

Republic of Kiribati

FY2017 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Expansion of Betio Port”

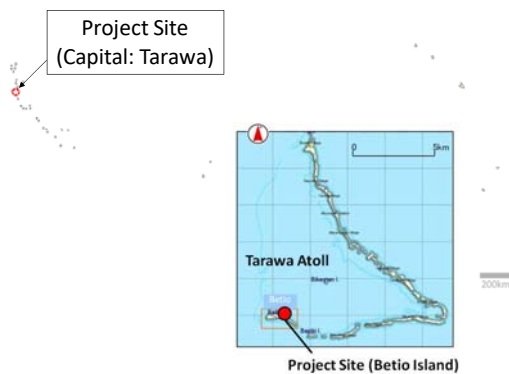
External Evaluator: Keisuke Nishikawa, Japan Economic Research Institute Inc.

0. Summary

In this project, a wharf where container ships can berth was developed and stevedoring equipment was procured to enhance port functions of Betio Port, which was the most important port in Kiribati. The relevance of this project is high as it was consistent with the development plans and development needs of Kiribati at the time of both planning and ex-post evaluation in terms of developing a major economic infrastructural facility to realize stable supplies of goods through safe stevedoring operations and as it was also consistent with Japan’s ODA policy at the time of planning to support the development of economic and transport infrastructure. As for implementation of the project, the project outputs were mostly as planned, and the project cost and period were also within the plan. Therefore, the efficiency is high. With regard to project effects, all quantitative indicators related to improvements of stevedoring efficiency were achieved and qualitative effects that were to ensure safety in stevedoring operations and shipping navigation were also generated. While the information on the reduction of transportation costs and prices through implementing this project was not sufficiently captured, some impacts such as the generation of a more competitive environment and a stable supply of goods were observed. Therefore, the effectiveness and impact of this project are high. Regarding operation and maintenance, while the financial aspects were largely sound, there were issues seen in terms of institutional and technical aspects as well as operation and maintenance conditions. Therefore, the sustainability can be judged to be fair as a whole.

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

1. Project Description



Project Location



Wharf and Access Trestle Developed in This Project

1.1 Background

Betio Port is the only full-scale international port in Kiribati handling foreign trade goods, and has been playing an important role as a hub for domestic sea transport connecting scattered islands. At the port, a wharf, container yard and related facilities and equipment were developed in 2000 through Japan's grant aid project. These port facilities are being utilized as a logistics base for internationally and domestically traded goods and as a wharf and a processing factory for seafood unloaded from fishing vessels. However, due to further advancement of containerization of international goods, 90% or more of the goods handled at Betio Port had been in containers at the time of planning and the sizes of container ships in the Pacific region had become larger. Those regular international container ships could not berth at the wharf developed in the grant aid in 2000 because of the shortage of the depth of water and the length of the wharf, forcing container handling to be done offshore through linking with barges. Offshore container handling was an issue in terms of safety and efficiency and a factor pushing up transportation costs. Moreover, among ports including nearby countries, it was one of the few international ports where container ships could not berth at the wharf, and it was an urgent matter to develop a wharf that would enable berthing operations by container ships.

1.2 Project Outline

The objective of this project was to enhance port functions by developing facilities and equipment at Betio Port, thereby contributing to the reduction of transportation costs.

Grant Limit / Actual Grant Amount	(Detailed design) 52 million yen / 51 million yen (Construction) 3,052 million yen / 3,026 million yen
Exchange of Notes Date / Grant Agreement Date	(Detailed design) November, 2010 / November, 2010 (Construction) June, 2011 / June, 2011
Executing Agency	Kiribati Ports Authority (KPA)
Project Completion	May, 2014
Main Contractors	The Consortium of Dai Nippon Construction and Toa Corporation
Main Consultant	Ecoh Corporation
Basic Design	June 2008 – January 2009 (Implementation Review Study: June 2009 – September 2010)
Related Projects	[Grant Aid] The Project for Improvement of Betio Port (1997)

	The Project for Rehabilitation of the Betio Port (2005)
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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: October, 2017 – December, 2018

Duration of the Field Study: December 4 – 16, 2017, and May 14 – 23, 2018

3. Results of the Evaluation (Overall Rating: A¹)

3.1 Relevance (Rating: ③²)

3.1.1 Consistency with the Development Plan of Kiribati

Kiribati's development plan at the time of planning of this project was the *Eighth Kiribati Development Plan* (2008-2011), in which 'Economic Growth and Poverty Reduction' and 'Infrastructure Development' were the two areas set among the six major development strategies. In these two areas, an importance was placed on the development and improvement of economic infrastructure including ports and on the development of efficient and effective maritime transport. In addition, the *Mid to Long-term Corporate Plan* (2004-2007) of the Kiribati Ports Authority (hereinafter referred to as 'KPA') in charge of operating international port facilities in Kiribati, had the target of improving cargo handling efficiency at Betio Port by 50% and set out a strategy to keep expanding the port area and paving the container yard.

