

**Ex-Post Project Evaluation 2021:
Package I-4 (Tanzania, Seychelles)
Evaluation Reports**

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United Republic of Tanzania

FY2021 Ex-Post Evaluation Report of

Japanese Grant Aid Project

‘The Project for Improvement of Tazara Intersection,
the Project for Improvement of Tazara Intersection (Phase2)
and
the Project for Improvement of Tazara Intersection (Phase3)’

External Evaluator: Ruiko Hino,

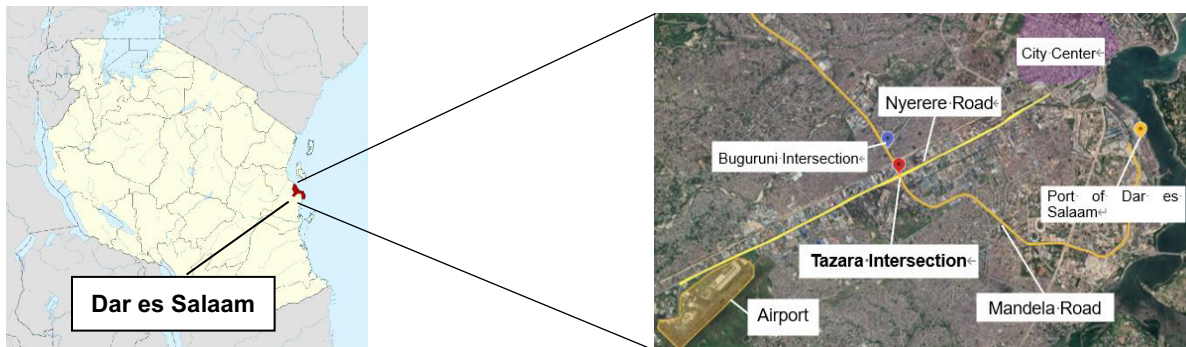
Foundation for Advanced Studies on International Development

0. Summary

The project constructed the first flyover in Tanzania in the direction of Nyerere Road at the Tazara Intersection to create a grade separation; the project aimed to alleviate traffic congestion on Nelson Mandela Road (hereinafter referred to as ‘Mandela Road’) and Nyerere Road starting from this intersection. About relevance, the project was found to be consistent with the development plan of Tanzania and the development needs which promoted the development of the transport sector in Dar es Salaam, a critical economic hub in Tanzania. In terms of coherence, the project was consistent with Japan’s ODA policy, according to which infrastructure development is a priority area. The cooperation and coordination with other projects and support within JICA were also as expected, and the results were confirmed, as well as with other donor projects, as expected. In light of the above, relevance and coherence were high. Regarding efficiency, all outputs were achieved as planned, the project cost was within the plan, and the project period slightly exceeded the plan, so the efficiency was high. Regarding effectiveness, degree of intersection saturation was significantly increased, average intersection transit time was reduced considerably on Nyerere Road, although not on Mandela Road, and Nyerere Road travel time was also significantly reduced when compared to the actual values. In addition, the impact of the project was also observed in terms of stabilising the livelihoods of low-income groups living in the outer-urban extension and improving safety within the intersection. Therefore, the effectiveness of the project’s implementation was generally as planned, and effectiveness and impact were high. Regarding sustainability, while no issues were observed in policies and systems or in institutional/organizational and technical aspects, some issues were observed regarding financial aspects and the current status of the operation and management system; the sustainability of the project was moderately low.

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

1. Project Description



Project location (source: prepared by the evaluator).



Flyover constructed by the project (photo by the evaluator)

1.1 Background

Dar es Salaam, the project site, is the largest city in Tanzania. Dar es Salaam is the starting point for major transport systems such as trunk roads, railways and ports and is a crucial transport hub for the whole of Tanzania. At the same time, the city is also an important gateway on the international corridor from the Port of Dar es Salaam, an excellent natural port facing the Indian Ocean, to neighbouring landlocked countries.

At the time of planning, traffic congestion in Dar es Salaam was worsening yearly due to population growth and an increase in the number of vehicles passing through the city. It was feared that, if appropriate measures were not taken, traffic congestion in the city would further worsen and hamper the economic growth of Tanzania and East African countries.

Under these circumstances, the Tanzanian government asked Japan to conduct a development study, *The Study for Formulation of Dar es Salaam Transport Policy and System Development Master Plan*, to improve the transport network in Dar es Salaam, and the Japan International Cooperation Agency (JICA) conducted the study from April 2007 to June 2008. The development study developed a Transport Master Plan¹ with 2030 as the target year and selected several priority projects to be implemented between 2008 and 2015. This project is one of the priority projects selected in the said Master Plan. The target site, the Tazara Intersection, is located

¹ Dar es Salaam Urban Transport Master Plan (2008).

approximately 8 km south-west of the city centre and is the intersection of Mandela Road (the most crucial major transport road from the port, connecting various trunk roads) and Nyerere Road (the only trunk road connecting the airport to the city), where traffic volume was very high. It was chronically congested, with vehicle speeds falling into the 6 km/h range during peak hours. The development study, therefore, proposed an elevated crossing as one of the most urgent intersections in Dar es Salaam where congestion relief measures should be implemented.

