the implementation approach, though the problem was seen in terms of the measures taken by the Angolan side regarding the exclusion of Lobito Port. Therefore, its relevance is high.

3.2 Effectiveness[19] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

Table 2 shows the direct effect indicators for Namibe Port.

Table 2 Direct Effect Indicators at the Port of Namibe

Indicators at the Port of Namibe	2007 (Actual)	2011 (Target)	2011 (Actual)	2012 (Actual)	2013 (Actual)
Safety enhancement of the cargo ship berthing time (Number of contact of ship side and quay corner)	About 450 ships	0	0	0	0
Control of dust incidence when working at apron and yard (days/year)	360	Decreased	Decreased	Decreased	Decreased
Improvement of container loading/unloading cycle (Ship→apron→yard) (time/cycle)	14 min. 40 sec.	Decreased	10 min. 15 sec.	10 min. 15 sec.	10 min. 15 sec.

Source: Basic Design Report (2007), Data provided by EPN for 2011-2013

[19] Sub-rating for Effectiveness is to be put with consideration of Impact.

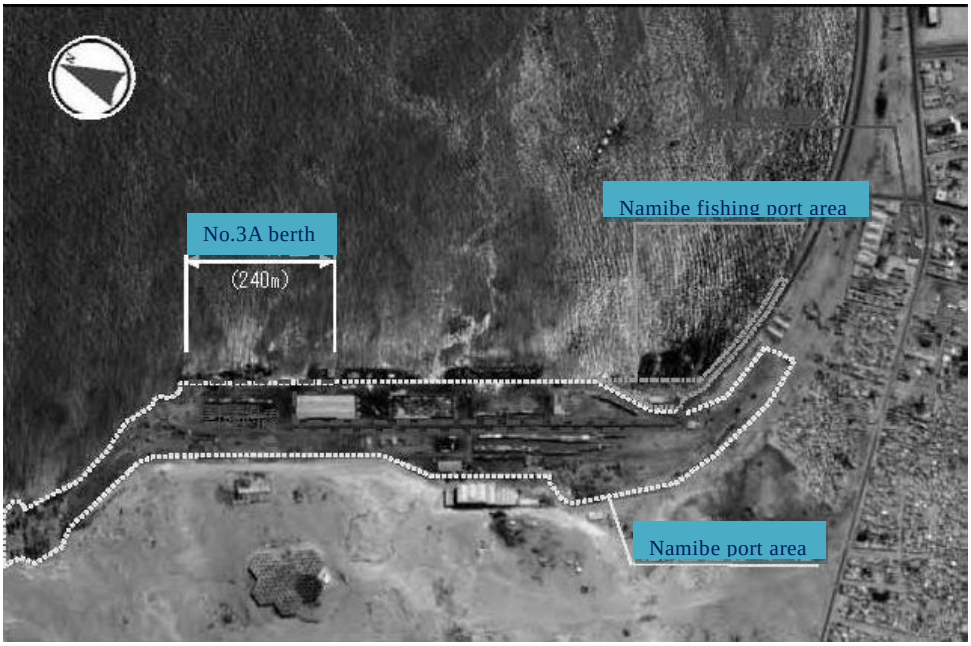


Figure 1　Panorama of Namibe Port

Photo 3 Ship Berthing at 3A Wharf (Project Area)　Photo 4 Ship Berthing at 3B Wharf

Freight ship safety is confirmed to have improved with no ship holds striking the pier corners when berthing since project completion. Still, within two and a half years after the project completion, plates have collapsed for pier fenders[20] No. 4, No. 15 and No. 16[21], and damage has also been observed on fender No. 3. These fenders require some sort of measures.

The direct effect of this project is now clear in terms of dust during cargo handling work. While the project did reduce dust during work, there was still dust during work in the apron and the yard, which are two areas outside the scope of rehabilitation in the project (areas targeted for Phase II). The apron and yard area was being paved by a foreign contractor

[20] Fenders are treated as consumables to be replaced when damaged. EPN was given 3 spare fenders and trained in fender replacement during the project.

