Ex-Post Project Evaluation 2016 : Package I-5
(Marshall Islands, Samoa, Tuvalu, South Pacific (Fiji, Tonga, Vanuatu), Timor-Leste)

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Republic of the Marshall Islands

FY2016 Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Improvement of Domestic Shipping Services in the Marshall Islands"

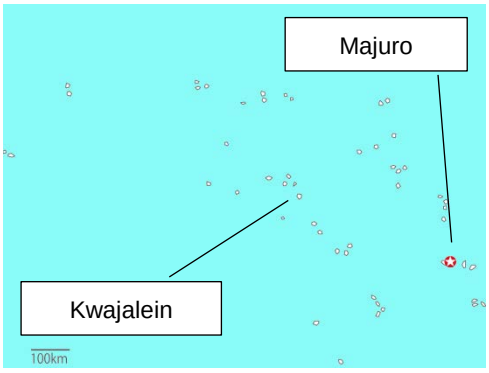
External Evaluator: Hirofumi Azeta, Japan Economic Research Institute Inc.

0. Summary

The objective of this project was to restore and enhance the sea transport capacity depressed by faulty and sunken vessels in the Marshall Islands and to improve on-board safety and comfort by procuring one cargo-passenger vessel and one landing craft, thereby contributing to the improvement in convenience of transport between urban areas and the outer islands and to the stability in commodity transport. This project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high. Both the project cost and project period were within the plan. Therefore, the efficiency of the project is high. Although the total operating days of each cargo-passenger vessel and the transport volume of copra[1] were below the baselines and targets, some effects, such as improvements in on-board safety and comfort, were achieved as a result of the vessels provided through this project. In addition, impacts, such as the improvement in convenience of sea transport throughout the country as a whole, the increase in cash income for the outer islands, and the stable supply of daily commodities to the outer islands, were achieved. Therefore, the effectiveness and impact of the project are fair. Some problems were identified in both the financial aspects and current status of operation and maintenance of the project, for example, issues in the regular maintenance of safety equipment and in the frequency of dock maintenance. Therefore, the sustainability of the project effects is fair.

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

1. Project Description



Project location

A landing craft procured through this project

[1] Dried meat of coconuts. Copra is transported from the outer islands to a copra oil refinery factory in Majuro, and the products such as coconut oil and copra cake (Remaining of copra from which oil is extracted. Copra cakes are used as livestock feed) are exported.

1.1 Background

The Marshall Islands is an island nation which is composed of five independent islands and 29 atolls. Approximately 70% of the nation's population resides on two atolls: Majuro, on which the capital city is situated, and Kwajalein; and the remaining 30% resides on the outer islands. On the outer islands, the supply of daily commodities depends on sea transport from the capital city, Majuro, among which copra, the major product and important source of cash income of the outer islands, is also transported to Majuro by sea. Therefore, the sea transport infrastructure connecting the islands is an essential lifeline for people on the outer islands.

In the Marshall Islands, Marshall Islands Shipping Corporation (MISC), which is under the supervision of the Ministry of Transportation and Communications (MTC), has carried out inter-island cargo-passenger sea transport[2] services since October, 2006 and had operated three cargo-passenger vessels (MV AEMMAN, MV RIBUUK AE and MV LANDRIK) as well as a landing craft (LC JELJELAT AE) which had been used for the transport of construction materials, construction equipment, and heavy machineries. However, MV LANDRIK, one of the three cargo-passenger vessels, was heavily deteriorated and frequently had troubles. This was because MV LANDRIK was 26 years old at the time of project planning and had not undergone dock maintenance since its propeller and related parts were repaired in 2007, the only maintenance since the MTC purchased it secondhand in 2000. Although two other cargo-passenger vessels (MV AEMMAN and MV RIBUUK AE) and the landing craft (LC JELJELAT AE) were in operation while MV LANDRIK was having troubles, residents in the outer islands suffered significantly from the decrease in services. Moreover, because LC JELJELAT AE sank on January 1st, 2011, means of transport for construction materials, construction equipment, and heavy machineries were lost, and thus, maintaining the transport services for the outer islands of the Marshall Islands became very difficult.

This project was implemented based on the background mentioned above to restore and maintain the passenger-cargo transport services for the outer islands of the Marshall Islands and to secure measures of and sufficient capacity for safe and smooth transport by constructing a cargo-passenger vessel for the replacement of an existing cargo-passenger vessel, MV LANDRIK, and a landing craft for the replacement of a sunken landing craft, LC JELJELAT AE.

1.2 Project Outline

The objective of this project was to restore and enhance the sea transport capacity depressed by faulty and sunken vessels and to improve on-board safety and comfort by procuring a cargo-passenger vessel and a landing craft, thereby contributing to the improvement in

[2] The government of the Marshall Islands operated vessels by itself before October, 2006.

convenience of transport between urban areas and the outer islands and to the stability in commodity transport.

G/A Grant Limit / Actual Grant Amount	1,288 million yen / 1,259 million yen
Exchange of Notes Date /Grant Agreement Date	May, 2012 / June, 2012
Executing Agency	Ministry of Transportation and Communications
Project Completion Date	November, 2013
Main Contractors	A cargo-passenger vessel: Kegoya Dock Co., ltd A landing craft：ISB Corporation
Main Consultant	Fisheries Engineering Co., Ltd.
Basic Design	January, 2011 – March 2012
Related Projects	There were no projects designed only for the procurement of vessels, such as cargo-passenger vessels. Grant aid projects in the fisheries sector in which small fishing boats or small fish collection boats were procured are as follows; - Project for improvement of the fish marketing system in the outer islands (1991 -1992) - Project for improvement of the fish marketing system in the outer islands (phase 2) (1995) - Project for development of fishing communities in Jaluit Atoll (2000) - The Project for Construction of Fish Market Center at Majuro (2008) Taiwan: - Provision of a newly constructed vessel (MV AEMMAN) (2005)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hirofumi Azeta (Japan Economic Research Institute Inc.)

2.2 Duration of Evaluation Study

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

Duration of the Study: August, 2016 – October, 2017

Duration of the Field Study: November 2 – 17, 2016, February 6 – 11, 2017

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

3.1 Relevance (Rating: ③[4])

3.1.1 Consistency with the Development Plan of the Marshall Islands

In the Marshall Islands, *VISION 2018* (2003 – 2018) was established as a national development plan, which regards "the development of outer islands" as one of its strategic areas. The improvement of living conditions of the residents in the outer islands and the enhancement of inter-island transport, including sea transport, have been a part of its main agenda. In its outer island promotion strategy, *VISION 2018* targets efficient redirection of natural and human resources to economic activities in the Marshall Islands by improving service delivery in the areas of transport, communication, and in energy sectors. This project was designed to contribute to the realization of these targets[5].

At the time of ex-post evaluation, the development policies at the national level were *VISION 2018* (2003 – 2018), a long-term plan, and the *National Strategic Plan 2015 – 2017*, which was formulated in 2014 as a medium-term plan to achieve the goals set in *VISION 2018*. The *National Strategic Plan 2015 – 2017* sets ten national development themes, including "ensuring outer islands populations receive access to all necessary services allowing all Marshallese citizens to enjoy a high quality of life" and "building a sound infrastructure that provides energy, environmental, infrastructure and transportation security for all atolls". One of the five strategic areas to achieve the national development themes is infrastructure development; and, transport, including sea transport, is regarded as one of the important pillars of infrastructure development.

It is therefore concluded that this project has been highly consistent with the national development policy both at the time of project planning and ex-post evaluation.

3.1.2 Consistency with the Development Needs of the Marshall Islands

At the time of project planning, the supply of almost all daily commodities to the outer islands, such as rice, flour, canned foods, and cloths, depended on sea transport from Majuro. Moreover, the transport of copra (dried meat of coconuts) to a processing factory in Majuro, which was almost the only source of cash income for the residents in the outer islands, also depended on sea transport. Therefore, the enhancement of the inter-island sea transport network was an important issue in order to improve the living conditions of the residents in the outer islands.

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

[4] ③: High, ②: Fair, ①: Low

[5] Source : *Preparatory Survey Report*, P1-15.

Furthermore, sea transport was the major means of transport for home visits to the outer islands for workers and students living in Majuro, and for business trips to the outer islands for business people, and for travel to boarding schools in the outer island for students.

In this situation, the number of sea transport services decreased because one of the three cargo-passenger vessels had frequent troubles. As a result, vessels were operated by loading the number of passengers to more than the vessels' capacities and the cash incomes of residents in the outer islands were affected by the consequent decrease in the amount of transport of copra. Furthermore, because the landing craft owned by MISC sank in January 2011, the means of transport to carry heavy and large cargo to the outer islands was lost, thus hindering construction projects on the outer islands[6].

At the time of ex-post evaluation, the supply of daily commodities still depended on sea transport from Majuro to the outer islands excluding Ebeye Island[7]. Furthermore, copra remained the only source of cash income for the residents in the outer islands and the transport of copra remained dependent on inter-island sea transport.

The transport of cargo and passengers by MISC vessels since the planning of this project are as follows in the table below. The transport volume of cargo and the number of passengers increased 64% and 133% respectively from 2010 to 2016.

Table 1. Changes in annual cargo transport volume and the numbers of passengers by MISC vessels

Fiscal year (FY)	2010	2011	2012	2013	2014	2015	2016
Cargo (tons)	3,053	2,703	3,055	7,080	10,154	4,755	4,996
Passengers (persons)	2,170	3,455	2,640	4,560	6,704	4,914	5,053

Source: Documents provided by MISC.

Note 1: The table above shows the transport volume of cargo and the number of passengers of all MISC vessels including the cargo-passenger vessel and the landing craft procured through this project. The cargo and passengers transported by charter operations are not included.

Note 2: The fiscal year of the Marshall Islands is from October 1 to September 30 of the following year. For example, Fiscal year 2016 is from October 1st, 2015 to September 30th, 2016 (this definition applies to all other sections in this report).

Note 3: The cargo volume and number of passengers increased in FY2014 after the cargo-passenger vessel and the landing craft procured through this project started operations. The cargo volume and number of passengers decreased because the number of calls at ports in the outer islands, where the number of residents and cargo volume are small, has increased since FY2015.

The transport volumes of copra by MISC vessels since the planning of the project are as

[6] Source : *Preparatory Survey Report* and *Ex-ante Evaluation Report*

[7] Ebeye Island, located on Kwajalein Atoll, has a population of more than 10,000, second to Majuro. On this island, commodities are supplied by cargo vessels from Guam and other places; thus, it does not depend on a daily supply of commodities transported from Majuro.

described in the table below. It shows a 10% increase from FY2011 to FY2016.

Table 2. Changes in transport volume of copra

Unit: tons

FY	2011	2012	2013	2014	2015	2016
Annual transport volume of copra by the MISC vessels	3,944	5,089	4,881	3,644	4,366	4,346
Annual purchase volume of copra by Tobolar	4,037	5,124	7,048	4,778	5,056	7,291

Source: Documents provided by MISC and documents provided by Tobolar.
Note1: Tobolar Copra Processing Authority (Tobolar) is the sole copra processor in the Marshall Islands.
Note 2: All copra produced in the outer islands is transported to the factory of Tobolor in Majuro.

The number of operating days of each vessel at the time of project planning and ex-post evaluation is as follows in the tables below. It can be said that the field-trip operating days of MV LANDRIK, which was decommissioned due to deterioration in 2015, was replaced by the cargo-passenger vessel procured through this project (MV KWAJALEIN), and the number of charter-trip operating days of LC JELJELAT AE, which sank in 2011, was replaced by the landing craft also procured through this project (MV MAJURO).

Table 3. Field-trip operating days of cargo-passenger vessels

Unit: days

FY	2010	2016
AEMMAN	154	121
RIBUUK AE	122	75
LANDRIK	96	-
MV KWAJALEIN	-	143
Total	372	339

Table 4. Charter-trip operating days of landing crafts

Unit: days

FY	2010	2016
LC JELJELAT AE	147	-
MV MAJURO	-	183
Total	147	183

Source: Documents provided by MISC.
Note: The vessels procured through this project are MV KWAJALEIN (a cargo-passenger vessel) and MV MAJURO (a landing craft).

In summary, the sea transport by MISC has played an important role for the lifeline of the people of the Marshall Islands and this project has restored the transport functions once performed by a faulty cargo-passenger vessel (MV LANDRIK) and a sunken landing craft (LC JELJELAT AE). Therefore, it is concluded that this project has been consistent with the development needs of the Marshall Islands at the time of the project planning and the ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

Japan mentioned "overcoming vulnerability" as one of the priority areas of the *Country*

Assistance Policy, for the Marshall Islands in 2012 and also mentioned that it would emphasize the supports for domestic infrastructure development, especially maritime infrastructure, which were most important for strengthening its economic activities for growth in the Marshall Islands.

Furthermore, Japan expressed its intention to support the improvement of the transport and communication infrastructure of Pacific island countries in Annex 2 *Action Plan* of "Islander's Hokkaido Declaration" adopted in the "Fifth Pacific Islands Leaders Meeting (PALM5)" in May 2009. In addition, Japan was planning to support infrastructure development and the establishment of an infrastructure maintenance mechanism in the *Rolling Plan for the Republic of Marshall Islands* (May, 2009).

In light of the above, this project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating:③)

3.2.1 Project Outputs

The planned and actual outputs of this project in Table 5 below show that the planned outputs were achieved. The gap between the planned and actual gross tonnages (tonnage measured by overall internal volume of a vessel) of the landing craft was generated by the changes in the calculation procedures of the volume, and there were no changes made to the design of the landing craft.

Table 5. Comparison of Original and Actual Outputs

	Planned	Actual
Project scope on the Japanese side		
Equipment procurement		
Construction of the cargo – passenger vessel	Length overall: 49.85m x Breadth: 9.00m x Depth: 5.15m, Gross tonnage: 580 tons, Passenger capacity: 150 passengers	Length overall: 49.85m x Breadth: 9.00m x Depth: 5.15m, Gross tonnage: 583 tons, Passenger capacity: 150 passengers
Construction of the landing craft	Length overall: 44.09m x Breadth: 10.80m x Depth: 3.0m, Gross tonnage: 463 tons, Passenger capacity: 50 passengers	Length overall: 44.09m x Breadth: 10.80m x Depth: 3.0m, Gross tonnage: 416 tons, Passenger capacity: 50 passengers
Workboats	2	2
Outboards	4	4
Pallet lifts	4	4
Forklift	1	1

	Inflatable life rafts for existing MISC vessels	13 sets (25 persons/set)	13 sets for 25 persons
	Others	Spare parts and others	Spare parts and others
Consulting Services		Preparation of tender documents, assistance in tender and contract, and supervision during shipbuilding	Preparation of tender documents, assistance in tender and contract, and supervision during shipbuilding
Project scope on the Marshallese side		Carry out banking procedures and cover necessary banking commissions. Obtain necessary licenses and certificates, such as radio station license and provisional certificate of registry which are necessary for the construction in and transport to the Marshall Islands.	Carry out banking procedures and cover necessary banking commissions. Obtain necessary licenses and certificates, such as radio station license and provisional certificate of registry which are necessary for the construction in and transport to the Marshall Islands.

Source: Documents provided by JICA.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The planned and actual project costs are in Table 6.

Table 6. Comparison of Planned and Actual Project Costs

Unit: million yen

	Planned	Actual
Cost covered by the Japanese side	1,287	1,259
Cost for construction	-	1,189
Cost for design and supervision	-	70
Cost covered by the Marshallese side	1.3	1.6
Total	1,288	1,261

Source: Documents provided by JICA.

The total project cost, which was 1,261 million yen, was within the planned cost (98% of the planned project cost). The increase in the costs covered by the Marshallese side is due to the change in the exchange rate (USD1.00 was 84.46 yen at the time of project planning and 105.22 yen at the time of project implementation).

3.2.2.2 Project Period

The project period was planned to be 20 months at the time of planning and the actual project period was 18 months from June 2012 to November 2013. Therefore, the actual project period was within the planned period (90% of the planned period). The planned periods from contract agreement to delivery were 14 months and 13.5 months for the cargo-passenger vessel and the

landing craft respectively, but the delivery of both vessels was made at 12 months, about two months earlier than planned.

The project period was shorter than planned because docks for vessel construction were available at the opportune moment and the construction of the vessels started without latency, although the project period was set at the time of planning on the assumption that there would not be any available berths at docks for vessel construction in Japan.

As mentioned above, both the project cost and project period were within the plan. Therefore, the efficiency of the project is high.

3.3 Effectiveness[8] (Rating: ②)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

In this project, as sea transport capacity was expected to be restored and maintained, targets were set on a) the total operating days per year of each cargo-passenger vessel, b) the number of charter operations per year of the landing craft, and c) the transport volume of copra by all MISC vessels per year. In addition, as the fuel economy of vessels was expected to improve, a target was set for the reduction of fuel consumption of each vessel.

Table 7. The total operating days per year of a cargo-passenger vessel and the number and days per year of charter operations of the landing craft

	Baseline	Target	Actual		
	2010	2016	2014	2015	2016
	Planned year	3 years after completion	1 year after completion	2 years after completion	3 years after completion
Total operating days of a cargo - passenger vessel (days / year) *1	166*2	184	88	165	143
Number of charter operations of the landing craft (times / year)	23*3	26	19	18	12
Total charter operating days of the landing craft (days / year)	100	-	111	128	124

Source: Documents provided by JICA and documents provided by MISC and others.
*1: This does not include the charter operating days as well as preparation and unloading days for field-trip services.
*2: Actual operating days of the existing cargo-passenger vessel, MV AEMMAN.
*3: The actual number of charter operations of LC JELJELAT AE (sunk in January, 2011)
Note: The figures for FY 2014 (from October 2013 to September 2014) indicate the actual performance for 10 months as the project was completed in November 2013.

Total operating days per year of a cargo - passenger vessel (MV KWAJALEIN) in FY2016

[8] The sub-rating for effectiveness is to be made with consideration of the impact.

was 143 days, which was 22% below the target. According to MISC, this was because it could not purchase fuel on time, as it took time for the government to disburse the budget. As a result, the days at berth increased and this hampered the increase of operating days.

The number of charter operations per year of the landing craft was expected to increase 13%, from 23 in the baseline year to 26, but the actual number of charter operations in FY2016 was 12, which was below the target. In spite of this, the total charter operating days of the landing craft (MV MAJURO) at the time of ex-post evaluation was 24% more than in the planned year[9].

Table 8. Transport volume of copra

Unit: tons

	Baseline	Target	Actual		
	2010	2016	2014	2015	2016
	Planned year	3 years after completion	1 year after completion	2 years after completion	3 years after completion
Transport volume of copra by all MISC vessels in a year	3,969	4,600	3,644	4,366	4,346

Source: Documents provided by MISC.

The transport volume of copra, which was 4,346 tons in 2016, was slightly below the target volume, 4,600 tons. This seems to be because of the financial issues of the shipper (Tobolar). MISC mentioned that all copra transported by MISC was consigned by Tobolar and that employees of Tobolar traveling on MISC vessels purchased copra in cash from producers on the outer islands but very often gave up purchasing copra due to lack of cash in hand.

Photo 1. Copra loaded onto a cargo – passenger vessel (MV KWAJALEIN).

Tobolar has made operating losses since FY2012. Although Tobolar has received subsidies from the government, the subsidies have not been sufficient to cover the operating losses. As a result, Tobolar has posted net deficits and the amounts of cash and deposits have decreased significantly in recent years.

[9] As the number of operating days per one charter operation vary significantly, it seems more appropriate to evaluate by the total charter operating days per year. Therefore, charter operations were evaluated by the total charter operating days.

Table 9. Amounts of fuel consumption

		Baseline	Target	Actual
		2010	2016	2015-2016
		Planned year	3 years after completion	2-3 years after completion
Amount of fuel consumption of each vessel	Cargo-passenger vessel	99.0 tons / year	10% decrease	5.9% decrease
	Landing craft	219.2 tons / year	10% decrease	9.4% decrease

Source: Documents provided by JICA and documents provided by MISC.
Note 1: The baselines of each cargo-passenger vessel and the landing craft were estimated based on the rated outputs of the main engines of MV AEMMAN and LC JELJELAT AE respectively.
Note 2: Actual amounts of fuel consumption were calculated using seven bunker reports each taken from separate field trips (in FY2015-2016) made by MV KWAJALEIN and MV MAJURO submitted by MISC.

The information on the amounts of fuel consumption per year of each vessel was not provided by MISC. Therefore, the evaluator obtained the information on the fuel consumption amounts of actual trips made each by the cargo-passenger vessel (MV KWAJALEIN) and the landing craft (MV MAJURO), then calculated the estimated fuel consumption amounts that the baseline cargo-passenger vessel (MV AEMMAN) and landing craft (LC JELJELAT AE) consumed when making the same trips, using the same preconditions of the fuel consumption simulations conducted at the time of project planning. Finally, the actual fuel consumption amounts and the estimated fuel consumption amounts were compared.

In the fuel consumption simulation conducted at the time of project planning, the fuel consumption amounts per day for the cargo-passenger vessel (MV AEMMAN) and the landing craft (LC JELJELAT AE) were assumed as noted in the table 10 below[10]. Estimated fuel consumption amounts were then calculated based on the number of days of navigation and days at berth obtained from the log books of the cargo-passenger vessel and the landing craft procured by this project.

Table 10. Preconditions used in the fuel consumption simulation

	During navigation	At berth
	(Using the main engine and generator engine)	(Using only the generator engine)
Cargo-passenger vessel (MV AEMMAN)	1.700 Tons /day	0.225 Tons/day
Landing craft (LC JELJELAT AE)	2.825 Tons /day	0.200 Tons /day

Source: Documents provided by JICA.

[10] At the time of planning, it was assumed that the main engines and generator engines were used during navigation, while only generator engines were used at berth. However, in the actual operations , main engines were not stopped at several islands where anchors could not be casted (e.g., at Kili, Jabot, Lib and Mejit) according to MISC. Therefore, in the calculation of estimated fuel consumption amounts, it was assumed that the fuel consumption amounts at berth at the outer islands, mentioned above, is half the amount of the fuel consumed during navigation.

Using the comparison mentioned above, it was confirmed that the actual fuel consumption of a cargo-passenger vessel and the landing craft decreased by 5.9% and 9.4% respectively from the estimated fuel consumption amounts. However, these decreases in fuel consumption did not exceed the target reductions (10% reduction).

It should be noted that the estimated fuel consumption amounts used as baselines were rather small[11], because the estimated fuel consumption amounts were calculated based on an assumption that the main engines of the vessels were stopped at berth, although vessels do not stop main engines even at berth during actual operations in cases that the sea condition is rough.

3.3.2 Qualitative Effects (Other Effects)

At the time of project planning, it was expected that the on board safety and comfort improved through this project.

(1) Safety

Safety was expected to improve through several measures, such as: installing firefighting equipment, including fire extinguishers; installing lifesaving apparatus, including life jackets; stopping the operation of the deteriorated MV LANDRIK as a cargo-passenger vessel; and decreasing the number of services with excessive passenger load factors.

1) Installation of firefighting equipment

It was confirmed that sufficient firefighting measures were taken, as the planned items and amounts of firefighting equipment were installed as designed in the preparatory study.

2) Installation of lifesaving apparatus

It was confirmed that sufficient safety measures were taken against accidents, as more lifesaving apparatus than passenger capacity was installed. However, as it was not possible to carry out the periodic inspections of inflatable life rafts in the Marshall Islands so their inspection deadlines were not met.

Photo 2. Inflatable life rafts installed in a vessel.

[11] As the operating records of main engines at berth during actual operations were not obtained, it was not possible to compare the actual consumption amounts and the estimated fuel consumption amounts using the same conditions. If the actual operation of main engines were to be reflected, estimated fuel consumption amounts would be bigger. Therefore, it is most probable that the actual reductions in the fuel consumption amounts are bigger than the target reductions.

3) Handling of the replaced vessel, MV LANDRIK

MV LANDRIK had not been operated since 2015 considering its safety risk, and MISC also had a clear policy not to operate it anymore. Therefore, it was confirmed that there were not any adverse results for the passenger safety.

4) Services with excessive passenger load factors

It was confirmed that there were several field-trip services – even at the time of ex-post evaluation – in which the number of passengers loaded during peak seasons was more than capacity, such as during summer and the periods before and after Christmas. However, the MTC examines draft lines before departures to make sure that the total weight is not more than the weight limit. Besides, in case the number of passengers exceeds capacity, MISC is allowed to launch vessels only after it has installed more lifesaving apparatus than the number of passengers and has received approval by the MTC. In addition, it was confirmed that crews have exercised vigilance so that women and children did not stay on the cargo deck area and that passengers did not approach fuel oil tanks.

The total number of field trip services excluding the services by the landing craft and the number of services with excessive passenger load factors are as follows:

Table 11. Number of services with excessive passenger load factors

Unit: times

FY	2011	2012	2013	2014	2015	2016
Total number of field-trip services, excluding the services by the landing craft	27	21	30	34	32	27
Number of services with excessive passenger load factors, excluding the services by the landing craft	10	5	10	9	8	8

Source: Documents provided by MISC.

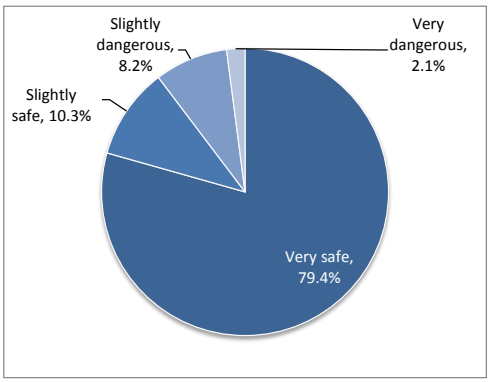
In order to avoid services with excessive passenger load factors MISC started taking preparatory actions to react to the demands during the peak period in the summer of 2017, for example, increasing the number of field trip services on routes with higher demands. It was confirmed that the MTC was also taking actions to control the services with excessive passenger load factors. For example, in order to avoid any situations in which passengers without tickets boarded causing the number of passengers to exceed capacity, the MTC constructed a terminal building at the port entrance in December 2016 and began checking the number of passengers in the building before boarding.

In relation to the above, 89.7% of the passengers interviewed in the beneficiary survey[12]

[12] The beneficiary survey was conducted on the users of the vessels procured through this project, which included residents in the capital city, Majuro (50 persons), residents in Ebeye Island (25 persons) and residents in other outer islands (including the passengers interviewed in the cargo-passenger vessel procured through this project, MV

answered that the vessels procured through this project were either “Very safe” or “Slightly safe”.

The reasons they answered that the vessels were safe included: (i) support by crews (47.1%), (ii) installation of equipment such as lifesaving apparatus (28.7%), (iii) installation of handrails (26.4%), and (iv) greater stability of vessels (12.6%).



Figures 1. Answers by passengers on the vessel safety

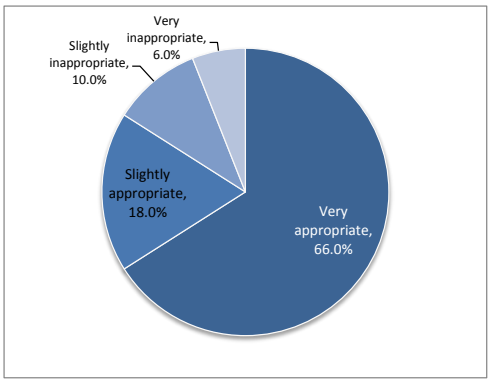


Figure 2. Answers by passengers on the usability of toilets (answered only by female passengers)

(2) Comfortability

At the time of planning, it was expected that the comfortability of vessels was improved, for example, by making the stability of the cargo-passenger vessels greater than MV AEMMAN, which heavily rolled and pitched, by extending the cabin space per person, and also by increasing the number of toilets.

Regarding stability, the cargo-passenger vessel was constructed according to the design, making the width of the vessel 0.5m bigger than that of MV AEMMAN. Thus sufficient stability has been secured[13].

Regarding the cabin area, it was expected at the time of planning that a passenger could secure 1 m^2 on the deck. In the beneficiary survey, as 79.4% of the passengers answered that they secured more than 1 m^2, it was confirmed that many passengers have been able to secure sufficient space in vessels[14].

Four toilet facilities were installed in the cargo-passenger vessel, which has passenger capacity of 150, and three facilities were installed in the landing craft, which has a passenger capacity of

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KWAJALEIN, 22 persons) as well as residents (23 persons) and retail shop staff (6 shops) in the outer islands who received service for commodities transported by the vessels. The interview survey was also conducted at a college in Majuro. Because students use sea transport during busy seasons, the interview survey results on the convenience of sea transport might be biased downward. The survey results for onboard safety might be also biased downward as the interview survey for the vessel was conducted in November when sea conditions tend to be rough. The proportions of male and female respondents were 49% and 51% respectively.

[13] According to the personnel concerned from MISC (e.g., captain of the cargo-passenger vessel), they realized that the stability of the cargo-passenger vessels procured through this project is greater than MV AEMMAN.

[14] However, 55.9% of the passengers who used crowded services (34 persons) answered that they could not secure 1 m^2 in the vessel, and thus, the comfortability of crowded vessels was rather low.

50, so that about one toilet facility could be installed for the use of 35-40 passengers, corresponding to the number of toilets installed in airplanes. Toilets were designed and made accessible for women in that they were installed at locations not directly visible to passengers staying on deck, and doors were installed at the entrance to the toilet area[15]. In the beneficiary survey, 84.0% of female interviewees (50 persons) answered that the locations of toilets were appropriate, and thus it is possible to say that the toilets have been more accessible for passengers.

3.4 Impacts

3.4.1 Intended Impacts

At the time of planning, it was expected that the convenience for people traveling between urban areas and the outer islands improved due to the increase in the number of annual operating days. It was also expected that the increase in copra cargo volume would contribute to an increase in the cash income of the residents in the outer islands and an increase in the national copra production volume.

It was also expected that the lifelines would be stabilized through securing regular transport of daily commodities as a result of the restoration of the implementation structure of sea transport, and that the anxiety of residents in the outer islands about living conditions would decrease.

(1) Improvement in convenience

Annual operating days of all vessels operated by MISC excluding charter operations are as follows in the table below. The table shows that the number of actual operating days as of FY2016 is relatively smaller than the planned year (FY2010). However, MISC increased its total operating miles and number of port calls excluding those at Majuro compared to 2010. Therefore, the convenience for the residents in the outer islands was considered to have improved.

[15] In the vessel which has been used as a baseline (MV AEMMAN), toilets were installed next to the decks where passengers stay. Therefore, it has been pointed out that female passengers tended to avoid using the toilets, feeling ashamed of being watched going in and out of toilets.

Table 12. Changes in total operating days of all MISC vessels, total operating miles and number of port calls

FY	2010	2011	2012	2013	2014	2015	2016
Total operating days of all MISC vessels (days)	419	397	402	414	402	481	398
Total operating miles (miles)	19,567	18,760	11,482	19,771	29,717	30,522	30,171
Number of port calls excluding Majuro (times)	140	115	109	175	223	217	158
Number of ports called (port)	28	23	22	24	25	28	29

Source: Documents provided by MISC.

In the beneficiary survey, 90.7% of the interviewees answered that the convenience was "significantly improved" or "slightly improved". However, when the question on their levels of the satisfaction on convenience (i.e., whether they could use sea transport whenever they wanted) was asked, only 52.6% answered "significantly satisfied" or "slightly satisfied".

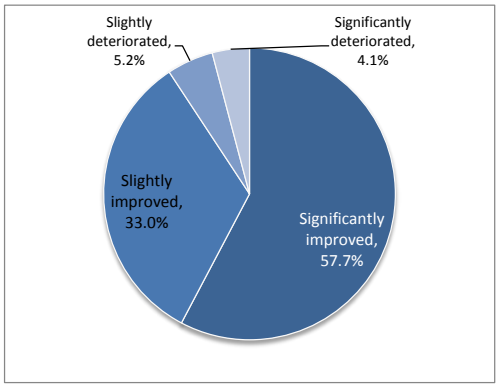


Figure 3. Answers by passengers on the improvement in the convenience of MISC vessels

(2) Increase in cash income of the residents in outer islands through the increase in the transport volume of copra

The annual copra purchase volume by Tobolar shows an increasing trend, although it has largely fluctuated with the effect of weather. Therefore, this seems to have led to an increase in the cash income of the residents in the outer islands. Since FY2014, when the vessels were procured, MISC transported 60% - 86% of copra purchased by Tobolar, and thus, it is possible to say that MISC has been playing important roles in the increase in the cash income of the residents in the outer islands.

Table 13. Change in transport volume of copra

FY	2011	2012	2013	2014	2015	2016
Annual copra purchase by Tobolar (tons)	4,037	5,124	7,048	4,778	5,056	7,291
Annual transport volume of copra by all MISC vessels (tons)	3,944	5,089	4,881	3,644	4,366	4,346
Proportion of copra transported by MISC vessels	97.7%	99.3%	69.3%	76.3%	86.4%	59.6%

Source: Documents provided by MISC and documents provided by Tobolar.

When interviewed, among 23 residents who were involved in copra production in the outer islands (16 persons were copra producers and 7 persons were workers for copra production), 68.2% answered that the income from copra production significantly increased, and nobody answered that the income decreased. Therefore, it is possible to say that the income from copra production has increased.