1.2 Project Outline

The objective of this project is to reduce congestion on Mandela Road and Nyerere Road starting from the Tazara Intersection by constructing a flyover in the direction of Nyerere Road at the intersection, thereby contributing to smooth traffic and logistics in the city of Dar es Salaam.

Grant Limit/Actual Grant Amount	The Project for Improvement of Tazara Intersection (hereinafter referred to as 'Phase 1') 3,127 million yen/3,127 million yen The Project for Improvement of Tazara Intersection (Phase 2) (hereinafter referred to as 'Phase 2') 346 million yen/346 million yen The Project for Improvement of Tazara Intersection (Phase 3) (hereinafter referred to as 'Phase 3') 1,722 million yen ² /1,722 million yen Total (Phase 1 to Phase 3) 5,195 million yen/5,195 million yen
Exchange of Notes Date /Grant Agreement Date	Phase 1 June 2013/June 2013 Phase 2 July 2014/July 2014 Phase 3 March 2015/March 2015
Executing Agency	Tanzania National Roads Agency (hereinafter referred to as 'TANROADS')
Project Completion	22 October, 2018
Target Area	Dar es Salaam
Main Contractor(s)	Sumitomo Mitsui Construction Co., Ltd.
Main Consultant(s)	Oriental Consultants Global Co., Ltd. Eight-Japan Engineering Consultants Inc. (Joint venture)
Preparatory Survey	May 2011–Feb 2012

² Includes a grant for a contingency of 157 million yen.

Related Projects	<p>Japanese ODA Loan</p> <ul style="list-style-type: none"> - Road Sector Support Project 2 (April 2013) <p>Technical Cooperation Projects</p> <ul style="list-style-type: none"> - Project for the Capacity Development in Road Maintenance Management (2006–2011) - Dar es Salaam Comprehensive Urban Transport System Formulation Study (2007–2008) - The Capacity Development Project for Improvement of Dar es Salaam Transport (Phase 2) (2014–2017) - Project for Revision of Dar es Salaam Urban Transport Master Plan (2016–2018) - Feasibility Survey for Improving Night-time Road Safety through Application of Solar-powered Active Road Studs (2017–2018) <p>Grant Aid Projects</p> <ul style="list-style-type: none"> - The Project for Widening of New Bagamoyo Road (May 2010) - The Project for Improvement of Transport Capacity in Dar es Salaam (January 2013) <p>Other International Organizations and Donors</p> <ul style="list-style-type: none"> - Rehabilitation and upgrading of 16 km of Nelson Mandela Road (European Union, hereinafter referred to as the ‘EU’), completed in 2011) - Dar es Salaam Urban Transport Improvement Project (World Bank, hereinafter referred to as ‘WB’, (2017–2023, planned)
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2. Outline of the Evaluation Study

2.1 External Evaluator

Ruiko Hino, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

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

Duration of the study: September 2021–November 2022

The first field study was conducted remotely using local consultants.

The local consultant contract period: November 2011–November 2022

Duration of the second field study: 22 May, 2022–28 May, 2022

2.3 Constraints during the Evaluation Study

(Conducting the field study remotely using local consultants)

In this study, due to the impact of the spread of COVID-19, the external evaluator did not travel to the field for the first field study. The external evaluator utilised local consultants remotely to conduct an actual inspection of the project site, collect information and data, and interview project stakeholders, and the external evaluator scrutinised the content obtained and made an evaluation analysis and assessment.

(Information constraints during procurement and in the analysis of factors)

In analysing the challenges and factors in the project's procurement of construction contractors, there were only a limited number of parties with good knowledge of the situation at the time, and sufficient detailed information was not available. The analysis was mainly based on documents provided by JICA. Therefore, there were information constraints in this regard.

3. Results of the Evaluation (Overall Rating: B³)

3.1 Relevance/Coherence (Rating: ③⁴)

3.1.1. Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Tanzania

The Government of Tanzania formulated *Tanzania Development Vision 2025* (hereinafter referred to as 'Vision 2025') in 1998 as a development plan with a long-term perspective. The vision aimed to improve the quality of life of the people, achieve good governance based on the law, and achieve a competitive and robust economy. It also stated that increased competitiveness requires advanced technological capabilities, high productivity and modern, efficient transport and communication infrastructures. The vision is the latest long-term perspective development plan at the time of the ex-post evaluation.

The *National Strategy for Growth and Reduction of Poverty* (2005/06–2009/10), which was the national development policy of Tanzania at the time of planning, identified the transport sector as a priority sector, and nearly 15% of the national budget was allocated to the sector every year. The road sector was also the most significant investment sector in the *10-year Transport Sector Investment Programme* (2007/08–2016/17), a comprehensive strategy document for the transport sector.