In the *Tenth Kiribati Development Plan* (2016-2019), which was the development plan at the time of ex-post evaluation, 'Economic Growth and Poverty Reduction' and 'Infrastructure Development' were the two areas set among the six major development strategies, as those in the *Eighth Kiribati Development Plan*, emphasizing the formulation and execution of a comprehensive maintenance plan of major infrastructure facilities. As a sector-level plan, the *Statement of Intent*, positioned as the strategic plan of the KPA, continued to set efficient cargo handling through provision of safe and reliable port facilities as a key item.

Therefore, this project can be said to be consistent with these development plans as it was

¹ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

² ③: High, ②: Fair, ①: Low

a project to develop port facilities at Betio Port, which was the most important port in Kiribati, to realize efficient maritime transport thereby contributing to economic growth of Kiribati.

3.1.2 Consistency with the Development Needs of Kiribati

At the time of planning of this project, deadweight tonnages of container ships providing regular services in the Pacific were between 10,000 and 20,000 tons. Among the ports called at by those container ships, Betio Port was one of the few international ports they could not be berthed directly due to the shortage of the depth of water and the length of the wharf, forcing container handling to be done offshore³. Consequently, container handling operations had been an issue in terms of safety and efficiency, and berthing hours of container ships had been longer, becoming a factor in pushing up transportation costs.

This project was implemented under such development needs. Betio Port was a port catering for the majority of exports and imports of Kiribati at the time of both planning and ex-post evaluation, whose concrete values of exports and imports are shown in Table 1.

Table 1: Export/Import Values and Proportion of Betio Port

	Export			Import		
	Export value (thousand Australian dollars)		Proportion of Betio Port	Import value (thousand Australian dollars)		Proportion of Betio Port
	Whole of Kiribati	Betio Port		Whole of Kiribati	Betio Port	
2012	6,783	5,518	81.4%	104,825	103,439	98.7%
2013	6,919	4,727	68.3%	111,088	107,000	96.3%
2014	11,254	8,985	79.8%	118,990	117,825	99.0%
2015	13,299	11,531	86.7%	137,462	136,293	99.1%
2016	14,123	12,047	85.3%	147,401	144,004	97.7%

Source: Document provided by Kiribati National Statistics Office

Kiribati has a trade structure in which import values are more than 10 times greater than export values, and Betio Port particularly functions as a port catering for 96% - 99% of the imports of all Kiribati and occupies 95% - 98% of all export values⁴. The main import commodities (2016) were food (32.2%), machinery/transport equipment (20.1%), manufactured goods (10.5%) and beverages & tobacco (10.1%), and the main export commodities were coconut oil (36.0%) and fish (29.5%).

³ A cargo handling method in which cargoes are unloaded onto a barge from a ship anchored offshore; then the barge is carried to the wharf

⁴ Kiribati has one more international port in Kiritimati Island. The rest of export/import values are those by exporting and importing at Kiritimati Island.

At Betio Port, while it was necessary to conduct offshore handling operations before implementing this project, handling operations have been realized with cargo ships berthed at the wharf after project implementation, which shows that the port has a very essential position as the largest port of the country in realizing exports and imports of commodities in a safe and efficient manner. The executing agency commented at the time of ex-post evaluation that Betio Port as a window to supply various commodities especially in the country had a very significant role and that efficient cargo handling led to a stable supply of goods.

This project can be said to have been one that solved cargo handling problems at the time of planning and performed the function as the most important port, underpinning the country's exports and imports also at the time of ex-post evaluation. Therefore, this project was consistent with the development needs of Kiribati at the time of both planning and ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

At the time of planning of this project, Japan had set out 'Infrastructure development' as one of the key areas of assistance for Kiribati, in which a focus was placed on the assistance for economic and social infrastructure development such as electrical power, roads, ports, fishing ports, and so on, and the human resource development conducive to improvements in maintenance capacities of those facilities. Moreover, in the *Annex 2 Action Plan* of the *Islanders' Hokkaido Declaration* adopted at the Fifth Pacific Islands Leaders Meeting⁵ held in 2009, Japan expressed its intention to support the development of transport infrastructure in each Pacific island country⁶.

Therefore, this project, which supported economic and transport infrastructure such as a port, can be said to be consistent with the direction of Japan's assistance for the Pacific and Kiribati at the time of planning.