Photo 4. Commodities displayed in an outer island shop.

(3) Stabilization of the lifelines by regular transport of daily commodities

At almost all outer islands except Ebeye Island, transport of daily commodities seems to have become more frequent due to the above-mentioned increase in the number of port calls. In the interviews with the residents on the outer islands (23 people), 69.5% answered that "the amount of the commodities significantly increased" or "slightly increased". Similarly, 83.3% of the retail shops interviewed also answered that "the number of commodities significantly increased" or "slightly increased".

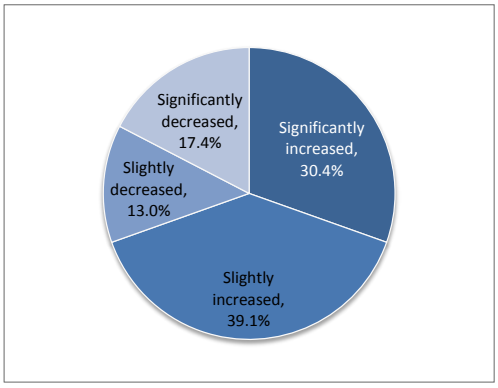


Figure 5. Answers by the island's people on the number of commodities

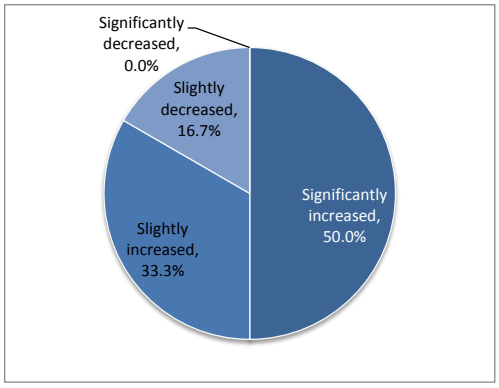


Figure 6. Answers by retails shops on the number of commodities

The fact that most of the commodities at retail shops were transported by MISC vessels shows that this project contributed to the increase in supply of daily commodities to the outer islands[16].

3.4.2 Other Positive and Negative Impacts

3.4.2.1 Impacts on the Natural Environment

As the vessels in this project were installed with equipment, such as devices for oil pollution control,

[16] However, as the beneficiary survey was conducted only on the five islands of Ailiglaplap Atoll located in the Southwest area of the Marshall Islands, it was not possible to confirm from the beneficiary survey whether the supply of daily commodities had improved to all outer islands.

sewage pollution control, and air pollution control, it was confirmed that vessels were constructed as designed to comply with the International Convention for the Prevention of Pollution from Ships. Therefore, it can be said that the actions taken to prevent negative impacts on the natural environment were appropriate. In addition, there were not any comments from the beneficiary survey on negative impacts to the natural environment made through the course of this project.

3.4.2.2 Land Acquisition and Resettlement

There were no resettlements or land acquisitions planned in this project. In addition, it was confirmed through the field studies in this ex-post evaluation that there were no resettlements and land acquisitions conducted in this project.

3.4.2.3 Unintended Positive/Negative Impact

Other impacts expected in this project were the achievement of the usability of toilets for women, elimination of drop accidents by children during navigation by improving the structure of handrails, and poverty reduction of the residents on the outer islands through improving their accessibility to sea transport.

As toilets were designed with attention to usability for women, 84.0% of the female interviewees in the beneficiary survey answered that the locations of toilets were appropriate, as mentioned in "3.3.2 Qualitative Effects".

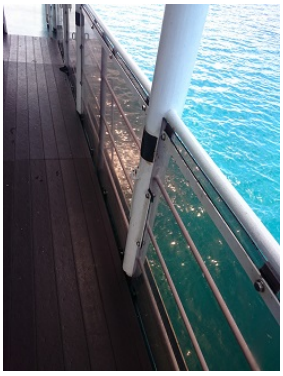


Photo 5. Plastic boards installed on handrails.

In order to prevent drop accidents by children, plastic boards were installed on the handrails on decks. As a result, it was confirmed that neither drop accidents nor similar accidents have happened since the vessels have started operations.

Although impacts on poverty reduction on the outer islands were not confirmed, the increase in cash income from the increase in copra purchase volume from the outer islands was confirmed. The increase in cash income is estimated to have led to poverty reduction.

As for the evaluation of the effectiveness of this project, some quantitative effects, such as the increase in the total charter operating days per year of the landing craft, the decrease in fuel consumption amounts of each cargo-passenger vessel, and qualitative effects, including improvements in safety and comfortability, were achieved. However, some operation and effect indicators, such as the total operating days of each cargo-passenger vessel and the transport volume of copra, were below targets. In addition, some issues were identified in the area of safety—one of the qualitative effects—as vessels were very often operated with a passenger load factor above capacity.

As for the evaluation of the impact, it was confirmed that the convenience for sea transport users on the outer islands improved because the operating miles and number of port calls of all MISC vessels

increased, and also the beneficiary survey results concluded so. It was also confirmed that a) the stability of lifelines, such as the supply of daily commodities to the outer islands, improved, b) the vessels did not cause any negative impacts to the natural environment, and c) there were neither resettlements nor land acquisitions.

Based on the result above, it is concluded that this project has to some extent achieved its objectives. Therefore, the effectiveness and impact of the project are fair.

3.5 Sustainability (Rating :②)

3.5.1 Institutional Aspects of Operation and Maintenance

The ministry of the Government of the Marshall Islands which has primary responsibility for this project was the MTC at the time of planning and ex-post evaluation. In the field of maritime affairs, the MTC specializes in the formulation of policies, supervision of vessel registration and marine safety, while MISC, which is under the supervision of the MTC, is in charge of the operations of domestic sea transport.

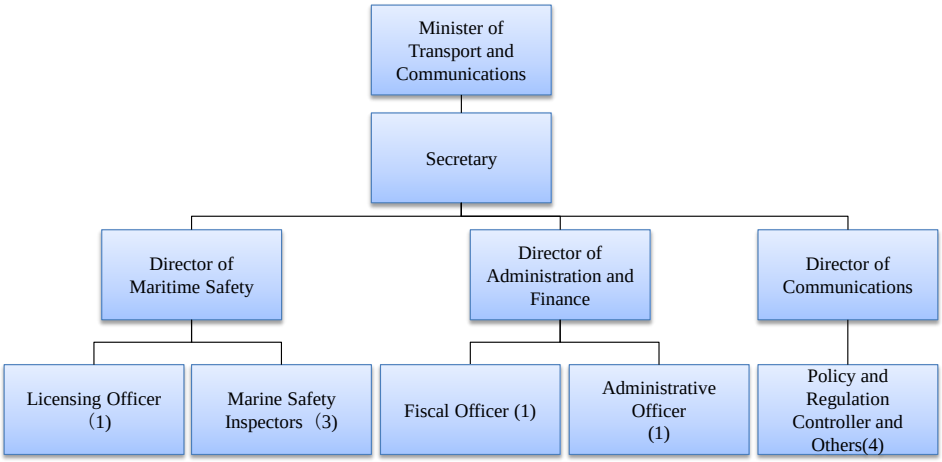


Figure 7. Organization chart of the MTC

Source: Documents provided by the MTC.

At the time of ex-post evaluation, the number of the MTC staff was 14 (including the secretary), and the section for maritime safety under the Director of Maritime Safety was composed of five persons, including three marine safety inspectors and one licensing officer. The organizational structure of the MTC was the same at the time of planning, and the number of staff in each section had been slightly increased.

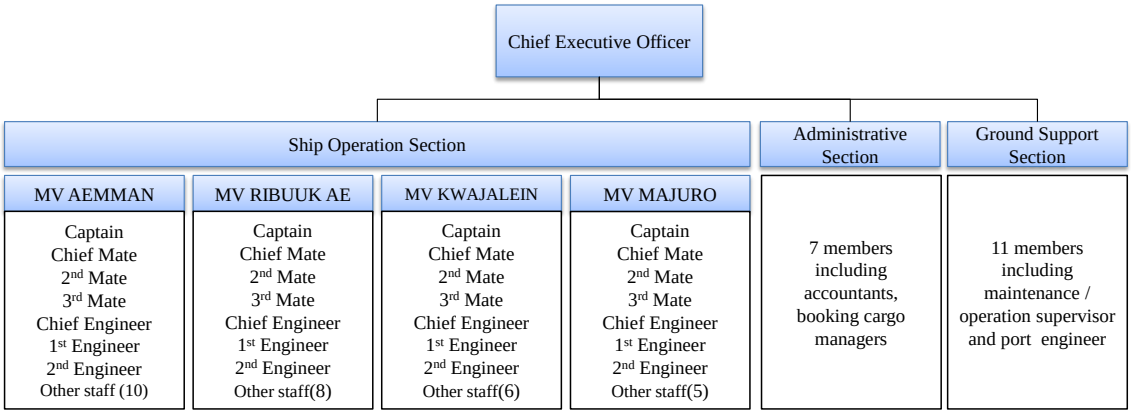


Figure 8. Organization chart of MISC

Source: Documents provided by MISC.

MISC has maintained the same organizational structure since project planning, and the total number of staff as of February 2017 is 76, of which 8 persons, including the Chief Executive Officer: belonged to the administrative section; 11 persons to the ground support section; and 57 persons to the ship operation section. Out of 57 persons in the ship operation section, 28 persons, which comprise about half of the section's staff, were officers who held licenses. Therefore, the number of personnel and license owners at the time of ex-post evaluation were almost the same at the time of planning. Operation and maintenance activities were carried out by MISC and were not entrusted to either private or other bodies.

Based on the above, it is concluded that there were not any specific issues in the institutional aspects of operation and maintenance, as both the MTC and MISC maintained the same organizational structure and number of personnel as that at the time of planning

3.5.2 Technical Aspects of Operation and Maintenance

According to interviews with the project consultant, MISC staff members had advanced skills compared to engineers in neighboring countries and there were not any problems in the technical aspects of operation and maintenance. During the field study, it was also confirmed that there were not any problems that had remained unsolved over a long period of time due to lack of technical skills.

In addition, it was confirmed that MISC staff members had utilized the maintenance manual provided by the project consultant at the time of ex-post evaluation and that maintenance activities had been recorded in log books.

In this project, the Preventive Maintenance Policy (PMP) was introduced for the main engine, generator engines, and other major components. Based on the PMP, parts should be replaced by spare parts and periodically maintained even if they were not damaged. In the maintenance

manual, PMP work activities were described. In the ex-post evaluation, it was confirmed that MISC had conducted PMP work activities following the maintenance manual.

However, it was also found that MISC had maintained its technical levels by appointing foreign engineers to chief engineer and engineer positions because it had been difficult to recruit Marshallese which was due to the fact that there were not any maritime schools in the Marshall Islands[17]. In order to increase the technical skills at MISC as a whole, officers who held licenses gave guidance to personnel with insufficient technical capability through conducting actual operations.

In addition, the MTC reported that it had invited lecturers from the Pacific Community to Majuro and held seminars on safety measures and maritime traffic management for MISC staff and others from December 2016 to January 2017.

As a whole, it is possible to say that there were not any specific issues in the technical aspects of operation and maintenance by MISC.

3.5.3 Financial Aspects of Operation and Maintenance

As at the time of planning, MISC made operating losses, as it could not cover operating expenses, such as personnel expenses, and fuel expenses, with operating revenues, such as freight incomes and charter incomes. However, MISC posted net income by receipt of subsidies from the government, which compensated for operating losses.

MISC – estimating necessary maintenance budget according to the maintenance manual – requested its maintenance budget from the government. Because the government also recognized the importance of the maintenance of vessels after the sinking of LC JELJELAT AE, it allocated significantly larger budgets to MISC than at the time of planning. According to the MTC and the Ministry of Finance, the government preferentially allocated the necessary budget to MISC based on the understanding mentioned above.

Table 14. Income statements of MISC

Unit: thousand USD

FY	2010	2011	2012	2013	2014	2015
Operating revenues	1,296	844	842	1,032	1,659	1,204
Operating expenses	2,368	2,306	2,007	2,032	2,869	2,899
Operating loss	-1,072	-1,461	-1,166	-1,000	-1,210	-1,695
Government subsidies	969	1,142	1,396	1,225	1,299	1,750
Net profit	-103	-344	231	226	89	55

Source: Financial statements of MISC.

[17] There are maritime schools, for example, in Micronesia, Kiribati, Tuvalu, Samoa, the Philippines, Singapore and Hawaii. According to MISC, the retention rate of foreign engineers is high. When interviewing several foreign engineers during the field studies, it was confirmed that there were many engineers who had worked in the field for about 5 to 10 years.

The revenue of the Government of the Marshall Islands relies heavily on financial supports made through the Compact of Free Association with the United States (Compact) [18]. It is not likely that the revenues of the Government of the Marshall Islands and the budget allocation to MISC will suddenly decrease, because the current compact is effective through 2023 and there are no signs of change in the supports from the US government.

However, the Government of the Marshall Islands, in *National Strategic Plan* 2015 - 2017 and other documents, aims at achieving a balanced budget before 2023 on the premise that financial supports will not continue after 2023. If the financial supports made by the US government do not continue, the government subsidy allocated to MISC may be drastically reduced and the financial aspects of operational maintenance may face serious problems.

Table 15. Breakdown of government revenues

Unit: million USD

FY	2014	2015	2016
Tax revenues	24.7	25.1	31.0
Non-tax revenues	13.6	20.6	33.2
Special grant	7.9	8.0	8.7
Grants	99.9	121.0	104.5
of which are grants from the US government	12.3	12.5	14.3
of which are financial supports from the compact	75.6	78.4	79.2
Total revenues	146.2	174.7	177.4
Percentage of grants from US government and financial support among total revenue	60.1%	52.0%	52.7%

Source: Documents provided by MISC.

The budget allocated by the government to MISC is divided into the allocation from the general budget and the allocation from the Vessel Maintenance Fund. The former is used for operations and minor maintenance work, while the latter is used for large-scale maintenance work, such as dock maintenance conducted every few years. The budget from the Vessel Maintenance Fund is regulated and not to be used for purposes other than maintenance.

It was confirmed that there were some issues in the budget allocation through the Vessel Maintenance Fund, as approved budgets in FY 2013 and 2014 were not actually allocated[19] and the scheduled dock maintenance was postponed to the following fiscal years respectively. It is

[18] The Marshall Islands became independent in 1979 after having been governed by the United states as a part of the United Nations Trust Territory of the Pacific Islands since 1949, but it concluded the Compact of Free Association (Compact) with the United States in 1986. By the compact, the Marshall Islands started receiving financial supports, while it also started entrusting authority and responsibility of defense and security to the United States. In October 2004, the amended compact came into force.

[19] Due to the emergent need for funding of some state owned companies, such as Air Marshall Islands, the approved budgets were rearranged.

relevant to note that although dock maintenance should be done once every two to three years in principle, the vessels of MISC could subsequently go through such maintenance every four years using the budget amounts allocated in FY 2015 and 2016. Therefore, the budget allocation amounts for operation and maintenance were not necessarily sufficient[20].

Table 16. Actual budget allocations by the government (Unit: thousand USD)

Unit: thousand USD

FY	Allocations from government general budget		Allocations from Vessel Maintenance Fund	
	Approved	Actual	Approved	Actual
2010	900.0	894.6	75.0	74.5
2011	850.0	844.5	297.9	297.9
2012	807.6	801.1	600.0	595.2
2013	870.6	801.1	927.7	424.3
2014	1,309.5	1,299.1	443.0	0.0
2015	1,310.1	1,310.1	481.0	439.4
2016	1,260.1	1,260.1	477.2	477.2

Source: Documents provided by MISC.

The government preferentially allocates a budget to MISC, and the budget allocated through the Vessel Maintenance Fund is regulated and not to be used for purposes other than maintenance. However, it has been concluded that there were some minor issues in the financial aspect of operation and maintenance because approved budgets were not actually allocated for several fiscal years and the allocated budgets were not enough for all vessels to undergo dock maintenance every two to three years.

3.5.4 Current Status of Operation and Maintenance

The two vessels procured through this project were in good condition and there were neither deteriorations nor failures of equipment which had remained unresolved for lengths of time due to a lack of technical skills.

Since 2010, the vessels owned by MISC have undergone dock maintenance in Fiji using the budget allocated through the Vessel Maintenance Fund as described in the table below. MISC was planning to send the cargo-passenger vessel and landing craft procured through this project sequentially to berths for dock maintenance from FY2017 to 2018.

[20] The cost for the maintenance of a vessel in its berth is about USD 450 thousand. If the annual budget allocation amount is USD 450 thousand, it is once every four years that MISC can carry out the maintenance of all vessels (4 vessels).

Table 17. Dock maintenance history

FY	2011	2012	2013	2014	2015	2016
Name of vessel	MV LANDRIK	MV RIBUUK AE	MV AEMMAN	-	MV AEMMAN	MV RIBUUK AE

Source: Documents provided by MISC.

In the field studies, it was confirmed that the two vessels procured through this project had undergone maintenance works to be done in the short term and medium-long term in accordance with the maintenance manual prepared and provided by the project consultant.

It was confirmed that MISC had carried out maintenance works related to the PMP in the manual accordingly in which necessary works of the PMP were described and it was also confirmed that sufficient amounts of spare parts were stored as MISC had purchased additional spare parts.

However, the inflatable life rafts procured in this project, which were supposed go through inspections every year, had not been checked after their initial procurement because there were no engineers who could carry out such inspections in the Marshall Islands. MISC was considering countermeasures to this at the time of ex-post evaluation. “Emergency Position Indicating Radio Beacons (E-PIRB)” had not gone through periodic inspections either. In addition, MISC carried out dock maintenance on vessels (such as removing seaweed and repainting the vessel bottoms) only every four years, although such dock maintenance should be done every two to three years in principle.

As a whole, although the vessels procured through this project went through maintenance work following the manual, there were some issues with the periodic inspections of safety equipment and frequency of dock maintenance.

Based on the above findings, it is concluded that some problems were observed both in terms of financial aspects and the current status of operation and maintenance, although institutional and technical aspects did not have any problems. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project was to restore and enhance the sea transport capacity depressed by faulty and sunken vessels in the Marshall Islands and to improve on-board safety and comfort by procuring one cargo-passenger vessel and one landing craft, thereby contributing to the improvement in convenience of transport between urban areas and the outer islands and to the stability in commodity transport. This project has been highly relevant to the country’s

development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high. Both the project cost and project period were within the plan. Therefore, the efficiency of the project is high. Although the total operating days of each cargo-passenger vessel and the transport volume of copra were below the baselines and targets, some effects, such as improvements in on-board safety and comfort, were achieved as a result of the vessels provided through this project. In addition, impacts, such as the improvement in convenience of sea transport throughout the country as a whole, the increase in cash income for the outer islands, and the stable supply of daily commodities to the outer islands, were achieved. Therefore, the effectiveness and impact of the project are fair. Some problems were identified in both the financial aspects and current status of operation and maintenance of the project, for example, issues in the regular maintenance of safety equipment and in the frequency of dock maintenance. Therefore, the sustainability of the project effects is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Prevention of services with excessive passenger load factors

Even after two vessels had been procured through this project, vessels have been loaded with a number of passengers greater than vessel capacity during the summer and Christmas seasons. In order to further improve safety, it is desirable to reduce the number of services with excessive passenger load factors by responding to seasonal increases in demand, for example, through increasing the number of services, especially at routes and islands with large demands.

At the time of ex-post evaluation, when vessels were launched with passenger load factors greater than capacity, MISC responded to this by loading a higher number of lifesaving apparatus than that of passengers. However, it is desirable to take further actions through the initiative of the MTC. Such actions would include conducting the checking the number of passengers thoroughly before departure so that vessels do not load a higher number of passengers than that of lifesaving apparatus.

Improvement in the frequency in dock maintenance and implementation of periodic inspection of lifesaving apparatus

In the ex-post evaluation, it was found that dock maintenance of vessels was carried out only once every four years. Therefore, it is desirable to carry out such maintenance every two to three years, for example, by increasing budget allocations for such purposes.

In addition, inflatable life rafts have not gone through periodic inspection after their

procurement due to the absence of engineers in the Marshall Islands, although they were supposed to go through such inspections every year. E-PIRB did not go through periodic inspections either[21]. Realistic responses to these issues would be to carry out the periodic inspection of such safety equipment owned by MISC when vessels are sent for dock maintenance or to invite engineers from neighboring countries, such as Fiji.

Neighboring countries also have similar issues in periodic maintenance of safety equipment. Therefore, it is also conceivable to establish a framework in the future for conducting periodic inspections of safety equipment through both the employment of engineers from institutions such as those of the Pacific Community and through cost sharing programs attended by several countries, including the Marshall Islands.

Enhancement of maritime education

Many of the crew at MISC were recruited from outside the Marshall Islands. Although it is desirable to secure Marshallese crew members in order to accumulate skills and experiences in the organization, the bottleneck in doing so lies in the absence of maritime schools in the Marshall Islands.

Therefore, it is advisable to consider enrolling Marshallese applicants to maritime schools for example, in Micronesia, Hawaii, the Philippines, Samoa, and Singapore, and scholarships should be arranged and provided by the government so that the number of Marshallese graduates from maritime schools could increase.

Decrease in the operating losses of MISC in response to the possible termination of fiscal supports from the US government

The operation and maintenance expenses of MISC are mostly supported by the subsidies from the Government of the Marshall Islands, while the government's revenues depend heavily on the fiscal supports from the US government.

If the fiscal supports from the US government do not continue in 2023, it is expected that the operation and maintenance budget allocations for MISC will be drastically reduced.

Therefore, the government of the Marshall Islands, in response to the possible termination of the fiscal supports in 2023, would have to consider countermeasures to decrease operating losses of MISC, such as a gradual increase in shipping fares and a decrease in the expenses of MISC.

4.2.2 Recommendations to JICA

At the time of ex-post evaluation, there were no issues in the maintenance conditions of the

[21] Normally, this is supposed to undergo checks every 2-3 years.

two vessels procured through this project, and it is desirable that MISC continue the maintenance of these vessels in an appropriate manner into the future as well. It is also recommended that JICA examine the maintenance status of the vessels and the implementation status of periodical inspections of safety equipment for a certain time period.

As mentioned above, neighboring countries also have issues with such periodic inspections of safety equipment. Therefore, in a case in which several pacific countries consider establishing a common framework for the periodic inspection of safety equipment, it is recommended that JICA consider providing supports, such as technical cooperation and human resource development.

4.3 Lessons learned

Introduction of Preventive Maintenance Policy (PMP) for safe vessel operations

MISC has carried out the maintenance activities as described in the maintenance manual, and it has also implemented the PMP as a part of such maintenance activities. As a result of this, MISC has been able to properly maintain the vessels procured through this project, and it has also been able to avoid shortages of spare parts. Therefore, it is considered necessary to introduce such a PMP when procuring vessels through other projects, and also, to give guidance to executing agencies so that they can continue implementing a PMP even after the completion of projects. It is also desirable to incorporate activities into maintenance manuals for the conducting of a PMP in order to make them a part of regular maintenance activities.

Establishment of Vessel Maintenance Fund

The government allocates the maintenance budget for vessels through the Vessel Maintenance Fund, which was established before this project, and the budget allocated through the fund cannot be used for purposes other than maintenance. Therefore, it is possible to say that this is an effective mechanism which ensures the implementation of maintenance activities on an assumption that the government allocates sufficient budgets to it.

Securing a maintenance budget and ensuring its execution are essential procedures for safe vessel operations. Therefore, when procuring vessels in other counties where governments allocate maintenance budgets for vessels, it is recommended to encourage governments and executing agencies to ensure the execution of maintenance budgets through the establishment of a similar fund.

(End)

Samoa

FY2016 Ex-Post Evaluation of Japanese ODA Grant Aid Project

"The Programme for Improving the Weather Forecasting System and Meteorological Warning Facilities"

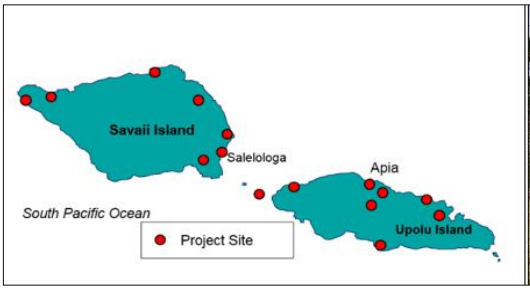
External Evaluator: Hisae Takahashi, Japan Economic Research Institute Inc.

0. Summary

This project was implemented to improve the capacity of meteorological observation and the vulnerability to meteorological disasters by installing equipment for the meteorological observation system and early warning facilities as well as conducting the necessary technical cooperation to operate and maintain the equipment. The purpose of the project is highly consistent with the development strategy and environment sector plan of Samoa, which has aimed to improve resilience to climate change and measures to meteorological disasters and the development needs of Samoa, which has been frequently damaged by natural disaster, as well as Japan's aid policy. The targets, enabling upper air continuous observation and the required weather observation for airport authority, were achieved by implementing the project. A system to transmit and receive the data needed to analyze the meteorological forecast was established and meteorological prediction was made possible based on the accurate information. Accordingly, the provision of weather information, including the movement of cyclones, storm areas and rainfall as well as disaster surge warnings issued, which were not available before implementing the project, have contributed to agricultural activities for the people as well as the Samoan tourist industry. Therefore, the effectiveness and impact of this project are high. Though the project cost was within the plan, the project period exceeded the plan due to changes in the technical cooperation period, the impact of a cyclone and applying the new scheme to provide technical cooperation. Consequently, the efficiency of the project is fair. Although the operation and maintenance of equipment provided by the project is in good condition, some minor institutional, technical and financial problems were confirmed, therefore the sustainability of the project can be judged to be fair.

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

1. Project Description



Project Locations

Data Collection Unit, Barometer, Temperature and Humidity Sensor (Le Piu Tai in Savaii Island)

1.1 Background

Samoa comprises seven small islands in addition to the main large islands of Savaii and Upolu. These two are volcanic islands with precipitous mountains, while the body of the population inhabits inshore areas, where the social infrastructure is established. Accordingly, there was urgent need to establish appropriate countermeasures for natural disasters such as destructive storms, storm surges, flooding and tsunami caused by cyclones. In fact, 12 powerful cyclones attacked over the 60 years since 1950[1] and most of the entire population of the islands was affected. In addition to the cyclones coming every few years, the islands of Samoa have experienced frequent infrastructural and agricultural losses due to destructive floods. Such an environment had made harder life to the poor who supported agriculture, one of the key Samoan industries. Thus, effective disaster prevention measures were required from a perspective of poverty alleviation.

In Samoa, meteorological information and early warnings from the Samoa Meteorology Division (SMD) is the initial information for the national institutions working for disaster prevention. Under these circumstances, the capability of the SMD was required to be strengthened, given the critical need to improve the promptness and accuracy of weather information and early warnings. However, meteorological observation of SMD at the time of the plan was mainly conducted by manual with limited equipment, which meant the necessary weather information could not be obtained on a timely basis. Accordingly, this project aiming to strengthen the disaster prevention system was implemented by improving the country's capacity for meteorological observation; introducing equipment for an automatic weather systems, weather forecast and early meteorological warnings systems.

1.2 Project Outline

The objective of this project is to improve the capacity for meteorological observation and ease vulnerability to disasters by establishing a weather observation system and meteorological warning facilities, helping expedite the quick evacuation of residents when disasters occur and

[1] Source: documents provided by JICA

tourism by improving aviation safety and stabilizing activities in agricultural and fishery sectors by utilizing meteorological data.

E/N Grant Amount / Actual Grant Amount	745 million yen / 745 million yen
Exchange of Notes Date / Grant Agreement Date	March 2010 / March 2010
Executing Agency	Ministry of Natural Resources and Environment (MNRE)/ Samoa Meteorology Division (SMD)
Project Completion	September 2015
Main Contractors	(Construction) Japan Trade & Engineering Corporation (Equipment) Japan Radio Co., Ltd. / Environmental System & Services Pty Ltd./ Japan Trade & Engineering Corporation
Main Consultants	International Meteorological Consultant Inc./ Japan Weather Association (JV)
Procurement Agency	Japan International Cooperation Center
Preparatory Survey	July 2009 – February 2010
Related Projects	・Follow up project (Installation of Automatic Weather Observation Systems in the three suburbs of Apia)（2008） ・Grant aid "The Project for Rehabilitation and Improvement of Cyclone-Damaged Ports and Foreshore Protection in Western Samoa" (1992) and "The Project for Rehabilitation of Cyclone-Damaged Ports in Western Samoa"（1997） ・Australian Agency for International Development, "South Pacific Sea Level and Climate Monitoring Project" (Installation of tide gauge at twelve sites in South Pacific (One at port in Apia of Samoa)（1991-2010）」 ・China "Samoa Integrated Geo-hazard Array"（Installation of Seismic Observation Unit and Observation Data Processing System）（2009~2011）

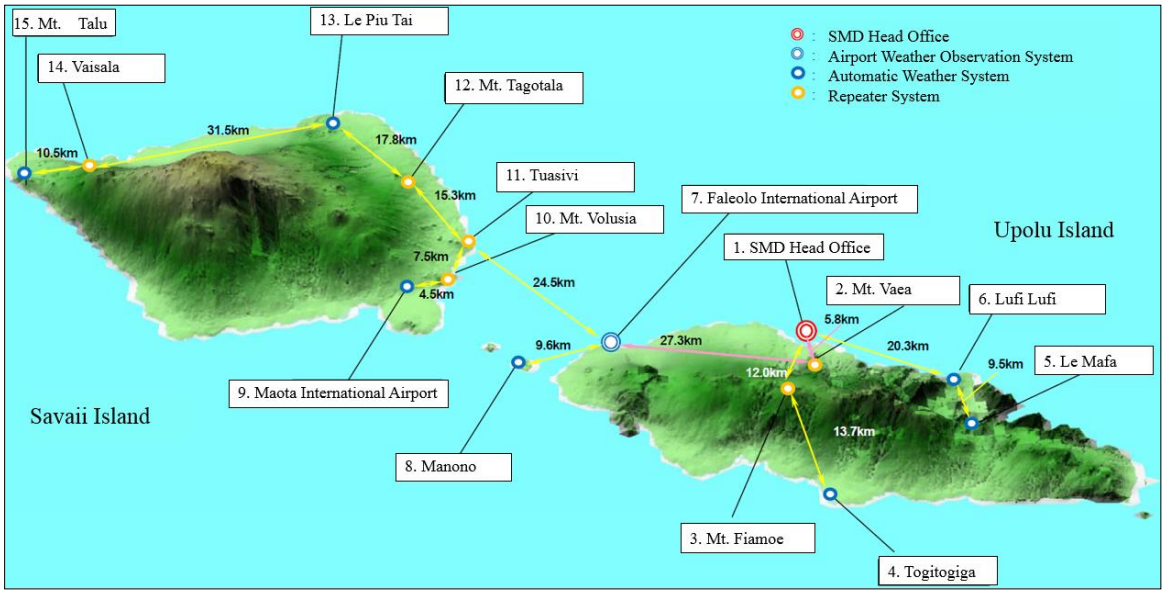


Figure 1 Site Map of the Programme for Improving the Weather Forecasting System and Meteorological Warning Facilities

Source: Document provided by JICA

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Japan Economic Research Institute Inc.[2]

2.2 Duration of Evaluation Study

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

Duration of the Study: August, 2016 – October, 2017

Duration of the Field Study: October 17, 2016 –October 29, 2016 / February 19, 2017 – February 26, 2017

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

3.1 Relevance (Rating: ③[4])

3.1.1 Consistency with the Development Plan of Samoa

Strategy for the Development of Samoa (SDS) (2008-2012), a development policy at the time of planning, emphasized the need to implement aviation meteorology services in accordance with international standards and indicated an enhanced capacity on SMD. This strategy also highlighted the importance of implementing *National Adaptation Programme of Action (NAPA)* for continuous social and economic growth and particularly focused on

[2] Joined the evaluation team of Japan Economic Research Institute Inc. as a team member from Ernst & Young ShinNihon LLC.

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

[4] ③: High, ②: Fair, ①: Low

boosting measures to combat disasters caused by climate change. *The Operational Plan 2006-2008* of the Ministry of Natural Resource and Environment (MNRE) also emphasized enhancing the function of meteorological services, and laws and regulations, such as *Disaster & Emergency Management Act 2006* and *Climate Change Act 2006*, which reaffirmed to focus on mitigating disaster and the risk of climate changes, and sustain the environment[5].

SDS (2012-2016) at the time of the ex-post evaluation shows a total of 14 key major priority areas within four sectors (economic, social policies, infrastructure and the environment). The environment sector specifies strength against climate change and natural disasters as well as environmental sustainability as a priority area[6]. With the concept of priority areas indicated in the environment sector of *SDS*, the *National Environment and Development Sector Plan* (2013-2016) set out a vision of protecting Samoa's nature and environment, having strength against natural and human-caused disasters and supporting sustainable and healthy human life. In addition, while priority projects from nine areas[7] were implemented along with NAPA, this project is highly prioritized as helping establish a framework to provide accurate weather information required to implement agricultural and health-prioritized projects in this plan.

As stated above, Samoa's development strategy has kept an eye on climate change as well as emphasized to improve resilience against disasters from the time of planning through to the time of ex-post evaluation. The MNRE operational plan, law and regulations for disaster and climate change and the National Environment Sector Plan also indicate enhancing the function of meteorological services, alleviating damage caused by disasters and the need to consolidate strength against disasters. The project was implemented to improve weather observation capability as well as disaster vulnerabilities and has accordingly been deemed relevant to the development plan.

