

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”

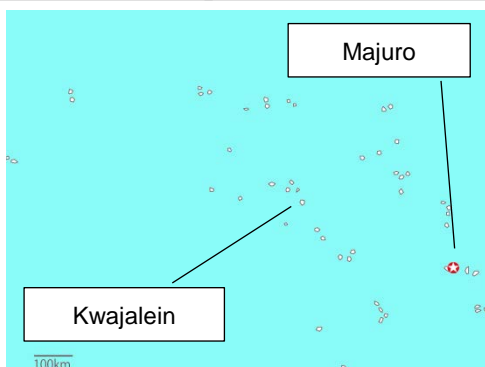
External Evaluator: Hirofumi Azeta, Japan Economic Research Institute Inc.

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 copra¹ 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 transport² 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	<p>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;</p> <ul style="list-style-type: none"> - 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) <p>Taiwan:</p> <ul style="list-style-type: none"> - 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: B³)

3.1 Relevance (Rating: ③⁴)

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 targets⁵.

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 islands⁶.

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 Island⁷. 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 Tobolar 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 Effectiveness⁸ (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 year⁹.

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 below¹⁰. 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 small¹¹, 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 survey¹²

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%).

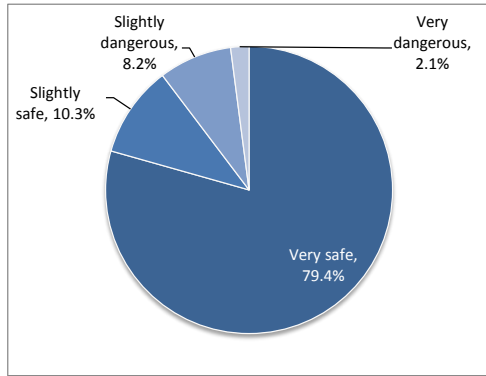


Figure 1. Answers by passengers on the vessel safety

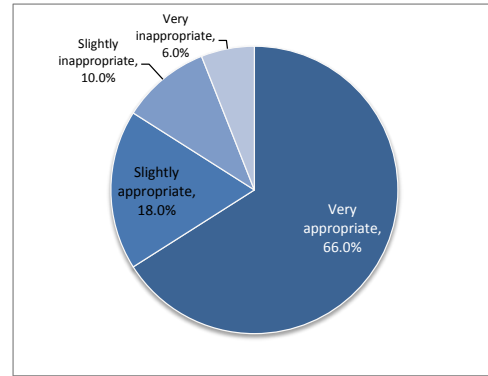


Figure 2. Answers by passengers on the usability of toilets (answered only by female passengers)

(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 secured¹³.

Regarding the cabin area, it was expected at the time of planning that a passenger could secure 1 m² on the deck. In the beneficiary survey, as 79.4% of the passengers answered that they secured more than 1 m², it was confirmed that many passengers have been able to secure sufficient space in vessels¹⁴.

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

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 m² 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 area¹⁵. 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”.

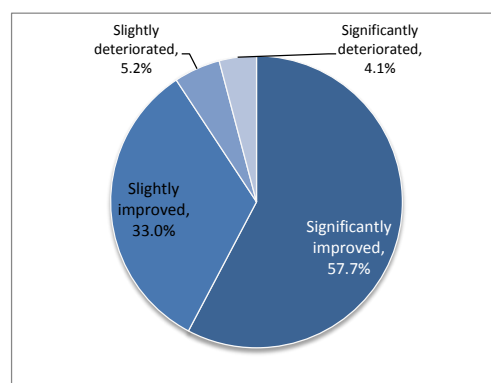


Figure 3. Answers by passengers on the improvement in the convenience of MISC vessels

- (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”.