The national development plan of Tanzania at the time of the ex-post evaluation, the *National Five-Year Development Plan* (2021/22–2025/26) (hereinafter referred to as 'FYDP III'), indicated that the country was not taking advantage of its geographical comparative advantage in connecting the markets of neighbouring countries and its potential as a logistics hub linking the markets of regional trading blocs due to lack of infrastructure development. The construction of

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

⁴ ④: Very High, ③: High, ②: Moderately Low, ①: Low

nine new flyovers was planned in Dar es Salaam to ease traffic congestion and provide quick access. In addition, the comprehensive transport sector strategy, *Phase Three of the Transport Sector Investment Programme (2018/19–2020/21)* (hereinafter referred to as ‘TSIP III’), stated that the road transport sector was to receive the most investment after the railway sector. Furthermore, the programme also stated that road transport is the most used mode of transport and the lifeline for the country’s economic development.

Thus, the national development plan of Tanzania at the time of planning and during the ex-post evaluation consistently positioned road sector development as a cornerstone of policy. Based on the above, the project is consistent with the development plan of Tanzania.

3.1.1.2 Consistency with the Development Needs of Tanzania

At the time of planning, the number of registered vehicles in Dar es Salaam was increasing rapidly at approximately 7% per annum, faster than the population growth rate (5.6% per annum), exacerbating traffic congestion. Traffic volumes at the target site, Tazara Intersection, were very high, with chronic congestion to the extent that vehicle speeds fell to 6 km/h during peak hours. Dar es Salaam is a major transport hub for Tanzania. If no measures were taken to alleviate traffic congestion, it was feared that the traffic congestion would worsen further, hindering the economic growth of Tanzania and East African countries.

From the time of planning to the time of the ex-post evaluation, the number of registered vehicles in Tanzania has increased, from approximately 160,000 in 2011 to over 270,000 by 2021.⁵ There was also an increasing trend in traffic volume within the Tazara Intersection at the time of the ex-post evaluation, as shown in Table 1.

Table 1: Traffic volumes within the Tazara Intersection

(Unit: cars/12 hours)

2019	2020	2021
24,776	20,168	30,202

(Source: TANROADS)

In light of the above, the project is highly consistent with development needs in Tanzania, as the need to reduce traffic congestion in Dar es Salaam was consistently high at the time of planning and ex-post evaluation, and Dar es Salaam, the target site, is a critical transport and trading hub with neighbouring countries.

⁵ Based on data from the Tanzania Revenue Authority.

3.1.1.3 Consideration and Fairness to Marginalised People

Although the project was not designed with particular consideration for marginalised people (children, women, people with disabilities, the elderly, etc.) at the time of planning, the pedestrian crossing was wide enough, and no steps were identified, resulting in a design that was somewhat accessible to the elderly and other people with walking difficulties (site visit and interviews with elderly and disabled people using the Tazara Intersection).⁶

3.1.1.4 Appropriateness of the Project Plan and Approach

The project was initially planned to be implemented under the grant limit of the Exchange Notes (hereinafter referred to as 'E/N') of Phase 1. However, the following circumstances led to the conclusion of new E/Ns for Phase 2 and Phase 3.

The original project cost was 3,127 million yen (the E/N grant limit of Phase 1), but the first tender (January 2014) was unsuccessful⁷. This necessitated another tender, but foreign currency accounted for approximately half of the construction cost, and the project cost increased significantly due to the yen's depreciation. This necessitated a partial scope cut of the original plan to accommodate the project within the E/N grant limit of Phase 1. The E/N of Phase 2 (grant limit of 346 million yen) was concluded in July 2014, as the bridges would not function as a whole facility if the construction subject to the scope cut were not implemented, and the expected effects, such as traffic congestion relief, would not be realised. After the E/N of Phase 2, a second tender was conducted (September 2014), but it was unsuccessful, and a third tender had to be conducted. After the second tender, there was a further depreciation of the yen. In the process of confirming the factors behind the unsuccessful tender, it became clear that the contractor side requested consideration for ensuring site safety, taking into account local traffic conditions and construction matters, due to the need to work at heights in this project (documents provided by JICA). As a result, the required project cost increased due to the need to ensure site safety, strengthen safety management and address various risks, including exchange rate fluctuations and local price increases. As a result, it was necessary to adjust the project cost reduction by cutting the scope of the facilities subject to the cooperation of Phase 1. The E/N of Phase 3 (grant limit of 1,722 million yen) was concluded because the bridges would not function as a whole facility if the construction subject to the scope cut were not implemented, and the expected effects, such as traffic congestion mitigation, would not be achieved.

The rapid depreciation of the yen, which was a significant factor in the change of plan, was difficult to envisage at the time of planning, and this can be considered an external factor. As for the risk that the contractors were aware of, it is believed that it was difficult for JICA/consultants to grasp.⁸

⁶ 10 people (8 elderly and 2 disabled) were interviewed (Mar 2022).

⁷ A factor analysis of bidding irregularities is described in 3.2 'Efficiency'.

⁸ Based on the interview with the JICA Tanzania Office and the consultant's response to the questionnaire.