3.1.2 Consistency with the Development Needs of Samoa

At the time of planning, alongside concerns over expanding disasters caused by climate change, Samoa had to implement urgent tasks to establish appropriate measures against natural disasters such as destructive storms and storm surges caused by cyclones, and flooding and tsunamis. Therefore, despite the strong need to improve prompt and accurate weather information, early warning systems and meteorology disaster monitoring capability, the weather observation of SMD during those days was conducted mainly manually and with limited equipment. Accordingly, SMD was unable to provide upper-air observation data, distribute the national observation data to the Global Telecommunication System (GTS),

[5] Source: Documents provided by JICA
[6] Source: Samoa Ministry of Finance web site.
（http://www.mof.gov.ws/Services/Economy/EconomicPlanning/tabid/5618/language/en-US/Default.aspx）
[7] This includes Water, Agriculture, Health, Forestry, Tourism, Planning, Education, Fisheries and Industry.

receive real-time weather data, observe tsunamis caused by rising sea levels or earthquakes, announce prompt forecasts and warnings, monitor cyclones and issue pre-warnings, etc.

Samoa has suffered damage from floods, forest fires, tsunami, drought and vigorous tropical cyclones, etc. even after the project was implemented (See Table 1). The effects of Climate Change were introduced in the evaluation report of the *Intergovernmental Panel on Climate Change*. Furthermore, unusual phenomenon caused by climate change and unprecedented in Samoa were confirmed, such as hailstorms that hit Samoa in 2011 and 2016[8]. Accordingly, the need to understand accurate disaster information and weather information for proper action as warnings as well as develop an early-warning system is high, even at the time of ex-post evaluation.

Table 1 Natural Disaster Observed in Samoa

Year	Hazards (Month)
2008	Drought (May), Forest fire (September), Tsunami (November, December)
2009	Tsunami (November)
2010	Forest fire (July, August)
2011	Flood (December)
2012	Cyclone EVAN (December), Flood (December)
2014	Cyclone AMOSA (December), Flood (December)
2016	Forest fire (September)

Source: Questionnaire responses and documents provided by Fire Emergency Service Authority

3.1.3 Consistency with Japan's ODA Policy

In the Fourth Pacific Islands Leaders Meeting held in May 2006, Japan declared priority areas for its assistance plans. Based on this plan, "Education", "Environmental Conservation", "Health", "Increased Income" and "Infrastructure development" sectors were highlighted as areas of cooperation for Samoa. Among these, this project was categorized under "Environmental Conservation". The "Sendai Cooperation Initiative for Disaster Risk Reduction" adopted in the 3rd UN World Conference on Disaster Risk Reduction also agreed to observe disasters in states vulnerable to climate change, such as small islands, to provide technical cooperation and target measures to develop infrastructure for weather forecasting. This project established a weather observation and disaster warning system and as well as disaster measures, also supported fundamental measures to adapt to climate change. Accordingly, this project is consistent with key cooperation areas for Samoa.

As described above, the project is highly relevant to Samoa's development policies and the development needs of Samoa as well as Japan's ODA policy. Therefore, its relevance is high.

[8] Source: Questionnaire and Interview survey to executing agency

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

【Japanese Portion】

The major outputs of this project included procurement and installation of weather observation systems, early-warning systems and airport weather observation systems as well as construction of ancillary facilities, consulting services and technical cooperation to operate and maintain procured equipment as well as improving the weather forecast system and service. The planned and actual outputs are as shown in Table 2 and Table 3.

Equipment was procured and installed almost as planned, except for the change in locations for installing the Automatic Weather Systems and the specifications of two antennas used for the meteorological data communication system. The reasons and measures for those changes are written as follows. Since these changes did not impact on efforts to generate the expected effects and functions of equipment which were expected at the time of project planning, it can be said that no issues due to the changes were identified.

Table2 Planed and Actual Output

（Procured and Installed Equipment, Constructed Ancillary Facilities）

	Name of the Equipment/Facility	Site	Plan	Actual
Procured and Installed Equipment				
1	Airport Weather Observation System (AWOS)	Faleolo International Airport	2	As planned
	AWOS Display System		3	
2	Automatic Weather System (AWS)	Le Mafa	1	
		Saluafata/Lufi Lufi [Note 1]	1	
		Togitogiga	1	
		Manono	1	
		Le Piu Tai	1	
		Maota International Airport	1	
		Mt. Taru	1	
	Calibration Instrument	The SMD Head Office	1	
3	Meteorological Data Communication System (including Data Repeating System)	Each Site [Note 2]	15	
4	Meteorological Data Management System	The SMD Head Office	1	
5	GTS Message Switch System		2	
6	MTSAT Data Receiving System		1	
7	Forecast Support System		2	
8	Early-Warning System		1	
9	Power Back-up System		2	
10	Wind Profiler System		1	
Ancillary Facilities				
11	Power Back-up Shed	The SMD Head Office	1	As planned
12	Equipment Shed	The SMD Head Office	1	
13	Concrete Shelter	Each Site [Note 3]	17	
14	Foundation of Wind Profiler System	The SMD Head Office	1	

Source: Document provided by JICA and interview to SMD and Consultant

Note 1: The site location for the installation was shifted from Saluafata to Lufi Lufi.

Note 2: The specifications of the antenna of the Meteorological Data Communication System (two sites) were changed.

Note 3: One concrete shelter was constructed at each site except Faleolo International Airport, where three concrete shelters were constructed.

【Changes of Output from the Original Plan】

① Changes in the Site Location:

Changes of site for installing AWS at Lufi Lufi, 800-900m away from the original site Saluafata

(Reason) The plan was to install AWS in the premises of the local church in Saluafata. However, the landowner requested to change the site when installing the equipment due to its size. Accordingly, it was decided to relocate the site to Lufi Lufi, considering the distance from the original site and the data transmission conditions.

② Changes in Antenna Specifications:

Antenna of Lufi Lufi bound for the SMD Head Office

(Reason) The distance for communication exceeded 20 km due to the change of site, reaffirming the need to change the antenna size.

Antenna of Faleolo Airport bound for Manono

(Reason) A minor packet error caused because of the difference in sea level between Faleolo airport and Manono. Accordingly, the antenna size was changed to avoid errors and boost quality.

Table 3 Planned and Actual Outputs
(Consulting Service and Technical Assistant)

	Planned	Actual
Consulting Service	Basic design, Detailed design, Support of tendering, Supervision of installed systems, Advice of operation of installed equipment and systems	As planned
Technical Assistance	1) Preparation of manual to operate and maintain equipment 2) Conducting training sessions on quality management of observed data 3) Awareness and dissemination of meteorology information 4) Improvement of the system and weather-forecasting service 5) Improved promptness and accuracy of disaster warnings 6) Providing information to meet users' needs and high Convenience	(1) ～(6) Almost as planned 【Additional item】 Repair and rehabilitation of equipment for communication and meteorology observation

Source: Documents provided by JICA, interview with SMD and Consultant

Consulting services and technical cooperation were also conducted almost as planned.

Technical cooperation components were conducted in this project to generate the benefits of procured equipment more efficiently and effectively, given the needs raised in the preparatory survey. In particular, details of how to operation and maintain procured equipment and ancillary facilities under this project were given, whereupon two members of the SMD staff

gained the necessary knowledge. The support has also helped improve the observed data by refining the methods used to check, manage and analyze the same. Accordingly, papers and reports for meteorological data, which can be used to determine mid- to long-term trends and for weather forecasts, have been regularly prepared. The means to deliver the information, which have been made easier to understand for Samoan people, have improved by preparing an SMD website, a TV weather-forecasting program and a weather icon, among others. Awareness activities on weather information and measures in the event of disaster were also conducted by holding open classes for 20,364 students in total; mainly at primary schools across Samoa. Besides, before starting technical cooperation, activities to repair and rectify equipment for data communication and meteorological observation were added after they sustained damage when cyclone EVAN hit Samoa in December 2012.

【Samoan Portion】

The following seven items were implemented as Samoan Portions as planned:

1) Flattening out access road furrows and cutting grasses
2) Cutting grasses and site preparation of each site
3) Cutting branches of high trees which obstruct the meteorological data communication system
4) Installation of fences for protection against any damage and theft of the equipment and systems
5) Securing the site for construction works
6) Demolition/relocation of the existing facilities that may obstacle during construction works
7) Providing the stable commercial power supply intake work for constructed facilities

Meteorological Data Communication System (Vaisala)

Inside the airport control tower: AWOS Display System (Faleolo International Airport)

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost to be borne by Japan was planned as 745 million yen (E/N limit) and the actual project cost matched this total exactly (100% of the planned amount). The total project cost, including the Samoan portion, 67 million yen, was planned as 812 million yen, but the cost borne by Samoa could not be determined, which meant the total project cost could not be compared with the planned total project cost. Conversely, it was confirmed that the Samoan side had done all the works as planned without any issues. (See 3.2.1 Output)

3.2.2.2 Project Period

Though the project period was expected to be 37 months[9], the actual project period was 64 months from June 2010 till September 2015, significantly longer than planned (173% of the originally planned project period). The major reasons were as follows: 1) the period for technical cooperation was modified after the planning stage till the commencement of the project, 2) The Joint Coordination Committee in March 2014 saw the need to extend the project period and make the output of project activities firmer and more effective, considering the status of progress and for the following reasons: delays in preparing project activities and the administration procedure for implementing technical assistance under the new grant aid scheme "Grant Aid for Environment Program[10]", delays in commencing technical assistance due to the convenience of the counterpart side, delay in commencing training to maintain and repair equipment damaged by cyclone. Details of each reason are given as follows:

【Changes of period for technical cooperation with the nature of meteorological observation in mind】

The preparatory survey originally defined the period for technical cooperation as 19 months. According to the procurement agent and consultant, however, the period for technical cooperation was set as 24 months when they made the contract. Though no detailed background or reason could be confirmed in official documents, the procurement agent considered that it was changed to two years to cover two rounds for each season during the project, since technical assistance was provided for meteorological observation.

【Delays for operation in line with the new scheme】

Technical cooperation for operating and maintaining the equipment was provided for the new equipment installed. The original plan was to provide technical assistance under the "Environment and Climate Change Scheme" alongside the installation of the equipment.

[9] The project period I defined as from the contract with the consultant to the completion of technical assistance.

[10] One of the grant aid program schemes established in fiscal 2008 to support countries vulnerable to the negative effects of climate change. The scheme was renamed as the "Grant Aid for Environment and Climate Change Scheme" in 2010, then the sub scheme, including this scheme, was abolished in 2015.

However, the plan and implementation of the activities got underway while seeking a better approach soon after the introduction of the new scheme. Meanwhile, the mission to revise the Project Design Matrix for technical assistance was dispatched after installing equipment, which delayed the start of activities for technical cooperation by 4.5 months.

【Delays in commencing technical cooperation because of the convenience of the counterpart】

When technical cooperation was due to start, the main SMD counterpart was studying abroad, which meant activities could not be started as planned. Furthermore, since the key person behind this project at that time, the CEO of MNRE, passed away suddenly, the project activities had to stop for a certain period[11].

【Delays caused by damage due to Cyclone EVAN】

In December 2012, Cyclone EVAN hit Samoa, which damaged the equipment procured by the project. Since it happened before the technical assistance training started, the equipment had to be repaired, resulting in a delay of four to five months for starting the training.

Some of the factors delaying the project period had an impact when proceeding with the project through trial and error by the executing agency and project experts applying the new scheme. Conversely, the planned effects were fully generated through this approach. Furthermore, experts utilized this period to repair and maintain the equipment as part of on-the-job-training, providing good opportunities to the counter personnel to gain experience in repairing and maintaining equipment.

Based on the above, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficient of the project is fair.

3.3 Effectiveness[12] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

(1) Operation Indicators: Enhancement of the weather-monitoring capability

Before implementing the project, SMD was not able to provide information on the direction of the cyclone to the Samoan people. This was because SMD lacked equipment to observe the upper air, as required by the World Meteorological Organization (WMO)[13]. Thanks to the project however, the direction, speed and temperature of the wind at a height

[11] Though confirming the fact with related parties, detailed reasons for the delays were not obtained.
[12] Sub-rating for Effectiveness is to be put with consideration of Impact.
[13] A specialized agency of the United Nations. It is dedicated to international standardization, improvement and coordination of meteorology services and to promote efficient exchange of meteorological information and documents among each of the member countries and regions.

of 12 km in the sky can be observed by installing a wind profiler system[14] (See Table 4). Accordingly, SMD can provide better information, such as the path of the cyclone around Samoa and El Niño events relating to the occurrence of cyclones. Moreover, it is now possible to provide upper-air observation data which is crucial to improve the accuracy of weather forecasting for meteorological organizations worldwide.

At the time of project planning, since four out of five meteorological observation territories[15] lacked observation station, the SMD headquarters was unable to receive the observed data in real time at each site, meaning the weather information at each site was not reflected in the weather forecasting. Thanks to the installed equipment, at the time of ex-post evaluation, real-time data was observed at all observation territories as planned. In addition, the number of observation points registered by the WMO also increased from nine before the project implementation to 17 points, although they were not set as indicators. Accordingly, it is confirmed that approximately twice as much information can be reported to the WMO, which helps enhance the weather-monitoring capability[16].

Table 4　Capacity for Upper-Air Observation and Capacity for Automatic Continuous Meteorology Observation

	Baseline	Target	Actual	
	2009	2016	2012	2015
	Planned Year	3 Years After Completion	Completion Year	3 Years After Completion
Capacity of Upper-Air Observation				
・Wind direction and speed in upper air	Incapable	No raining: 3-6 km high Raining: 7-9 km high	12 km high	12 km high
・Temperature		Approximately up to 1.4 km high	12 km high	12 km high
Number of observation territories in Samoa	One territory	Five all territories	Five all territories	Five all territories

Source: Documents provided by JICA and executing agency

(2) Effect indicator: Enhancement of weather forecast provision capability

Weather phenomena within each territory of weather observation in Samoa can be observed in a timely manner thanks to automatic meteorological observation, which helps SMD properly reflect weather phenomena in weather forecasting. Conversely, the number of weather and coastal forecasts provided by SMD is twice daily and has not increased since the project implementation (See Table 5). This is because providing the weather information twice (once in the morning and evening respectively) daily is considered enough when the

[14] Equipment to monitor the upper air from the ground. It can observe the vertical distribution of wind direction and speed above the observation point in real time

[15] Two sites in Upolu Island and three sites in Savaii Island.

[16] The accuracy of weather forecasting will be enhanced by transmitting data observed in the home country to the WMO and meteorological divisions overseas as well as receiving such data from other countries reciprocally.

weather condition is settled. Since the target set at the time of project planning does not match the local situation, it is considered inappropriate. Frequencies of weather forecasts are increased based on the needs when disasters occur based on the scale and circumstances of the disaster, hence it can be said that an environment to provide forecast information, by taking the present status into consideration, has been prepared.

While information required for aviation forecasts can be obtained, the number of aviation forecast has not been regularly provided due to the lack of SMD staff (See details for Sustainability (2)). Accordingly, an aviation forecast is provided when required[17] at the time of ex-post evaluation. Although this information was not reported by SMD to the control center in the airport, data observed by SMD can be also confirmed at the airport control center among stakeholders via the AWOS display system monitor. Accordingly, a system to confirm the observed data has been prepared and the weather forecast provision capability is said to have improved.

Table 5 Number of Weather, Coastal and Aviation Forecast Provision

	Baseline	Target	Actual	
	2009	2016	2012	2015
	Planned Year	3 Years After Completion	Completion Year	3 Years After Completion
Number of weather forecast provision	Twice / day	4 times/day	Twice / day	Twice / day
Number of coastal forecast provision	Twice / day	4 times/day	Twice / day	Twice / day
Number of aviation forecast provision	0 times / day	4 times/day	Non-scheduled	Non-scheduled

Source: Documents provided by JICA and Executing Agency

3.3.2 Qualitative Effects (Other Effects)

(1) Enhancement of weather forecast and the disaster warning provision capability

Installing meteorological observation, communication and data management systems made it possible for SMD to transmit meteorological data observed in Samoa to GTS and receive data observed in numerous countries, allowing more accurate forecasting. For example, when cyclones occur, since the wind direction, rainfall and direction of a cyclone can be predicted, this has created an environment to provide warnings of meteorological disaster prediction via mobile phone text messages.

Questionnaires and beneficiary surveys[18] conducted during the ex-post evaluation with

[17] Based on the interview with SMD staff members.

[18] To complement the quantitative information, questionnaire and beneficiary surveys were conducted. Questionnaire surveys were made with 13 staff members of related institutions using weather forecasts for their services (3 staff members from related ministries, three from Hotel, two from the Fire and Emergency Service Authority, two from

related institutions and the local residents show that approximately more than 70% of related institutions having responded that the accuracy, frequency and reliability of weather forecasts had improved and greater than or equal to 80% of the local residents answered the improved weather-forecasting ability (See Table 6). Similarly, as for the disaster warning provision capacity, 70 to 80% of related institutions answered that the accuracy, frequency and reliability had improved and greater than or equal to 90% of the local residents answered that the system to deliver the meteorological alarms to the Samoan people had improved. Accordingly, it can be said that the improved capability of weather forecast and disaster warning was confirmed.

Table 6 Improved Weather-Forecasting Capacity

		Greatly improved	Improved	No change	Worse	Much worse	No answer
Related Institutions	Accuracy	30%	40%	10%	0%	0%	20%
	Frequency	22%	55%	11%	0%	0%	11%
	Reliability	50%	20%	20%	0%	0%	10%
Local residents	Accuracy	49%	42%	1%	0%	0%	1%
	Frequency	52%	37%	2%	0%	0%	1%
	Reliability	50%	38%	2%	0%	0%	1%

Source: Questionnaire and Beneficiary surveys

Table 7 Improved Capacity for Meteorology Disaster Warning Provision

		Greatly improved	Improved	No change	Worse	Much worse	No answer
Related Institution	Accuracy	36%	45%	18%	0%	0%	0%
	Frequency	36%	45%	18%	0%	0%	0%
	Reliability	27%	45%	27%	0%	0%	0%
Local residents	General	26%	71%	2%	0%	0%	0%

Source: Questionnaire and Beneficiary surveys

Note: As the wording, "capacity of alarming/warning", was not well understood by Samoan people, "the system to deliver meteorological alarms to the Samoan people" was reconfirmed with them.

(2) Enhanced ability to provide weather information to the Samoan Airport Authority

Before implementing the project, SMD manually observed meteorological information except for atmosphere pressure and was located away from the airport, which hampered the

airlines, one from the Port Authority and one from a private oil transporting company). A beneficiary survey was conducted among a total of 127 local residents in Upol, Savaii and Manono Islands (Valid response: 127). 65 of whom male and 62 female. The age breakdown was: 16-25 years old for 24 samples, 26-35 for 27 samples, 36-45 for 31 samples, 46-55 for 27 samples and over 56 for 18 samples respectively. Though evaluators attempted to obtain a list of residents from which to select respondents, such lists were unavailable. Accordingly, respondents were selected by applying the purposeful selection method at fruit and vegetable markets, fish markets, bus stops, wharves and so on.

speed of response. Under such circumstances, both SMD and the Samoan Airport Authority (SAA) made meteorological observations respectively, although this was inefficient. Furthermore, SMD conducted visual observations of visibility and cloud height as the most important elements ensuring safe take-off and landing operations, meaning that it was in a difficult situation to even observe those data during the night.

This project installed AWOS capable of observing data on a real-time basis at two sites of a runway, and an AWOS Display System in Faleolo airport displaying the same information as could be monitored with SMD. Thanks to these systems, SAA can now confirm information such as wind direction, wind speed, temperature, rainfall, cloud height and visibility, which was formerly observed manually by SMD and informed to SAA via phone. Those data are currently observed on both sides of the runway every five minutes and shown in displayed systems, allowing timely and accurate weather forecasts via the SMD observation systems. Moreover, SAA no longer needs to perform observations, which also helps reduce its workload.

(3) Enhanced data communication capacity and providing information

Meteorological data, available at the AWS installed at each site in Samoa, are transmitted to SMD via a meteorological data communication system and then distributed to the WMO GTS system via the GTS switch system. Simultaneously, since meteorological data observed by other countries can also be received the data communication capacity for transmitting and receiving meteorological observed data in Samoa is considered enhanced. It also indicates how SMD can make forecasts based on more meteorological data and trends, led to enhance forecasting accuracy in Samoa.

As well as improvements made to the observed data and forecast information, the project provided technical assistance to prepare weather icons and maps for weather forecasting as well as displaying and explaining meteorological information and reporting weather forecast services, allowing SMD to provide weather forecast programs on TV.

Information on cyclones, storms, high waves and so on is informed via mobile phone text message by utilizing the Early-Warning System. Information on alarms is shared via SMD with the Disaster Management Office (DMO), which then informs the persons in charge of major related institutions, media and representatives in each village. Within these systems, it was confirmed that their contents and frequency had improved, meaning an enhanced capacity to provide information.

（Photos）Screens of the TV weather forecast program showing the weather icon

(4) Improved capacity to respond to Climate Change

By installing equipment which was procured in this project, including for observation, telecommunication and data management systems, SMD can understand and manage information related to climate change (analysis of climate change information, climate system trends in Samoa) and also publish monthly reports including rainfall and temperature and quarterly reports for meteorology information and weather information around Samoa such as El Niño-Southern Oscillation (ENSO)[19] and ENSO index[20]. Before implementing the project, no analysis of climate change information or preparation of documents to respond to climate change could be conducted. However, technical assistance provided training to input the data obtained into the program for analysis and control, whereupon its accuracy was reconfirmed to prepare the products. Accordingly, it helped enhance the capacity to prepare the documents for climate change, summarize the information of climate change and then publish those products.

3.4 Impacts

3.4.1 Intended Impacts

(1) A wider understanding of meteorological information and measures against disasters, development of a system to deliver information to expedite evacuation

Thanks to easily understandable explanations on weather forecasts and information on disasters through TV and radio programs, the local public responded that their understanding was considerably higher in the beneficiary survey result. In Samoa, where no TV weather forecasting existed before the project, most people predicted the weather or disasters from the appearance of the sky based on their experiences, radio and so on. As described before, TV programs for weather forecasts started after the project was implemented, whereupon information explained with icons or animations for the weather helped deepen their understanding of meteorological information or measures against

[19] A phenomenon whereby the surface pressure between the tropical western and eastern Pacific Ocean varies like a see-saw every few years. The Southern Oscillation is accompanied by changes to El Nino and La Nina and is also known as ENSO (El Niño/Southern Oscillation) alongside the El Nino.

[20] An index showing the differences in surface pressure between Tahiti and Darwin. This is also one of the standards showing the force of trade winds, where a positive value indicates a high trade wind.

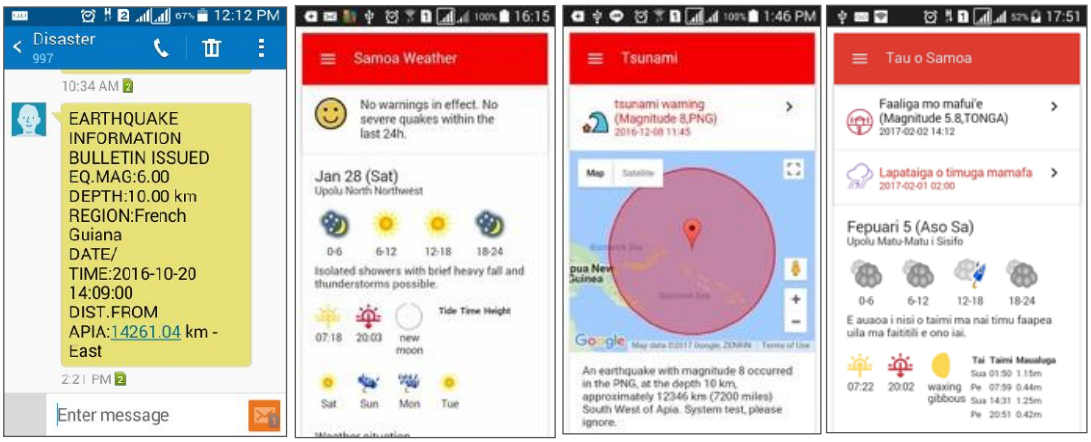
disasters. The beneficiary survey result also showed 90% of the local residents responded that the explanation of weather information via TV or radio has been getting easier to understand. Conversely, some respondents commented that some weather information was explained with technical terms which were hard to understand even now and highlighted the need to simplify the terminology used. In this project, some awareness activities on countermeasures against disasters were conducted for primary school students. In the interview survey conducted at markets and etc., it was often explained that the students who participated in these awareness activities (open classes) at schools, shared what they learned with their parents and families at home. As well as awareness activities continued by NGOs and others even after the project was completed, the technical cooperation under this project also helped improve understanding of weather information or the measures and response to disasters through open classes and etc. for Samoan people.

Moreover, SMS text messages were distributed when disasters occur to institutions involved in decision-making for disaster management and representatives of villages. The SMS message is a trigger to sound the sirens installed in each village, as such, an information delivery system to prepare evacuation was prepared. This system is acknowledged as a key measure for disasters required the emergency in Samoa. Moreover, further improvement of the measure to disasters was confirmed as SMD has worked to develop a Hazard Early-Warning Application for smartphones for further utilization by the Samoan people after the project completion. (See the Column below)

Column：Impact for improving meteorology and the disaster warning system after project completion
～Development of Hazard Early Warning Applications～

In 2012, the project installed AWS and Early warning system in SMD. Through this equipment, meteorological information for Samoan people can be provided in a format which is more easily understood. It also included swift responses to deliver the information to major institutions using the disaster information and leaders of each village via SMS in the event of disaster. Meanwhile, there have been issues such as an inability to send SMS messages to all people in Samoa due to the capacity limitations. Also, an SMS only contains up to 160 characters per message. To improve the system, SMD has worked to develop a smartphone application (App) with technical support by a JICA volunteer and an app service was finally launched from February 2017. This app was developed to complement the existing system which has been utilized and delivers early warning information to a wider scope of people in Samoa. In addition, information useful for daily life in Samoa, such as weather forecasts of every six hours, sunrise and sunset times, tide tables and so on is displayed in both English and Samoan (users can set the preference).

At the time of the ex-post evaluation, the mobile telecommunication network in Samoa had developed considerably and the number of smartphone users was increasing. Even in areas where not all people have smartphones, if a few members among neighbouring relatives, friends and acquaintances receive early warnings through their smartphones, the information is expected be shared easily in Samoa, where family and community bonds are prioritized. Accordingly, this app is expected to become an important tool for regional disaster prevention in Samoa's future.



Early warning information Issued by SMS

App Screen ① Weather forecast in four hours and four days

App Screen ② Tsunami warning An alarm will sound.

App Screen ③ Earthquake occurred in Tonga and heavy rain warning in Samoa

Source：Interview with SMD and JICA Volunteer, documents prepared by JICA Volunteer

(2) Contribution to agricultural activities

In this interview survey with farmers selling agricultural crops at the market, it was explained that farmers and local people use the weather information for their farming and

agricultural activities. For example, it was confirmed that major respondents refer to the weather forecast for agricultural activities, such as the timing of watering or seeding. Given the status of agriculture as a key industry in Samoa, contributing to agricultural activities can be indirectly considered a means of boosting national income stability. In the beneficiary survey, while approximately 13% of respondents were farmers, 33% of respondents mentioned that they used the weather information for farming or agricultural activities. This means that as well as farmers, other local people also utilized weather information to cultivate their home gardens.

(3) Boosting the safety of aviation and tourism

For the tourist industry in Samoa, which mainly targets outdoor activities such as surfing, weather forecasts constitute indispensable information and the Samoan Tourism Association (STA) receives information on meteorological trends and the occurrence of natural disasters via SMD and DMO. According to STA, the contents and timing of the meteorological information provided have significantly improved and the information has been received well in advance of disasters following the 2013 project implementation. Accordingly, in the tourist sector in Samoa, sufficient advance information on weather trends and disasters has allowed them to propose safe plans and schedule to the tourists. Accordingly, it can be said that the project helped those in the tourism sector have a safer trip to Samoa.

Although aerodrome predictions have not made regularly, a system to provide the necessary information as required has been established. When pilots request a briefing, SMD can always provide the required information such as wind trend, volume, rainfall and visibility, etc. on a real-time basis. Accordingly and as described in 3.3 Effectiveness Qualitative Effect, it can be said that the project has also helped improve safe civil aviation operations.

3.4.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

To implement this project, an Environmental Impact Assessment was conducted in line with the "City Planning Management Act." Monitoring was performed based on the assessment result and a report was also prepared[21]. No complaints concerning noises and etc. were generated during the project, according to interviews with the executing agency and residents during the site survey as well as the monitoring report. Thus no negative impact on the natural environment was confirmed.

[21] Source: Interview with executing agency and confirmation of the current situation in the site survey

(2) Land Acquisition and Resettlement

No land acquisition and resettlement were generated for this project. Land within which to install the equipment for meteorological observation was leased with the landowner's consent and the absence of any issues was confirmed in an interview with the executing agency.

(3) Other Impacts: Improving the workload efficiency of SMD staff

Changes which involve observing the major data automatically instead of manually mean the efficiency of the daily work of SMD staff members has improved. Within Maota International airport in particular, SMD staff had to be dispatched to Savaii Island for weekdays to report the data to SMD, which was observed manually, by phone. At the time of ex-post evaluation, eliminating the need to dispatch the SMD staff by collecting observed data remotely helped cut costs too.

Observation of upper-air, automatic and continuous observation and weather information required for SAA is possible by installing the meteorological observation equipment. Also, a system to receive the necessary information to analyze the meteorological forecast has been established by installing data communication equipment. Based on this forecast and information, an arrangement to inform of a warning following a quick evacuation in the event of disaster was possible via the early-warning system. Furthermore, thanks to technical assistance, the accuracy of information to determine meteorological trends provided by SMD staff members as well as their presentation skills to inform weather information were improved. Accordingly, information, including the cyclone direction, storm area and rainfall, could be identified in advance and a warning could be issued before the disaster. The information required to ensure the safe operation of civil aviation is available and the capacity to provide observed meteorological information in a manner easily understood by Samoan people has been improved. This information has boosted the key industries including agricultural and tourist sectors in Samoa.

As described above, this project has largely achieved its objectives. Therefore, effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The SMD weather forecast department is responsible for the Operation and Maintenance (O&M) of meteorological observations, data communication and early-warning systems provided under this project (see Table 2). Of the 40 SMD staff members at the time of ex-post

evaluation, 16 belong to the weather forecast department. Four work for O&M of weather observation facilities and equipment (including those installed outside Apia) and two work on cleaning or cutting the grass. According to the executing agency, there is a need for six staff members for adequate O&M, which shows the shortage of technical staff members with adequate skill and knowledge in the weather observation and communication equipment provided.

A quick response team of three SMD staff members is assigned when immediate action is required in response to accidents involving machinery. Although a quick response team was also required at SAA at the time of project planning, it has not yet been properly organized due to a lack of staff. However, SMD staff members are assigned around the clock at Faleolo International Airport as the SMD equipment is installed, hence the SMD staff assigned at the airport can respond when any immediate action is required.

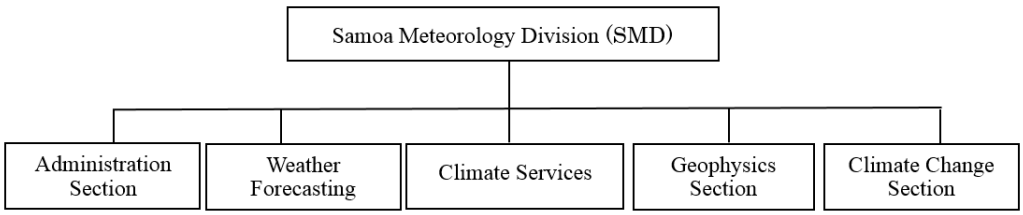


Figure 2 SMD Organization

Source: SMD Web site http://www.samet.gov.ws/index.php/staff/service1 (referred on 5/10/2017)

3.5.2 Technical Aspects of Operation and Maintenance

Training for O&M was implemented through the scheme of "Grant Aid for Environment Program" in this project. Consequently, SMD staff members obtained fundamental O&M skills in newly installed weather observation and communication systems, thanks to which they already have technical capacity in essence. It also emerged at the time of the site visit that O&M manuals provided during the trainings were utilized on a routine basis. Besides, enhancement of technical aspect was spearheaded by continued support given by JICA to build capacity in terms of meteorological observations and forecasting in Pacific Island countries[22], training sessions in equipment calibration and inspection methods supported by Australia and China, as well as technical support for weather observation by the WMO.

Conversely, locally in Samoa, there is a shortage of technical staff members with adequate knowledge required to simulate weather data, communication techniques and IT area. SMD currently has only two staff members with adequate knowledge, despite attempts to recruit for a full-time position. In this regards, the limitation of appropriate human resources on a

[22] JICA supported efforts by Fiji to improve the capacity for meteorological observations and forecasts through the Project for Reinforcing Meteorological Training Function of Fiji Meteorology Services (FMS) since 2014. Though the counterpart is FMS, Samoa is involved in the program for third country training and receives indirect benefits.

local level should be a technical issue. Currently, the shortage of human resources is filled by email communication to obtain advice from Japanese experts in this project and JICA volunteers in the IT field.