In light of the above, the implementation of this project was consistent with the development and sector plans as well as the development needs of Kiribati at the time of both planning and ex-post evaluation, and with Japan's ODA policy for Kiribati at the time of planning. Therefore, the relevance of this project is judged to be high.

⁵ 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 that both the Pacific island countries and the region have been facing

⁶ In the *Action Plan*, in the (2) *Development of infrastructure* of 1. *Economic Growth*, providing financial cooperation for transport infrastructure and support the improvement in infrastructure maintenance capacities through technical cooperation was proposed.

3.2 Efficiency (Rating:③)

3.2.1 Project Outputs

In this project, a wharf which large vessels can berth and an access trestle were developed, navigation aids were installed and stevedoring equipment was procured at Betio Port.

Details of the planned and actual outputs are shown in Table 2.

Table 2: Planned and Actual Outputs of This Project

Components	Plan	Actual	Remarks
Wharf	200m	200m	Width: 18m, steel pipe pile structure
Access trestle	261m	262m	Width: 6.5m, steel pipe pile structure
Port handling equipment			
Forklift	1 unit	1 unit	30.5 tons
Tractor & Trailer	3 units	3 units	For 20 feet container use: 2 units For 20 – 40 feet container multi-use: 1 unit
Navigation aids			
Buoy	11 units	11 units	Channel entrance and access channel: 8 units Anchoring area: 1 unit, Ship wreck area: 2 units
Beacon	2 units	2 units	Wharf: 2 units

Source: Implementation Review Study Report, document provided by JICA



Wharf



Forklift in handling operations

Additionally, an agreement between the two countries had been made to carry out the following items as the ones to be borne by Kiribati.

- Obtaining of an environmental license
- Lending of the temporary yard
- Exemption of port handling charges
- Grooming of the project site (as necessary)
- Removal of unexploded bombs (as necessary)
- Exemption of taxes and duties
- Payment of banking commission fees

- Issuance of visas to those concerned with the project
- Installation of pipelines
- Free lending of a barge and a tugboat owned by the KPA

Items borne by Japan were executed mostly as planned, as shown in Table 2. It was confirmed at the time of ex-post evaluation that the items borne by Kiribati except for the installation of the pipelines were also executed⁷. Moreover, although there was wreckage near the vessel rotating area, it was removed (not included as a component of the project) by the Kiribati side in 2015.

As for the installation of the pipelines, a project to install more tanks in the oil tank yard located next to the KPA premises was carried out with the assistance of Taiwan, which was completed and commissioned in mid-2017. Based on the plan of Kiribati Oil Company Ltd. to conduct designing for the installation of the pipelines after these tanks came into operation, a designing work to switch the pipelines from the old wharf (fishery wharf) to the new wharf was underway at the time of ex-post evaluation. If it was to progress smoothly, the pipe installation work was expected to commence by the end of 2018.

In this project, spaces for the pipelines would only be secured on the access trestle and the wharf, and the actual installation was planned to be done by the Kiribati Oil Company Ltd. and some other entities, meaning that the pipelines would not be installed during the period of this project, according to the agreement between the two countries at the time of planning. Also, while there was a delay in the installation of the pipelines, unloading of oil to the old wharf was handled without a hitch as in the past, and thus not causing any significant effects on economic or social activities even without the pipelines installed on the new wharf⁸. Therefore, non-installation of the pipelines does not have a negative impact on the generation of project effects at the time of ex-post evaluation. As the installation of the pipelines was affected by the progress of a different project and was seen as a component outside the scope of this project, it was judged that the actual output had not decreased compared to the planned output.

The KPA did not have a tugboat at the time of both planning and ex-post evaluation. While the purchase of a tugboat was one of the priorities of the KPA, it was commented that its priority level was not necessarily high compared to other items under budget constraints. As the port is inside the lagoon, waves are relatively gentle. However, considering further safety of vessels, it is thought desirable to procure a tugboat as the international port.

⁷ As the KPA does not have a tugboat, only the barge was provided for free of charge.

⁸ However, the facility is dilapidated and it is necessary to install pipelines on the new wharf in the near future to carry out unloading operations from larger oil tankers.

3.2.2 Project Inputs

3.2.2.1 Project Cost

This project was planned at a total cost of 3,125 million yen composed of Japan's project cost of 3,104 million yen (52 million yen for the detailed design + 3,052 million yen for the main works) and Kiribati's project cost of 21 million yen.

The actual project cost borne by Japan was 3,077 million yen, as shown in Table 3, while the amount of input by Kiribati was unknown.

Table 3: Breakdown of Actual Project Cost by Japan

(Unit: million yen)

Breakdown	Project cost
Detailed design	51
Construction	2,792
Direct construction	2,039
Other construction	753
Equipment	120
Design and supervision	114
Total	3,077

Source: Information provided by JICA

As the cost borne by Kiribati could not be captured, only that by Japan was compared. The actual cost was 99% of the plan, showing that it was within the plan.