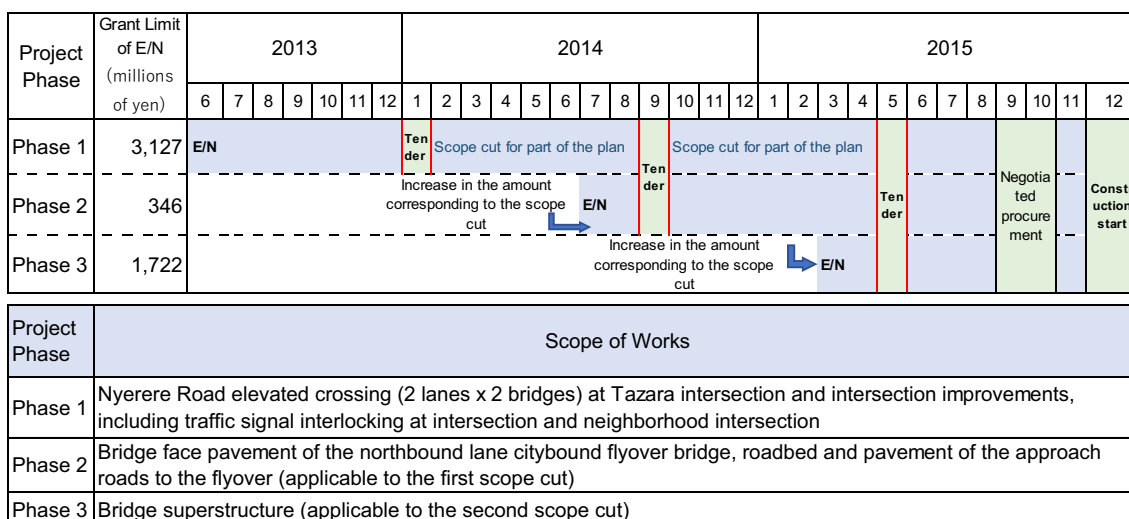


Chart 1 Exchange Notes and the tenders

(Source: prepared by the evaluator based on the documents provided by JICA)

From the above, it can be said that the two scope cuts and the increase in the project cost to compensate for the scope cuts were necessary changes to achieve the expected effects of the project's implementation, such as easing traffic congestion.

3.1.2 Coherence (Rating: ③)

3.1.2.1 Consistency with Japan's ODA Policy

At the time of planning, Japan's *Country Assistance Program for Tanzania* (June 2012) identified 'infrastructure development to support economic growth and poverty reduction' as a priority area, and the project was positioned within the 'Transport Network Development Programme'. In addition, the Fifth Tokyo International Conference on African Development⁹ (hereafter referred to as 'TICAD') identified the 'promotion of infrastructure development and capacity building' as a critical issue. Furthermore, the *Yokohama Action Plan 2013-2017*, which outlines specific initiatives for the TICAD process, clearly stated 'development of key infrastructure in both urban and rural areas' as a priority area. This project corresponded to this plan.

As described above, consistency between the project and Japan's ODA policy can be observed.

⁹ The Tokyo International Conference on African Development has been held seven times since 1993, led by the Government of Japan, in collaboration with the United Nations, the United Nations Development Programme (UNDP), the World Bank and the African Union Commission (AUC).

3.1.2.2 Internal Coherence

The JICA Development Study ‘Dar es Salaam Comprehensive Urban Transport System Formulation Study (2007–2008)’ was conducted with the objective of formulating an urban transport master plan, and this project was recommended as one of the high-priority projects in the developed urban transport master plan. In response to this recommendation, the government of Tanzania asked the government of Japan to implement the project, and the project was implemented and achieved the expected results. In addition, an advance feasibility study (hereinafter referred to as the ‘Pre-F/S’) of the project was conducted as part of the development study. The Pre-F/S was utilised in the planning of the project.

Solar-powered active road studs, a proposed product of the JICA Support for Japanese Small and Medium Enterprises (SMEs) Overseas Business Development ‘Feasibility Survey for Improving Night-time Road Safety through Application of Solar-powered Active Road Studs (2017–2018)’, were introduced for the purpose of night-time traffic safety at the project site. In the above project, the solar-powered active road studs were introduced to the government of Tanzania, and the Tanzanian side requested installation of the product on a pilot basis. In response to this request, a project design change was made to install the solar-powered active road studs, and the product was installed. In the opinion of the implementing agency, introducing the solar-powered active road studs has contributed to improving safety at the project site. This evaluation has also confirmed the impact of improved safety within the intersection, so it appears that the effect was close to what was expected.¹⁰

3.1.2.3 External Coherence

At the time of the planning and the implementation of the project, a project for bus rapid transit (hereinafter referred to as ‘BRT’), which WB and the African Development Bank supported, was coordinated with its development plan. Space has been provided between the two lanes of flyovers constructed under the project to allow BRT installation. In particular, during the preparatory survey of the project, the consultant conducted several interviews with the donors supporting the BRT project to confirm the plan and to share information on the project. In this way, appropriate coordination between the project and the BRT development plan was made and it was designed to ensure the effectiveness of the mutual projects and synergies are expected.¹¹

The project was consistent with the development plan and development needs of the partner country, and no issues were identified in the project plan or approach. It is also consistent with ODA policy. Cooperation and coordination with other projects and assistance within and outside JICA were implemented as expected, and the results were confirmed.

¹⁰ Safety improvements within intersections are discussed in more detail in 3.4 ‘Impact’.

¹¹ BRT construction on Nyerere Road had not started at the time of the ex-post evaluation.