Enough spare parts necessary for the installed equipment were supplied at the time of project completion and the project was unaffected by any shortage of spare parts by the time of the ex-post evaluation. However, they still lack access to all spare parts except for batteries in Samoa, which they must procure from overseas when finishing spare parts procured as stocks of equipment. The executing agency understands available procurement routes but must consider a procurement plan considering the required budget for continuous operation ahead of time, as there are many expensive parts.

3.5.3 Financial Aspects of Operation and Maintenance

SMD, responsible for equipment O&M, is supported by revenue from government. Based on the fact that the SMD annual budget increased approximately 2% at the time of planning[23], it was estimated that a 6% increase in the entire SMD budget would be required to cover all O&M costs additionally required. The SMD annual budget has now increased about 5% p.a. (see Table 8), which is still short of the budget. According to SMD staff members, although SMD requests a necessary budget for O&M to MNRE every year, only half the request is approved. They have covered budget shortfalls by diverting from the budget of other activity. However, it might not be possible to supplement by diverting the budget when consumable supplies or spare parts have to be replaced in future. The remaining supplies are scarce at the time of ex-post evaluation, despite having replaced supplies and parts by spare parts procured as supplies at this project until now. Therefore, the O&M budget should be secured instead of diverting other activity budget to facilitate equipment operation.

Table 8 SMD Budget

(Unit: thousand tala)

	2009/10	2013/14	2014/15	2015/16
Budget	**1,151**	**1,437**	**1,529**	**1,618**
Expenditure (Detail)	**1,151**	**1,437**	**1,529**	**1,618**
Personal expenses	896	980	1,034	1,086
Operation expenses	133	297	320	356
Administrative expenses	122	160	175	176

Source: Samoa Ministry of Finance, "Approved estimate of receipts and payments of the government of Samoa for the financial year"

3.5.4 Current Status of Operation and Maintenance

Based on the SMD interview and site visit, it was confirmed that equipment and their ancillary facilities under this project were effectively utilized and operated. The facility is

[23] Source: documents provided by JICA

also well maintained with cleaning and grass cutting. Daily checks suggested as part of technical support were not followed at the mandated frequency, due to a lack of human resources. However, daily mandated check items are still conducted every two or three days and this had not caused any serious issues or breakdown by the time of the ex-post evaluation. SMD properly conducted the refinishing paint of concrete shelters and responded to the broken equipment. Although no supplies and replacements except batteries can be locally procured in Samoa, all the equipment remained in operation without any problem by replacing broken parts with spare parts provided under this project. As indicated above, when all the spare parts are used, they need to procure supplies and replacement from outside Samoa. If SMD makes a proper plan and secures a budget, there will be no sustainability issues.



(Left) Concrete shelter: repainted wall by SMD (Togitogiga observation point)
(Centre) Inside the concrete shelter: Batteries (Left), Indoor units (Centre), IP phone (Mt. Talu observation point) (Right)
(Right) SMD staff working to maintain the data collection system (Le Piu Tai observation point)

In light of the above, some minor problems have been observed in terms of the institutional aspect, technical aspect and financial aspect. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to improve the capacity of meteorological observation and the vulnerability to meteorological disasters by installing equipment for the meteorological observation system and early warning facilities as well as conducting the necessary technical cooperation to operate and maintain the equipment. The purpose of the project is highly consistent with the development strategy and environment sector plan of Samoa, which has aimed to improve resilience to climate change and measures to meteorological disasters and the development needs of Samoa, which has been frequently damaged by natural disaster, as well as Japan's aid policy. The targets, enabling upper air continuous observation and the required

weather observation for airport authority, were achieved by implementing the project. A system to transmit and receive the data needed to analyze the meteorological forecast was established and meteorological prediction was made possible based on the accurate information. Accordingly, the provision of weather information, including the movement of cyclones, storm areas and rainfall as well as disaster surge warnings issued, which were not available before implementing the project, have contributed to agricultural activities for the people as well as the Samoan tourist industry. Therefore, the effectiveness and impact of this project are high. Though the project cost was within the plan, the project period exceeded the plan due to changes in the technical cooperation period, the impact of a cyclone and applying the new scheme to provide technical cooperation. Consequently, the efficiency of the project is fair. Although the operation and maintenance of equipment provided by the project is in good condition, some minor institutional, technical and financial problems were confirmed, therefore the sustainability of the project can be judged to be fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

・Use of simple words for weather information

Technical cooperation implemented the start of a “Weather Forecast Program on TV using weather symbol and animation graphics”, which widened public understanding of weather information. However, voices from related authorities and residents persists about providing the information using easier terminology, given the jargon still used for a part of weather information. SMD must engage in further consideration to comment on weather information in understandable language.

・Securing budget for supplies and replacement parts

By the time of ex-post evaluation, the supplies and replacement parts necessary for the equipment had been provided from stocks procured at the time of project completion. However, four years have now elapsed since that time and the remaining spare parts in stock are scarce, hence SMD needs to procure additional supplies and replacement parts in the near future. SMD requires to immediately make a procurement plan for stocks from the following year onward and must submit a budget to MNRE and the Ministry of Finance showcasing its importance, reflecting the need to import all spare parts except batteries, consider budget limitation and avoid system outages due to a lack of spare parts.

・Securing human resources

SMD only has two technical staff members to analyze weather data, which hinders

efforts to ensure an appropriate number of briefings and form a rapid response team at the airport. The SMD staff members work in three shifts and more technical staff members with knowledge and experiences are required. Accordingly, SMD needs a prompt plan with appropriate recruiting activities to increase the number of staff members.

4.2.2 Recommendations to JICA

SMD had JICA volunteers with technical knowledge and experience of IT at the time of ex-post evaluation and covered the capacity and human resource shortage necessary for regular business. The SMD staff members have limited abilities in terms of the quality and quantity of IT and communication techniques, for which ongoing technical training would be required. JICA is expected to be aware of SMD's needs and help maintain and boost the capacities of SMD staff members by continuously dispatching volunteers as required.

4.3 Lessons Learned

・Flexible business activities by effectively utilizing external factors

Samoa was attacked by massive cyclone during the project, damaging equipment provided under this project. Technical cooperation with installed equipment were also delayed due to the need to restore such equipment, based on which project activities have been temporarily suspended. Meanwhile, required repair works of the equipment were conducted under the guidance of experts to the staffs of executing agency. Consequently, that period was utilized for on-the-job staff training, which has improved the capacity of staff members to executing agency. This is good practice that helped improve staff capacity through flexible responses and activities; considering effectiveness and sustainability, even under unexpected circumstances.

Tuvalu

FY2016 Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for Improvement of Education Facilities at Motufoua Secondary School"

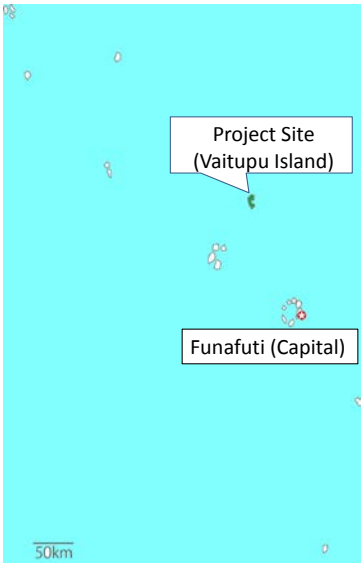
External Evaluator: Keisuke Nishikawa, Japan Economic Research Institute Inc.

0. Summary

In this project, facilities were rehabilitated and upgraded and equipment was procured to improve the safe and adequate learning environment at Motufoua Secondary School (hereinafter referred to as 'MSS'), the only public secondary school in Tuvalu. The relevance of this project is high as it was consistent with the development plan and sector plan as well as the development needs of Tuvalu at the time of both planning and ex-post evaluation in terms of Tuvalu's education policy, a plan which aims to achieve high-quality education, and the importance of secondary education, and as it was consistent with Japan's ODA policy at the time of planning. As for the implementation of the project, it was judged that the project cost exceeded the plan in reality since the actual project cost was almost the same as the plan while the project components contracted from the original plan. Also, the project period significantly exceeded the plan. Therefore, the efficiency is low. With regard to project effects, while the target including the number of students per classroom was achieved, the improved capacity of student dormitories and the better efficiency in operation of school affairs were not achieved as the student dormitories and the administration building were not constructed. Regarding the impact, it is considered that a certain degree of positive impact was generated as the students became able to concentrate on their studies and had profound understandings of their class contents, although little improvement in test results was observed. Therefore, the effectiveness and impact of this project are fair. It was confirmed that there were no institutional issues in operation and maintenance and that they had the technical capacity to conduct routine maintenance. No financial problems were found as a certain level of the operation and maintenance budget had been allocated, and the facilities and equipment developed in this project were in good condition as a whole. Therefore, sustainability is judged to be high.

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

1. Project Description



Project Location (Vaitupu Island)[1]

General classroom building constructed in this project

1.1 Background

MSS is the only public secondary school and is a full boarding school, providing four-year education to pupils who have completed an eight-year primary education and who have passed the national examination. However, at the time of planning of this project, usable facilities had decreased due to a fire incident and dilapidation, forcing MSS to operate the school using temporary classrooms and buildings with safety concerns. In addition, no other education opportunities were provided to pupils who failed the examination after enrollment and left the school, causing an increase in the youths living in the society without having acquired any necessary skills for employment or social life. The Government of Tuvalu recognized the need to provide new education opportunities to this increasing number of out-of-school children as an urgent issue and started to introduce Technical Vocational Education and Training (hereinafter referred to as 'TVET') at MSS. However, the facilities of MSS had much damage due to the harsh natural environment and were not offering sufficient functionality as education facilities. At that time, the school facilities had a risk of the main structure becoming compromised due to heavy damage to the edges of its eaves from strong winds. Student dormitories also had damage to their apertures (doors and windows) throughout the buildings; half of showers and toilets were not usable due to damage; and, security mesh fences were also damaged. In this way, the learning environment was not sufficient in terms of safety, sanitary, and functional aspects.

[1] Tuvalu consists of 9 island groups and all of the islands in the map are part of Tuvalu.

1.2 Project Outline

The objective of this project is to provide a safe and adequate learning environment through rehabilitating and upgrading the facilities and through procuring necessary equipment for Motufoua Secondary School, thereby contributing to the provision of higher-quality education.

E/N Grant Limit or G/A Grant Amount / Actual Grant Amount	692 million yen / 692 million yen
Exchange of Notes Date / Grant Agreement Date	August 2011 / August 2011
Executing Agency	Department of Education, Ministry of Education, Youth and Sports
Project Completion	March 2014
Main Contractors	(Construction) Kitano Construction Corp. (Equipment) Ogawa Seiki Co., Ltd.
Main Consultants	Joint Venture of Matsuda Consultants International Co., Ltd. and INTEM Consulting, Inc.
Basic Design	January 2010 – February 2011
Related Projects	[Grant Aid] Upgrading and Expansion of Educational Facilities at Motufoua Secondary School (1996) [Other International and Aid Organizations] EU: Outer Island Social Development Support Program (1997-2007) UNESCO : Support for connection to the Internet at the Motufoua Secondary School (2006) Taiwan: Provision of computers to the Motufoua Secondary School (2008), Development of PC Laboratory at the Motufoua Secondary School and Support for Farm Development (2010) Italy: Solar Power Generation Network Integration Project (introduced a solar power generation system into the Motufoua Secondary School) (completed in 2010)

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: August, 2016 – October, 2017

Duration of the Field Study: October 25 – November 1, 2016, and March 14 – 16, 2017

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

3.1 Relevance (Rating:③[3])

3.1.1 Consistency with the Development Plan of Tuvalu

In the development plan of Tuvalu, 'National Strategy for Sustainable Development: Te Kakeega II' (2005-2015), effective at the time of planning of this project, 'Education and Human Resource Development' was one of the strategic areas. Also, in 2006, 'Tuvalu Education Strategic Plan 2006-2010' was formulated with a plan to engage in education reform which would provide quality education. In the plan, strengthening of TVET and the improvement of the environments of education facilities was positioned as an urgent issue in relation to high school level education.

The 'National Strategy for Sustainable Development: Te Kakeega III' (2016-2020), the national development plan effective at the time of ex-post evaluation, has 'Education and Human Resources' as one of its 12 strategic areas, with a focus on providing high-quality education. Additionally, in the education sector, 'Tuvalu Education Sector Plan III' (2016-2020) was formulated, having an area of focus on the importance of securing access to education and continuous maintenance of infrastructure at MSS.

Therefore, the importance of education was indicated in the national development plan both at the time of planning and ex-post evaluation. In the plans of the education sector, the importance of access to education and the maintenance of MSS are described, showing that this project, which developed the facilities of Tuvalu's only public secondary school, was in line with these policy directions.

3.1.2 Consistency with the Development Needs of Tuvalu

At the time of planning, MSS was Tuvalu's only public educational institute providing four-year education to pupils who passed the national examination upon completing their

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

[3] ③: High, ②: Fair, ①: Low

eight-year primary education. However, MSS was not adequate as an educational facility in terms of safety, sanitation, and functions since the facilities had a fire, had become dilapidated, and were damaged by the harsh natural environment in its location along the coast. In addition, the TVET courses, established in 2009 had to be operated with two separate grades of students studying together while using temporary buildings due to the shortage of facilities.

MSS at the time of ex-post evaluation was the only public secondary school[4] with four courses which included science, commerce, literature and technology, targeting students from Year 9 to Year 13[5]. The school also had TVET separately, which was operated as a preparatory course for enrollment into a degree program at Fiji National University. The Certificate Level 4 (CERT IV) Education (a level which qualifies pupils for entry into an undergraduate diploma program) was provided under three programs including Carpentry and Joinery, Fabrication and Welding, and Horticulture.

The number of students taking and passing national examinations and the number of students at MSS during the period from project planning to ex-post evaluation (2011-2016) are shown in Tables 1 and 2.

Table 1: Number of Students Taking and Passing National Examinations and Enrolled at MSS

	2011	2012	2013	2014	2015	2016
Number of Students taking the National Examination	283	250	239	235	181	189
Number of Students passing the National Examination	152	174	146	148	147	149
Number of Students enrolled at MSS	114	126	125	100	106	0

Source: Data provided by the Executing Agency

[4] There was a private secondary school (Fetuvalu High School) operated by a church in the capital of Funafuti, but the only public school was MSS.

[5] Education for Year 13 was added in 2015 with a view to going on to universities outside the country. As the small satellite campus of the University of the South Pacific (headquartered in Fiji) is the only higher education institute in Tuvalu, fully-fledged degree programs are generally taken outside the country.

Table 2: Number of Students at MSS

	2011		2012		2013		2014		2015		2016	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Year 9	46	68	56	70	58	67	48	52	39	67	0	0
Year 10	40	78	44	72	46	66	65	62	52	60	48	73
Year 11	41	73	25	57	41	72	33	56	36	55	48	47
Year 12	60	70	37	75	33	64	44	67	29	62	31	45
Year 13	0	0	0	0	0	0	0	0	8	20	13	30
TVET	18	8	24	22	10	15	0	0	17	20	12	9
Total	205	297	186	296	188	284	190	237	181	284	152	204

Source: Data provided by MSS

In recent years, except for 2016, more than two-thirds of the students who passed the national examination moved on to MSS[6], indicating that the school had been an important education facility for a total of 400 – 500 students.

Therefore, MSS had played a significantly important role in providing access to education as the only public secondary school in Tuvalu both at the time of planning and ex-post evaluation. Moreover, it had also played an important role not only in providing secondary education but also through TVET and as a bridge to tertiary education outside the country as such tertiary education couldn't be received inside Tuvalu.

3.1.3 Consistency with Japan's ODA Policy

Japan set 'Overcoming Vulnerabilities and Promoting Human Security' as one of the key assistance areas at the 5th Pacific Islands Leaders Meeting[7] held in 2009, and indicated 'the improvement of educational infrastructure in isolated islands and rural areas' as a concrete action plan. Assistance through this project was consistent with this assistance policy.

In response to this regional policy, the assistance policy for Tuvalu at the time of its planning had four priority areas, one of which was the 'Improvement of Social Services' (assistance for the improvement of water and sanitation, education, and health).

Therefore, this project was consistent with these policy directions of Japan.

[6] The reason for the number of Year 9 students in 2016 being zero is that a decision was made by the Parliament to suspend the admission of Year 9 students to MSS in response to the occurrence of a fatal incident involving a Year 9 student in a student dormitory in 2014 (the same measure has been taken for the year 2017). Furthermore, the 'Tuvalu Education Sector Plan III' (2016-2020) lays out a policy to have Year 9 and Year 10 students be hosted at local primary schools. It implies that the total number of students will be smaller to a certain degree in the future. However, the needs for MSS as the only public secondary school continue to be high.

[7] A summit-level meeting held every three years since 1997 to establish closer cooperative relationships and to enhance ties between Japan and Pacific island nations through exchanging opinions at the leadership level regarding various issues both the Pacific island countries and the region have been facing

It was confirmed that this project was consistent with the development and sector plans as well as the development needs of Tuvalu at the time of planning and ex-post evaluation and with Japan's ODA policy at the time of planning.

Therefore, the relevance of this project is high.

3.2 Efficiency (Rating:①)

3.2.1 Project Outputs

In this project, it was planned that a) general classrooms and student dormitories would be newly constructed, b) general classrooms, special classrooms, student dormitories, and so forth would be rehabilitated, and c) educational and administrative equipment would be procured. Table 3 summarizes planned and actual outputs captured at the time of ex-post evaluation.

Table 3: Planned and Actual Outputs of this Project

		Plan		Actual	
		Facility contents	Area size	Facility contents	Area size
New construction	General classroom block 1	8 classrooms + 2 preparation rooms	664.3m^2	8 classrooms + 2 preparation rooms	664.3m^2
	General classroom block 2	4 classrooms	299.5m^2	4 classrooms	299.5m^2
	Boys dormitory 1	50 students x 2 rooms	468.0 m^2	Cancelled	—
	Boys dormitory 2	50 students + bathroom area, etc.	412.2m^2	50 students + bathroom area, etc.	412.2m^2
	Girls dormitory 1	50 students x 2 rooms	468.0 m^2	Cancelled	—
	Girls dormitory 2	50 students + bathroom area, etc.	412.2m^2	50 students + bathroom area, etc.	412.2m^2
	Administration Block	Principal / Deputy Principal's room, Teachers' room, Printing room, First-aid room, etc.	276.5m^2	Cancelled	—
		Total	3,000.7m^2	Total	1,788.24m^2
Rehabilitation	General classroom block	8 classrooms + 4 preparation rooms	699.8m^2	8 classrooms + 4 preparation rooms	699.8m^2
	Special classroom block	6 classrooms + 3 preparation rooms	648.0m^2	6 classrooms + 3 preparation rooms	648.0m^2
	Boys dormitory	54 students x 3 rooms + ablution area, etc.	715.6m^2	54 students x 3 rooms + ablution area, etc.	715.6m^2
	Girls dormitory	54 students x 3 rooms + bathroom area, etc.	813.6m^2	54 students x 3 rooms + bathroom area, etc.	813.6m^2
	Dining hall & kitchen	Dining hall, Kitchen, Storage	622.1m^2	Dining hall, Kitchen, Storage	622.1m^2
	Water reservoir facilities for dormitories	Buried reservoir tank + Elevated tank	—	Buried reservoir tank + Elevated tank	—
	Total		3,535.1m^2	Total	3,535.1m^2

Equipment	Educational equipment, Administrative equipment, Furniture, etc. (102 items in total)	Educational equipment, Administrative equipment, Medical equipment, etc. (92 items in total)

Source: Information provided by JICA

Rehabilitated Special Classroom Block

Rehabilitated Cooking Practice Room

Major changes in outputs were the cancellations of one boys' dormitory, one girls' dormitory, and the administration block. As a consequence of these cancellations, furniture and other items for the new administration block were also excluded from the project scope. Tender cancellation and tender failures occurred as the project cost calculated was not sufficient for the contractor, resulting in the scaling-down of the project scope.

At the time of the site visit during the ex-post evaluation, effects from the cancellation of these facilities were checked, as shown in the following paragraph.

With regard to student dormitories, the dormitory blocks constructed in the early 1980s were still being used as they were when originally constructed, but concerns were felt for the safety of students as there were cracks on the walls and as doors and windows were also damaged. Similarly, as for the administration block, the existing Information Center accommodating the principal's room, the library, and so forth were still being used as they were before, so there was no space where all teachers could meet each other. Teachers of each subject were generally using the preparation rooms in classroom buildings as their offices.

Therefore, part of the outputs planned in this project had not been achieved, showing that expansion and substitution of necessary functions were not fully realized.

Girls' Dormitory Newly Constructed

Girls' Dormitory Unimproved

In this project, in addition to cooperation components from Japan, it was planned that Tuvalu would obtain permits and approvals necessary for project implementation and would implement site preparation works, cleaning and sludge removal from the existing sceptic tanks, development of temporary facilities necessary for school operation during the construction period, securing of electricity supply into the buildings to be expanded, provision of temporary facilities for construction, and so forth. According to the Executing Agency and the project consultant, all of these components were implemented during the project implementation period.

3.2.2 Project Inputs

3.2.2.1 Project Cost

This project was planned at a total cost of 696 million yen, including Japan's cooperation amount of 692 million yen.

The actual amount contributed by Japan was a total of 690 million yen consisting of 579 million yen for construction, 10 million yen for equipment, and 101 million yen for design and supervision. As the amount of contribution from Tuvalu was unknown, only the amounts of contribution from Japan were compared. While the actual amount of contribution from Japan was apparently within the plan, it was the amount after the cancellations of Boys' Dormitory 1, Girls' Dormitory 1 and the Administration Block. In the evaluation judgement, the actual amount was required to be estimated with the assumption that these facilities were actually constructed and the associated equipment was procured. While the actual amount detailing each facility and piece of equipment was unknown, it was estimated, judging from the cost breakdown in the plan, that the construction and procurement of facilities and equipment practically exceeded the plan by almost 200 million yen.

Therefore, the actual amount of cooperation from Japan was as planned at 100% of the plan; however, it did not match the reduced outputs.

3.2.2.2 Project Period

The planned implementation period of this project was a total of 18.5 months, including 3.5 months for detailed designing, 2.5 months for inviting tenders, and 12.5 months for construction and procurement.

In the initial plan, it was estimated that 2.5 months would be needed from the opening of tender to the signing of contracts, but a tender cancellation occurred once due to the withdrawal of a prospective bidder and a tender failure occurred twice as the bidding prices were higher than the planned prices. Eventually, 13 months were required for the contractor to be selected and the contract to be signed after the third opening of the tender. As a primary consequence of this factor, the actual period of the signing of the grant agreement till the completion of construction and procurement was 32 months between August 2011 and March 2014, exceeding the plan substantially by 73%.

In light of the above, efficiency is low as the project cost practically exceeded the plan and the project period significantly exceeded the plan.

3.3 Effectiveness[8] (Rating:②)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of planning of this project, the operation indicators of this project were expected to be the number of students per classroom with permanent structure[9], the percentage of students who could stay in the dormitories with permanent structure, and the percentage of students receiving education until their final year.

[8] Sub-rating for Effectiveness is to be put with consideration of Impact.
[9] Indicating the facilities with solid structure constructed in the previous project 'Upgrading and Expansion of Educational Facilities at Motufoua Secondary School (1996)' and this project.

Table 4: Operation Indicators of this Project

	Baseline	Target	Actual			
	2010	2017	2014	2015	2016	2017
	Planned Year	3 Years After Completion	Completion Year	1 Year After Completion	2 Years After Completion	3 Years After Completion
Number of students per classroom with permanent structure*	55	28	25	25	25	25
Percentage of students who could stay in the dormitories with permanent structure	50%	100%	71%	66%	88%	No data
Percentage of students receiving education until their final year	76%	100%	100%	100%	100%	100%

Source: Data provided by JICA and the Executing Agency

* The number of students per classroom indicates the maximum number of students taking the same class.

Regarding the number of students per classroom with permanent structure, it was confirmed that the target figure had been well achieved immediately following project completion as the number of classrooms increased through this project and a sufficient number of classrooms were available. Also, the 'Percentage of students receiving education until their final year', an indicator to show the percentage of students who could take classes in the classrooms with permanent structure until their final year, was an indication of the physical capacities of classrooms. The target of this indicator had also been achieved immediately following project completion[10].

On the other hand, as for student dormitories, one building for boys and one for girls were not built and the old student dormitories continued to be used. The capacities (i.e., the number of beds) of each dormitory building and the number of students were as follows.

[10] The percentages of students reaching their final year based on the student populations were 72% (2015) and 56% (2016) due to various reasons, such as a lack of academic achievement, suspension, expulsion and so forth.

Table 5: Number of Students in Dormitories

Name of Student Dormitory			Bed capacity	2014	2015	2016
Boys' Dormitory	Naisali	New	50	37	24	26
	Ionatana	Previous	20	30	20	21
	Taui	Previous	20	29	16	20
	Jiro	Previous	18	30	16	21
	Toomu	Old	16	33	23	19
	Toalipi	Old	24	30	20	20
	7th Former Hostel	Old	20	0	25	24
	Total		168	189	144	151
	Percentage of Students in Facilities with Permanent Structure		—	67%	53%	58%
Girls' Dormitory	Toalipi	New	50	35	41	24
	Ionatana	Previous	44	43	48	29
	Taui	Previous	50	36	51	28
	Jiro	Previous	50	48	57	28
	7th Former Hostel	Old	34	0	32	26
	Toomu	Old	26	34	42	26
	Naisali	Old	30	41	44	30
	Total		284	237	315	191
	Percentage of Students in Facilities with Permanent Structure		—	68%	63%	57%

Source: Data provided by MSS

Note: `Previous' means the dormitories constructed in the Grant Aid project 'Upgrading and Expansion of Educational Facilities at Motufoua Secondary School', implemented in 1996, which were rehabilitated in this project.

The percentage of students who could stay in the dormitories with permanent structure was between 66% and 88%, calculated based on the information provided by the Executing Agency. However, based on the actual number of students per dormitory obtained, the percentage of students staying in the dormitories constructed and rehabilitated in the previous project and in this project turned out to be 53% - 68%. It was observed that the old student dormitories needed to be continually used as it had been difficult to accommodate all students in the dormitories constructed in this project and the previous one even if all students were meant to stay in these dormitories.

3.3.2 Qualitative Effects (Other Effects)

At the time of planning of this project, the qualitative effects expected through project implementation indicated that an adequate facility environment for teachers to do routine work and have meetings would be developed, improving their ability in the operation of school affairs, and that effective teaching in line with the curriculum would be enabled in classes.

With regard to improvements in operations of school affairs, teachers' work and meetings had both been conducted in existing buildings, such as each preparation room and the

Information Center, as the administration block was not built in this project. In other words, it can be said that an environment where teachers could always gather together had not been developed and there were still issues in terms of school operations. Concerning the realization of effective teaching in classes, however, many comments were heard from the principal and other teachers stating that they had observed substantial improvements in the contents and practicality taught in classes, such as those seen through demonstrations by teachers, the possibility of efficient implementation of cooking practice, and the greater ease of drawing figures and producing works of art in technology classes, as the equipment, especially the cooking and technology equipment, had been renewed along with the improvement of facilities. Therefore, it is considered that effective operation of classes has become possible as the development of facilities and equipment has enabled the contents to be materialized into the curriculum, such as practical lessons and demonstrations.

3.4 Impacts

3.4.1 Intended Impacts

In addition to the qualitative effects described above, the following impacts were expected through implementing this project.

(1) As a result of effective classroom teaching, better-quality education would be provided.
(2) Provision of superior education would lead to the improvement in students' learning outcomes.

These impacts were checked in conjunction with teachers, staff, and students of MSS in the ex-post evaluation, and it was heard that the following effects had been generated.

- Students could concentrate on their studies as the desks, chairs, ceiling fans, ventilation, and lighting in the new classrooms had improved.
- Understandings gained by students had become deeper as the facilities and equipment were developed and practical lessons became easier.
- Driving rain used to leak into classrooms during rough weather, causing classes to be cancelled. However, such cancellations of classes had been eliminated, and it had become possible for all students staying in dormitories to do self-studying in the classrooms at night (as there were no study desks in dormitories, students in lower grades had to study on their own beds before the implementation of this project).
- As a sufficient number of desks and chairs were provided, all students became able to be seated during classes.

- Since fans were installed and the ventilation environment improved significantly, students could concentrate on their studies.
- With the improvement of blackboards and notice boards, more information could be written down and displayed.

As above, feedback from both teachers and students were obtained, stating that the degree of concentration and understanding gained by students had risen through continuous teaching in classes regardless of the weather and through practical teaching with better facilities and equipment. It can be said that a certain degree of effects had been generated.

A check was conducted as to whether learning outcomes had actually improved as a result of these improvements to the learning environment. As shown in Table 6, quantitative improvements were not observed in particular. As the exam takers and exam questions were different in any given year, it was difficult to verify causal relationships.

Table 6: Results of Examinations at the End of Each Year

	2013	2014	2015	2016
Year 10	31%	44%	36%	28%
Year 11	51%	48%	84%	47%
Year 12	67%	76%	61%	65%

Source: Data provided by the Executing Agency
Note: The percentage of students scoring pass marks in all subjects is indicated.

3.4.2 Other Positive and Negative Impacts

3.4.2.1 Impacts on the Natural Environment

In Tuvalu, the Environment Protection Regulations had been set forth under the Environmental Protection Act, and it was required to conduct an Environmental Impact Assessment prior to project implementation. As this project was designed to construct and rehabilitate the facilities within the existing school premises, no particular negative impacts were expected. Therefore, a fully-fledged Environmental Impact Assessment was not necessary and a submission of a Preliminary Environmental Assessment Report was expected instead. In addition, in approving the project plan, it was necessary to reach an agreement with the Council of Vaitupu Island (called Kaupule), where MSS is located, regarding the extraction of aggregate (i.e., corals and sand), the cutting of trees, the disposing of wastes, and so forth.

Furthermore, the following measures were to be taken during the construction to avoid negative impacts on the natural environment:

- Construction waste generated at the project site was to be minimized by bringing in prefabricated materials and components.
- Existing facilities were to be utilized to the extent possible as temporary facilities.
- Use of concrete was to be limited so as not to require excavation of large amounts of aggregate in Vaitupu.
- Rainwater collection systems were to be rebuilt to conserve underground water.
- Wastewater was to be discharged into the ground through a septic tank and a soakage pit in accordance with the standards of the Public Works Department of the Ministry of Works and Energy.

These procedures and measures were checked in the ex-post evaluation study, which found that while the Preliminary Environmental Assessment Report had not been submitted as an independent report, a project proposal including the descriptions on environmental impacts had been submitted to the Development Coordinating Committee of the Government of Tuvalu and its contents had been discussed. Also, an approval of the environmental measures to be taken in association with this project had been obtained from the Council of Vaitupu Island and all necessary measures were subsequently taken.

As all measures to prevent negative environmental impacts were taken and no particular impacts were found during and after project implementation, it is considered that there were no problems in terms of the environmental aspect as a whole.

3.4.2.2 Land Acquisition and Resettlement

Interviews with the principal of MSS and the project consultant were conducted during the ex-post evaluation and confirmed that this project was implemented within the existing school premises and that no resettlement or land acquisition occurred.

Regarding the quantitative effects of this project, as the classrooms with permanent structure increased, both the number of students per classroom and the percentage of students who could study in those classrooms until their final year rose, achieving the target value set at the time of planning. However, the cancellations of constructing student dormitories (boys and girls: one for each) and the administration block resulted in the shortage of bed capacities of student dormitories with permanent structure, and no major improvements were observed in school operation by the teachers and other staff members.

As for the impact, while no improvements in exam results were seen in particular, a certain level of positive impacts were considered to have been generated as it was heard from teachers and students that students had become able to concentrate on their studies and had gained a

better understanding of the contents taught in classes. In addition, no particular negative impacts on the natural environment and on social aspects were observed.

In light of the above, this project has achieved its objectives to some extent. Therefore, the effectiveness and impact of the project are fair.

3.5 Sustainability (Rating:③)

3.5.1 Institutional Aspects of Operation and Maintenance

The Executing Agency of this project was the Department of Education of the Ministry of Education, Youth and Sports, which is the organization supervising MSS. The Department had 10 staff members comprised of school supervisors, training officers, and others, all of whom are operating under the Director of Education.

Routine maintenance of facilities and equipment was undertaken by MSS under the direction of the Department of Education School Supervisor and the principal. There was a maintenance team (seven members in total: three carpenters, two plumbers, one waterman, and one driver) formed directly under the principal as an internal organization. Maintenance of the equipment in the technology department was undertaken by four teachers in the department, and large-scale repair, for example, the replacement of the roof in the traditional assembly hall (outside the project scope), within the premises was carried out with the participation of villagers of the island and students.