3.2.2.2 Project Period

The planned project period⁹ of this project was 45 months, including the detailed design and tender periods. The actual project period was 42 months from December 2010 till May 2014. All the construction and equipment procurement were completed within the planned period, showing that the actual period¹⁰ was within the plan (93% of the plan).

The outputs of this project were largely as planned and the project costs and periods were both within the plan. Therefore, the efficiency is high.

⁹ As the ex-ante project evaluation summary did not have a specific commencement date, the work schedule indicated in the implementation review survey report was adopted. However, in the work schedule, the Exchange of Notes date and the Grant Agreement date were not included as the planned period of this project. The commencement of the project period was considered to have started from the detailed design phase (contract signing date for consultants). Therefore, the start of the detailed design phase was regarded as the commencement of the project in this ex-post evaluation study for the planned and the actual periods.

¹⁰ Non-installation of pipelines is not regarded as a delay in the project period.

3.3 Effectiveness and Impacts¹¹ (Rating:③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

At the time of planning of this project, the distance required for transporting containers in handling operations was set as an operation indicator, and a length of time for a vessel to stay at port and the number of vehicles unloaded and containers handled per hour were set as effect indicators. Table 4 shows the actual values of these indicators captured in the ex-post evaluation.

Table 4: Operation and Effect Indicators of This Project

	Baseline	Target	Actual
	2010	2017	2017
		3 Years After Completion	3 Years After Completion
Distance required for transporting containers from vessels ^{Note 1}	1,500m at sea + 200m on land	600m on land	Within 600m on land
Length of time for a vessel to stay at port ^{Note2}	109.8 hours	39.9 hours	Maximum of 36 hours
Number of vehicles unloaded from a vessel per hour	5.1	30	30
Number of containers handled per hour	5.7 (loaded) 8.0 (empty)	18.5 (loaded and empty)	20 (loaded and empty)

Source: Ex-ante Evaluation Summary Sheet, Implementation Review Survey Report, document provided by the executing agency

Note 1: Distance from container vessels to the container yard

Note 2: Length of time staying at the port to handle 300 loaded containers and 300 empty containers

In addition to the results in Table 4, the following items of a total of six vessels which called at Betio Port between late January and the beginning of March 2018 were measured in the ex-post evaluation to capture the latest situations of the number of containers handled per hour: (1) Berthing time, (2) Starting and ending time of container handling, (3) Number of containers handled and (4) Departure time of the vessels. As a result, an average of 18.7 containers was handled per hour, ranging from 10.0 to 23.3 containers. It was heard that when the vessel with 10.0 containers efficiency berthed, more time was required as the loading work for containers to be transported from Betio Port to Kiritimati Island in Kiribati was added to the normal container handling operations.

Therefore, the reduction of container transporting distance, an operation indicator, was

¹¹ Sub-rating for Effectiveness is to be put with consideration of Impact.

achieved through constructing the wharf and the access trestle. Regarding the effect indicators, it was confirmed that all of them achieved their target values. The original measurement under the ex-post evaluation revealed that the target figure for the number of containers handled per hour has been achieved. As a whole, it can be said that handling efficiency improved significantly.

The number of vessels calling at port in 2006 (container ships with deadweight tonnage of 10,000 tons or more occupying the wharf of Betio Port), before executing this project, was 23, which increased substantially after the completion of this project, reaching 62 in 2015, 60 in 2016 and 80 in 2017. The main factor for this was the number of shipping companies operating vessels calling at Betio Port, which was two before project implementation but increased to four at the time of ex-post evaluation.

3.3.1.2 Qualitative Effects (Other Effects)

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

- (1) The elimination of offshore cargo handling will improve operational safety.
- (2) Impacts of bad weather on berthing operations will be reduced, which will increase opportunities for cargo handling.
- (3) The safety of vessels going through access channels will improve.
- (4) Arrivals and departures of vessels during the nighttime will become possible.

According to the executing agency, as a result of developing a new wharf through this project,

- (1) As the depth of the sea at the wharf became deeper compared to that before the project, berthing of larger vessels such as container ships became possible. Consequently, offshore cargo handling was completely eliminated, enabling safe handling operations.
- (2) Export and import values of cargoes through Betio Port have been consistently increasing (Table 1) and handling operations increased. Hindrance of handling operations due to bad weather was reduced substantially.
- (3) Navigating safety of vessels improved by installing buoys and beacons.
- (4) Arrivals and departures of all vessels during the nighttime became possible by installing buoys and beacons.