Therefore, its relevance and coherence are high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

A summary of the project's planned and actual outputs is given in Table 2.

Table 2: Planned and actual outputs

Item	Plan	Actual
Foundation works for flyover (bridge)	Reinforced concrete (RC) cast-in-place piles (2 bridges) Total number of piles: <u>132</u>	RC cast-in-place piles (2 bridges) Total number of piles: <u>133</u>
Flyover (bridge) substructure	Separate up and down lines flyover (2 bridges) RC abutments (2 abutments) RC piers (11 piers)	As planned
Flyover (bridge) superstructure	Up and down lanes separation flyover (2 bridges) - Main bridge (total length 155 m, total width 8.5 m) - Western approach bridge (total length 150 m, total width 8.5 m). - Eastern approach bridge (total length 120 m, total width 8.5 m). - Ancillary works (rubber bearings, expansion joints, bridge face waterproofing, bridge face drainage, guardrails)	As planned
Access road (Embankment section)	U-shaped retaining wall (total length 116 m) L-shaped retaining wall (total length 302 m) Gravity retaining wall (total length 106 m)	As planned
Pavement	Asphalt pavements Base layer: general road section (5 cm thick, 32,900 m ²) Bridge section (4 cm thick, 6,400 m ²) Surface layer: access roads (5 cm thick, 4,700 m ²), general roads and bridge sections (4 cm thick, 38,900 m ²) Interlocking block pavements: footpaths (4,800 m ²)	As planned
Ancillary facilities work	Signalling system (1 set), road lighting (34 locations), road traffic signs (1 set), road markings (1 set), road drainage system (1 set), net fencing (830 m), turfing (5,500 m ²)	<u>In addition to those listed on the left, solar-powered active road stud installations (92)</u>

(Source: prepared by the evaluator based on documents provided by JICA. Underlined parts indicate changes from the plan).

As shown in Table 2, all planned outputs were produced as planned. In addition, 92 solar-powered active road studs were installed as an additional output.

Changes from the outline design included changes to the left-turn lane geometry within the Tazara intersection,¹² and changes from the detailed design included changes to the construction method of the main bridge¹³ and minor design changes in the pier foundation works of the

¹² The left-turn lane geometry was changed to allow for more efficient left turns within the Tazara Intersection.

¹³ In order to shorten the construction period within the intersection, the construction of the three-diameter main bridge was changed from a three-block construction to a five-block construction. At the same time, the quantity of compression PC steel bars (high-strength steel bars) and reinforcing bars was changed, as well as the arrangement of the transverse-tightened PC cables.

southern flyover, all of which were implemented for efficiency and safety during construction and were reasonable changes.

Some items borne by Tanzania were also implemented almost as planned, although there were some delays, such as duty exemptions and exemption from customs clearance fees. Progress on items borne by the other party was monitored and, with some exceptions, implemented in a timely and appropriate manner.

In this project, based on the challenges in similar projects in the past (delays in items to be borne by the recipient government (removal of utilities, resettlement, etc.) affected the progress of the project), information on items to be borne by the Tanzanian side was shared during the monthly process meetings.¹⁴

3.2.2 Project Inputs

3.2.2.1 Project Cost

In this evaluation, the planned project cost was taken as the total amount of the grant limits of E/Ns from Phase 1 to Phase 3 and compared with the actual input. As the information on the total project cost on the Tanzanian side was unavailable, only the Japanese side project cost was compared with the plan. The total project cost on the Japanese side was 100% of the planned amount and within the plan.

Table 3: Planned and actual project costs

(Unit: millions of yen)

	Plan	Actual	Ratio of Planned (%)
Total project cost	6,525	-	-
Japanese side	5,195	5,195	100 %
(Phase 1)	3,127	3,127	100%
(Phase 2)	346	346	100%
(Phase 3)	1,722	1,722	100%
Tanzanian side	1,330 ¹⁵	-	-

(Source: prepared by the evaluator based on the documents provided by JICA)

3.2.2.2 Project Period

The overall project period slightly exceeded the plan (110%). The main construction period was as planned. The main reason why the overall project period exceeded the plan was that it took 19 months for the three tenders and two months for the subsequent negotiated contract procurement period. Regarding the detailed design, its period was extended by four months

¹⁴ At the time of planning, there were also plans to specify the details of the burden on the other party in the contractor's agreement and to clarify where responsibility for delays, etc. lies, but the implementation of these plans was not confirmed. The reasons for the lack of implementation could not be confirmed during the research for this evaluation.

¹⁵ 20,390 million Tanzanian shillings (hereinafter referred to as 'Tshs'). Converted at 1 USD = 1,755 Tshs and 1 USD = 114.53 yen.

compared to the planned period in Phase 1. This is because this is the first project in Tanzania for the construction of a flyover, and the consultant and the implementing agency needed time to consult with the relevant parties and to respond to and revise the various points raised in the tender documents (documents provided by JICA).