[21] There are 16 fenders arranged on the 240-meter 3A pier, numbered starting from the north side.

with temporary asphalt during the ex-post evaluation, making it so that hardly any dust is produced across all port areas.

The container handling cycle, moving a container from ship to apron to the temporary storage yard, was streamlined with the project; the cycle went from taking 14 minutes 40 seconds before the project to 10 minutes 15 seconds after the project.

As explained above, there were marked improvements in port safety, dust during work and the container handling cycle at Namibe Port.

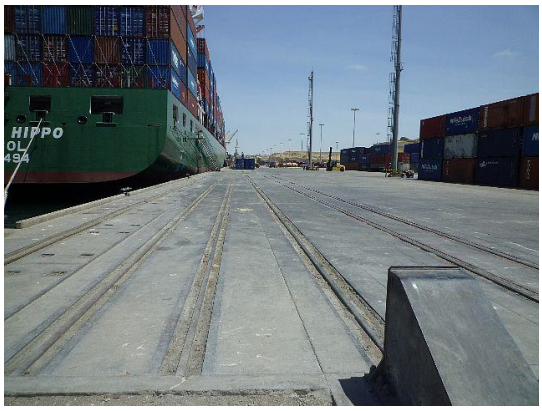


Photo 5 Apron of 3A Wharf

Photo 6 Yard of 3A Wharf

Photo 7 Cargo Handling (1)

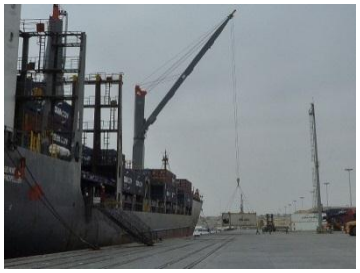


Photo 8 Cargo Handling (2)

Photo 9 Cargo Handling (3)

While not the indicators envisioned during the project planning phase, the number of entering ships, gross tonnage of entering ships, cargo handling volume, and container handling volume (in TEUs) are given in Table 3 as the basic operation and effect indicators for Namibe Port. Since project completion in 2011, all operation and effect indicators have soared, showing the huge impact that the emergency rehabilitation in the project has had.

Table 3　Quantitative Operation and Effect Data at the Port of Namibe

Effect Data	2008	2009	2010 (Work completion*)	2011 (Project completion*)	2012	2013
Number of ships entering port per year (ships/year)	241	192	206	248	248	264
Gross tonnage of ships entering port per year (ton/year)	2,717,516	3,502,656	3,187,850	3,792,416	5,405,408	5,600,496
Average tonnage of ships entering port (ton/ship)	11,276	18,243	15,475	15,292	21,796	21,214
Cargo handling volume per year (ton/year)	901,792	1,103,053	929,744	971,925	1,381,730	1,615,341
Container handling volume (TEU/year)	22,269	24,295	22,061	24,475	27,811	35,589

Source: Data provided by EPN

*: Work completed in March, 2010. Project completed in July, 2011.

While individual ship data was not available, average ship tonnage figures suggest that the number of ships entering port which exceed design standards for maximum ship tonnage (22,219 DWT[22]) in the port facilities (pier facilities, including fenders) have increased from 2012. This trend has been confirmed through interviews with EPN, who records the maximum ship tonnage entering the port as being 37,113 DWT.

3.2.2 Qualitative Effects

EPN and vendors at Namibe Port have confirmed in interviews that the container handling cycle has improved and drinking water and other supplies are supplied to ships more efficiently now as a result of repairs to 3A pier, the apron, the yard and other Namibe Port facilities, as well as cargo handling equipment procured in the project. The project has also increased profits for EPN and port vendors.

Also, the data in Tables 2 and 3 as well as interviews with port vendors have confirmed that even with the increases in gross tonnage of entering ships, cargo handling volume and container handling volume since project completion, the container handling cycle is stable and the project has allowed port vendors to handle these volumes efficiently.

[22] Dead Weight Ton

3.3 Impact

3.3.1 Intended Impacts

According to EPN, there were 65 port vendors and companies in Namibe Port at time of ex-post evaluation. EPN introduced 11 of the more active companies with offices near the port. Findings from interviews with these companies are given below.