It was confirmed through the site survey, trade statistics and interviews with shipping companies that items (1) – (4) were actually realized. In the interviews with shipping agents (two agents) and a shipping company (1 company) using Betio Port, safer handling operations through berthing of container ships and the realization of port arrivals and departures regardless of the time slot were largely highly valued.

Therefore, it can be judged that the qualitative objectives of this project have been achieved as a whole.

3.3.2 Impacts

3.3.2.1 Intended Impacts

Through the execution of this project, it was expected as quantitative impacts that transportation costs composed of the prices of imported goods distributed in the country would be reduced through more efficient cargo handling which would lead to price reductions of imported goods. As for qualitative impacts, it was expected that (1) as an impact on shipping companies, the number of days required for one voyage can be shortened, improving maritime transportation services such as increased vessel assignment frequencies, and (2) a stable supply of goods would contribute to the improvement in people's lives.

In the interviews with shipping agents and major retailers (five companies in total)¹² in the ex-post evaluation, it was heard that whether prices had dropped through more efficient cargo handling was not clear, but that increases in imported goods and a stable supply of goods were realized with more vessels calling at port. While the changes in retail price index in Table 5 do not clearly show the effects of price increase control through this project, no price soaring has occurred, implying that a stable supply of goods have underpinned it. In the interview survey, there was an opinion heard that there was more competition among shops because of increased goods, inferring that a certain level of consumer benefits was generated.

Table 5: Rate of Changes of Retail Price Index

	2012	2013	2014	2015	2016
Rate of changes of retail price index	-3.0%	-1.5%	2.1%	0.6%	1.9%

Source: Document provided by Kiribati National Statistics Office

Regarding qualitative impacts, according to the shipping company, the number of days required for calling at port by the vessel was three before project implementation, but it was shortened to one to two days after project implementation. Moreover, some opinions were heard from the shipping company and retail businesses that goods are supplied more stably, suggesting that this project contributed to the stable supply of goods and the improvement in the living environment of residents.

¹² There were two agents for the ships calling at Betio Port, both of whom were interviewed. Also, major retailers were the three major companies importing goods through Betio Port.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

At the time of planning of this project, it had been judged that undesired impacts on the environment through project implementation would not be serious and there would be no problem because this project was not regarded as a large-scale project in the port sector in light of JICA's Guidelines for Environmental and Social Considerations (2004). Preparation of the environmental impact assessment report of this project was not required by the domestic law of Kiribati, and development permission of this project was issued in October 2008 by the Ministry of Environment, Lands and Agricultural Development. When executing the project, it was planned that, to avoid negative impacts on the natural environment, (1) as a measure against marine pollution, a pile-driving method which would not scatter oil would be adopted to avoid impacts on marine species caused by oil spillage during construction, and (2) for oil spillage caused by other factors, marine pollution due to unforeseen circumstances would be minimized by always having an oil fence available and collect it instantaneously with an absorption mat. Monitoring activities of water quality and air quality were to be conducted by the Ministry of Environment, Lands and Agricultural Development.

In the ex-post evaluation, the actual performance of these items was checked with the executing agency and the project consultant, revealing that there were neither activities that generated muddiness such as dredging and so on nor oil spillage cases that would require oil fences since the barge was not used and the construction work was done from the land. Also, no circumstances were created that would pollute the sea during or after project implementation.

Construction wastes were disposed of at a landfill of the town council in Betio where this project was implemented, and no muddy water from the concrete plant was discharged directly into the sea. It was heard that the piling work for the construction of the wharf and the access trestle was done by adopting a method called a vibro-hammer method to minimize noise.

It was confirmed that no impacts on the natural environment were caused either during or after project implementation and the Environment and Conservation Division of the Ministry of Environment, Lands and Agricultural Development commented that no issues were found as there were no negative environmental impacts in particular. In fact, there were no complaints from fishermen or residents, showing that there were no problems as a whole.

(2) Resettlement and Land Acquisition

Since this project was an expansion of the existing port facilities toward the sea, it was considered that no new land acquisition or resettlement of residents would occur. Checked at the time of ex-post evaluation, this project was executed as planned and neither new land acquisition nor resident resettlement occurred. Therefore, it can be concluded that there were no problems.