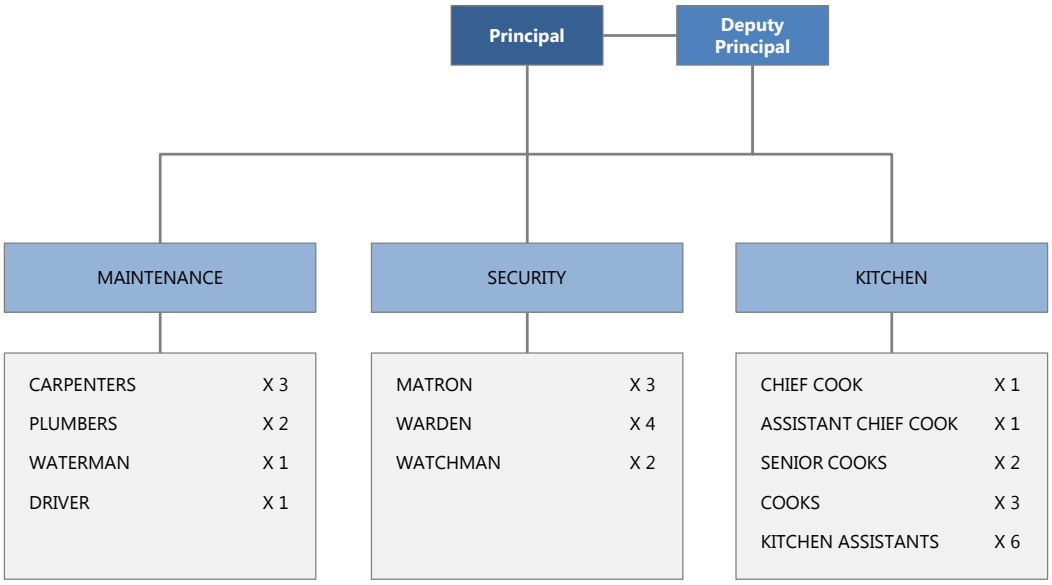


Figure 1: MSS Administrative Organization Chart (Support Division)

Source: Provided by MSS

There were no changes in the structure of operation and maintenance at MSS at the time

of planning and ex-post evaluation. The number of maintenance team members was seven including a driver, the number of which had remained the same.

The total number of teachers was 49, and among that number, there were 10 Fijian teachers who had joined through the Fiji Volunteer Services (FVS) since 2014. Some of the teachers were away[11] due to long-term training programs in Fiji and New Zealand, but MSS responded to such vacancies by hiring temporary staff members within the country. Volunteer teachers from FVS were also with MSS and no particular manpower shortage was observed at the time of ex-post evaluation.

Therefore, there were no particular problems seen in terms of the institutional aspects of operation and maintenance.

3.5.2 Technical Aspects of Operation and Maintenance

According to the principal at MSS, while the maintenance team had the ability to carry out basic maintenance work on the facilities and equipment at the school, they could not repair some equipment, such as photocopiers, computers, refrigerators and so forth. When considering the cost for transportation and repair, it was not necessarily efficient to do the repair. Therefore, whether to do the repair required consideration from not only technical aspects but also financial aspects. However, no lack of skills for the maintenance of facilities was found and it was assumed that the contents and methods for maintenance training instructed to MSS staff by the contractor of this project at the time of project completion were sufficient. When there were any troubles with the electricity system, the maintenance team could get prompt support from Tuvalu Electricity Corporation and it was heard that the electricity supply had become significantly stable compared to that of several years ago.

Regarding the training for maintenance, training programs on electricity and electronics, supported by Fiji National University, and on carpentry, through the support of Taiwan, had been implemented in recent years, but there were neither regular nor systematic training programs. Also, it was heard that there was no maintenance manual in particular. However, as there was no frequent turnover of the staff on the maintenance team, maintenance work had been carried out based on the long-term experience of each staff member.

Therefore, while the training system to improve technical skills of the maintenance team had not been established, the skills of MSS on maintenance of facilities and equipment were considered to be largely sufficient.

[11] At the time of ex-post evaluation, 11 teachers were away from MSS for one to three years to obtain academic degrees in either Fiji or New Zealand. Their scholarships were provided by either the Government of Tuvalu or that of New Zealand.

3.5.3 Financial Aspects of Operation and Maintenance

In Tuvalu, approximately 20% of the national budget has been allocated to the Ministry of Education in recent years to date, and 10 - 20% of the Ministry budget is allocated to MSS.

Table 7: Budget and Expenditure of MSS

(Unit: thousand Australian dollars)

	2011	2012	2013	2014		2015		2016	
	Budget	Budget	Budget	Budget	Expenditure	Budget	Expenditure	Budget	Expenditure
Salary	823	823	836	1,043	1,043	1,009	1,009	1,099	1,099
Travel and Communications	14	14	14	14	26	11	11	15	19
Maintenance	30	25	35	35	25	35	32	36	57
Electricity	21	20	20	20	14	20	17	20	16
Fuel	1	1	2	5	5	5	5	5	3
Food	400	400	400	400	378	460	405	460	342
Other	60	60	60	60	60	60	60	60	60
Total	1,349	1,344	1,368	1,577	1,551	1,600	1,539	1,695	1,596

Source: Data provided by the Executing Agency

Note 1: 1 Australian dollar = 81.7 yen (2016 average, based on the JICA Foreign Currency Conversion Rate Table)

Note 2: Individual figures and total figures may not necessarily correspond due to rounding.

While the largest item of the budget is the salary for teachers and the staff, expenditures on food for students (fully subsidized by the government) comprises 20 – 30% of the entire budget. The amount of budget for maintenance has been approximately 35,000 Australian dollars every year and it seems sufficient for conducting routine maintenance. The maintenance status also indicates that there are no particular issues to be observed. While the budget is broken down to show expense items, it can be accommodated for the necessity of each item at the principal's discretion, as seen in 2016 when the amount of maintenance expenses necessarily exceeded the initial budget.

Therefore, no concerns were seen in terms of the financial aspect of operation and maintenance.

3.5.4 Current Status of Operation and Maintenance

The maintenance work at MSS, including the facilities and equipment developed in this project, was mainly undertaken by doing repairs based on the damage records reported by teachers and other staff members. It was confirmed that the maintenance team had been checking the points concerned within the school every day and that the classroom blocks and

dormitories developed in this project had been cleaned by students every day and kept in clean conditions. Inside the school campus including the courtyard was also kept in good condition.

MSS Campus

With respect to the status of the facilities developed, it was confirmed that some measures had been taken, such as non-metal materials for the frames of louver windows being used to prevent chloride damage as MSS is located along the coast. On the other hand, as the joint sections of water faucets in the wash basins of boys' and girls' dormitories were made of plastic, it was difficult to tighten them again after the faucets had become totally loose, and the ex-post evaluation found that most of them had been taken apart. Prompt repairs were considered necessary.

As for the equipment procured in this project, one refrigerator was out of order due to trouble with the compressor. In addition, a switch on an electric circular saw and a belt on a thicknesser needed to be replaced. However, it was heard that a long time was required to procure parts due to the locational factor, that is, being an outer island of Tuvalu. It seemed that approximately two weeks would have been required if the parts could have been found in the capital of Funafuti, and three months, for example, if the part would have needed to be procured from another country.

The facilities developed in this project were generally cleaned and inspected on a routine basis and were maintained largely in good condition. While there were some issues in the maintenance condition of equipment, it was unavoidable that an unusually long time would have been required to procure spare parts under the condition of being an outer island, where there were no agents. Therefore, some of the equipment was not fully repaired. It seemed inevitable in this project, as a realistic matter, that some equipment couldn't be repaired from a cost-effectiveness viewpoint.

Overall, it was confirmed that there were no issues in the institutional aspects of operation and maintenance and that the school had the technical skills to undertake routine maintenance work. Financially, no problems were observed, as a certain level of operation and maintenance budget had been allocated. In terms of operation and maintenance status, it can be said that while some of the equipment was unusable, they were generally well maintained. Therefore, no major problems have been observed in the institutional, technical, and financial aspects and

current status of the operation and maintenance system. Therefore, the sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, facilities were rehabilitated and upgraded and equipment was procured to improve the safe and adequate learning environment at MSS, the only public secondary school in Tuvalu. The relevance of this project is high as it was consistent with the development plan and sector plan as well as the development needs of Tuvalu at the time of both planning and ex-post evaluation in terms of Tuvalu's education policy, a plan which aims to achieve high-quality education, and the importance of secondary education, and as it was consistent with Japan's ODA policy at the time of planning. As for the implementation of the project, it was judged that the project cost exceeded the plan in reality since the actual project cost was almost the same as the plan while the project components contracted from the original plan. Also, the project period significantly exceeded the plan. Therefore, the efficiency is low. With regard to project effects, while the target including the number of students per classroom was achieved, the improved capacity of student dormitories and the better efficiency in operation of school affairs were not achieved as the student dormitories and the administration building were not constructed. Regarding the impact, it is considered that a certain degree of positive impact was generated as the students became able to concentrate on their studies and had profound understandings of their class contents, although little improvement in test results was observed. Therefore, the effectiveness and impact of this project are fair. It was confirmed that there were no institutional issues in operation and maintenance and that they had the technical capacity to conduct routine maintenance. No financial problems were found as a certain level of the operation and maintenance budget had been allocated, and the facilities and equipment developed in this project were in good condition as a whole. Therefore, sustainability is judged to be high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

At MSS, while it was confirmed that the budget for routine maintenance had been allocated and could be flexibly used to some extent at the principal's discretion, maintenance expenses were expected to increase as the facilities and equipment gradually became decrepit. For this reason, it is considered important that a long-term maintenance plan be formulated, and that the Ministry of Education secure the budget for large-scale maintenance works

separately every few years.

In this project, the project scope was scaled down, and the boys' dormitory, the girls' dormitory and the administration block were not constructed. Due to this, some of the effects targeted in this project were not generated, particularly the safety of students staying in the dilapidated dormitories. Since there was a plan not to have Year 9 and Year 10 students at MSS, the number of students was expected to be smaller than the number estimated at the time of project planning. It would be desirable to allocate students into the dormitories developed in both this project and the previous project so that a safe living environment can be realized.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Examination of the components and cost of a project in an outer island of a small island nation

In this project, curtailment of the project scope and a substantial extension of the project period occurred mainly due to a discrepancy between the project cost estimated during the planning stage and the bidding price offered by the contractor. While the assistance to Tuvalu's only public secondary school is of great significance for the country's human resource development, there were constraints in securing materials, equipment, local contractors, and human resources as well as a lack of accessible transportation routes as the school is located on an outer island. Therefore, in a project implicating nationwide effects despite inherent difficulties in providing efficient assistance, such as in a project which was implemented in an outer island of a small island nation similar to this project, it is considered important to examine project components and costs more elaboratively than in other projects.

End

Republic of Fiji / Kingdom of Tonga / Republic of Vanuatu

FY2016 Ex-Post Evaluation of Technical Cooperation Project

"The Project for Strengthening the Need-Based In-Service Training for Community Health Nurses"

External Evaluators: Keisuke Nishikawa, Japan Economic Research Institute Inc.

0. Summary

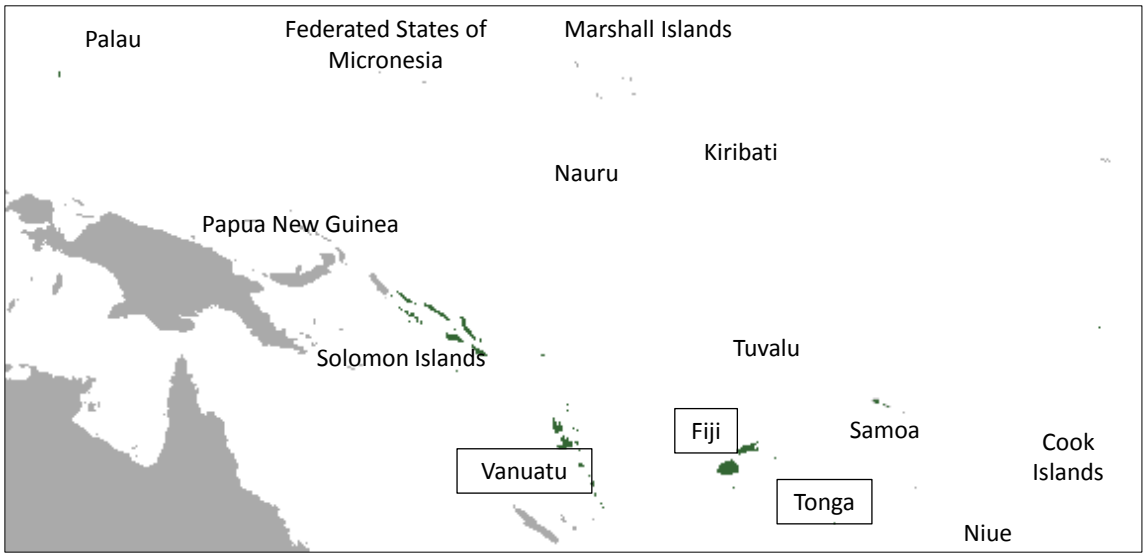
This project had the objective of improving capacities of nurses, who were key actors in community health services, by conducting competency assessments then supervision and coaching[1], (hereinafter referred to as 'S&C') and so forth based on the result of such assessment, as well as by establishing an implementation model of need-based in-service training[2] (hereinafter referred to as 'NB-IST'). The relevance of this project is high as this project was consistent with the directions of the development policies and needs of Fiji, Tonga, and Vanuatu set forth to improve the quality of health services and to develop human resources for health in each country, and as it was also consistent with Japan's priority areas for assistance to develop human resources in the field of health for the improvement of health services. The project purpose was judged to have been largely achieved as the implementation mechanism of NB-IST and S&C was strengthened in all three countries, although some issues were observed in terms of the sustainability and the further development after project completion (i.e., impact) as there were some insufficiencies in data development in Fiji and Tonga and as the S&C activities were not necessarily conducted to their completion in Vanuatu. Therefore, the effectiveness and impact are judged to be fair. The efficiency of the project is fair as the project cost exceeded the plan in spite of the project period being within the plan. Sustainability of the generated effects is judged to be fair as some countries had issues of either not having a sufficient promoting institutional mechanism and its techniques or securing a training budget.

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

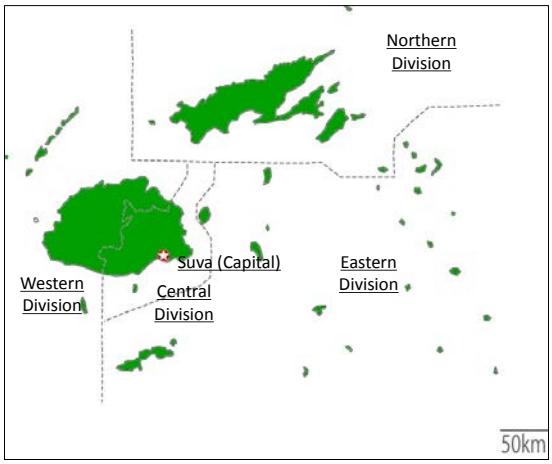
[1] In this report, 'supervision' refers to visits and instructions given by nursing supervisors to inexperienced in-service nurses in rural areas, and 'coaching' refers to a process in which supervisors incentivize nurses in their discussions to draw out the capabilities of nurses.

[2] A continuous series of training reflecting on-site needs so that community-based in-service nurses can provide high-quality nursing services in rural areas and outer islands where no hospitals are located. A more general training for in-service nurses, not reflecting on-site needs, is called 'in-service training' (IST).

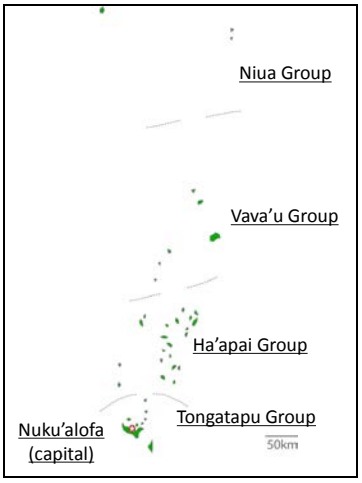
1. Project Description



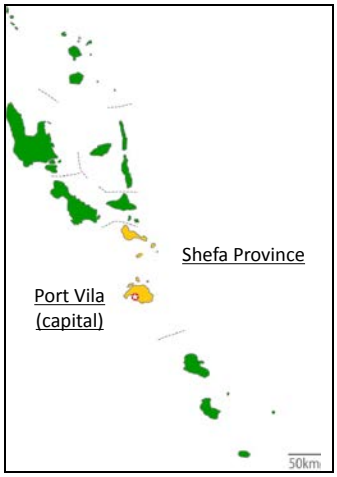
Locations of Fiji, Tonga, and Vanuatu in the Pacific Region



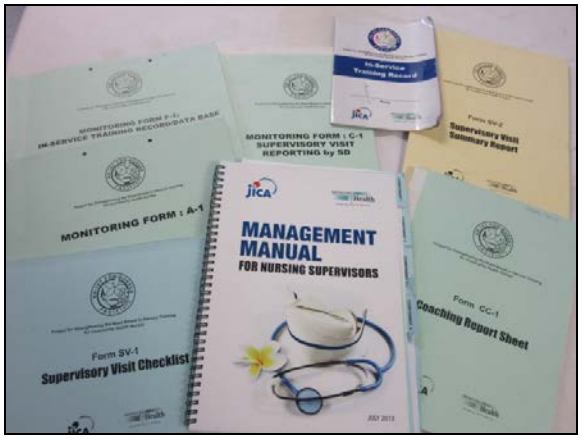
Project Location (Fiji: entire country)



Project Location (Tonga: entire country)



Project Location (Vanuatu: Shefa Province)



Manuals Developed through This Project (Fiji)

1.1 Background

While the strengthening of human resources for health (hereinafter referred to as 'HRH') in the Pacific region was recognized as an urgent issue to achieve the 'Millennium Development Goals', it was difficult to develop sufficient human resources due to budget constraints in addition to overseas migration of HRHs. Also, the abilities developed by medical specialists were relatively low compared to those in developed countries. In Fiji, the nursing staff was the main provider of community health services and it was essential to improve the abilities of community nurses to improve health indicators, but there were issues in terms of weaknesses in nursing supervisors' abilities to supervise medical professionals, including in-service nurses, and in the quality and quantity of continuous medical education that was supposed to be provided on the spot.

Japan implemented the technical cooperation project 'In-service Training of Community Health Nurses' in Fiji for three years from April 2005, in which a competency assessment of community health nurses and S&C based on the result of said assessment were conducted while an implementation model of NB-IST was established and piloted in the Central and Eastern Divisions of the country, and through which some degree of outcomes was produced.

After the project, a request for technical cooperation to disseminate the model nationwide was made by the Government of Fiji and 'The Project for Strengthening the Need-Based In-Service Training for Community Health Nurses', which targeted the Pacific region including Tonga and Vanuatu—having similar problems, was implemented for approximately three years from October 2010.

1.2 Project Outline

Fiji	Overall Goal		Quality of community health services improves in Fiji.
	Project Purpose		The mechanism of the NB-IST is strengthened.
	Outputs	Output 1	The NB-IST policy takes effect.
		Output 2	A nationally standardized Monitoring and Evaluation (M&E) system for the NB-IST is operated.
		Output 3	A management package for fostering nursing supervisors is developed.
		Output 4	Functions of IST Coordinators are strengthened at national and divisional levels.
		Output 5	The progress and results of the project are shared within, among and beyond Fiji, Tonga, and Vanuatu.

Tonga	Overall Goal		Quality of community health services improves in Tonga.
	Project Purpose		The mechanism of the NB-IST adopted into existing nursing supervision system is strengthened.
	Outputs	Output 1	Nursing supervision system is redefined to accommodate in the NB-IST mechanism.
		Output 2	M&E system of NB-IST mechanism is established in line with the newly defined nursing supervision system).
		Output 3	Nursing supervisors' abilities in assessing competency of nurses are improved.
		Output 4	Nursing supervisor's abilities in Coaching and NB-IST are improved.
		Output 5	The progress and results of the project are shared within, among and beyond Tonga, Fiji and Vanuatu.
Vanuatu	Overall Goal		The entire NB-IST system is designed and piloted in the pilot province with the prospect of expansion to other provinces.
	Project Purpose		A field-adjusted model of S&C for community health nurses is undertaken in the pilot province on a regular basis.
	Outputs	Output 1	The model of S&C piloting is designed and available.
		Output 2	Nursing supervisors in the pilot province are equipped with S&C skills.
		Output 3	S&C is being practiced by Nursing Supervisors on a routine basis in the pilot province.
		Output 4	The progress and results of the Project are shared within, among and beyond Vanuatu, Fiji and Tonga.
Total cost (Japanese side)			463 million yen
Period of Cooperation			[Fiji] October 2010 – February 2014 (extension period) November 2013 – February 2014 [Tonga] January 2011 – January 2014 [Vanuatu] March 2011 – February 2014
Implementing Agency			[Fiji] Ministry of Health Division of Nursing Services [Tonga] Ministry of Health Nursing Division (Community Health Nursing, Clinical Health Nursing, Queen Salote School of Nursing) [Vanuatu] Ministry of Health Human Resource Development and Training Unit, Vanuatu College of Nursing Education, Vanuatu Nursing Council, Shefa Provincial Health

Other Relevant Agencies / Organizations	None
Supporting Agency / Organization in Japan	Specified Nonprofit Corporation HANDS KRI International Corporation
Related Projects	[Technical Cooperation] (Fiji) 'In-service Training of Community Health Nurses' (2005 - 2008) * Follow-up Cooperation was implemented in FY2008 and FY2009

1.3 Outline of the Terminal Evaluation

In the Terminal Evaluation conducted from August – September 2013, the following judgement was made on the achievement statuses of Project Purpose and the Overall Goal, and recommendations, described in 1.3.3, were made.

1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

[Fiji]

Among the five indicators to measure the achievement level of Project Purpose, only the nursing supervisors' participation rate in management training was achieved and the subsequent achievement of indicators on the activities implementation rate were judged to be difficult under the conditions where the Ministry of Health could not secure necessary funding.

[Tonga]

As both of the indicators set to measure the achievement of Project Purpose were expected to reach 100% by project completion, Project Purpose was judged to have almost reached the planned level.

[Vanuatu]

While all the indicators set to measure the achievement of Project Purpose had reached their targets, financial and technical aspects for regular and continuous implementation of S&C were judged to have had some issues.

1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation

[Fiji]

At the time of terminal evaluation, it was considered difficult to estimate the achievement of Overall Goal at the indicator level. However, regarding the quality of services, some degree of improvement was expected as punctuality in work starting time, improvements in attitudes toward customers, and capacity improvements in the areas where

NB-IST was conducted had been reported.

[Tonga]

The Overall Goal was expected to be achieved by continuously implementing not only NB-IST but also activities such as coaching and so forth.

[Vanuatu]

The achievement of Overall Goal was not optimistically regarded. It was required for Shefa Provincial Health Office to continue to operate and improve the S&C pilot model and independently determine the issues to be tackled in short training programmes for nurses at local levels from the information obtained through S&C, then acquire the know-how and carry out NB-IST, including the procurement of funds and trainers.

1.3.3 Recommendations from the Terminal Evaluation

[Fiji]

To the Project Team	1. Ensure appropriate monitoring of the project by tracking all the pre-determined indicators. 2. Monitor and analyse the quality and usage of the data collected at the sub-divisional, divisional, and national levels. 3. Facilitate discussions on improvements necessary to address the gaps between M&E tools and skills. 4. Appropriately determine the reporting deadlines and activity frequencies related to the component activities of the NB-IST mechanism.
To the Implementing Agency	1. Consolidate ministry-wide efforts for improving management practice and capacity under one programme. 2. Continue capacity strengthening of agencies (the Nursing Council in particular) related to human resource development. 3. Continue efforts to regularise IST Coordinator positions under the structure. 4. Support capacity building of nursing managers at all levels of M&E 5. Integrate the IST Database into the Human Resource Information System.

[Tonga]

To the Project Team	・ Revisit and fine-tune the NB-IST mechanism and the IST Manual to ensure consistency of contents and quality between sections ・ Finalise the IST Manual, obtain an endorsement from the Ministry of Health and distribute copies to all individuals concerned. ・ Fine-tune the tools, such as formats for M&E to make them more useful and friendly for the users. At the same time, support the users of the

	M&E system, particularly those at the national level, to sufficiently understand the usefulness of the data and utilise them. .
To the Implementing Agency	1. To continue and further enhance practices of supportive supervision ・ (1) Devise feasible and realistic strategies by examining available resources necessary for capacity building activities, including NB-IST. (2) Proactively link up with and utilise donor-funded programmes in which nurses play significant roles. ・ Secure opportunities for checking and improving the capacity of nursing supervisors in order to ensure appropriate and meaningful application of the skills acquired. 2. To improve the quality of services ・ Develop another competency standard specific to different areas of nursing, including community health. ・ Revise the competency standards in appropriate timing and intervals to reflect the changes in health needs. ・ Keep training nursing supervisors and nurses to ensure meaningful competency assessment exercises.

[Vanuatu]

To the Project Team	1. Identify outcomes, issues, strengths and weaknesses of the S&C model piloted in Shefa Province. 2. Complete the S&C guidelines and related training to ensure that Shefa Provincial Health Manager has sufficient tools/skills required to implement S&C.
To the Implementing Agency	1. Appoint a relevant officer who supports the trials of the S&C model in Shefa Province that is to be sustained after the end of the project. 2. Clearly define the supervisory and managerial roles and responsibilities for supervision management and develop the Terms of References to effectively allow zone supervisors[3] to function in the pilot S&C model. 3. Ensure disbursement of the budget for S&C operations both at the central and provincial levels. 4. Facilitate capacity development of Vanuatu Nursing Council which plays an important role in ensuring quality of nursing.

[3] Shefa Province is divided into four areas (zones) and one nursing supervisor for each zone has been assigned.

2. Outline of the Evaluation Study

2.1 External Evaluators

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: August, 2016 – October, 2017

Duration of the Field Study: November 1-26, 2016, and March 4-22, 2017 (March 14-16 was spent for the field study of a different project)

2.3 Constraints during the Evaluation Study

The Project Design Matrix (PDM)[4] of the project to be evaluated was prepared separately for each of the three countries. While the contents are similar in that Outputs, Project Purpose and Overall Goal were set for every country, there were no clear targets commonly set for all three countries. Moreover, while regional cooperation encompassing the three countries was one of the Outputs, achievement of certain outcomes within the project scope was not set as a target. Therefore, the evaluation was basically conducted separately for each country in terms of evaluation judgement, meaning that this ex-post evaluation has some sections that don't necessarily evaluate all three countries as a whole. However, as this project was implemented as a single technical cooperation project, the situations of each country were captured first, and in the summary part of Effectiveness and Impact, the achievement levels of the three countries as a whole were judged based on the volume of Inputs of project experts as it was the element having the largest influence on the Input volume (amount)[5].

3. Results of the Evaluation (Overall Rating: C[6])

3.1 Relevance (Rating: ③[7])

3.1.1 Consistency with the Development Plan of Fiji, Tonga and Vanuatu

At the time of planning and completion of this project, the following policies were set forth on HRH development in the Pacific region and the target countries of this project.

[Common to three countries]

At the time of planning, among the five priority agendas put forward by the Pacific

[4] PDM is a matrix outlining the project, used in operating and managing the series of phases in the project cycle – planning, implementation and evaluation of a development aid project. It contains the Overall Goal, Project Purpose, Outputs, Activities and Inputs, etc.

[5] The actual inputs of the experts are described in '3.3.1 Inputs' under '3.3 Efficiency'.

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

[7] ③: High, ②: Fair, ①: Low

Human Resources for Health Alliance[8] (hereinafter referred to as 'PHRHA'), 'Strengthening of nursing services and nursing education' and 'Continuous Professional Education' were highlighted, and this project was consistent with these agendas.

Although the activities of PHRHA became inactive after the time of project planning, the need for HRH development in the Pacific remained high at the time of project completion. In the Pacific Health Ministers Meeting held in 2013, HRH development planning, cooperation among the countries in the region, and maintaining the momentum to set regional standards were set as the directions, indicating that this project was in line with the regional policy on HRH development both at the time of planning and completion.

[Fiji]

In the 'Ministry of Health Strategic Plan 2007-2011', effective at the time of planning, 'improvement in the quality of health services by increasing in-service training opportunities for HRH' was set forth as an important agenda item.

At the time of project completion, the 'Ministry of Health Strategic Plan 2011-2015' was the policy document with strategic objectives to improve the qualities of primary healthcare services and the medical services for communities provided by community health nurses, which also recognised the importance of continuous training of health staff to improve the quality of services. In this way, consistency with this project was confirmed.

[Tonga]

In the 'Eighth Strategic Development Plan 2006/07-2008/09' and the 'Ministry of Health Corporate Plan 2008/09-2011/12', used at the time of planning of this project, implementing primary healthcare and keeping infectious and communicable diseases under control, and preventing, controlling and treating lifestyle-related diseases were regarded as the issues to be tackled.

In the 'Tonga Strategic Development Framework 2011-2014' a policy effective at the time of project completion, 'providing quality, effective and sustainable health services' was one of the outcome objectives while its strategic objective was to provide effective treatment and preventative healthcare. Also in the health sector, the 'Ministry of Health Corporate Plan 2013/14-2015/16' had six priority areas, including service provision at community-level health facilities and strengthening of HRH and the health system. As this project was related to five areas, it can be said that the project maintained consistency with the policy aspects.

[Vanuatu]

At the time of project planning, Vanuatu set forth the health sector policy in the 'Priority

[8] A regional organization to formulate and implement the strategies on HRH development in the Pacific region

Action Agenda 2006-2015' to provide comprehensive health services and facilitate its structure of providing effective and equitable health services by strengthening the structure which decentralises power. As this Priority Action Agenda was a national plan covering 10 years, it was effective at the time of project completion, but it was revised in 2012. In the health area, key objectives were that all citizens would be able to receive the same kinds of health services and the quality of services provided would be improved and that adequate development and retention of HRH would also be an important agenda. As for the sector-level plan, the 'Health Sector Strategy 2010-2016' was formulated, which makes reference to the provision of more in-service education opportunities to improve the skills of nurses who were the key to providing better health services.

Based on the above, it was confirmed that this project was consistent with the directions of the development plans for each country, both at the time of planning and ex-post evaluation, to improve the quality of health services and develop HRH.

3.1.2 Consistency with the Development Needs of Fiji, Tonga and Vanuatu

At the time of planning and completion of this project, the following needs for HRH were put forward in the target area of this project.

According to JICA documents, as there were many skilled medical technicians migrating overseas in the target area of this project, particularly doctors, simple medical services were provided by nurses, alternative services were provided by nurse practitioners who had wider coverage of medical practices than nurses, and medical services were provided by medical assistants, all requiring an enhancement and strengthening of primary healthcare and medical services. However, improvement of skills through fostering community health nurses was not sufficient, and the nurses in outer islands and remote areas had few opportunities to receive training. The following issues were also becoming obvious in each country.

- Supervision of medical staff, including in-service nurses, by their supervisors was loose and the continuous medical education to be done through on-the-job training was lacking.
- More than a few medical staff members were providing services with minimal updating of their knowledge after graduating from school.
- The retention rate of inexperienced medical staff members was low, and one of the reasons raised was a lack of support, such as training and so forth.

Even at the time of project completion, there was still a situation existing in which remote areas and outer islands were facing a shortage of doctors and nurses, requiring community health nurses needing to multi-task, and in which sufficient in-service education was lacking. Also, the needs for the development of HRH as a whole still remained in the region as expressed at the Pacific Health Ministers Meeting in 2013 where the development of HRH

data, allocation of sufficient budget for human resource development, and providing of continuous professional education were needed.

In addition to these regional challenges, each country recognised the following needs at the time of planning and completion.

Table 1: Needs of Each Country on the Development of Human Resources for Health

	At the Time of Planning	At the Time of Completion
Fiji	・ While the in-service training mechanism is functioning in the Central and Eastern Divisions of the country, where the ‘In-service Training of Community Health Nurses’ was implemented between 2005 and 2008, sufficient verification of outcomes and the formulation of a national policy based on the result which is necessary to disseminate the model nationwide have not been carried out. ・ As there is no system developed to foster nursing supervisors, the next-generation group of nursing supervisors has hollowed out.	・ In the Nursing Act set in 2011, annual renewing of nursing licenses has become mandatory. The prerequisite includes 20 hours or more of in-service training every year. ・ The number of nurses was 1,811 in 2009, which needed to be increased as seen in the submission from the Ministry of Health to the Government stating that an additional 1,510 nurses needed to be hired between 2010 and 2018.
Tonga	・ There is frequent turnover of hospital nurses (primary medical service providers) and community health nurses (primary health service providers), and it is necessary to foster nurses who can handle multi-tasking work.	・ As new nurses are assigned every year, there is a need to conduct training continuously to develop their skills. ・ It has not reached a stage where concrete training programmes have been planned to solve the issues identified through S&C, thus requiring an in-service training system for nurses. ・ The number of nurses was 350 in 2005, but increased to 377 in 2013 and 435 in 2016.
Vanuatu	・ There are very few opportunities for continuous education for community health nurses in service. ・ No concept of fostering ‘nursing supervisors’ who are supposed to supervise community nurses exists. For this reason, there is little supervision conducted regularly.	・ Knowledge and skills of nursing supervisors undertaking supervision are still insufficient. ・ Training on the issues identified through competency assessments needs to be conducted continuously for community health nurses, and training for graduates of the Vanuatu College of Nursing Education needs to be conducted based on

		actual work after nurses are posted. ・ The number of nurses increased from 374 in 2010 to 487 in 2012 (including nurse aides).