Port rehabilitation work in the project was confirmed as having improved the container handling cycle for port vendors, streamlined the supplying of drinking water and other supplies to ships, allowed more efficient mooring, and reduced warehousing fees, business expenses and other distribution costs.

As shown in Table 3, cargo and container handling volumes have increased since project completion. Also, it is apparent from interviews that business is expanding, leaving visible impacts on the local economy. Port vendors expecting cargo volumes to increase even further are establishing offices near the port, and leading marine carriers which operate container vessels are planning distribution expansions, including land transport.

Photo 10 Mossamedes Railway in Namibe Port

Photo 11 Railway Connection to 3B Wharf

3.3.2 Other Impacts

3.3.2.1 Impacts on the natural environment

Interviews with EPN and port vendors confirmed that there were no negative environmental impacts from the project either during or after the work.

3.3.2.2 Land Acquisition and Resettlement

The project was implemented on EPN land, and thus there was no issue with resettlement or land acquisition.

This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Namibe Port facilities were rehabilitated and equipment outfitted in the project ultimately to both improve cargo handling work efficiency and to ensure handling safety. The following items and specifications were implemented as planned, except for a few slight alterations. The slight alterations consisted of changed design specifications for ancillary work for rehabilitated pier sections as agreed upon by both countries.

(1) Namibe Port

[Facilities]

・Rehabilitation of the berth (Length: 240 m): Concrete replacement, installation of fenders, installation of key crane rail

・Rehabilitation of apron (Area: 4,800 m^2) and yard (Area: 16,148 m^2)

・Rehabilitation of inner port road (Length: 658 m, Width: 10 m)

・Rehabilitation of water supply facility for apron

・Installation of 2 light towers in the yard

[Equipment]

・Cargo handling equipment (Reach stacker, forklift, mobile crane)

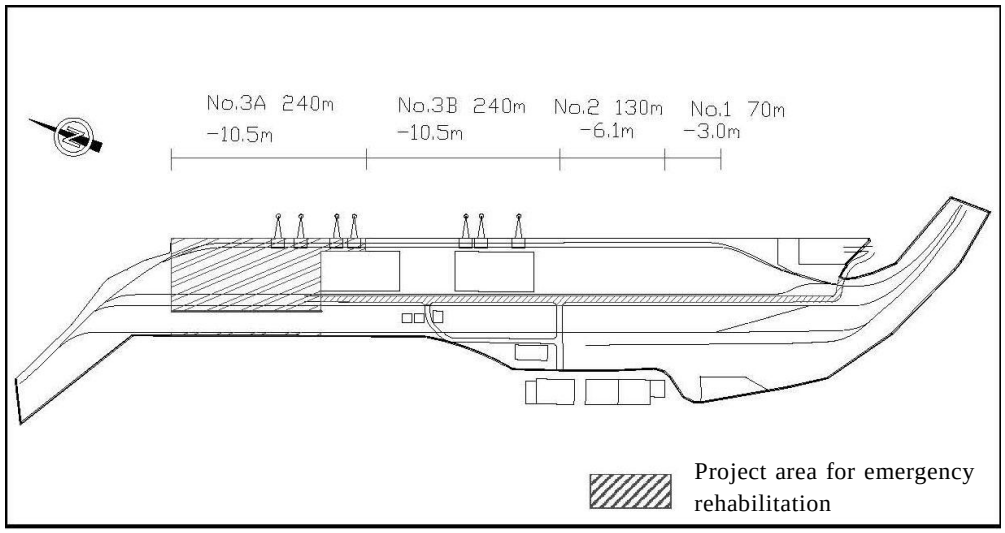


Figure 2 Plan of Namibe Port

The scope of Angolan side work items included developing a temporary yard and soil pit; removing obstacles and other site maintenance; and connecting electricity, water and other utilities. They were confirmed to have completed their scope as planned.

The construction contractor pointed out the following issues in a defect inspection conducted in July 2011, one year after work completion. These points were confirmed during ex-post evaluation.