Table 4: Planned and actual period of the project

	Plan	Actual	Ratio of Planned (%)
Total	June 2013–April 2018 59 months	June 2013–October 2018 65 months	110%
Detailed design	November 2012–February 2013 4 months (<i>Note 1</i>)	May 2013–Dec 2013 8 months	(200%)
Bidding period	July 2013–September 2013 (3 months) (<i>Note 1</i>) June 2014–September 2014 (4 months) (<i>Note 2</i>) Mar 2015–May 2015 (3 months) (<i>Note 3</i>)	Nov 2013–May 2015 19 months	(190%)
Negotiated contract procurement period	-	September 2015–October 2015 2 months	N/A
Main construction	June 2015–April 2018 35 months	December 2015–October 2018 35 months	100%

(Source: prepared by the evaluator based on materials provided by JICA).

Note 1: Period planned in Phase 1. *Note 2:* Period planned in Phase 2. *Note 3:* Period planned in Phase 3. The ratio of planned for the detailed design compares with the period planned in Phase 1. In contrast, the ratio of planned for the bidding period compares with the total bidding period for Phase 1 to Phase 3.

Column 1: Challenges and factors in the procurement of the contractor for the project.			
Three tenders were conducted for the project, taking 19 months for the tender period; none of the three tenders were very competitive, and the tender prices exceeded the target prices (see table below).			
	Bidding date	Number of tendering companies	Reason for a malfunction
1st tender	January 2014	2 companies (X and Y)	Exceeded the target price (145%)
2nd tender	September 2014	1 company (X)	Exceeded the target price (119%)
3rd tender	May 2015	1 company (Y)	Exceeded the target price (139%)
(Source: prepared by the evaluator based on the documents provided by JICA)			
The main reasons for the low competitiveness of the tenders were that (i) the contractors perceived that there were risks in the implementation of the project (traffic restrictions by the client ¹⁶ and the risk of utility relocation not being implemented in a timely and appropriate manner ¹⁷) and (ii) the Japanese construction industry was booming and there was a significant labour shortage, which led to contractors			

¹⁶ The project involved the construction of a flyover on top of the existing road, which required traffic control to carry out the work on top of the existing road while maintaining traffic on the alternate route (a side road newly constructed by the project).

¹⁷ Based on the documents provided by JICA and the interview with the consultants and the contractor.

holding back from bidding. This is considered to be the case. Reasons (i) and (ii) were not fully understood by JICA and the consultants, at least at the time of the first tender.¹⁸ It is believed that some Japanese contractors were aware that delays in utility relocation had led to delays in project implementation in previous projects in Tanzania.

Secondly, it is believed that the main reasons for the excess of the target price are exchange rate fluctuations, the risk of price increases¹⁹ and the project implementation risks reflected in the bid prices of the responsive bidders. Actions were taken to address these issues before the second bidding round, such as increasing the project cost by concluding the E/N of Phase 2, clarifying the instructions on the costing rate in the bidding documents and obtaining a letter of commitment from the client regarding traffic control implementation and utility relocation. Before the third bidding, actions were taken to increase the project cost by concluding the E/N of Phase 3 (including the application of the grant for contingency),²⁰ changing the estimation assessment method, changing the estimation rate, etc.,²¹ all of which resulted in unsuccessful bids²² (documents provided by JICA).

The consultant conducted three rounds of estimations at the time of bidding, with multiple persons in charge of verification, comparison and review with similar projects, confirmation of the cost estimate by the Grant Aid Design and Cost Estimate Review Office and the Loan, Grant and General Administration Department of JICA, and exchange of opinions with the contractors. It appears that efforts to reduce uncertainty in the cost estimate were appropriately made (questionnaire response from the consultant).

The three tenders for the project were conducted in 2014 and the first half of 2015, when the 'Comprehensive Improvement Initiatives'²³ had been implemented within the Japanese grant aid projects. At the time of the ex-post evaluation, the grant for contingency has been extended to all facility construction projects, and the response to risks such as exchange rate fluctuations and price increases has been strengthened. In addition, with regard to items to be borne by the counterpart country, including utility relocation, which was a factor in the contractors' refraining from bidding for the project, the responsible entity, process details and estimated amount for each item are confirmed in an agreed document at the study stage. A report is received from the counterpart government at the implementation stage. Additionally, for grant aid projects since the November 2015 cabinet meeting, no public announcement will be made in principle if the counterparty-borne works, such as utility relocation, are not completed. Therefore, it can be said that the risks of exchange rate fluctuations and price increases, which were an issue when procuring contractors for the project, and the risks in project implementation have been addressed through the comprehensive approach of the grant aid project at the time of the ex-

¹⁸ With regard to (i), at the time of the second tender, the client's letter of commitment regarding traffic control implementation and utility relocation was attached to the tender documents. For (ii), no direct action was taken after the second tender.

¹⁹ The exchange rate used for the estimation at the time of the preparatory survey, Phase 1, Phase 2 and Phase 3 were JPY 83.00/USD, JPY 93.43/USD, JPY 102.32/USD and JPY 114.53/USD, respectively. The price inflation rates in Tanzania from the planning to the bidding were 7.9% (2013), 6.1% (2014) and 5.6% (2015) (IMF). In addition, prices of key materials and equipment in Tanzania increased by 16% between the conclusion of the E/N of Phase 1 and before the conclusion of the E/N of Phase 2 (documents provided by JICA).