Source: JICA documents and information provided by the Ministry of Health in each country compiled and analysed

In Fiji, it became a requirement in 2011 to obtain continuous professional development points (hereinafter referred to as 'CPD') to renew a nursing license. It was confirmed through interviews conducted in each country that Tonga and Vanuatu also had the idea of making it an obligation to receive 20 hours of CPD every year in the future, an idea that showed the needs for continuous education for in-service nurses were also high at the time of completion. In Tonga, the results of S&C were not linked to the implementation of in-service training and it was necessary to strengthen the in-service education system. While the number of nurses was on the increase compared to the planning period in all three countries, according to the Ministry of Health in each country, the number was still insufficient even at the time of project completion, thus more nurses were required.

Therefore, it can be said that the implementation of in-service training for community health nurses, as that targeted in this project, was consistent with the development needs of all three countries not only at the time of planning but also at the time of completion.

3.1.3 Consistency with Japan's ODA Policy

In the 'Islanders' Hokkaido Declaration' announced at the fifth Pacific Islands Leaders Meeting held in May 2009, 'Overcoming vulnerabilities' was one of the priority areas for assistance, and this project was consistent with the 'Support capacity building of healthcare infrastructure and human resource development of healthcare workers for the enhancement of health system' in the Action Plan set forth under the declaration.

Regarding the priority areas of Japan's assistance for each country at the time of planning of this project, for Fiji, 'Improvement of community health services' was described in the priority development agenda in 'Development of HRH' in the 'Rolling Plan for the Republic of Fiji'. For Tonga, 'Development of HRH' was clearly indicated as a priority development agenda in the 'Rolling Plan for the Kingdom of Tonga', in which 'Improvements in medical services' was stated. Also for Vanuatu, Health and Medical Services was a priority area for assistance to Vanuatu (FY2010 Country Data Book [Ministry of Foreign Affairs]) with a focus on the development of HRH.

Therefore, the consistency of this project with Japan's ODA policy for the Pacific region and each country can be said to be high.

In light of the above, the project is highly relevant to the development plans and development needs of the Pacific region, particularly of Fiji, Tonga and Vanuatu, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Effectiveness and Impact[9] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Achievement of Project Purpose

This project, targeting each Ministry of Health in three countries in the Pacific (Fiji, Tonga, and Vanuatu), aimed to establish a model for improving health indicators in which competency assessments of community health nurses would be conducted and S&C would be done based on the assessment result, then would implement in-service training programmes based on the extracted needs. The achievement levels of the Outputs set in this project (described in pages 3-4 in this report) were largely as follows.

Table 2: Overall Achievement of Outputs in Each Country at the time of Project Completion

Country	Achievement of Outputs
Fiji	Output 1 (on the formulation of policy document for NB-IST), Output 3 (on the development of a management package for fostering nursing supervisors) were achieved, and Output 5 (on cooperation with other countries) was partially achieved. On the other hand, part of Output 4 and Output 2 (related to data handling, such as the database on monitoring and evaluation and that of the IST inventory) were achieved to a limit.
Tonga	Outputs 1 to 4 were achieved as documents on the functions, responsibilities, and the reporting system of nursing supervisors, as well as documents on the M&E system were prepared, while training for nursing supervisors on competency assessment skills, S&C, and NB-IST was sufficiently conducted. Regarding Output 5, which is on the cooperation among the three countries, it was partially achieved as the number of activities was not necessarily sufficient.
Vanuatu	Outputs 1 and 2, related to the formulation of documents on competency assessment and training for nursing supervisors and health managers, were largely achieved. Output 3 was partially achieved, that is, while the indicator on the regular implementation of S&C was achieved, no follow-up to link the results with improvement measures had been done. Output 4, on information sharing and learning among the three countries, was achieved to a limit.

The Project Purpose was to establish an NB-IST system in Fiji and Tonga, and introduce and establish S&C in Vanuatu through this project. As for the achievement level of the Outputs set forth, activities related to NB-IST and S&C were regularly

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

implemented during the project period in all countries. In this regard, the Output can be said to have been achieved. On the other hand, particular issues were found in terms of data development in Fiji (regular updates of the M&E database and IST inventory[10]) and verification of the S&C results gathered and measures taken in Vanuatu. In Tonga, while data development was not positioned as an Output, it was observed as an issue, similarly to Fiji. In addition, while this project was implemented as a regional project covering three countries and some information was shared among them, no cases in which some concrete outcomes were shared and in which they learned from each other were observed.

In this project, the Project Purpose was expected to be achieved with the achievement of Outputs. Table 3 shows the indicators to measure the level of achievement and their actual achievement at the time of project completion.

Table 3: Achievement of Project Purpose

	Indicator	Actual
Fiji	(1) More than 80% of community health nurses are assessed competency as per the guideline in each division.	'The achievement of Indicator 1 was limited'. A competency assessment was to be conducted twice a year. During the final year of the project, the implementation rate of the first competency assessment was 80.6% but the second one only at 27.9% due to a heavy load of various work done by nursing supervisors.
	(2) More than 95% of health facilities which had once or more supervisory visit per year as per the guideline.	'Indicator 2 was achieved'. The percentage of health facilities which received one or more supervisory visits a year (a visit by nursing supervisors to conduct supervision) was 98%, and health facilities receiving two visits exceeded 80%.
	(3) 70% of supervisors are fully trained on all the components of the management package for nursing supervisors.	'Indicator 3 was achieved'. The percentage of nursing supervisors taking training programmes was 98%. (all of the 78 sub-divisional nursing supervisors, sub-divisional health sisters and health sisters in charge of clinical services, and 24 out of 26 nurse practitioners designated by divisional nursing supervisors)
	(4) 80% of planned NB-IST is conducted in each division at the end of year.	'Indicator 4 was achieved'. A total of 86 training sessions were planned for each division and 73 were implemented (Implementation rate: 85%).
	(5) Inclusion of selected indicators of NB-IST mechanism into Business Plan[11] of each division	'Indicator 5 was only partially achieved'. It was confirmed that NB-IST implementation was included in the Business Plans of the Western and Northern divisions in 2013 (the final year of the

[10] The IST inventory is a database in which the competency assessment results and training history of nurses are recorded. The M&E database refers to a database in which implementation rates and results of competency assessment and S&C were aggregated and analysed.

[11] Each division has a business plan based on the Five-Year Strategic Plan of the entire Ministry of Health, which stipulates the kinds of activities to be implemented every year (August to July of the following year).

		project).
Tonga	(1) Percentage of registered nurse whose competencies were assessed using the competency standard once or more in one year	'Indicator 1 was achieved'. 98% in 2013 (as of the end of November, 2013).
	(2) Percentage of registered nurses that received coaching with a coaching sheet once or more in one year	'Indicator 2 was achieved'. 93.3% in 2013 (as of the end of November, 2013).
	(3) Improved aspects in the supervision system noticed by national level supervisors (qualitative data will be used)	'Indicator 3 was largely achieved'. According to the interviews held with the Ministry of Health and documents provided by JICA, the following qualitative effects were confirmed. - Clarification of the role of nursing supervisors in remote areas. - Homogenisation of supervision contents. S&C, which used to be a tool for 'searching for shortcomings', became a means of developing the skills of each person to provide better services. - Improvements in communications between bosses and subordinates. - Through the meeting on competency assessments, 'areas to be improved' through training were concretely clarified, such as nursing measures at the time of emergency disasters, legal and ethical issues in nursing activities, etc.
Vanuatu	(1) 80% of health facilities receive one or more supervisory visits in a 6-month period.	'Indicator 1 was achieved'. 84% in the second half of 2012 (21 out of 25 facilities), 100% in the first half of 2013, and 80% in the second half of 2013.
	(2) 80% of community health nurses are assessed their competency based on the Competency Standard once a year.	'Indicator 2 was achieved'. It was 71% in 2012 but reached 100% in 2013.
	(3) 80% of community health nurses needing coaching receive coaching once or more in a year.	'Indicator 3 was achieved'. It was 33.3% in 2012, but it increased to 88.6% in 2013.

Source: Documents provided by JICA, information provided by the Ministry of Health of each country and judgement on the level of achievement by the evaluator

In Fiji, Indicators 2 – 4 of the Project Purpose exceeded the target values, showing that the purpose was sufficiently achieved. On the other hand, Indicator 1 had some issues in that a competency assessment could not always be implemented on a regular basis as shown in the implementation rate of the second competency assessment, which was substantially lower than the target because nursing supervisors were busy with other duties and the transportation budget for visits was not sufficient. Regarding Indicator 5, while NB-IST was included in the Business Plans of the Western and Northern divisions, indicators were neither selected nor integrated. Moreover, no concrete inclusion was seen in the Central and Eastern divisions, leaving some problems. However, it was an appropriate approach as a whole toward the achievement of the objective of this project which was to formulate NB-IST-related policies, establish a monitoring and evaluation system, and develop the skills of IST coordinators and nursing supervisors. As for the

overall achievement of the Project Purpose, while the implementation rate of the second competency assessment of a given year was low, other essential indicators, such as the implementation of supervisory visits and NB-IST, exceeded their targets. Therefore, the Project Purpose was largely achieved.

In Tonga, Indicators 1 and 2 showed the values for the nurses at primary (health centre) and secondary (regional hospital) facilities in the target areas of this project, and latest data collected on them at the time of project completion was the data for November 2013. They were both at high levels, exceeding 90%. As for Indicator 3, related to improvements in the supervision system, as stated above, the effects were generated in such a way that the challenges nurses faced became clear through competency assessments and S&C, and competency assessments and S&C were regarded as a tool for improving the skills of nurses. As a whole, enhancement of the NB-IST mechanism was sufficiently made because the competency standards were clarified; S&C was implemented and strengthened; and, efforts were made to strengthen the skills of monitoring and evaluation. Therefore, the Project Purpose can be judged to have been achieved. The targets of this project were community health nurses working at health centres in remote areas at the beginning of planning, but it was decided to expand targets to all nurses, as the nurses in Tonga could play roles as clinical nurses as well as community health nurses during their careers while being in charge of several tasks. It was a change which aimed to improve the overall skills of those among the limited nursing resources and which was considered to have actually been effective.

The Project Purpose of Vanuatu is a summary of Outputs 1 – 3 and can be said to have been largely achieved when seeing the achievement of Outputs 1 – 3. As for the Indicators of the Project Purpose, they show that the Project Purpose as a whole is also considered to have been achieved as all of (1) – (3) in the above table had already reached the target values. While one of the Outputs of the PDM for Vanuatu targeted the entire country, the Project Purpose was limited to Shefa Province[12] for which the country's capital of Port Vila was also the capital of the province. As the initial project design was inadequate, the target area of all components was limited to Shefa Province, based on the recommendation of the Mid-term Evaluation in 2012. It seems to have been appropriate to review the target area, as it was a practical judgement that possible achievements would be constrained under the limitation in both inputs and period.

In the beneficiary survey[13], conducted as part of the ex-post evaluation study, a

[12] As Vanuatu is an island country divided into six provinces in which 65 islands have residents, it was not realistic to implement this project in all provinces. Therefore, Shefa Province, which had many nurses and also the capital, in which the Ministry of Health was located, became the pilot province. The project was expected to have relatively high project effects by narrowing the area.

[13] A survey targeting the nursing supervisors and all nurses who received training in the field of NB-IST in this project was conducted by sending questionnaires to the hospitals and health centres in the target location. A total of

question was asked as to whether they had a better understanding of NB-IST. 81% of the respondents replied that they had a deeper understanding, while the rate of the same response was high, at 88% in Fiji, where a preceding project was implemented between 2005 and 2008. Nursing supervisors and nurses in each country commented that the competency standards had been ambiguous and the assessment process had been unclear prior to this project; competency standards for nurses were set while competency assessments and S&C came to be implemented with regularity through this project, which led to better transparency of the assessment process and more opportunities to consult with supervisors on a regular basis.

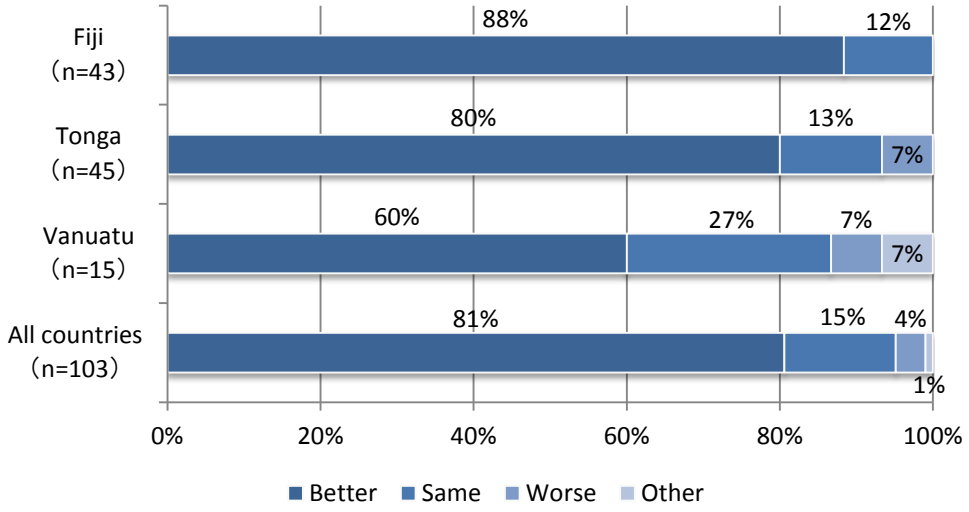


Figure 1: Change in the Level of Understanding of NB-IST
(Question: Do you think that you have better understandings of NB-IST after this project was implemented?)

In Fiji, where the preceding project was implemented in 2005 – 2008 and a component in the building of a database of S&C and training records was incorporated, there were issues in terms of regular updating of data. However, in all three countries, indicators related to the competency assessments and S&C were largely achieved, and it can be said that a system in which the needs of nurses could be captured and the fields to be improved could be identified was strengthened. Therefore, the implementation mechanism of NB-IST and S&C as a whole was enhanced and the Project Purpose was largely achieved. With regard to the sharing of experiences among the three countries, no

103 responses were obtained – 43 in Fiji, 45 in Tonga, and 15 in Vanuatu. The breakdown by gender shows five males (6%) and 97 females (94%). The main questions were on the improvement in the levels of understanding of NB-IST, improvements in nursing services and community health services after training, the implementation status of competency assessments, S&C and NB-IST, changes in communication among nurses, etc.

significant effects beyond the sharing of progress and information were observed in particular.

In light of the above, the Project Purpose was largely achieved.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

As the Overall Goal, it was expected that after this project was implemented, the quality of health services would be improved by establishing NB-IST in Fiji and Tonga, and the NB-IST system through the establishment of S&C would be designed and steered in the pilot province with the prospect of expanding to other provinces in Vanuatu in the future.

The achievement status of the indicators set for each country's Overall Goal was captured at the time of ex-post evaluation. The summary is described in Table 4 below.

Table 4: Achievement of Overall Goal

	Indicator	Actual
Fiji	Number of sub-divisions which have Competency Assessment score of more than 3 in average for all 15 competencies. (All sub-divisions by 2019) (Supplementary information: five-grade rating from one to five)	In each sub-division, average scores of the sub-division in competency standards were not aggregated. The percentages of nurses scoring an average of 3 or higher for 15 competency standards were submitted by Central and Eastern divisions. The Central division was 20% and the Eastern division was 38%.
Tonga	The percentage of registered nurses whose results of competency assessment were rated either 3, 4, 5 at all indicators.	According to the Performance Management System reports (2015 and 2016 versions) issued by the Ministry of Health, the percentages of nurses scoring 4 or above for all standards were 27.8% in 2014 and 66.3% in 2015.
	The percentage of registered nurses whose results of competency assessment were improved in comparison with the baseline data (in 2013)	Unknown (not possible to obtain)
Vanuatu	NB-IST is implemented once or more in a year in the pilot province.	Competency assessments and S&C were implemented for all nurses in the pilot province in 2016. However, it had not reached the stage where the challenges were extracted from the results, and training for the nurses in service in the province had been planned and implemented with a view toward nationwide dissemination.

Source: Analysed from the information provided by the Ministry of Health of each country

In Fiji, the indicator set was the number of sub-divisions having scores of above an average of three (five-grade assessment from one to five) for all 15 competencies required for community health nurses. However, in fact, the data on the percentage of nurses

scoring an average of three in the 15 competencies in each sub-division were submitted only by the Central and Eastern divisions (no submission from the Western and Northern divisions). The two divisions have 10 sub-divisions and the percentage of nurses scoring an average of three varied from 3% to 85% depending on the sub-divisions. This average percentage for the Central division was 20% and that of the Eastern division was 38%. As the definitions were different and the data were not collected from all of the four divisions of the country, it was not possible to verify the achievement of the indicator in a sufficient manner. It is presumed that at least more than half of the nurses were not scoring an average of three or higher. One of the reasons could be the lower scores for competency standards due to an increase in new nurses every year, showing a continuous need for skill development of community health nurses.

In Tonga, it is considered desirable to obtain four or higher in all competencies of the five-grade assessment system and a report on the competency assessment results is prepared every year. According to the reports, while the percentage of nurses with 4 or higher in all competencies was less than one-third in 2014, it increased substantially to two-thirds in 2015. While there was no accurate data on the percentage of nurses scoring 'three or more' set for the Overall Goal, it was assumed that the skills of nurses in Tonga were steadily improving as the percentage was to reach at least 80% or higher according to the Ministry of Health in Tonga. With regard to the comparison in the level of achievement between 2013 and at the time of ex-post evaluation using the second indicator, it was not possible to make a comparison as the 2013 baseline data had not been captured at the Ministry of Health. However, competency assessments have been implemented for most of the nurses in the country and the percentage of nurses scoring four or higher in competencies was 66.3% in 2015, significantly higher than 2014. It means that their assessment is estimated to have improved at the time of ex-post evaluation compared to 2013.

In Vanuatu, S&C was not implemented in a sufficient way, as regular visits by nursing supervisors to community health nurses were not done in 2014 and 2015. In 2016, two nursing supervisors[14] from the Vila Central Hospital, located in the capital, secured the budget needed from the Ministry of Health to visit nurses in Shefa Province, a pilot province, and visited all nurses in the province to conduct competency assessments and S&C. However, this has remained as an activity conducted by a few nursing supervisors and a challenge remains, as this activity has not become institutionalised to involve all of the nursing supervisors concerned. Moreover, in Vanuatu, it was not confirmed that the issues extracted through competency assessments and S&C were reflected in training

[14] In addition to the instructing of in-hospital nurses at the Vila Central Hospital, they along with four zone nursing supervisors appointed in the same province are in charge of instructing community health nurses in Shefa Province.

contents as NB-IST. Therefore, the Overall Goal can be said to have been only partially achieved.

As a whole, the information related to the indicators for measuring the achievement level of the Overall Goal was not sufficient, but it is expected that the Overall Goal will be sufficiently achieved based on the data related by Tonga. On the other hand, it became clear that there were some issues in terms of the level of achievement in Fiji and in Vanuatu, in terms of the lack of actions taken at the institutional level for the realisation of NB-IST, which were fundamental issues, at the time of ex-post evaluation. In the survey on the improvements in the quality of community health services, conducted as part of the beneficiary survey, while 80% of the respondents answered that they had improved, the percentages were 67% in Fiji and 27% in Vanuatu, as shown in Figure 2. In the same way for the achievement of indicators, it was observed that while a high percentage of nurses in Tonga felt that the quality of community health services had improved, the percentages were moderate in Fiji and low in Vanuatu.

In light of the above, it can be judged that the Overall Goal as a whole has only been partially achieved.

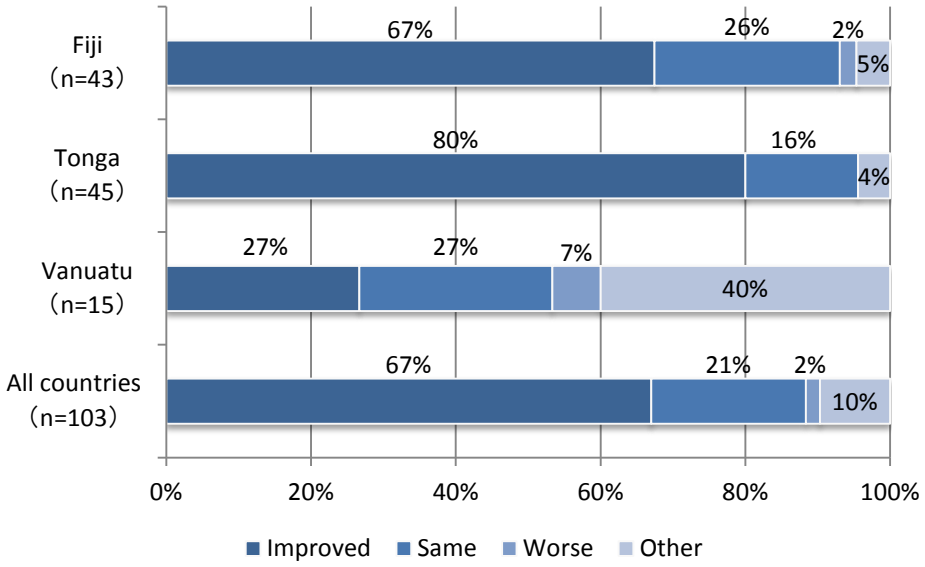


Figure 2: Improvement in the Quality of Community Health Service
(Question: As a result of the project, do you think that the quality of community health service has improved?)

3.2.2.2 Status of Project Effects after Project Completion

In the ex-post evaluation, the statuses of the Project Purpose and each Output, whose achievements at the time of project completion were checked in '3.2.1 Effectiveness',

were captured and analysed at the time of ex-post evaluation. The key results were as follows.

In Fiji, S&C and competency assessments conducted by nursing supervisors were largely implemented using various forms introduced through this project. The policy related to this project and the plan related to training the staff members at the Ministry of Health were formulated on a regular basis but the planned training had not been sufficiently implemented due to budget constraints. However, a system in which nurses are required on an annual basis to take 20 hours or more of lecture courses or self-studies on CPD in order to renew their nursing licenses annually was introduced, which confirms that a mechanism in which nurses continuously take training to improve their skills has sufficiently taken root. Updating of the M&E database and the IST inventory was not carried out regularly, having become an issue since project completion, and it was occasionally taken notice that some information was missing. Regarding strengthening of the NB-IST system set forth as the Project Purpose, according to the Ministry of Health, competency assessments conducted through meetings between nursing supervisors and nurses based on the competency standards as well as through supervisory visits with nursing supervisors visiting other nurses to be instructed have been implemented twice a year nationwide, and it was confirmed that education to nursing supervisors was carried out through training programs conducted by the Ministry of Health. After the usefulness of the competency assessment system for nurses, which was introduced through this project, was recognised at the Ministry of Health, a similar system was applied and introduced for doctors in 2016.

In Tonga, it was heard that competency assessments, S&C and M&E for nurses were implemented by utilising the IST manual continuously and were taking root as a system through their continuous implementation. As for the competency assessments, when a performance assessment system for public sector employees of the entire government was introduced in 2016, the assessment of nurses, which already had a more detailed assessment system, it was allowed to substitute the assessment sheet introduced in this project for it, due to its usefulness and coverage highly regarded. On the other hand, regarding M&E, the implementation rates of the various activities specified were not necessarily sorted out in the database, requiring continued improvements.

In Vanuatu, no particular S&C activities for in-service nurses had been implemented for two years after the completion of this project. The main reasons were that health managers of Shefa Province were frequently changed, that the direction and chain of command on the implementation of S&C and competency assessments was not clear and the implementation mechanism was not adequately established, and that zone nursing supervisors in Shefa Province got rotated frequently, resulting in insufficient S&C

training and recognitions, and so forth. Also, damages to regional health centres caused by a powerful cyclone in March 2015 and priorities subsequently given to preventive measures against infectious diseases were the causes of not implementing S&C in the same year. As described above, while the competency assessments and S&C were implemented once in Shefa Province in 2016, it cannot be said that the Outputs and the Project Purpose related both to the acquiring of techniques and to the implementation of the S&C model developed further after project completion. It is necessary to keep an eye on whether the competency assessments and S&C will be continuously implemented and firmly established as a mechanism from now on.

In the ex-post evaluation study, whether competency assessments and S&C continued to be implemented in each country after the completion of the project was checked with nursing supervisors and nurses through the beneficiary survey. The following responses, shown in Figures 3 – 5, were obtained as to the implementation status of each activity.

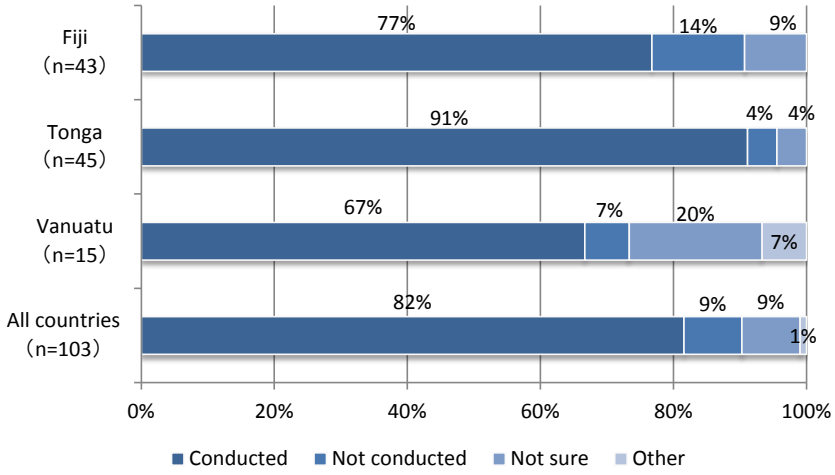


Figure 3: Regular Implementation of Competency Assessments
(Question: Do you think that competency assessments have been regularly conducted in your country over the last three years?)

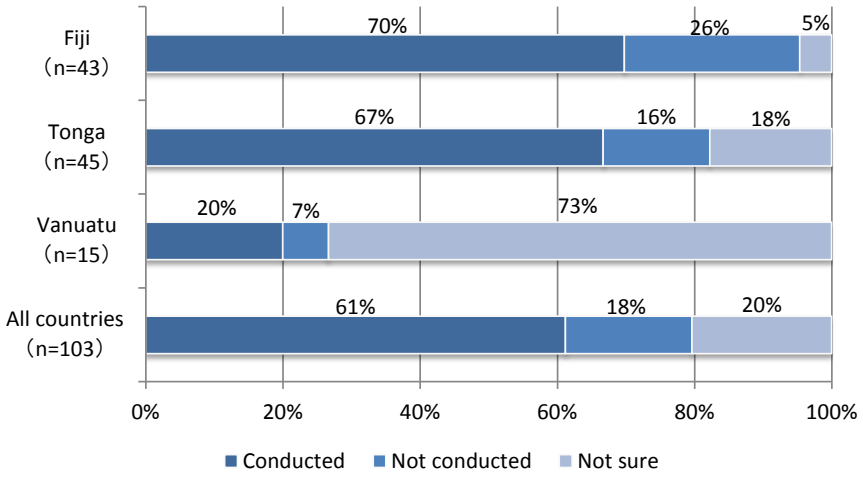


Figure 4: Regular Implementation of Supervisory Visit
(Question: Do you think that supervisory visits have been regularly conducted in your country over the last three years?)

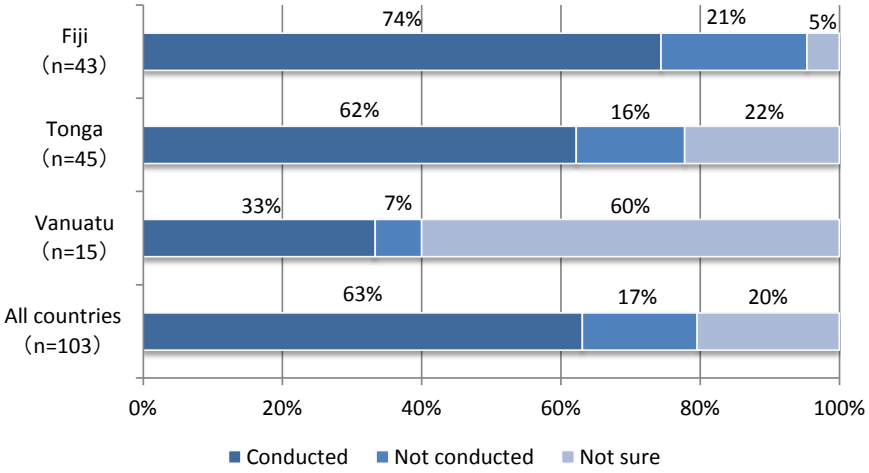


Figure 5: Regular Implementation of Coaching
(Question: Do you think that coaching has been regularly conducted in your country over the last three years?)

As the competency standard was set in this project (in the previous project for Fiji), the implementation rates of competency assessments based on it exceeded 80% in the three countries as a whole. Particularly in Tonga, where the competency assessments have been used for performance assessments of government employees, the implementation rate was high, exceeding 90%. The implementation rates of S&C were lower compared to the competency assessments, being a little over 60% for the three countries as a whole, with approximately 70% in Fiji and Tonga, and 20 – 30% in Vanuatu. Overall, while the

competency assessments have been implemented at a high level, visits and coaching by nursing supervisors for the issues identified through competency assessments have not necessarily been implemented sufficiently.

3.2.2.3 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

According to the interviews held with the Ministry of Health of each country, there were no particular negative impacts caused by this project on the natural environment in all three countries. As this project had components to mainly prepare various guidelines and manuals and to implement training programmes, no negative impact on the natural environment is considered to have occurred. Therefore, there are no problems.

(2) Resettlement and Land Acquisition

Similarly, to the above mentioned 'Impacts on the Natural Environment', there seems to be no problems since it was heard that there were no resettlement or land acquisition cases caused through the conducting of this project in all three countries.

Regarding the continuation of activities related to the Overall Goal and project effects, it was confirmed that the guidelines, manuals and forms created in this project as a whole were continuously utilised. As represented through the institutional mandate of the implementation of continuous professional training for nurses in Fiji and through the recognition of the competency assessment form as the one used in the performance assessments of government employees in Tonga, competency assessments and S&C continue to be implemented. However, there were some issues found in terms of the achievement level of the Overall Goal as a whole, particularly in Vanuatu, where issues were observed in terms of the sustainability of the effects of this project. Also, the data development for M&E and IST was not necessarily sufficient in Fiji, where the largest input was made. Therefore, it is judged that there are some issues with the Impact as a whole.

In light of the above, the project has achieved the project effects to some extent. Therefore, the effectiveness and impact of the project are fair.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

The planned and actual inputs of this project are shown in Table 5.

Table 5: Planned and Actual Inputs of this Project

Inputs	Plan	Actual (At the time of Project Completion)
(1) Experts	Project management / Health policy, Project coordination / Nursing, Impact study, M&E system, Management of public health nursing, Baseline/End-line survey, S&C	17 in total (Fiji: 76.97 MM, Tonga: 28.07MM, Vanuatu: 18.37MM) Project management, Health policy, M&E system, S&C, Management of public health nursing, Impact study, Project coordination
(2) Equipment	No detailed information	PC, Printer, Photocopier, Projector, Digital camera, etc.
(3) Local Activities	No description	94.39 million yen[15] (Fiji: 61.09 million yen; Tonga: 18.08 million yen; Vanuatu: 15.23 million yen)
(4) Regional Training	No detailed information	Twice (August 2011, August 2012. Both in Fiji)
Japanese Side: Total Project Cost	450 million yen in total	463 million yen in total
Fiji, Tonga, Vanuatu Side: Total Project Cost	No information	No information

Source: Document provided by JICA

3.3.1.1 Elements of Inputs

Regarding the number of experts, their fields of expertise, and the equipment provided, there seems to have been no problem in light of project components in all three countries. However, the number of Man-Months (MM) of experts reported for Vanuatu was only 18.37MM over three years, and it was considered not to have necessarily been sufficient to have S&C take root as a system.

As for the inputs from the counterparts, plans were respectively made mainly for their personnel expenses and domestic transportation, as well as the installation of the project office, its utility expenses and so forth, and it can be said that the actual inputs were mostly as planned, as shown in Table 6.

[15] Due to rounding-off, it is slightly different from the sum of each country's values.

Table 6: Planned and Actual Inputs from the Counterparts

Country	Plan	Actual
Fiji	1. Personnel expenses for counterparts, domestic transportation 2. Installation of the project office and the utility costs at the office, etc.	1. Counterparts: 20 in total 2. Project office, Electricity and water charges, Phone 3. Cash expenses (15 thousand Fijian dollars), Salary for counterparts, Transportation costs
Tonga	1. Personnel expenses for Counterparts, domestic transportation 2. Installation of the project office and the utility costs at the office, etc.	1. Counterparts: 16 in total 2. Project office, Electricity and water charges 3. Salary for counterparts, Transportation costs
Vanuatu	1. Personnel expenses for counterparts, domestic transportation 2. Installation of the project office and the utility costs at the office, etc.	1. Counterparts: 11 in total 2. Project office, Electricity and water charges 3. Salary for Counterparts, Training budget, Transportation costs

Source: Documents provided by JICA

From the interviews in the ex-post evaluation, responses from each country were made stating that a sufficient number of counterparts had been assigned and expenses had been borne to the greatest extent possible.