Table 4 Confirmation of items indicated in defect inspection

	Items from Defect Inspection	Measures Confirmed in Ex-Post Evaluation
1.	Damage confirmed on 3 fenders from cracking and loose bolts. Replaced by construction contractor within 3-4 months as damage points within the warranty period. After replacement, EPN confirmed that they would handle repairs and replacements after the sections had exceeded the defect warranty period.	After two and a half years, now outside the defect warranty period, plates have collapsed on 3 fenders, and another fender is significantly damaged. As of ex-post evaluation, EPN had not repaired or replaced any fenders.
2.	Included with the 3A pier and apron, a Namibe Port component, one apron side key crane rail was connected to the existing in-port rail. There is a problem on the existing in-port rail side.	EPN has solved the problem.
3.	Minor cracks were found on the concrete structures for gutters on access driveways and around stormwater inlets which pose no issue to the structures. These were repaired by the construction contractor.	EPN is handling subsequent O&M for the structures.
4.	EPN has laid road surface marking and installed speed bumps and preventive fencing for the container yard and access driveways within the project scope in order to handle containers properly.	EPN is handling containers properly.
5.	There were no subsidence, collapsing, irregularities in the normal, cracking in the concrete or other structural defects.	EPN is handling structural O&M.
6.	There was no damage to the bollards, bumping posts, ladders or other ancillary works for pier rehabilitation.	EPN is handling O&M for ancillary work.
7.	There was no subsidence, collapsing, concrete	EPN is handling O&M for the

	cracking, or other structural defects in the repaired apron, paved container yard, or paved access driveways.	apron, container yard, and access driveways without issue.

3.4.2 Project Inputs

3.4.2.1 Project Cost

Table 5 shows total project costs at the planning phase and gives a comparison of the planned and actual project costs for Namibe Port rehabilitation work.

Table 5 Project Cost Comparison

(Unit : Million Yen)

Item	E/N Grant Limit	Plan for Namibe Port	Actual for Namibe Port
1. Construction and Equipment Procurement	3,313	1,865	1,800
2. Consulting Services	128	67	132
3. Contingency	491	276	-
Total	3,932	2,207*	1,932

Source: Prepared from data provided by JICA

*: As a result of rounding off one million yen or less, there is a marginal error in total.

While project plans included rehabilitation of both Namibe Port and Lobito Port, Lobito Port rehabilitation work was not performed. The planned project costs for rehabilitation of Namibe Port only were 1,865 million yen for construction and equipment procurement costs, 67 million yen for consulting services, and 276 million for contingency, coming to a total of 2,207 million yen.

Actual project costs for rehabilitation of Namibe Port only were 1,800 million yen for construction and equipment procurement costs, and 132 million yen for consulting services, coming to a total of 1,932 million yen. The reasons for the increase in consulting service costs, despite only being for the rehabilitation of Namibe Port, were the revisions in construction and supervisory structure, additional tender preparation work and survey fees by utilizing contingency, all of which were associated with the cancellation of Lobito Port.

The actual total project costs for Namibe Port rehabilitation work were lower than the plan, coming to 88% of the planned cost.

3.4.2.2 Project Period

The project period was planned as 23 months (May 2008 to March 2010): 11 months for tender and 12 months for construction and equipment procurement.

Due to the revisions in construction and supervision for Lobito Port work being cancelled, additional tendering work and additional study related to contingency operations, the project period increased by 4 months in total. Tendering work increased from 11 months to 13 months, and construction and equipment procurement (revised project period from basic design during tender document preparations) increased from 12 to 14 months.

Moreover, another factor for the extension of the project period was the visa problems for Japanese and third country staff of the main contractor. Ultimately, it took 27 months before project completion, starting in May 2008 and completing in July 2010. Thus, the project period for Namibe Port rehabilitation work was longer than planned, at 117% of the planned period.

The project cost was kept within the plan, but the project period was longer than the plan. Therefore, the efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

An organizational chart for EPN is given in Figure 3, and their organizational structure with employees by department and field is given in Table 6. O&M for Namibe Port is mainly handled by the Department of Commerce and Operation, and the Department of Engineering.