²⁰ Since the grant for contingency was introduced on a trial basis in October 2009 and then extended to all grant aid projects involving 'facility construction' and some grant aid projects involving 'equipment procurement' in 2015 and the first and second tenders were before the extension of the application, the application of preliminary costs at the time of the conclusion of the third E/N is considered to be appropriate.

²¹ With regard to estimation assessments, the 15% reduction from the lowest price at the time of the third-party estimate was changed to the lowest price. With regard to the exchange rate for estimation, the rate was changed from the average of the last six months to the average of the last three months.

²² Company Y, which participated in the third tender, had previous experience in implementing a project with TANROADS as the client, which could be seen as a reflection of the risk in implementing the project in the bidding price.

²³ https://www.jica.go.jp/activities/schemes/grant_aid/index.html (accessed 2022-8-25)

post evaluation.

On the other hand, the comprehensive approach does not directly address trends in the Japanese construction market and the declining willingness of constructors to bid, which were not fully understood at the time of procuring constructors for the project. If a response to this issue were to be considered, the Japanese construction market trends could be monitored from the planning stage, and if demand in the Japanese construction market shows an upward trend, measures such as increasing the number of projects briefing sessions for interested companies during the survey stage to encourage constructors to bid for the project could be considered. In this case, the policy on the implementation of items to be borne by the client and successful examples of grant aid in the implementing country (e.g., examples where safety considerations were implemented through appropriate coordination among relevant stakeholders, as in the case of this project) should be communicated to increase the willingness to bid in countries and regions where the project implementation risk is considered relatively high, such as in Africa.

As mentioned above, the duration of the main construction work was as planned. It was confirmed that the following actions were taken to ensure efficient implementation of the main construction work (the consultant's response to the questionnaire).

- Securing traffic for construction vehicles by deploying traffic controllers. This prevented delays in the delivery of materials and equipment and improved the efficiency of the work.
- The piers were installed by crane after assembly of the semi rebar on the ground. This shortened the construction cycle.

It can also be considered that appropriate safety measures were taken and that the fact that there were no accidents led in some aspects to the efficient implementation of the works. The following specific safety measures were taken (the consultant's response to the questionnaire and interview).

- Close coordination between the contractor, the implementing agency and the traffic police was achieved, and traffic control by the traffic police was properly enforced during traffic management (when existing roads are closed to traffic and traffic is secured via alternate routes such as temporary roads), avoiding severe traffic congestion.
- When major traffic restrictions were in place, such as changes to vehicle traffic lanes and right-turn prohibitions for large vehicles, traffic restriction information was broadcasted via radio for several weeks before and after.
- 'Japanese-style safety management' was implemented to ensure safety management and increase awareness and motivation among workers (see the column in 3.3.2 'Impact').
- The sub-contractor procured and supplied the necessary safety equipment (helmets, gloves, boots, goggles, etc.) to the workers in accordance with the contract with the contractor.

The output of the project was as planned. Although the project cost was within the plan, the project period slightly exceeded the plan. Therefore, efficiency of the project is high.

3.3 Effectiveness and Impacts²⁴ (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Effect Indicators)

Baseline values, target values and actual values at the time of the ex-post evaluation of the effect indicators in quantitative effectiveness are presented in Table 5.

① Degree of intersection saturation

The degree of intersection saturation decreased significantly from the baseline value, and the target value was achieved. An intersection is considered saturated if the degree of intersection saturation is above 1.0, but the degree of intersection saturation at the Tazara Intersection at the time of the ex-post evaluation was 0.81, confirming that it was not saturated.

② Average intersection transit time

The average intersection transit time achieved the target on Nyerere Road but not Mandela Road. For Mandela Road, there was traffic congestion at the section before and after the Tazara Intersection and due to the bus terminal, and there was also information that traffic volumes had increased due to improvements at the Dar es Salaam Port; these factors are considered to have contributed to the failure to achieve the target value.

③ Nyerere Road travel time

Nyerere Road travel time achieved the target in the off-peak hours and almost achieved the target in the afternoon peak hours. Target values were not achieved for the morning peak hours. The overall average did not meet the target value, but compared to the baseline value, it was reduced by more than one minute as the baseline, and target values for this indicator are based on simulations. Therefore, the comparisons between the simulated values and actual values have constraints. Accordingly, comparisons were also made between the actual values at the time of planning and the actual values at the time of ex-post evaluation (see Table 6). The results showed a reduction of seven minutes in the morning peak hours and more than five minutes in the off-peak hours and afternoon peak hours.

²⁴ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Table 5 Effectiveness indicators

(Unit: listed in the table)

	Baseline value	Target value	Actual value	
	2011	2021	2022	
		3 years After Completion	4 years After Completion	
① Degree of intersection saturation (<i>Note 1</i>)	1.31	1.14	0.81	
② Average intersection transit time (<i>Note 2</i>) (seconds/vehicle kilometre)	166	95	88 (Nyerere Road) 223 (Mandela Road)	
③ Nyerere Road travel time (<i>Note 3</i>) (minutes)	28	26	Overall average	26.9
			Morning peak hour average	33.2
			Off-peak hour average	21.0
			Afternoon peak hour average	26.4

(Source: prepared by the evaluator based on the ex-ante evaluation and the traffic survey results).