As the project activities progressed on schedule, without being affected by a shortage in inputs, the inputs from each country were considered to have been adequate as a whole.

3.3.1.2 Project Cost

While the planned project cost from Japan was 450 million yen, the actual amount was 463 million yen, exceeding the plan (103% of the plan). As explained in the following section, ‘3.3.1.3 Project Period’, this was mainly due to the increase in activities costs associated with the need to extend the project period in Fiji. In Tonga, as the nurses targeted in this project, clinical nurses were added to the group of community health nurses initially-expected. However, as no additional activities or costs occurred, it was completed within the plan. In Vanuatu, changes in PDM affected neither the implementation of training for nursing supervisors in any province nor the implementation of various activities for nurses (training for nursing supervisors in all provinces had been completed before the PDM was changed), and the activities were implemented as planned. Therefore, no significant gaps were seen between the planned

project cost and the actual cost.

3.3.1.3 Project Period

The planned and actual project periods are shown in Table 7.

Table 7: Planned and Actual Period of this Project

	Plan	Actual
Fiji	July, 2010 – June 2013 (36 months)	October, 2010 – October, 2013 (Extension period) November, 2013 – February, 2014 (41 months in total)
Tonga	October, 2010 – September, 2013 (36 months)	January, 2011 – January, 2014 (36 months)
Vanuatu	January, 2011 – December, 2013 (36 months)	March, 2011 – February, 2014 (36 months)
Total	July, 2010 – December, 2013 (42 months)	October, 2010 – February, 2014 (41 months)

Source: Documents provided by JICA

Regarding the project period in Fiji, a period for additional activities associated with the change of PDM was needed for Fiji to achieve the Project Purpose, and it was extended until February, 2014, when the project period for Vanuatu had been planned to end. In Tonga, while the coverage of target nurses expanded, no additional activities that would require an extension of the project period occurred. In Vanuatu, activities for improvements in the technical skills of nursing supervisors in S&C were scaled down in coverage from nationwide to Shefa Province, while the project period was not extended and was completed in accordance with the plan.

In this project, as the implementation structure was designed so that the same experts would cover all three countries, the commencement of the project was originally planned to be at a different time among the three countries and a project period of 42 months was expected. While Fiji itself had an extension of five months, the actual cooperation period of the three countries as a whole was 41 months (98% of the plan) which can be judged to have been within the plan. However, in the regional project covering the three countries, an approximate period of three years for each country was thought to have been short, as analysed in ‘Effectiveness and Impact’, and from the viewpoint of generating project effects, so that the materials would be produced, training would be conducted and the in-service training system would take root.

In light of the above, although the project period was within the plan, the project cost

exceeded the plan. Therefore, the efficiency of the project is fair.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

In this project, the objectives were the strengthening of the need-based in-service training system based in Fiji and Tonga, and the implementation of the S&C model in Vanuatu, which produced certain outcomes during the project period. The policy and institution to sustain these outcomes at the time of ex-post evaluation were as follows.

Table 8: Policies on HRH Development at the time of Ex-Post Evaluation

Country	Main Policy Contents
Fiji	In the 'Ministry of Health and Medical Services National Strategic Plan 2016-2020' (a successor of the previous 'Ministry of Health Strategic Plan', with the same policy positioning), the importance of community-level primary healthcare is continuously indicated, and a provision of need-based continuous professional training is also indicated. The 'Learning and Development Policy 2016-2019' of the Ministry of Health was being formulated, in which the implementation of continuous professional training for the staff was included in the policy's objective.
Tonga	The 'National Health Strategic Plan 2015-2020' was formulated in 2015. Among the six strategic main outcome areas is the provision of quality health services and HRH, and there is a reference to training enhancement.
Vanuatu	The 'National Sustainable Development Plan 2016-2030' (a successor of the 'Priorities and Action Agenda 2006-2015') was officially announced in 2017. One of the strategies of 'Society Pillar', one of the three pillars, is 'Healthy Society'. In this strategy, an effective and efficient health sector management is regarded essential.

Source: Compiled from each planning document

As shown in the above table, improvements in health services have been set forth in the national plans in each country. In Tonga, the importance of HRH development is indicated in the National Health Strategic Plan, and in Fiji, the 'Learning and Development Policy 2016-2019', a policy on HRH development, was being formulated[16] and it has been confirmed that the importance of continuous education for the staff of the Ministry of Health, including nurses, was described in it. According to the Ministry of Health of Vanuatu, although no direct reference to HRH development was found in the policy document, they were reviewing the staff planning for nurses at first, prior to the elaboration of a human resource development plan which was to be followed by concrete discussions on the human resource development plan after its completion. It is estimated to take some time.

[16] According to the Implementing Agency, completion of the policy had been delayed due to the need for further elaboration (as of March, 2017).

Based on the above, while the concrete contents which are clearly stated differ from country to country, improvements in the quality of health services were mentioned in each country. Fiji and Tonga also specified improvements in the skills of HRH, indicating that human resource development has been positioned as an important policy. However, clear policy directions on HRH development were not sufficiently confirmed in Vanuatu.

3.4.2 Organizational Aspects for the Sustainability of Project Effects

The organisational aspects for sustaining the effects generated in this project were as follows in each country.

Table 9: Organisational Structure for IST in Each Country

Country	Organisational Structure
Fiji	The Division of Nursing Services of the Ministry of Health and Medical Services (2,621 nurses [2015]) is the Implementing Agency of this project, and four divisional health sisters (four in total) among the four divisions of the country and a nursing manager are assigned under the director of nursing. Also, IST coordinators and officers are appointed respectively under the Human Resource Development Unit of the Ministry of Health (in charge of planning and implementing training), nursing manager, and Divisional Health Sisters of each division. However, under the review of the staffing plan at the Ministry of Health, there were no national-level IST Coordinators appointed at the time of ex-post evaluation. It was being discussed whether the newly planned post of Deputy Director Nursing would play that role but a final decision had not been made. The training plan for improvement of the skills of the Ministry of Health staff has been controlled and managed by the Unit of the ministry. Training for nurses is planned by the Human Resource Development Unit based on the proposal of the nursing division, and jointly implemented with the nursing division. There was a system in which S&C was implemented with nursing supervisors visiting their nurses.
Tonga	The Nursing Division of the Ministry of Health (Community Nursing and Clinical Nursing sections: 435 nurses [2016]) is positioned as the Implementing Agency, and under the supervision of the chief nursing officer, nursing leaders of each section and each island group promote various activities of NB-IST[17] as supervisors. There is an S&C mechanism in which nursing supervisors visit their nurses and conduct the promotion.
Vanuatu	Unlike the two other countries, the Ministry of Health does not have a nursing division in Vanuatu. A chief nursing officer post within the Ministry was newly created in 2017 and is to manage nationwide nursing services full-time (Number of nurses: 487 [2012]). The main implementing agencies of this project are Shefa Provincial Health, Human Resource Development and Training Unit of the Ministry of Health, Vanuatu College of Nursing Education, Vanuatu Nursing Council. According to the Ministry of Health, Shefa Provincial Health has the role and responsibility to implement S&C in the

[17] Queen Salote School of Nursing was established at the Ministry of Health and it provides education to students seeking to become nurses, but it is not deeply involved in the implementation of NB-IST for in-service nurses.

	province, and there was formally a structure through which nursing supervisors appointed in every zone conduct S&C on their nurses. No structure to promote S&C and NB-IST was established in reality as the Public Health manager of the province had frequent rotations after the completion of this project[18].

Source: Information provided by the Ministry of Health of each country

At the time of ex-post evaluation, Fiji and Tonga had a structure to implement NB-IST-related activities with their nursing divisions taking the lead. In Fiji, IST Coordinators were assigned respectively to all four divisions of the country to enter and compile competency assessment results of nurses. In Tonga, leaders of each nursing section and island group were playing a leadership role. However, as the post for national-level IST coordinator was vacant in Fiji, information on the implementation status of competency assessments and S&C from each division as a whole was not being compiled at Ministry of Health. It was possible, and the situation was uncertain, whether the role of the national-level IST coordinator in Fiji could be played by the to-be-established deputy director of nursing as one of her roles rather than appointing a full-time coordinator. Other than this point, it seemed that there were no issues in the implementation structure of IST-related activities in both Fiji and Tonga.

In Vanuatu, activities on the development of nurses' skills, such as competency assessment and S&C, are the role and responsibility of each province. However, as this project has not been expanded to other provinces, these activities are still at the stage of implementing only in Shefa Province in reality, which was the pilot province. Moreover, as the public health managers of the province were frequently rotated after the completion of this project, most of the activities had practically been halted. It cannot be said that the structure to promote S&C and NB-IST was sufficiently established immediately after the completion of this project, and it was the same case at the time of ex-post evaluation. The Human Resource Development and Training Unit of the Ministry of Health is mainly in charge of training and study-abroad programmes for Ministry staff through aid projects and scholarship programmes, and has not established a training programme for community health nurses and in reality, is not involved in the implementation of competency assessments and S&C.

Therefore, while it can be said that the implementation structure of NB-IST was largely established in Fiji and Tonga, Vanuatu has not implemented it systematically. In sum, some issues as a whole were found.

[18] According to the Vanuatu College of Nursing Education, it is also playing a role as the secretariat of the Vanuatu Nursing Council, educating students aiming to become nurses, and guiding and supporting new nurses within a year of their graduation. The support includes the provision of education to new nurses.

3.4.3 Technical Aspects for the Sustainability of Project Effects

In Fiji, it was observed from the interviews with the Ministry of Health during the ex-post evaluation that NB-IST is regarded as an activity to be implemented on a regular basis for nursing supervisors and nurses. Actually, when several health centres in remote areas were visited, it was seen that competency assessments and S&C were regularly implemented and necessary documents such as the competency assessment sheet and the coaching sheet were filled in. It is considered that nursing supervisors have certain skills to implement NB-IST-related activities.

NB-IST is positioned as part of the curriculum in the diploma course on nursing supervisor development at Fiji National University[19]. Furthermore, the Ministry of Health has also been implementing a training session for nursing supervisors on competency assessment skills and leadership management in the field of nursing approximately once a year. These programmes are a confirmation that efforts on the development of nurses' skills have sufficiently been made.

However, regarding the collection and compilation of information nationwide after competency assessments and S&C have been implemented, there were issues found in terms of insufficiencies when carrying out regular updating and when entering competency assessment results for all nurses. It is important to update the data regularly to understand the overall needs adequately and reflect them into subsequent training programmes.

In Tonga, it was observed on the site visit during the ex-post evaluation that the nursing supervisors who took NB-IST training were conducting competency assessments and S&C regularly, including on outer islands, and were filling out the necessary documents. As stated above, when the performance assessment system of government employees was introduced, nurses were allowed to substitute their own competency assessment forms. For this reason, competency assessments and S&C have been implemented basically for all nurses.

Regarding the implementation of NB-IST-related training to develop the skills of nurses, it was heard that NB-IST training is carried out with other training sessions when possible, as it is financially difficult to conduct NB-IST training on its own. Also, at Vaiola Hospital, Tonga's top-referral hospital, doctors and nurses were undertaking in-house studies every week and some of them were learning at sessions on nursing ethics and on nursing in emergency and disaster situations which were judged to be necessary sessions from the results of competency assessments and S&C.

On the other hand, according to the Tonga Ministry of Health, the situation is similar to Fiji; documenting of NB-IST related activities, as well as taking and reporting of activity records were not sufficiently done and continue to be a challenge.

[19] According to the School of Nursing at Fiji National University, out of eight subjects established, 'Quality Management in Nursing' and 'Nursing Management' have lectures on competency assessment skills and S&C.

In Vanuatu, while the training sessions on competency assessment skills and S&C for nursing supervisors were conducted during the project period, there was only one supervisor who implemented them through utilising such knowledge after project completion. Regarding continuous training, it was heard that doctors and nurses at Vila Central Hospital, Vanuatu's top referral hospital, gathered every week to have training on various subjects on medical and nursing services, but no further training for nursing supervisors and community health nurses was conducted in particular at the provincial level in Shefa as the public health managers kept changing. Therefore, competency assessments and S&C were not being implemented as an institutional activity in Vanuatu, and no efforts to improve the skills of those concerned were observed, leaving issues in terms of technical sustainability of the Outputs of this project.

Based on the above, while Fiji and Tonga are equipped with sufficient skills to implement NB-IST and training and seminars are conducted, Vanuatu has concerns in both respective skills. Therefore, it can be said that there are some issues in the technical aspects as a whole.

3.4.4 Financial Aspects for the Sustainability of Project Effects

In order to sustain the effects generated in this project, it is necessary to secure a budget for NB-IST for nurses, but the situations of each country were mainly as follows, according to interviews with their health ministries.

Table 10: Current Situation and Issues on the Budget for IST in Each Country

Country	Current Situation and Issues on Budget
Fiji	At the Ministry of Health, 0.9 – 1.5 million dollars of budget have been allocated for training of the staff members every year. The Human Resource Development Unit allocates the necessary amount to each training course when the training plan is formulated. Approximately 20% of the entire training budget is directed to training for nurses. There are many cases in which S&C is conducted when supervisors visit an area where the supervisee nurses are stationed and when meetings are held at core hospitals in each division. Particularly in the Eastern division, which consists of many groups of islands, it is necessary to move by boat and there are constraints in terms of the number of boat services and the budget amount. (Two S&C visits, specified in the IST guideline, cannot always be implemented and it is generally only once a year).
Tonga	No budget for training has been secured by the Ministry of Health, and all expenses needed for HRH training are almost entirely dependent on the budget for training of projects funded by donors. As these projects are not necessarily targeting training on IST, it cannot be said that a sufficient training budget related to this project has been secured. There are also constraints in the amount of transportation fees for the conducting of competency assessments and S&C.

Vanuatu	The budget for S&C was secured, as a nursing supervisor at Vila Central Hospital submitted a proposal to the Ministry of Health in 2016, but no institutional budgeting in the annual activity plan of the Ministry of Health was observed. As there is no allocation of a training budget, S&C is substituted by voluntary instructions offered by two supervisors.

Source: Information provided by the Ministry of Health of each country

In Fiji, a certain level of budget has been secured for the staff members of the Ministry of Health, including nurses, for the purpose of HRH development, and training programmes planned at the beginning of the fiscal year have been implemented. According to the Ministry of Health, the budget for steady implementation of S&C has not been sufficient, but it was observed that the activities were carried out efficiently under budget constraints, as competency assessments and S&C were implemented as much as possible when nursing supervisors visited the areas of their nurses for different purposes.

In Tonga, no budget to implement NB-IST has been secured, and training on NB-IST is conducted only to the extent possible at the time of the annual meeting of nurses and at seminars supported by other donors where nurses gather. According to the Ministry of Health, the transportation budget for S&C was not sufficiently allocated either, but visits by nursing supervisors are not that difficult given the size of each island. It was thought that several visits and much instruction would be possible in respective island groups, activities which had been done previously.

In Vanuatu, similar to Tonga, no training budget was being secured. While Shefa Province was supposed to secure a budget for S&C, it was not budgeted for at the time of ex-post evaluation.

Based on the above, while it was confirmed that a training budget was being secured and some training for nurses was conducted in Fiji, there were no budgets in Tonga and Vanuatu, which remains as an issue requiring improvements regarding the efforts in solving the issues extracted from competency assessments and S&C to develop the skills of nurses.

In each country, the importance of health service improvement and the human resource development (including nurses) to support such improvement has clearly been stated in various policies. In terms of organisational aspects, while Fiji and Tonga had clear divisions in charge and a chain of command, Vanuatu had some issues as it was not implementing S&C systematically. As for the technical aspect, competency assessments and S&C were conducted steadily in Fiji and Tonga and training programmes covering the health sector in general including NB-IST were planned and implemented in Fiji, but there were issues found in terms of some constraints in the implementing status of training in Tonga and a lack of measures taken for the development of skills in Vanuatu. With regard to financial aspects, while the budget for

training, including IST was secured in Fiji, no evidence of a budget to steadily plan and implement the training programmes for skills improvement of HRH was confirmed in Tonga and Vanuatu.

In light of the above, some minor problems have been observed in terms of organisational, technical, and financial aspects in each of the countries. Therefore, the sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project had the objective of improving capacities of nurses, who were key actors in community health services, by conducting competency assessments then supervision and coaching, and so forth based on the result of such assessment, as well as by establishing an implementation model of need-based in-service training. The relevance of this project is high as this project was consistent with the directions of the development policies and needs of Fiji, Tonga, and Vanuatu set forth to improve the quality of health services and to develop human resources for health in each country, and as it was also consistent with Japan's priority areas for assistance to develop human resources in the field of health for the improvement of health services. The project purpose was judged to have been largely achieved as the implementation mechanism of NB-IST and S&C was strengthened in all three countries, although some issues were observed in terms of the sustainability and the further development after project completion (i.e., impact) as there were some insufficiencies in data development in Fiji and Tonga and as the S&C activities were not necessarily conducted to their completion in Vanuatu. Therefore, the effectiveness and impact are judged to be fair. The efficiency of the project is fair as the project cost exceeded the plan in spite of the project period being within the plan. Sustainability of the generated effects is judged to be fair as some countries had issues of either not having a sufficient promoting institutional mechanism and its techniques or securing a training budget.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

In the three countries of Fiji, Tonga, and Vanuatu, it was seen that competency assessments and S&C were being implemented though there were differences in frequency and implementation rates. However, it was not clear how the Ministry of Health in each country analyses results and evaluates such results to systematically utilise them in subsequent training programmes.

In Fiji, in order to steadily implement NB-IST, efforts are needed, in that the leaders of

nursing sections and IST coordinators in each division analyse the results of competency assessments and S&C and reflect them in the annual training plan as a detailed content of skill development training. In Tonga, while the implementation rate of competency assessments is high, securing of a training budget needed to improve the skills nurses are lacking has been a big issue. Therefore, it is important for the Ministry of Health to formulate a training plan and lobby the Treasury more rigorously for allocation of the budget during the budget request stage. In Vanuatu, it is necessary, for the establishment of NB-IST in the future, to re-educate nursing supervisors in Shefa Province first, and systematically and regularly implement competency assessments and S&C.

4.2.2 Recommendations to JICA

During the ex-post evaluation, it was observed that the JICA offices of each country were not always checking and following up with the status of the project in regard to the sustainability of its effects after the completion of this project. As the PDM has the Overall Goal set and encourages continuation of activities after project completion through technical cooperation projects, it is considered important to monitor the progressions and issues regularly (e.g., once every six months to one year), incentivise the implementing agencies to sustain and develop the Outputs, and disseminate the sustained Outputs.

4.3 Lessons Learned

<u>Examination of cooperation components in accordance with each country's situation</u>

This project was an application of NB-IST implemented in the Central and Eastern divisions of Fiji in the 2000s and was designed as a regional project with an aim to expand it to the entire geographical area of Fiji as well as that of Tonga and Vanuatu. However, the situations of each country in terms of nursing structures, human resources, and so forth are different and the Fiji model did not necessarily fit. Many Outputs and project activities were changed after their commencement in Tonga and Vanuatu. The major changes in particular were that (1) while 'community health nurses' working in health centres in remote areas were regarded as the targets of this project at the time of planning, instead of clinical nurses, a change was made after the project started to include all nurses in the country, and (2) the target area in Vanuatu was scaled down from an area that encompassed the entire country to only that of Shefa Province. While the objective to pursue the development of the skills of nurses remained consistent, various changes could affect the consistency of project activities[20]. Therefore, in examining the components of cooperation, it is necessary to survey, examine, and further discuss with the

[20] While the project area in Vanuatu scaled down from an area encompassing the entire country to that of the pilot province during project implementation, some of the activities (training on S&C for nursing supervisors of non-pilot provinces) had already been implemented.

Ministry of Health of each country during the planning stage the kinds of cooperation that will be concretely needed in light of the situations of each country, including the organisational structures to promote the activities so that the changes to PDM can be minimised.

Introduction of thorough planning for the size of inputs and activities in a regional project and a human resource development mechanism which considers the possibility of human resource outflow

In Pacific island countries where the size of population is small and overseas migration of skilled workers is frequently seen, there are several lessons learned on the measures of human resource development.

(1) In this project, it was an aim to establish a training structure for community health nurses in service in three countries within three years. The preceding project was implemented between 2005 and 2008 and this project had an input of approximately 77MM including long-term stays of experts in Fiji while Tonga and Vanuatu had this project with inputs of only 28MM and 18MM respectively without any stays of long-term experts over the course of three years. Particularly in Vanuatu, there were issues observed in terms of the establishment of its organisational structure for implementing various activities. What was achieved through the small volume of activity in this project is limited to the formulation of related documents and the implementation of associated training, as well as trials of S&C. It thus cannot be said that S&C has taken root as a system in the country. One of the factors for this is considered that the period and inputs needed for several people concerned, especially leaders, who could understand the meaning and effects of the project activities and implement the activities aspiringly, was not sufficient. As the human resource outflow is obvious in Pacific island states in particular, it is essential to establish a human resource development system that can cope with the migration of human resources after the project completion. To accomplish it, particularly in the case of a regional project involving several countries, it is necessary to utilise as many lessons learned from past projects as possible and conscientiously set the ‘necessary period and inputs’ by considering the situation of the country and the goal to be achieved. In the case where the inputs and the period are fixed, goal setting in line with them will be required.

(2) It is desirable to secure several counterparts to the same position (in the same facility) for respective activities of the project in order to implement the project as effectively and efficiently as possible. In island countries where one staff member had several roles like in this project, there were some cases seen where other staff members could not back up the activity of one of the staff members during that person’s time away. It is considered that minimising this risk would lead to sustaining the project effects.

(3) The introductions of the CPD system in Fiji and the government employee assessment system became incentives to continue the activities of this project. From this experience, if an

introduction of a related mechanism enhances or sustains the effects of this project, it is considered desirable to actively incorporate collaboration of these national mechanisms into project activities.

End

The Democratic Republic of Timor-Leste

FY2016 Ex-Post Evaluation of Japanese Grant Aid Project

"The Oecusse Port Urgent Rehabilitation Project"

External Evaluator: Hisae Takahashi, Japan Economic Research Institute Inc.

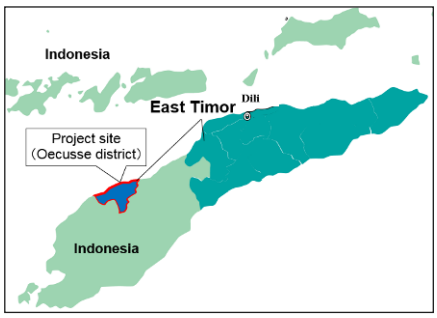
0. Summary

This project was conducted to help passengers board and alight the ferry safely and efficiently and improve the cargo handling service in Oecusse district, an enclave of Timor-Leste, by rehabilitating the existing jetty and terminal, thereby helping to promote economic growth in the Oecusse district and improve regional disparities. The development plan of Timor-Leste has consistently prioritized port development and the clearly specified rehabilitation of Oecusse port in the short- and mid-term plan. In Timor-Leste, marine transportation is a major means of connecting Dili, the capital and the Oecusse district. Hence the need to rehabilitate Oecusse port is high. Japan's ODA policy is also consistent with the purpose of this project; hence its relevance is high. By implementing this project, boarding at Oecusse port has become much safer and more efficient and the number of passengers has also largely increased, thanks to a drop in the number of cancelled ferry services and the launch of ferry services operated by private company. The rehabilitated Oecusse port has played the founding role in the plans ongoing at the time of ex-post evaluation to expand this port and increase the number of ferry services linking Dili and Oecusse. This means that the contribution of this project, which rehabilitated an essential economic foundation to develop Oecusse, can be considered high. Meanwhile, no increase in cargo volume could be confirmed, since no cargo vessel has berthed at the Oecusse port and the number of services operated by the substitute of Ferry Nakroma[1] and the cargo volume capacity remained limited during the maintenance period of Ferry Nakroma. Therefore, the project's effectiveness and impact are fair. Although the project cost was within the plan, the project period exceeded the plan because of the delay in procuring equipment. Therefore, the efficiency of the project is fair. Although most of the rehabilitated facilities are in good condition, there have been uncertain factors in institutional aspect and issues in technical and financial aspect of operation and maintenance were confirmed after the Oecusse district was designated as a Special Zone of Social Market Economy (ZEESM) which happened after project completion. Therefore, sustainability of the project effect is fair.

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

[1] Nakroma is a ferry for passengers and cargo, which was procured with support from Germany. It plies the route between Dili and Oecusse twice weekly and between Dili and Atauro once weekly.

1. Project Description



Project Location

Rehabilitated Oecusse Port

1.1 Background

In Timor-Leste, where all kinds of social infrastructure were shattered during the 1999 “Timor-Leste crisis”, prompt rehabilitation works were needed to promote economic activities of the country. The Oecusse district, the site of this project, is an enclave surrounded by the Indonesian West Timor, which comprises the western half of the island of Timor. It had a T-shaped jetty for cargo vessels constructed in 1992 by the Indonesian government in the Mahata area and a slipway constructed with German support in 2006 for a ferry in the Oebau area. However, the T-shaped jetty for cargo vessels was destroyed during the civil war, leaving only twice-weekly ferry services using the slipway as maritime transportation. On the other hand, the road transportation routed through West Timor of Indonesia was not actively taken because of the need for drivers to obtain a costly visa and the continuing low level of logistics. Under such circumstances, the commodity price in Oecusse district remained high compared to that of the Timorese mainland, which was the factor exposing a regional gap in Timor-Leste. Accordingly, maritime transportation remains the key means for the enclave of Oecusse district to access the mainland and rehabilitating the port facilities was imperative to sustain and improve residents’ lives of Oecusse district.

Based on this background, the Japan International Cooperation Agency (JICA) conducted preparatory surveys in 2009 and 2010 and deemed it appropriate to rehabilitate the jetty in the Mahata area, accessible by both ferry and cargo vessel. With the result of this survey, this project was implemented upon the request of Timor-Leste.

1.2 Project Outline

The objective of this project is to ensure safer and more efficient boarding and alighting for ferry passengers and operate a cargo transport service system by rehabilitating the existing jetty and developing a terminal at Mahata in the Oecusse district, thereby helping promote economic growth in the Oecusse district and improve regional disparities in Timor-Leste.

G/A Grant Amount / Actual Grant Amount	1,175 million yen / 872 million yen
Exchange of Notes Date /Grant Agreement Date	December 2010 / December 2010
Executing Agency	Ministry of Infrastructure / Port Authority of Timor-Leste (APORTIL)
Project Completion	July 2013
Main Contractor	Tobishima Corporation
Main Consultant	Japan Port Consultants, Ltd.
Basic Design	October 2009 – September 2010
Related Projects	・Technical Assistance "Dispatch of Advisor for port management"(2009), "Dispatch of Advisor for Port Facility & Security" (2012～2015) ・Grant Aid "The project for rehabilitation of Dili port" (2006) ・German Society for International Cooperation, Ltd. (GIZ:Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH) "Operation of Ferry" (2003～2007), "Construction of a slip way for ferry and terminal for passengers" (2004 ～ 2009), "Procurement of ferry" (2004～2009), "Training for staff of ferry operation" (2006～2011)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Japan Economic Research Institute Inc.[2]

2.2 Duration of Evaluation Study

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

Duration of the Study: August, 2016 – October, 2017

Duration of the Field Study: October 12, 2016 – October 26, 2016, March 7, 2017 – March 14, 2017

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

3.1 Relevance (Rating: ③[4])

3.1.1 Consistency with the Development Plan of Timor-Leste

At the time of this planning, the country's development policy *Five Year National Development Plan (NDP) (2003 – 2007)* targeted poverty reduction and enduring economic development and indicated "the development of transport infrastructure, such as roads, bridges,

[2] Participated in this affiliation as a sub-contractor from Ernst & Young ShinNihon LLC.
[3] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[4] ③: High, ②: Fair, ①: Low

ports, airports and communication systems, etc." as a priority area. At the time, since a mid-term national development plan was being prepared, the government set priority issues for development of each year along with NDP indicated above. Given that infrastructure development was one of the priority areas during the planning, the rehabilitation of the Oecusse port in the enclave helps reduce the regional gap in the country and securing safe and stable transport in this area was regarded as a highly important project from the national security aspect[5].

The *Strategy Development Plan (SDP) (2012 – 2016)*, a plan at the time of ex-post evaluation, aimed to become high and middle-income country by 2030, under the slogan "Goodbye Conflict, Welcome Development". This plan set the first stage from 2011 to 2015, focusing on priority areas during this stage for human development and infrastructure development and industry enhancement. The *Program of the Fifth Constitutional Government (2012 – 2017)*, the concrete plan of SDP, emphasized the development of a new port as a top priority, which targeted rehabilitation of Oecusse port, the targeted facility of this project[6], as well as of Com, Atauro, and Vemasse ports. Furthermore, the "State Budget 2017"[7] of the country clearly indicated expenses in the form of US$2.3 million operating costs for the Ferry Nakroma, which could continuously secure access between Dili and Oecusse.

As shown above, the development plan of Timor-Leste aimed economic revitalization and poverty reduction from the time of planning but by the time of ex-post evaluation and prioritized infrastructure development, including port development, to contribute to such purpose. The country's strategy program and state budget at the time of ex-post evaluation also show the importance of rehabilitating and ensuring the accessibility of Oecusse port. This project aimed to rehabilitate Oecusse port in the enclave of Timor-Leste for safer and more efficient passenger boarding and alighting and cargo loading; promoting economic revitalization and logistics in the Oecusse district and helping to reduce the regional gap. Therefore, this project has been highly relevant to the country's development plan.

3.1.2 Consistency with the Development Needs of Timor-Leste

The enclave of the Oecusse district had two port facilities for a cargo vessel and a ferry. However, the jetty for cargo vessels was destroyed during the civil war, leaving only twice-weekly ferry services using the slipway, which means cargos had to be loaded into the ferry. Consequently, the commodity prices in the Oecusse district remains high compared to that of the Timor-Leste mainland, leaving a regional gap in the country. This made it imperative to rehabilitate the port facilities to sustain and improve the lives of the Oecusse district residents.

[5] Source: documents provided by JICA
[6] Source: JICA (2014) "Data Collection Study on the Port Sector in Timor-Leste"
[7] República Democrática de Timor-Leste

After the Oecusse port was rehabilitated under this project, this district was designated as the Special Administration Region and the Social and Special Economic Zone in 2014, which has accelerated the development of roads, bridges and airports ever since. The demand for transportation has been increasing and ZEESM plans to procure a new ferry in 2017. Alongside, the further expansion of Oecusse port was approved to accommodate higher cargo capacity vessels[8]. In addition, the importance of the Oecusse port has been increasing in this area given the fact that there is a procurement plan[9] for Ferry Nakroma 2 by Administration of Port of Timor (APORTIL). Meanwhile, the poverty rate at the time of ex-post evaluation was 54% which was relatively high[10], compared to Dili (18.9%) and the national average (30.3%). This rate was also the worst in the country; hence the effort to reduce the regional gap has to remain high.

3.1.3 Consistency with Japan's ODA Policy

At the time of planning, the Japan government showed four supporting priority areas for Timor-Leste, 1) human resource development and improving government administration capacities toward establishing democratic governance, 2) improving economic and social infrastructure maintenance and its maintenance capabilities, 3) improving agricultural productivity and market accessibility and 4) improvement of public security and law enforcement capability[11]. This project aimed to boost the economic revitalization of the Oecusse district by rehabilitating existing jetties, which contributed to the priority area of 2) improving economic and social infrastructure maintenance and its maintenance capabilities. Therefore, this project was relevant to Japan's priority area for supporting Timor-Leste.

In the light of the above, this project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The plan and actual of this project outputs are shown as Table 1 and 2.

[8] Source: Interview survey to ZEESM
[9] Source: Interview survey to APORTIL
[10] Source: Timor-Leste Statistic office "Poverty in Timor- Leste 2014"
[11] Source: "ODA country data book 2010"

Table 1 Planned and Actual Outputs
(Civil engineering works and procurement of equipment)

Items	Plan	Actual
Repair and extension of jetty		
Existing jetty and trestle	Repair 630m^2 Extension 1,890m^2	(Jetty) Demolished: depths 5m, lengths 50m Extended: depths 5m, lengths 100m (Trestle connected to existing jetty) Demolished: lengths 33m for 1 place Extended: lengths 33m for 2 places
Transitional part of the trestle	Repair 140m^2 Extension 140m^2	
Rubber fenders	8 sets	As planned
Bollards	9 sets	
Navigation aid facilities	3sets	
Terminal development		
Administration buildings		
Administration office	Construction 150m^2	
Passenger terminal	Construction 300m^2	
Warehouse and dynamo room	Construction 450m^2	
Stacking yards and roads	Pavement 10,200m^2	As planned
Revetment	130m	
Outdoor lightings	15 sets	
Generator	1 set	

Source: documents provided by JICA and APORTIL, interview survey to the consultants

The jetty and terminal development were mostly implemented as planned. Although the existing jetty and trestle were actually described differently in the plan and actual for Table 1, the scope was implemented as planned, except for the plan to reutilize foundation piles for the existing jetty; and the trestle was changed to a design featuring the use of new steel piles, since it was judged that the welded places of existing piles lacked sufficient strength to be reused as foundation piles. During the preparatory survey of this project, though the degree of soundness of existing piles and their lengths were examined through an elastic wave study, the existence of the welded site and its strength were not sufficiently examined. These changes were appropriate taking both safety and sustainability into consideration. Also this change did not hinder the targeted effect but the project period, namely the process of procuring the equipment, was delayed as the piles were demolished and extended. (See “3.2.2.2 Project Period” for details)

Table 2 Planned and Actual Outputs
(Consulting services and soft components)

Plan	Actual
Consulting services : Detailed design and surveillance Capacity building program (soft component): Manual preparation and instruction related to the port operation Output① Establishing operation and management of the jetty Output② Establishing operation and management of the yard	As planned

Source: documents provided by JICA and APORTIL, interview survey to the consultants

The consulting services were implemented as planned and training APORTIL staff to operate and manage the jetty and yard; and drafting the manuals were supported during the project. In particular, these implementations included guidance for daily checks of the jetty, ensuring safety considering the new design jetty constructed and also for traffic rules inside the yard, such as separating passengers from people coming to meet them or see them off and the vehicle on board from that used for pick-up and technical guidance for preparing these manuals.