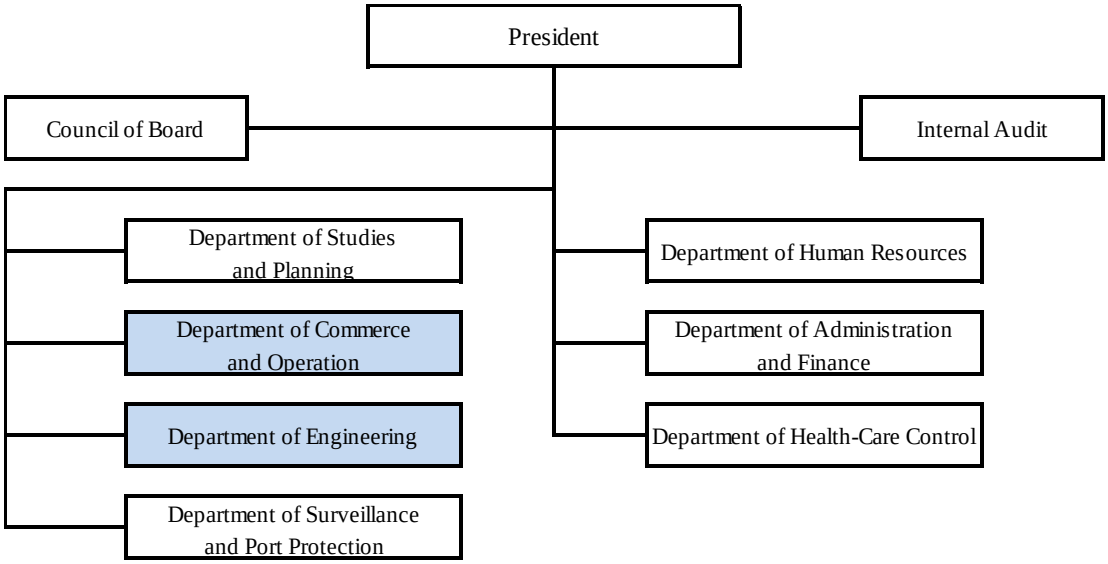


Figure 3 Organizational Chart of Namibe Port Authority

Source: Prepared from data provided by EPN

Table 6 Organizational Structure of Namibe Port Authority

(Unit: Persons, as of December, 2013)

Unit	Operation	Technical	Admini-stration	Manage-ment	Total
Council of Board	1	5	10	4	20
Internal Audit	0	2	0	1	3
Department of Studies and Planning	0	3	2	5	10
Department of Commerce and Operation	162	40	36	14	252
Department of Engineering	69	18	8	11	106
Department of Surveillance and Port Protection	0	3	148	9	160
Department of Human Resources	15	17	12	9	53
Department of Administration and Finance	0	11	31	8	50
Department of Health-Care Control	0	24	13	6	43
Total	247	123	260	67	697

Source: Prepared from data provided by EPN

At ex-post evaluation in December 2013, EPN had 697 employees.

A total 202 of the 252 staff in the Department of Commerce and Operation are involved in operations at Namibe Port: 162 operational and 40 technical. Meanwhile, 87 of the 106 staff in the Department of Engineering handle O&M for equipment and machinery: 69

operational and 18 technical. Total staff figures involved in O&M for Namibe Port are 289: 231 operational and 58 technical.

Given that these staff members are undertaking O&M for container handling at Namibe Port smoothly and without delay, and that there are clear role distinctions between the departments, the Namibe Port has an appropriate O&M structure.

3.5.2 Technical Aspects of Operation and Maintenance

While no details were available on the qualifications and other data on the 289 technical staff involved in O&M, the implementing agency states that there are no issues in terms of capability and that training is held for capacity building, albeit irregularly.

During basic design in 2007 and again during project implementation in 2010, individual experts were dispatched for training in port administration and port facilities and equipment management. Given that cargo handling work is being performed without issue, there are no perceived issues with the capacities of O&M technical staff.