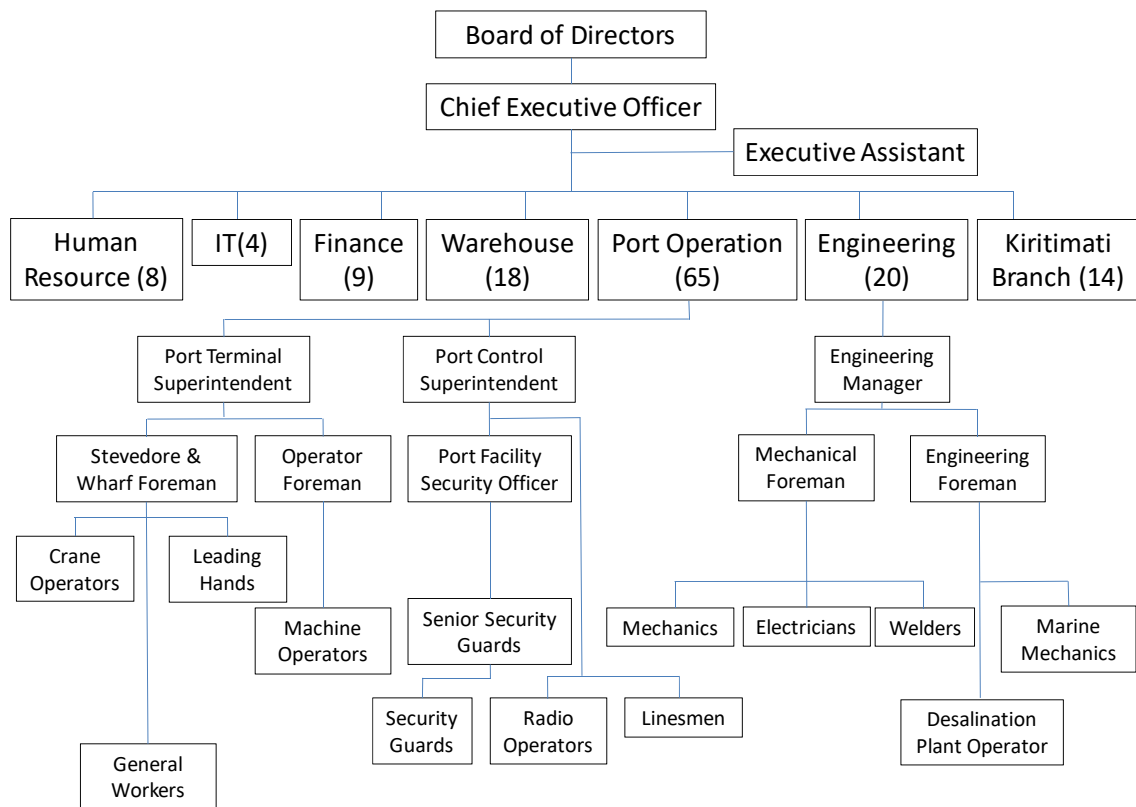
All the operation and effect indicators expected in this project were achieved and it can be said that cargo handling efficiency improved substantially. Moreover, qualitative effects were also sufficiently generated such as securing the safety of handling operations and navigating routes of vessels. While the reduction of transportation costs and price levels through implementing this project could not be sufficiently indicated in a quantitative manner, certain impacts were observed such as the generation of a more competitive environment and a smooth supply of goods. Additionally, there were neither negative impacts on the natural environment nor resident resettlement nor land acquisition cases.

In light of the above, the generation of project effects was seen largely as planned through project implementation. Therefore, the effectiveness and impacts are high.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

The executing agency of this project is the KPA, consisting of seven departments; human resources, finance, IT, warehouse, port operation, engineering and the Kiritimati branch under the chief executive officer. The operation and maintenance of the facilities and equipment developed in this project are under the charge of the port operation and engineering departments. As there is no more need to use the barge as a result of this project, the number of staff members has been gradually reduced, with the total number of staff members at 156 in 2017, eight members fewer than 164 in 2016. In 2018, the number of staff members was planned to be further reduced by not filling the posts of retirees, reaching 140 by the end of the year. Judgment that the KPA had had an excessive number of staff members is the reason behind it after the completion of this project, and it was considered from the viewpoint of efficient management that the reduction in staff numbers would not have negative impacts on operation and maintenance.



Source: Information provided by the executing agency

Figure 1: Organization Chart of the KPA (simplified version)

With regard to qualifications held by the staff members, each department had from one to several members with qualifications, including those in mechanical and maritime fields, showing that the KPA had a structure that did not have issues with performing fundamental items. However, a civil engineer necessary for the maintenance of the wharf has not been secured, which has hindered the judgment of the structural durability as well as sufficient formulation and implementation of a maintenance plan for the wharf and the access trestle. In this sense, there seems to have been some issues.

3.4.2 Technical Aspect of Operation and Maintenance

According to the executing agency, out of the facilities and equipment developed in this project, (1) capacities to formulate a maintenance plan of the wharf structure were lacking, (2) technical skills to maintain the upper surface was not sufficient, and (3) there were some issues as to the skills needed for repairing heavy equipment for handling operations. In fact, diagnosis of the structural durability and so on had been outsourced, and it was thought that the technical skills for continuously diagnosing internally were lacking¹³. Therefore, while

¹³ At the time of planning of this project, the KPA was maintaining the old wharf, which had a reclamation structure

there was a plan to formulate a maintenance manual for facilities such as the wharf, the actual formulation of the manual had not begun.