【Timor-Leste Side】

The planned and actual outputs of the Timor-Lesteese side were shown in Table 3.

Table 3 Planned and Actual Outputs of the Timor-Lesteese Side

Plan	Actual
1）Removal of temporary office and equipment inside the project site, removal of the remaining old administration office building	1）As planned
2）Repair and extension of the fence	2）As planned
3）Relocation of the ladder to the port side of Ferry Nakroma[12]	3）Not implemented
4）Expenses necessary to exempt various taxes and procedures at the bank	4）As planned

Source: documents provided by JICA and APORTIL, interview survey to the consultants

The ladder had not been installed on the port side of Ferry Nakroma, even at the time of ex-post evaluation. According to the APORTIL staff operating Ferry Nakroma, a preparatory survey was required for the ladder instalment. Although this survey should be planned in future, the installation period has not yet been determined. This remaining activity was not found to affect the project effects at the time of ex-post evaluation.

[12] The ladder of Ferry Nakuroma was installed on the bow side. A proposal was made to switch the ladder to the port side as the left of the ferry is docked at Oecusse port.

The constructed passenger terminal

Passengers heading to the jetty from the terminal

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost, as planned, saw 1,175 million yen borne by Japan and 21 million yen[13] borne by Timor-Leste, totaling 1,196 million yen. The actual project cost to be borne by Japan was 872 million yen, 74% of the planned amount, as the bidding price lowered the accumulated estimated amount. This cost reduction did not affect the level of output nor the project outcome. The actual cost to be borne by Timor-Leste was approximately 23.4 million yen, 110% of the planned amount, as the cost of constructing and rehabilitating the fences was higher than estimated. Given the remaining activities for installing the ladder on the port side of Ferry Nakroma[14], the project cost to be borne was 233% of the plan. However, the change was analyzed as appropriate, because a substantially increased construction cost over the estimated level was frequently seen, alongside increasing material costs in the country, but the increased cost could be covered by the Timor-Leste side and had no impact on the planned output. Accordingly, the actual project cost was 895.4 million yen in total and within the plan (75% of the planned amount).

3.2.2.2 Project Period

The planned project period[15] was 25 months and Table 4 shows the details of the actual period. It took 30 months from February 2011 through July 2013, which was longer than planned (120% of the planned period).

[13] Source: documents provided by JICA

[14] The amount is calculated by deducting the estimated cost of installing the ladder on the port side of the ferry (approximately 8.3 million yen) from the total planned cost.

[15] Based on the project schedule in the preparatory survey report, the project period was defined as the duration from the start of the consultant contract through the end of construction as well as the soft component, because the pre-evaluation sheet did not indicate the start of the project period.

Table 4 Planned and Actual Project Periods

	Plan	Actual	Plan/Actual
Consultant contract, bidding	7 months	7 months (February 2011 – August 2011)	100%
Procurement/ construction	19 months	24 months (August 2011 – July 2013)	126%
Soft component	1.5 months (Domestic 0.5 months, Overseas 1 month)	2.3 months May 1, 2013 – July 10, 2013 (Domestic 1.3 months, Overseas 1 month)	153%

Source: documents provided by JICA

The main reasons for the excess in the planned period were the delay in procuring a piling machine, re-arrangement of the transport ship due to the difference in actual loading weight from the details submitted and also the delay in delivery due to the unscheduled re-routing.

It was planned to rehabilitate the jetty by reutilizing existing foundation piles. However, new foundation piles had to be installed, since the existing foundation pile lacked sufficient strength to be reused. This change delayed the process of delivering the piling machine by about 3.2 months.

The plan for the equipment procurement involved processing the temporary steel for piling in China and delivering it to the Oecusse port via Singapore. However, a delay occurred on arrival at Singapore, as delivery was made during the peak Chinese New Year season. Besides, the transport ship had to be rearranged because of overloading due to underreporting the loading weight of the steel in the shipment document. The consultants rearranged with another transportation company, since the contracted company was unable to arrange the ship. Subsequently, a further delay occurred[16] due to the unscheduled re-routing via Indonesia during the delivery from Singapore to Oecusse port. The transport company was changed as a part of prompt action to make up the delay. However, there were some issues regarding the way the consultant managed and supervised the vender's procurement plan, such as underreporting of the load weight by the transport company and unscheduled re-routing.

The activity period in Timor-Leste for the soft components was as planned. However, the scheduled one-month activity period in Japan was actually extended to 1.3 months. The contract indicated a project period for domestic activities of 1 month (20 days). According to the consultants, the actual project period of 1.3 months included non-working days such as weekends and holidays and based on the interview survey, did not result in any delay to domestic activities.

Although the project cost was within the plan, the project period exceeded the plan.

[16] Source: documents provided by JICA and interview survey to the consultant

Therefore, efficiency of the project is fair.

3.3 Effectiveness[17] (Rating: ②)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

(1) The increase in the number of passengers

The baseline and target number at the time of the plan shows the number of passengers between Dili and Oecusse. Conversely, APORTIL had been recording the aggregated number of passengers among Dili – Oecusse – Dili at the time of ex-post evaluation, which differed from the plan in terms of scope. Accordingly, comparable data before implementing the project was obtained additionally from APORTIL during the ex-post evaluation and the effectiveness was analyzed referring its changes.

The number of passengers at the time of project completion and three years thereafter were respectively about 1.3 times and 2.9 times the number of passengers before implementing the project (2011). The number of passengers at three years after completion was expected at the time of the plan as 1.8 times the number of passengers in 2011, so the actual results indicated a significant increase in the number of passengers from the target number (See Table 5). The rehabilitation of Oecusse port enabled the ferry to be docked safely, which boosted the number of passengers as well as reducing the number of Ferry Nakroma operations cancelled, regardless of weather, and starting to operate a ferry by a private company.

Table 5 The Number of Passenger Dili - Oecusse

	Setting at the plan*1		Baseline/ Target
	Baseline	Target	
	2008	2015	
	Planned Year	3 Years After Completion	
Number of Passenger (person/year)	20,000	36,000	1.8

	Setting at the time of ex-post evaluation*2					Baseline /Target (3 years after completion)
	Baseline	Actual				
	2011	2013	2014	2015	2016	
	Appraisal Year	Completion year	1 Year After Completion	2 Years After Completion	3 Years After Completion	
No. of Passenger (person/year)	26,214	35,381	44,754	49,902	75,723	
Ferry Nakroma	26,214	35,381	44,754	49,902	39,317	2.9
Dragon Boat*3	-	-	-	N.A	23,516	
Raju Raju*4	-	-	-	-	12,890	

Source: documents provided by JICA、APORTIL、Dragon Shipping Company

*1: The number of passengers between Dili - Oecusse

*2: The number of passengers among Dili – Oecusse – Dili

*3: The passenger boat starting operation and launched by Dragon Shipping Company in August 2015. The number of passengers in 2015 was unknown due to the lack of data from the company.

*4：The passenger and ferry starting operations by Dragon Shipping Company in January 2016.

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

(2) The increase in the volume of cargo

The plan also showed the cargo volume data between Dili – Oecusse, while APORTIL data at the time of ex-post evaluation indicated the loading weight among Dili – Oecusse – Dili. Therefore, as when considering the number of passengers, the comparable data at the planned year for the cargo volume was obtained from APORTIL at the time of ex-post evaluation and effectiveness was analyzed based on its changes.

The availability of new cargo vessel services at the Oecusse port was expected under the plan alongside an increased loading weight under this project. However, at the time of ex-post evaluation, only Ferry Nakroma carried loads as before implementing the project and no berthing cargo vessel was confirmed. Consequently, although 6.9 times the volume of handling cargo at plan was expected for the targeted volume three years after completion, the actual volume recorded at one and two years after completion respectively was 92% and 65% of the volume at the time before implementing the project (2011), and did not achieve the targeted level; only the volume on project completion exceeded the baseline due to reduction in sailing cancellations of Ferry Nakroma. The reasons for decrease in the volume of handling cargo in 2014 and 2015 were that the replaced ferry was a small model during the time the Nakroma ferry was being maintained and the frequency of operation was decreased. The number of delivery vehicles and bikes two years after project completion was 3 times and 1.5 times that of the baseline year, respectively. Raju Raju started operation in 2016 and further increased the number of delivery vehicles and bikes respectively, by 4.6 times and 1.9 times, in 2016. As the data for the load weight of Raju Raju is not publicized, only the number of delivery vehicles was indicated below. Considering the load weight of these vehicles (including trucks), the total actual load weight at Oecusse port was assumed to have exceeded the figure indicated. Based on this assumption, the cargo volume is also considered to have shown a certain increase.

Table 6 Volume of Cargo Handled between Dili – Oecusse

	Setting at plan*[1]		Baseline / Target
	Baseline	Target	
	2008	2015	
	Planned Year	3 years after completion	
Load weight (ton/year)	2,330	16,000	6.9

	Setting at the time of ex-post evaluation*[2]					Baseline / Target
	Baseline	Actual				
	2011	2013	2014	2015	2016	
	Appraisal year	Completion year	1 Year After Completion	2Years After Completion	3Years After Completion	
Cargo volume (ton/year)	2,665	2,779	2,463	1,731	-	0.6
Nakroma*[3]	2,665	2,779	2,463	1,731	-	
Vehicle (number/year)	390	551	556	1,181	1,776	4.6
Nakroma	390	551	556	1,181	863	
Raju Raju	-	-	-	-	913	
Bike (number/year)	813	851	1,100	1,254	1,532	1.9
Nakroma	813	851	1,100	1,254	1,218	
Raju Raju	-	-	-	-	314	

Source: documents provided by JICA, APORTIL and Dragon Shipping Company and interview survey

*1: The load weight between Dili – Oecusse

*2: The load weight among Dili – Oecusse – Dili

*3: Since APORTIL changed the method used to measure the cargo volume in 2016, no comparable data for three years after project completion was obtained. The ratio for baseline / actual above was indicated using actual figures in 2015.

3.3.2 Qualitative Effects (Other Effects)

(1) Safe boarding of passengers and vehicles

Before rehabilitating the jetty under this project, since ferries could not be docked, passengers, vehicles and cargo had to be moved to/from the ferry via small boat, wading into sea water on a regular basis (see the picture below). Rehabilitation of the jetty increased safety when using the port alongside the constructed jetty, which meant the ferry could dock directly and allowed more space for the jetty after the project completion. The result of the beneficiary survey[18] at the time of ex-post evaluation also showed that 91% responded that boarding safety had “significantly increased” or “improved” (See Table 7). Respondents also

[18] The beneficiary survey was conducted for a total of 107 ferry users among Oecusse residents. The respondents by category are as follows: Sex: Male 83, Female 24, Occupation: Merchants 22, Farmer 15, Port operators 10, Drivers 7, Carpenters 6, Communicators 4, Others 19. The survey was conducted in an interview style, using a questionnaire under judgment sampling in the ferry between Dili and Oecusse, the waiting area and the Oecusse market. Based on the ferry departure / arrival time, the interview was conducted from 17:00 on Thursday (departure time at Dili) to 5:00 on Friday (arrival time at Oecusse) and from 17:00 on Friday (departure time at Oecusse) to 5:00 on Saturday (arrival time at Dili). Although the interview was targeted at passengers at equal intervals inside the ferry, the number of male respondents exceeded that of female respondents, since the latter were less keen to cooperate with the survey than male respondents.

indicated that the safety improvement was attributable to scheduled boarding being introduced under the instructions of Oecusse port staff to help ensure passengers, livestock and vehicles would board in a separate and orderly manner. As such, the effectiveness of the soft component was also confirmed under this project.

Table 7: Safety for Boarding at Oecusse Port

【Question】	Significantly improved	Improved	No change	Worsened	Significantly worsened
After rehabilitation, was the boarding safety improved?	57%	34%	7%	0%	2%

Source: the result of the beneficiary survey

Picture: Boarding ferry before (left) and after (right) rehabilitation of Oecusse port

Picture: Boarding order: vehicles (left) → passengers (centre) → livestock (right)

(2) Efficient Boarding Time

The implementation of this project significantly shortened the ferry boarding time with the availability of direct docking at the jetty. As shown in Table 8, 91% of respondents to the beneficiary survey indicated that the boarding duration had shortened. 70% of them also noted that the duration had changed, from 50-60 minutes before the project was implemented to 20 minutes after its completion (See Figure 1).

Table 8 Shortening of the Boarding Time

【Question】	Significantly shortened	Shortened	No change	Increased	Significantly increased
After the rehabilitation of the port, was the boarding duration shortened?	41%	50%	4%	2%	3%

Source: The result of the beneficiary survey

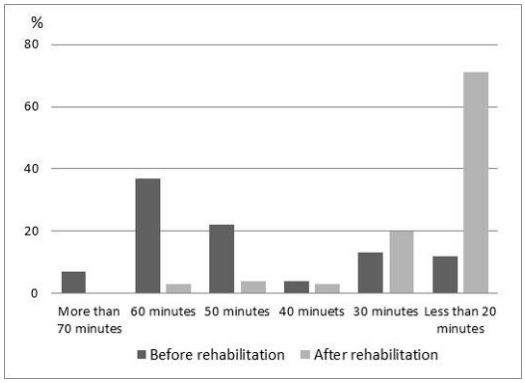


Figure 1 The Change in Boarding Duration at Oecusse Port

Source: The result of beneficiary survey

3.4 Impacts

3.4.1 Intended Impacts

(1) Reducing the logistics cost

At the time of the plan, a reduction in the logistic cost to Oecusse district was expected by implementing this project, which enabled direct docking of foreign cargo vessels at the port, an increased supply volume and the option of a delivery method. However, no foreign cargo vessel had docked at Oecusse port by the time of the ex-post evaluation and only Ferry Nakroma transported supplies until Raju Raju came into operation in 2016. The beneficiary survey also showed only 22% of beneficiaries responded that “logistic costs had decreased” and 64% stated that there was “no change”. Therefore, the effect of this project is considered limited in terms of reducing the logistic cost (See Table 9). One of the factors raised in an interview with APORTIL, ZEESM and consultants is the fact that the port wasn’t designed for large cargo vessels[19]. However, a decrease in transport and moving costs was predicted by having small- and medium-sized cargo vessels from Indonesia and other neighboring countries without docking of large cargo vessels. Thus, the design incompatible with docking of large cargo vessels does not directly explain the failure to reduce logistics costs. It was unclear how the logistic cost could be reduced and there was no common acknowledgement

[19] According to documents provided by JICA, it was predicted that small- and medium-sized cargo vessels from Indonesia or neighboring countries could go in-service.

among JICA related person and also executing agencies. Its logic should have been agreed among related parties if the reduction of logistic cost was assumed to be an impact. In addition, the logistic cost also can fluctuate due to various factors, including the rising fuel cost, in addition to the port environment and diversified delivery route, which should have been considered to determine the expected impact.

Table 9 Reducing the Transport and Moving Cost

【Question】	Significantly reduced	Reduced	No change	Increased	Significantly increased
After the rehabilitation of the port, was the transport and moving cost reduced?	16%	6%	64%	8%	6%

Source: The result of beneficiary survey

Note: The result of the survey shows only the respondents' impression about the changes in transportation costs by sea between before and after the project. Our survey team did not ask a question about the difference in transportation costs between by sea and by trucks.

(2) Contributed to reduce the gap between the mainland and the enclave of Oecusse district

Stabilizing the price of goods and promoting efforts to reduce disparities in living standards between Oecusse and the mainland were expected as the impact by rehabilitating Oecusse port in this project, through safe and efficient boarding and shipping of passengers and stable supply of goods and items.

Table 10 shows the beneficiary survey results, which confirmed the "Stable supply of commodities", "Changes in commodity price" and "Number of available commodities" in Oecusse. According to the result of the beneficiary survey, 94% of respondents answered that the supply of commodities had "stabilized" after project completion. Moreover, 91% of respondents answered that the variety of available commodities had "increased" or "largely increased" after the port rehabilitation. While the increase in cargo volume was limited, beneficiaries answered that the supply of commodities had stabilized and many explained that the variety of available commodities had increased. This may be attributable to an increase in the number of vehicles, including loaded trucks as well as the effects from the increased carry-on baggage of passengers which were not counted as part of the cargo volume. In the interview survey with passengers at Oecusse port, it was explained that the loading capacity in terms of total vehicles and cargo volume had increased and small livestock, including chickens, as well as medium- to large-sized livestock such as pigs, goats and cows, would now be transportable via Ferry Nakroma, since boarding became possible without any immersion in seawater. In particular, frozen meat, groceries, office supplies, tobacco, lunch boxes and light construction materials, etc. became widely available and thus the contribution of the project can be explained in improving the living

standards among Oecusse people. Accordingly, this project helped improve the lives of Oecusse residents through a part of those daily commodities. Conversely, since an increased cargo volume through berthing of cargo vessels was not fully confirmed, the generation of the impact remained within a certain level in terms of expected impact, including reducing the domestic gap and revitalizing the economy.

Table 10　Changes in Stable Supply of Commodities,
Kinds of Available Commodities and Commodity Price

Stable supply of goods	More stable	Stable	No change	Less stable	Worse
	43%	51%	4%	2%	0%
Variety of available goods and item	Largely increased	Increased	No change	Reduced	Largely reduced
	60%	31%	8%	0%	1%
Price of goods	Much cheaper	Cheaper	No change	Expensive	Much expensive
	11%	26%	30%	14%	19%

Source: Result of the beneficiary survey

Regarding the price of goods in the Oecusse district, 37% of respondents explained that it has been getting cheaper, 30% said no change and 33% stated that it had been getting expensive. No data to show differences in the price of goods between the capital city and Oecusse district could be obtained, despite confirming with the statistics office and etc. However, the local newspaper reported[20] that the price of goods for daily necessities had increased in the Oecusse district for a certain period while the maritime service between Dili and Oecusse was suspended due to the maintenance of Ferry Nakroma. This report introduces feedback from venders who sell daily goods at the market. According to this report, venders sold goods from trucks from Indonesia while they were unable to get goods transported from Dili by ferry, but found themselves unable to sell the goods at the same price as Dili because of the added tax. This report can be explained as one example of how stable operation (reduced ferry service cancellations) help reduce the price of commodities in the Oecusse district to a certain extent.

（3）Improved security for Oecusse district residents

It was expected that implementing this project would boost security for residents in the Oecusse district enclave by securing the maritime transportation route as an impact. However, this impact could not be clearly explained since the intention of this impact at the time of the plan and its position within the project could not be ascertained through project

[20] “Suara Timor Lorosae”, Newspaper dated February 1, 2016, reported that the contract for renting the substitute ferry during the maintenance period for Nakroma had been completed in December 2015, thus no ferry operated for about one month between Dili and Oecusse, resulting in an increase in the price of goods in Oecusse.

documents and interviews with stakeholders.

3.4.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

Since this project rehabilitated an existing port, limited but some undesirable environment and social impacts on water quality and the ecosystem, etc. were expected. Accordingly, an Environmental Management Plan was prepared at the time of the project plan and indicated that the water quality, air, noise, vibration, coral survey and local residents' survey had to be conducted appropriately in line with each construction stage. During the implementation stage, a preparatory survey and monitoring were conducted based on the plan. Subsequently, no negative impact on the natural environment from implementing this project was confirmed from an interview with the executing agency and interviews at project sites.

(2)Land Acquisition and Resettlement

No resettlement and land acquisition occurred due to the implementation of this project and no specific issues were also confirmed through the interviews to the executing agency.

(3) Other impact : Contribution to establish the economic foundation in the Oecusse district

As described above, the Oecusse district was designated as a Special Zone of the Social Market Economy for the country in 2014, whereupon infrastructure development, including an airport, road and bridges, were all promoted. Since the construction of an administrative building, road and a new airport, etc. are also planned, demand for transporting passengers and cargo is also expected to increase. Under such circumstances, ZEESM is preparing a plan to purchase a ferry[21] in 2017 which will operate between Dili and Oecusse; and also planning to expand the Oecusse port. Further utilization of Oecusse port in future will be largely reliant on the influence of Oecusse, which has been designated as a Special Zone of the Social Market Economy, but rehabilitation of the Oecusse port in this project still is an essential component of the foundation to implement the future plan. Accordingly, it can be said that this project helped develop an economic foundation for the Oecusse district.

Rehabilitation of Oecusse port allowed an expansion of the jetty space and boarding based on the plan, which largely improved boarding safety and efficiency. Since the project allowed ferries to dock at the jetty regardless of the weather, the ferry cancellation rate has been decreased and new ferry services operated by a private company have been launched, all of which has fueled a significant increase in passenger numbers. Conversely, the effect of

[21] Procurement of the ferry with the loading capacity for 320 passengers and 22 vehicles has been already arranged.

increasing the cargo volume set at the time of the plan remained limited, since cargo vessel operations did not increase and the number of operations and loading capacity of the substitute ferry were both limited while Ferry Nakroma was being maintained. Furthermore, the impacts of improving daily life convenience, such as the increased variety of available goods and stable supply of daily necessities in the Oecusse district were confirmed. Conversely, the contribution of this project to impacts including the revitalization of the Oecusse district and reducing the gap between domestic, expected to be generated through cargo vessel services and the increased cargo volume, remains as an indirect contribution. In light of the above, this project has achieved its objectives to some extent. Therefore effectiveness and impact of the project are fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

At the time of the plan, it was decided that APORTIL would oversee the Operation and Maintenance (O&M) of Oecusse port. However, the responsibility for O&M of Oecusse port was shifted to ZEESM since the Oecusse district was designated as a special administrative region as ZEESM in June 2014. Conversely, the decree of law "(Decreto-Lei n.o) /03/2003" designates APORTIL as the responsible institution for the O&M of all port facilities in Timor-Leste. At the time of ex-post evaluation, ZEESM and APORTIL were discussing the issues involved in transferring the management setup of the Oecusse port. Though it is agreed that "ZEESM will be an institution to manage Oecusse port" informally (verbally), ZEESM becomes the responsible entity only after the revised Decree with an article defined as "excluding Oecusse port" is officially passed[22]. Following this situation, although the staff required to operate the Oecusse port were employed by ZEESM and APORTIL, the institution responsible for O&M remained officially unclear.

At the time of the ex-post evaluation, nine staff (four of whom are with APORTIL and the remainder are former APORTIL but current ZEESM staff) are engaged in daily maintenance such as clearing, selling tickets, handing for boarding, etc. though it was estimated that 10 to 15 staff were needed for the O&M of Oecusse port at the time of the plan. Figure 2 shows the operational organization chart for Oecusse port terminal. There are vacancies (for berth operators) and cases where one staff handles two positions, underlining the fact that the number of staff deployed is below the required number described in brackets, representing an insufficiency in terms of the appropriate number of O&M staff.

[22] Source：Interview survey to APORTIL and ZEESM staffs

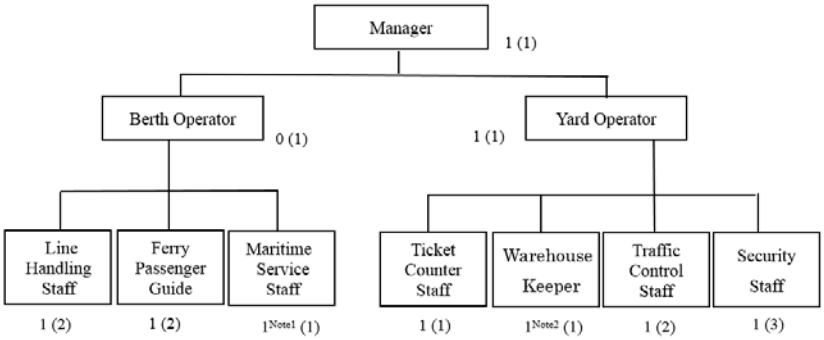


Figure 2 Organization Chart for O&M of Oecusse port

Note 1: Maritime service staff also serves as line handling staff.
Note 2: Warehouse keepers also serve as yard operators.
Note 3: The number shows the staff number assigned at the time of the ex-post evaluation. The number in brackets indicated the staff number required at the time of the plan.

As stated above, some issues were confirmed in terms of institutional aspects of O&M of Oecusse port such as a staff shortage as well as the positions of responsibility for the setup remaining undefined, etc.

3.5.2 Technical Aspects of Operation and Maintenance

It was planned that the APORTIL technical department would oversee O&M of the Oecusse port at the time of the plan. APORTIL is the institution with responsibility for O&M of all port facilities in Timor-Leste, meaning it has sufficient experience for daily O&M. However, the newly constructed jetty and yard in this project are installed toward the open sea from the revetment and their condition differs from those of other port facilities, hence training in appropriate O&M methods was provided to APORTIL staff. As mentioned above, the responsibility for O&M at Oecusse port will be transferred to ZEESM, while APORTIL staff who participated in the training are now tasked with maintaining Oecusse ports as ZEESM staff, which means they have the knowledge needed for daily cleaning and inspections of jetties, yards and etc. Though minor confusion was confirmed where the bus for waiting passenger getting off the ferry at the place nearby the yard rather than the parking area, it was also confirmed during the site survey that guidance to clarify separation of the boarding traffic flow between passengers and vehicles had been provided at the jetty.

Conversely, since no technical or other staff capable of handling lightning systems and repairs to the jetty was assigned, there was a lack of knowledge and experience to resolve issues such as damage of such systems and the ability to repair such damaged parts. Consequently, issues such as damaged parts remaining in use while unrepaired were confirmed during the site survey and raised concerns over safety aspects. Furthermore, since ZEESM are planning to

expand the port in 2017, it is indicated that efforts to assign experts to operate and maintain port facilities will be indispensable.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of the plan, the annual O&M cost of Oecusse port was estimated at approximately US$55,000, which included the salary cost of Oecusse port, inspection and maintenance costs and utility cost, etc. APORTIL, which oversaw O&M at Oecusse port, showed a surplus except for 2014 and the O&M cost of Oecusse port was included in the goods and service fee among the expenses of APORTIL until May 2014. The O&M of Oecusse port are under the jurisdiction of ZEESM, despite not being officially transferred after June 2014. Accordingly, at the time of ex post evaluation, APORTIL only covered the salary of four O&M staff for Oecusse port. Similarly, ZEESM only covered the salary for five staff members at the time of ex-post evaluation as the O&M budget could not be included under circumstances where the transfer procedure had not be officially completed, which meant the costs, except for salary, were not accounted for since June 2014. Moreover, the possibility of the situation remaining unchanged is likely until the responsible entity for Oecusse port is formally recognized, including O&M responsibilities, so concern over the sustainability of the financial aspects of O&M can be said to exist.

Table 12 Budget of APORTIL

(Unit: Thousand US$)

	2014	2015	2016
Revenue	4,577	4,361	2,794
Expense	5,733	360	2,573
Salary	147	167	167
Goods, service fees	275	193	2,464
Maintenance fees	115	59	61
Minor Capital	5,011	―	―
Consumables	―	―	―

Source: document provided by APORTIL

Note: Minor capital in 2014 include the cost of the ferry jointly purchased in 2014 by APORTIL and Germany.

3.5.4 Current Status of Operation and Maintenance

Though Oecusse port is mostly well maintained, the concrete portions of the jetty damaged in a collision with a ferry and a cracked fender damaged due to a fender pad and ferry anchor colliding during the berthing of a ferry are being utilized while left unrepaired. In addition, warehouses are not in use, since cargo vessels which use the warehouse have not been berthed, nor are toilets used, since water has not been supplied[23]. Excluding the daily visual inspection and regular cleaning, since the budget has not been allocated, no maintenance and repair works have been conducted. During the defect inspection survey conducted one year after the project

[23] Source: Interview survey to ZEESM and site survey

completion, 13 items requiring some responses were suggested to APORTIL but almost half remained unresponded. Some were left unattended from the time APORTIL was doing O&M, but the main reason for not responding to those items was because the appropriate O&M set up had not been organized. This, in turn, was because the responsible management entity for O&M had not been formally recognized, which left the responsibility unclear and prevented efforts to allocate a budget for the same.

Table 13 Responded Conditions to 13 Suggested Items during the Defect Liability Period Expiry Certificate

	Suggested items	Responded situation
1	To repair the part of damaged jetty, which was repaired tentatively	Not yet responded
2	To change Windows at ticket selling of passenger terminal	Responded
3	To repair the damaged roof of warehouse	Responded
4	To survey the exterior lightings	Responded
5	To confirm quality of fuel regularly and to stock it sufficiently	Responded
6	To execute necessary application to the authorities to obtain city electrical power supply	Responded
7	To receive the city water supply and operate water pump	Not yet responded
8	To open toilet for servicing guest	Not yet responded
9	To complete the fencing works	Responded
10	To prepare the manual of O&M and put new procedure it the statutory form, and update it to dissipate the dissociation between actual activity and the manual.	Not yet responded
11	To clarify the organization with task for each staff in written	Not yet responded
12	To establish a communication system among Oecusse port, Dili port and ferry Nakroma	Not yet responded
13	To consider and respond the request from Ferry Nakroma	Partially responded

Source: documents provided by JICA, interview survey to APORTIL and ZEESM

In light of the above, some minor problems have been observed in terms of the institutional, technical and financial aspect and current status. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was conducted to help passengers board and alight the ferry safely and efficiently and improve the cargo handling service in Oecusse district, an enclave of Timor-Leste, by rehabilitating the existing jetty and terminal, thereby helping promote economic growth in the Oecusse district and improve regional disparities. The development plan of Timor-Leste has consistently prioritized port development and the clearly specified rehabilitation of Oecusse port in the short- and mid-term plan. In Timor-Leste, marine transportation is a major means of

connecting Dili, the capital and the Oecusse district, hence the need to rehabilitate Oecusse port is high. Japan's ODA policy is also consistent with the purpose of this project; hence its relevance is high. By implementing this project, boarding at Oecusse port has become much safer and more efficient and the number of passengers has also largely increased, thanks to a drop in the number of cancelled ferry services and the launch of ferry services operated by private company. The rehabilitated Oecusse port has played the founding role in the plans ongoing at the time of ex-post evaluation to expand this port and increase the number of ferry services linking Dili and Oecusse. This means that the contribution of this project, which rehabilitated an essential economic foundation to develop Oecusse, can be considered high. Meanwhile, no increase in cargo volume could be confirmed, since no cargo vessel has berthed at the Oecusse port and the number of services operated by the substitute of Ferry Nakroma and the cargo volume capacity remained limited during the maintenance period of Ferry Nakroma. Therefore, the project's effectiveness and impact are fair. Although the project cost was within the plan, the project period exceeded the plan because of the delay in procuring equipment. Therefore, the efficiency of the project is fair. Although most of the rehabilitated facilities are in good condition, there have been uncertain factors in institutional aspect and issues in technical and financial aspects of operation and maintenance were confirmed after the Oecusse district was designated as ZEESM which happened after project completion. Therefore, sustainability of the project effect is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

- It was decided that responsibility for O&M of Oecusse port would be transferred from APORTIL to ZEESM after ZEESM started. However, since the formal transfer procedure has not yet been completed, a system to substantively implement O&M is unclear, which has led to the required activities stagnating. To make the O&M system clear and conduct appropriate maintenance activities, ZEESM and APORTIL must strive forward to advance procedures required for the formal transfer and develop a structure for O&M, including securing staff and budget. Moreover, in the meantime, there is a need to set up the tentative responsible structure system to conduct the maintenance activities needed to fix the damaged parts.
- No engineers or port experts have yet been assigned as O&M staff of ZEESM. Conversely, APORTIL is the institution which has overseen the O&M for all the ports of Timor-Leste and hence has plenty of knowledge and experience of O&M for ports. Even after the O&M works of Oecusse port officially shift to ZEESM, it is desirable for ZEESM and APORTIL to regularly get in contact and coordinate and develop a system allowing APORTIL to provide

the technical support required to ZEESM.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

・Preventing delay in the procurement of equipment by capturing and supervising a detailed plan

In this project, the plan to reutilize the existing foundation piles was changed to one involving the construction of new piles, although the consultants did not fully understand a procurement plan for the same. Accordingly, when processing and transporting the equipment, including from overseas, cases of under-reported loading weight and changes to the transportation route emerged, which significantly delayed the procurement period. To prevent this delay, consultants must work on managing and supervising progress, based on a full understanding of each step of the procurement plan in the course of project implementation.