During defect inspection, staff was instructed to make proper use of tugboats for berthing during port entry of ships. It is now confirmed that tugboats are being properly used for berthing.

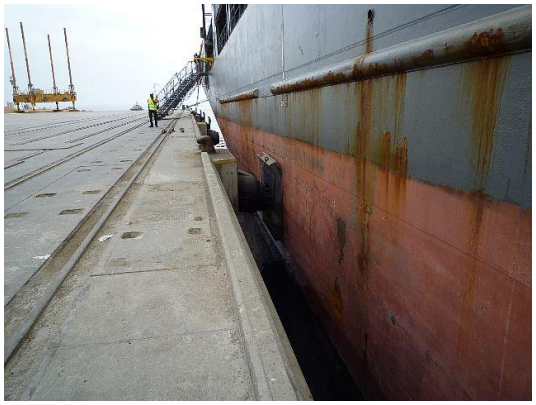


Photo 12 Berthed Ship (1)

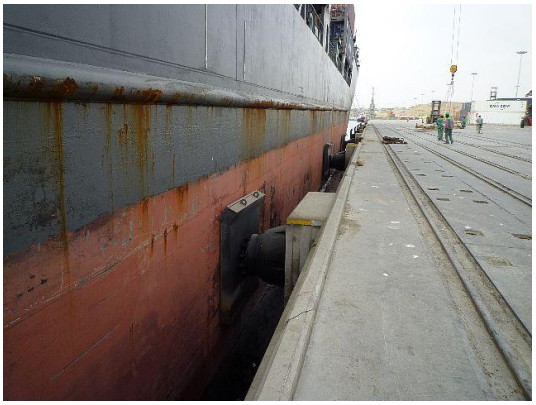


Photo 13 Berthed Ship (2)

For berthing work, EPN has no issues in terms of tugboat operation and other such technical skills. The problem that arose in berthing operations had to do with bumper O&M as the number of ships with tonnage exceeding design standards increased. EPN must now work to increase berthing operation skills, such as establishing basic limits for port entry of higher tonnage ships, and communicating closely with ships and dropping berthing speed further when forced to grant entry to ships at high tide at the ship's responsibility.

The Luanda Port Authority (APL[23]) and Lobito Port Authority (EPL[24]) are ahead of EPN in terms of capability and experience with regards to O&M of fenders and other port facilities, as well as operational skills for berthing heavy ships. EPN needs to learn from APL and EPL on these topics.

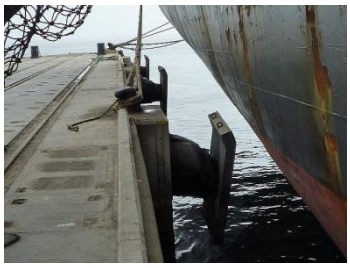


Photo 14 Fender No. 3

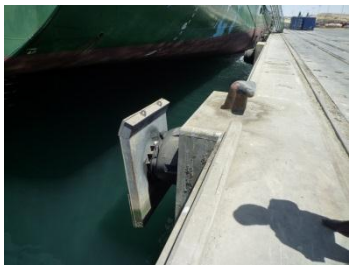


Photo 15 Fenders No. 3 & 4

Photo 16 Fender No. 4

Photo 17 Fender No. 15

Photo 18 Fenders No. 15 & 16

Photo 19 Fender No. 16

3.5.3 Financial Aspects of Operation and Maintenance

EPN revenues and expenditures are given in Table 7.

Table 7 Revenue and Expenditure of Namibe Port Authority

(Unit：Thousand Angola Kwanza)

Item	2008	2009	2010	2011	2012
A. Revenue	1,911,402	4,514,662	2,784,758	2,476,188	2,858,079
B. Expenditure	1,609,549	2,089,176	3,149,230	2,769,024	3,316,677
1) Materials	0	0	0	0	454,076
2) Depreciation	86,540	172,593	512,310	544,198	306,540
3) Staff Salary	1,065,132 (66%)*	1,196,737 (57 %)*	1,579,795 (50 %)*	1,589,222 (57 %)*	1,517,571 (45 %)*
4) Operation and Maintenance	457,877 (28 %)*	719,846 (34%)*	1,057,194 (33 %)*	635,604 (23 %)*	1,038,490 (31 %)*
C. Profit	181,216	1,567,383	▲302,612	▲88,013	131,067

Source: Data provided by EPN

*: Percentage to Expenditure

[23] Administracao do Porto de Luanda.
[24] Empresa Portuária do Lobito.