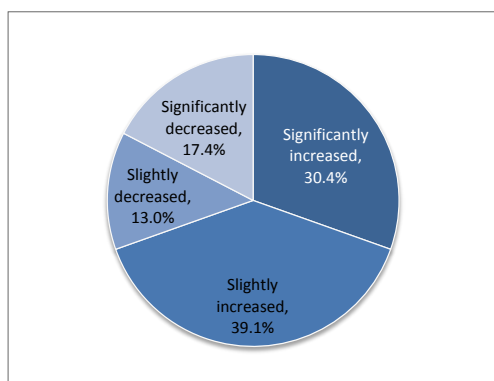


Figure 5. Answers by the island's people on the number of commodities

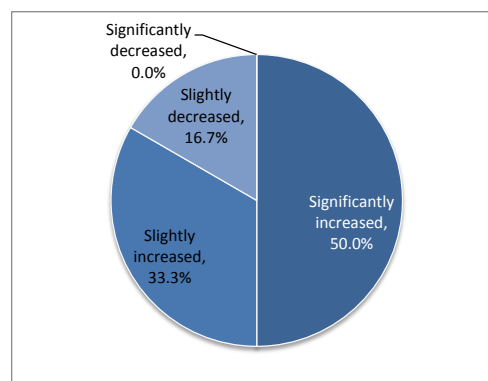


Figure 6. Answers by retail shops on the number of commodities

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 islands¹⁶.

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”.

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

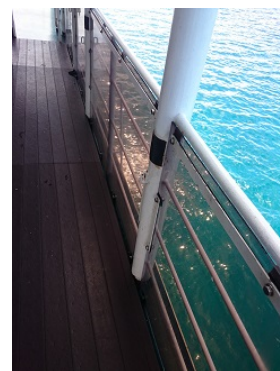


Photo 5. Plastic boards installed on handrails.

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.

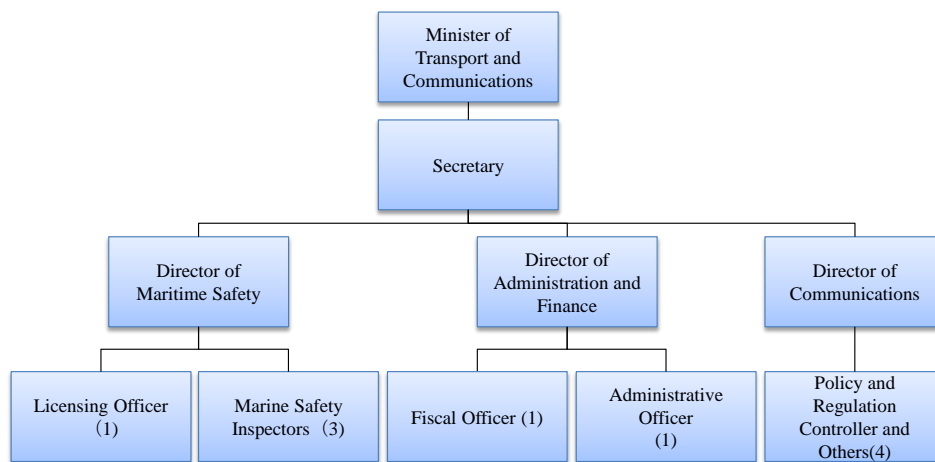


Figure 7. Organization chart of the MTC

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.

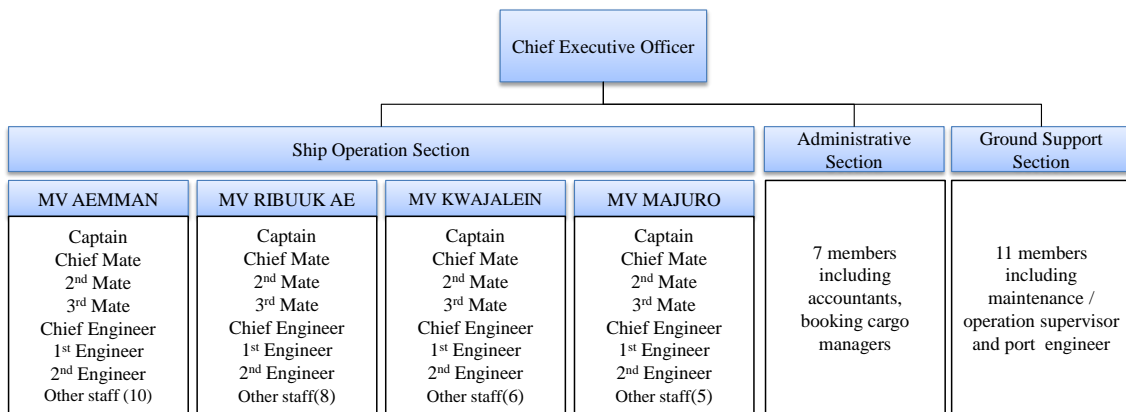


Figure 8. Organization chart of MISC

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 Islands¹⁷. 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 allocated¹⁹ 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 sufficient²⁰.

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 either²¹. 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)