In contrast, one of the reasons for insufficient repairs of heavy equipment for handling operations was the lack of mechanics' technical skills, however, delays in the budget process and procedures to procure spare parts seemed to be a larger factor.

At the KPA, the *Three-Year Human Resource Development Plan 2017-2019* had been formulated to improve the skills of internal staff members, which specified necessary external training programs including the ones for mechanics and electricians. However, it was not certain if they could be definitely conducted as the budget had not been necessarily secured¹⁴.

Based on the above, while there were certain technical skills to undertake usual operation and maintenance, some insufficient maintenance of wharf and heavy equipment was observed. Therefore, it is considered that there are some issues.

3.4.3 Financial Aspect of Operation and Maintenance

The KPA's financial balance in recent years is shown in Table 6.

Table 6: Operating Balance of the KPA

(Unit: thousand Australian dollars)

	2014	2015	2016	2017
Revenue	8,068	7,690	8,485	8,016
Betio Port	6,856	6,879	7,950	6,973
Kiritimati Port	1,211	812	535	1,043
Expenditure	7,718	7,366	8,068	7,996
Employment-related costs	2,801	2,678	3,269	3,099
Other costs	1,816	1,898	1,798	1,771
Depreciation	3,101	2,789	3,001	3,126
Operating balance	350	324	418	20

Source: Information provided by the executing agency

Cargo handling-related revenues account for a large proportion of the KPA's revenues, in which Betio Port accounts for 85% - 94% of the entire revenue of the KPA. Since 2014, when this project was completed, the operating balances of the KPA have been on a profitable trend. The major factor influencing the lower operating balance in 2017 was a revision of a port tariff table in September 2016, when some of the handling charges were

while the new wharf constructed in this project had a piling structure requiring higher skills for maintenance. In the plan, the new wharf was designed with an expected service life of 50 years without a need for routine maintenance. However, there were cracks on the upper surface of the wharf caused by collisions of calling vessels, requiring regular inspections of the condition of the wharf.

¹⁴ The costs for internal training were planned to be catered for by the KPA's budget.

lowered¹⁵.

The expenditures for repairs and maintenance were 394 thousand Australian dollars (AUD) in 2014, 333 thousand AUD in 2015, 529 thousand AUD in 2016 and 437 thousand AUD in 2017, accounting for 20% - 32% of 'Other costs' of Betio Port, the largest expenditure item. However, it was heard that this level could not be said to be sufficient to possess spare parts with a focus on consumables always in stock and that there were some instances in which the procurement of spare parts sometimes got delayed. Other major items of expenditure were fuel, utility charges, overseas travels and so forth.

Therefore, while the financial condition in relation to operation and maintenance can be judged to be largely sound, there are some issues observed in procuring spare parts. Hence, it is desirable to raise the level of surpluses, increase the budget for maintenance, and improve inventory management.

3.4.4 Status of Operation and Maintenance

At the time of planning of this project, the KPA was judged to have been properly managing the wharf and the container yard of that time. However, recommendations by the project consultants were made in the defect inspection conducted one year after the completion of port facilities developed in this project that stated 'as berthing and handling operations are executed even during severe weather conditions, it is necessary to formulate a port usage standards, understand the wharf design and berthing conditions, and continue education for the improvement of safety awareness'. Some improvements were seen that berthing operations during stormy weathers with wind velocities over 10m/second were discontinued after the defect inspection and a usage standard limiting the container weight to 25 tons or less was established. Nevertheless, the KPA has not installed any equipment (such as a wind gauge and a wave gauge) on the wharf to measure wind velocity and wave conditions, and the all meteorological data are captured from the information provided by the Kiribati Meteorological Service.

The facilities and equipment developed in this project were all being utilized. Their maintenance conditions, checked in the ex-post evaluation, were mainly as follows.

While the wharf and the access trestle were being used without any problems, a number of damaged spots on the concrete pavement of the upper surface of the wharf (connecting points) were identified. In addition to a structural diagnosis independently conducted by the KPA in 2017, JICA executed a site survey in 2018 as Follow-up Cooperation of this project, which revealed that there were no damages to the structure of the wharf itself and the

¹⁵ As the costs could be saved compared to the period of offshore handling, for example, the unloading fee of FCL (full container load) converted to a 40-foot container (FEU), which used to be 600 AUD, was reduced to 300 AUD.

damages could be repaired through thorough maintenance of the upper concrete pavement¹⁶. Also, regarding the structures on the upper surface of the wharf, there were damages to lighting poles and a beacon light guard wall due to collisions during the handling operations in the first year of operation, which left them still slightly tilted at the time of ex-post evaluation. In addition, though it was confirmed that major damages were repaired accordingly, damages which had not necessarily been appropriately repaired were occasionally seen. According to the executing agency, no collisions with port facilities have occurred after the first year of operation.