Looking at the budgets for fiscal years 2008 to 2012, the balance is unstable with two years of straight losses in 2010 and 2011. O&M costs have fluctuated somewhat between 23% and 34%, and staff salaries account for 45% to 66%. These two items account for a high percentage of expenses, especially salaries. Increasing staff numbers handling O&M after project completion by close to 80 staff has weighed down the budget (staff was up to 618 in FY 2009). As revenues at any moment will depend on the current economic climate, the budget needs to be restructured, possibly considering outsourcing some tasks to reduce personnel numbers or other measures.

The EPN balance sheet giving fixed assets, current assets, net assets and liabilities is shown in Table 8.

Table 8　Balance Sheet of Namibe Port Authority

(Unit: Thousand Angola Kwanza)

Item	2008	2009	2010	2011	2012
Fixed Assets	180,326	601,804	2,989,165	2,732,435	3,136,168
Current Assets	464,618	2,593,473	1,383,128	1,626,383	1,052,651
Total Assets	644,944	3,195,277	4,372,,293	4,358,818	4,188,819
Net Assets	398,507	2,013,163	3,407,430	3,395,087	3,526,155
(Balance)	(181,216)	(1,567,383)	(▲302,612)	(▲88,013)	(131,067)
Liabilities	246,437	1,182,114	964,862	963,731	662,664
Total Liabilities	644,944	3,195,277	4,372,292	4,358,818	4,188,819

Source：Data provided by EPN

For FY 2014, EPN is discussing the migration of equipment and over 400 O&M staff to an experienced private contractor. EPN would also outsource part of the port O&M in the agreement, including container handling work and O&M for the apron and yard. At ex-post evaluation, the two parties had almost reached an agreement. While outsourcing may resolve the instability issues with balancing the budget, job security for the migrated staff and how EPN will maintain their salaries is not clear. Also, EPN and the subcontractor have yet to prepare the rules of operation and other contractual agreements regarding everyday O&M work. MOT, IMPA and other responsible authorities need to be brought in to help prepare and reliably perform the rules of operation, and a system must be established for EPN to manage these rules.

APL is already outsourcing its O&M work to a private contractor. With EPN already in negotiations with the same contractor, it would likely be effective for them to learn from APL with regards to the rules of operation and actual operation methodology.

3.5.4 Current Status of Operation and Maintenance

O&M at Namibe Port for the facilities and equipment installed in the project is being performed smoothly with sufficient staff and using proper techniques.

Some fender O&M issues have been detected, however. Fenders are consumables, and damaged sections of 3 fenders were replaced during a defect inspection during the warranty period. EPN is responsible for heeding safety and handling repairs and part replacements with the warranty period now past, but they are not handling O&M properly.

In the just two and a half years after which the warranty period elapsed, 3 of the 16 fenders installed had collapsed plates (Nos. 4, 15 and 16), and another (No. 3) was greatly damaged.

The EPN side sees the four damaged fenders as a design and specification issue. Meanwhile, as shown in Table 3, an increasing number of vessels exceeding the design standards of the fenders of pier facilities have entered port since 2012. More likely, despite proper berthing with the use of tugboats, the repeated berthing of heavy ships exceeding the design standards has taken its toll and damaged the fenders.

At this rate, the damage could greatly impact the structure of the pier itself in the near future, bringing financial losses for EPN and port users. As such, after quickly replacing the fenders, EPN must improve its berthing operations to include careful decision on granting port entry and guidance for shipper companies.

EPN and the construction contractor have agreed that the contractor will sell its temporary yard facilities and construction equipment to EPN. EPN is currently operating and maintaining the facilities without issue.

As seen above, some problems have been observed in terms of technique, finances and O&M status. Therefore, sustainability of the project is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, port facilities were rehabilitated and cargo handling equipment was provided in a major regional port of Angola in order to ensure safe cargo handling and improve handling efficiency. The implementation of this project was consistent with the development policy and needs both during the planning phase and ex-post evaluation, also conforming to Japanese aid policy at that time. It can be judged that there was no problem

with the implementation approach, though there were problems seen in terms of the measures taken by the Angolan side regarding the exclusion of Lobito Port. Therefore, the relevance of this project was high. The project largely achieved the planned results. In the Port of Namibe, safety, the container handling cycle and dust produced during port work are all confirmed to have improved. Also, port rehabilitation work in the project has reduced distribution costs by streamlining mooring and reducing warehousing costs and business expenses. Thus, the effectiveness and impact of the project was high. In terms of project implementation, the efficiency of the project was fair; project cost was kept within the plan, but the project period was longer than the plan. The sustainability of the project was also fair due to operation and maintenance issues with pier fenders and financial issues with the EPN administration.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Berthing Operation Improvements and Proper Fender Operation and Maintenance

As direct outcomes of implementation, project achievements consist of improved ship operational safety, reduced dust during work on the apron and in the yard, and an improved container handling cycle. However, EPN is not effectively maintaining the facilities and equipment rehabilitated in the project, particularly the pier fenders, an important piece of pier facilities. If this leads to pier damage, the effects of the improved safety and efficient cargo handling from the project may be reduced in the future.

As such, the damaged fenders must be replaced immediately, followed by a review of EPN berthing operations, confirmation and improvement of fender O&M plans, confirmation of berthing operational methods with port vendors, information sharing and discussions on insurance for fender damage.

As the responsible authorities, it is desirable that MOT and IMPA discuss issues with EPN, determine countermeasures, and monitor EPN implementation of those measures.

4.2.1.2 Financial Improvements

While EPN revenue is unstable, their O&M costs are on the rise. EPN needs to work to become more financially sound and stable by revising their budget, including O&M costs and salaries, and discuss how to improve their revenues.

Outsourcing O&M to a private contractor would be an appropriate means of balancing these budgetary issues. Also, as the responsible authorities, MOT and IMPA need to be active in directing daily EPN O&M activity.

4.2.1.3 Operation and Maintenance Structure

In terms of both the O&M issues with fenders and the O&M structure of EPN itself, there is a need for EPN to learn from more experienced Angolan port authorities in APL and EPL.

Further, it is considered effective for EPN to create figures and data with annual reports, also giving monthly reports on EPN activity and reporting on exchanges with subcontractors, information exchanged with port vendors, problems and their solutions to their regulatory agencies, as well as improve two-way systems for transmitting information. These measures should be allowing MOT and IMPA, the agencies regulating EPN, to quickly understand EPN problems and handle them just as swiftly.

4.2.2 Recommendations to JICA

In this ex-post evaluation, effectiveness and impact of the project was fully confirmed, but there are some problems in terms of the sustainability of port O&M by EPN. As illustrated with the issues with fender O&M, EPN is seen as inexperienced in actual port administration. From now, it should be important that JICA monitor how MOT, IMPA and EPN handle the 'recommendations to the implementing agency'. When support is needed in tackling new issues, such as expanding roles, private outsourcing, and building information systems, it is important to provide support to the implementing agencies in the fields in which they lack sufficient expertise in order to sustain the effects of the project.

4.3 Lessons Learned

Capacity Development for Sustainable Operation and Maintenance

This project helped to rehabilitate and improve port functionality by performing emergency rehabilitation of port facilities and procurement of port equipment. While a minimal amount of technique in facility and equipment O&M was transferred to the O&M body, the transfer did not go as far as to transfer sustainable O&M techniques or develop capacity in organizational management. In the future, it is expected that operational management capacities of the organization to perform O&M for facilities and equipment installed by the project will be analyzed in terms of structure, skill, and finances at the planning implementation and management phases. Also, it is desired that capacity development programs be considered in any fields in which the organization lacks sufficient expertise.

(End)