Damages to the Upper Surface of the Wharf



Container Yard (outside the scope of this project)

While it was confirmed that a simple maintenance plan had been formulated and records were taken, it was not shared within the entire organization. In addition, as described above, there were some occasions where the materials and spare parts necessary for maintenance could not be procured promptly because of delays in ordering procedures and the budget shortage. At the time of ex-post evaluation, the KPA had just started establishing an inventory management system, and it was seen that frequently-used materials and spare parts were gradually purchased and equipped in the warehouse.

The weight limit of the wharf during handling operations is 30 tons per container, but it has been restricted to 25 tons since September 2016 as the pavement of the container yard, outside of the scope of this project, is deteriorated. This means that the maximum weight of the containers unloaded at Betio Port has been reduced by 17%, and an immediate redevelopment of the container yard has been requested by port users¹⁷.

¹⁶ At the time of planning, it was deemed necessary to have cooperation from the Ministry of Public Works and Utility. However, repairs of the wharf were all conducted by the KPA and no particular cooperation was observed.

¹⁷ The KPA has a plan to develop the container yard in 2018 and 2019, and the necessary budgetary measures have been taken. At the time of ex-post evaluation, the designing stage was completed.

Based on the above, it can be judged that there were some issues in terms of operation and maintenance conditions.

In light of the above, while the financial aspect seemed to be largely sound, some issues were observed in each of the institutional and technical aspects and the operation and maintenance conditions, indicating that there were some issues as a whole. Therefore, the sustainability of the project effects generated in this project is fair.

4. Conclusion, Recommendations and Lessons Learned

4.1 Conclusion

In this project, a wharf where container ships can berth was developed and stevedoring equipment was procured to enhance port functions of Betio Port, which was the most important port in Kiribati. The relevance of this project is high as it was consistent with the development plans and development needs of Kiribati at the time of both planning and ex-post evaluation in terms of developing a major economic infrastructural facility to realize stable supplies of goods through safe stevedoring operations and as it was also consistent with Japan's ODA policy at the time of planning to support the development of economic and transport infrastructure. As for implementation of the project, the project outputs were mostly as planned, and the project cost and period were also within the plan. Therefore, the efficiency is high. With regard to project effects, all quantitative indicators related to improvements of stevedoring efficiency were achieved and qualitative effects that were to ensure safety in stevedoring operations and shipping navigation were also generated. While the information on the reduction of transportation costs and prices through implementing this project was not sufficiently captured, some impacts such as the generation of a more competitive environment and a stable supply of goods were observed. Therefore, the effectiveness and impact of this project are high. Regarding operation and maintenance, while the financial aspects were largely sound, there were issues seen in terms of institutional and technical aspects as well as operation and maintenance conditions. Therefore, the sustainability can be judged to be fair as a whole.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

In the ex-post evaluation, it was confirmed that the wharf, developed through this project, was damaged as berthing operations were made under adverse weather conditions and as the way the handling equipment was handled was not appropriate soon after the facilities of this project were put into use. Therefore, it is important that the executing agency install the

necessary equipment such as wind and wave gauges and regularly conduct training sessions targeting the workers operating the handling equipment so that berthing and unberthing operations of vessels can be conducted safely and damages to vessels or the wharf can be avoided. Moreover, it is thought to be necessary to completely repair the damages to the wharf as soon as possible by securing a sufficient budget through JICA's Follow-up Cooperation and to promptly secure a sufficient budget for repairing and developing the container yard, which has become the cause of container weight restrictions, though the executing agency has already embarked on it.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Strengthening of instructions to ensure appropriate operation and maintenance of facilities and equipment

One of the causes of damages to the wharf developed through this project was the inappropriate usage of the handling equipment by workers. The workers had been engaged in offshore handling through the use of a barge prior to the completion of this project. In this project, as the wharf was developed to conduct all container handling operations on land at Betio Port, it is considered that strengthening operation instructions in conjunction with the provision of handling equipment would have been effective to avoid damages to the wharf so that the wharf would be operated adequately.

In the future, when a wharf is to be developed at a port where offshore handling operations are conducted, it is necessary to incorporate a soft-component (technical assistance) and provide operation instructions especially to handling operators as necessary so that the facilities and equipment can be utilized in good condition in the long run.

(End)