Note 1: The baseline and target values are the hourly saturation averages for the afternoon peak hours (16:00–19:00). As the intersection saturation is generally compared using the saturation during the busiest hours, for this evaluation, a traffic survey was conducted (16 February, 2022) during the morning peak hours (6:00–9:00), when more congestion was observed than during the afternoon peak hour. The actual value of the degree of intersection saturation was calculated at the busiest hour (7:00–8:00).

Note 2: The baseline and target values are the results of an all-way simulation using observed traffic volumes during the morning peak hour (7:00–8:00). The actual values are averages of measured intersection transit times on Nyerere Road and Mandela Road (10 February and 10 March, 2022). Therefore, there are certain constraints in comparing the reference/target values with the actual values (the consultant's response to the questionnaire).

Note 3: Both baseline and actual values are simulated values for the 11 km from the airport to the city centre based on the traffic survey during the preparatory study. The actual values are averages of the time taken to make three round trips every hour from the airport to the city centre (11 km) in the morning peak hours (6:00–9:00), off-peak hours (12:00–15:00) and afternoon peak hours (16:00–19:00) (values for the morning peak hours and afternoon peak hours were measured on 8 February, 2022, and values for the off-peak hours were measured on 25 May, 2022). The baseline and target values are simulated and unsuitable for comparison with the actual measured values, which are influenced by various external factors (interview with the consultant).

Table 6: Comparison of Nyerere Road actual travel time

(Unit: minutes)

	Actual values (2010)	Actual values (2022)
Morning peak hours	37.6	30.1
Off-peak hours	24.0	19.1
Afternoon peak hours	29.3	23.9

(Source: prepared by the evaluator based on data provided by the consultant and the results of the traffic survey)

Note: Actual values are the average time of travel from the airport to the 10.2 km point in the direction of the city centre; for 2010, the average of two trips, respectively, and for 2022, the average of three trips (the measurement dates are the same as in Table 5, ③).

3.3.1.2 Qualitative Effects (Other Effects)

1) Commuting time of the poor living in the outer urban extension

The findings of a qualitative study²⁵ of people living in the outer urban area and using

²⁵ Of twenty-one residents who use Nyerere Road on a daily basis, 20 have household incomes below the low- and middle-income country poverty line (USD 3.2 per day) (gender breakdown; 16 male, 4 female. Age breakdown; two in

Nyerere Road confirm that commuting time had decreased for residents who use Nyerere Road to commute to work or school. Twelve out of 17 valid respondents (70%) indicated that their commuting time to and from work had decreased significantly, while four (23%) indicated their commuting time had been reduced slightly.²⁶ In addition, 16 out of 17 respondents (94%) cited the implementation of the project as a factor in the decrease in commuting time to and from work.

2) Changes in access time to markets for the poor living in the outer urban extension

The results of the qualitative survey confirm that the access time to the market had decreased for residents using Nyerere Road. Eight out of 18 valid respondents (44%) indicated that the access time had been reduced significantly, while 10 (56%) indicated that the access time had decreased slightly. In addition, 17 out of 18 (94%) cited the implementation of the project as a factor in the decrease in access time.

3) Changes in access time to health facilities for the poor living in the outer urban extension

The results of the qualitative survey confirmed that the access times to health facilities had decreased for residents using Nyerere Road. Nine out of 14 valid respondents (64%) stated that the access time had been reduced significantly, while five (36%) noted that the access times had decreased slightly. All 14 respondents cited the project implementation as a factor in the decrease in access time.

Regarding 1) to 3), five minibus operators operating on routes using Nyerere Road were interviewed about the reduction in travel time on their routes, with three out of five (60%) reporting a significant reduction and two out of five (40%) reporting a slight decrease.²⁷ All of them also cited the implementation of the project as a factor in the reduction in driving time. In addition, three out of five respondents stated that the number of trips on the operational route had increased. As many residents living in the outer urban area use minibuses to commute to work and school and to access medical facilities, the reduction in the travel time of minibuses travelling on Nyerere Road supports the expression of the effect of the time reduction in 1) to 3) above.

3.3.2 Impacts

3.3.2.1 Intended Impacts

- 1) Revitalisation of logistics with landlocked countries through reduced time and transport costs in freight transport

their 60s, three in their 50s, eight in their 40s and seven in their 30s) were included in the analysis. Note that Tanzania's gross domestic product per capita is USD 1,076 (2018, WB), and it is classified as a low- and middle-income country. The survey was conducted in February 2022.

²⁶ Questions were asked using the six-case method (significantly less, slightly less, no change, slightly more, significantly more, don't know). The same applies to questions 2) and 3) and to the survey of minibus operators.

²⁷ The survey was conducted in March 2022.

In recent years, Tanzania's economic activity related to 'transport and storage' has grown faster than the real economic growth rate.²⁸ Looking at the value of Tanzania's exports to the seven countries bordering Tanzania,²⁹ the average value of exports (by country) in 2018–2020, after the project's implementation, except for exports to Kenya and the Democratic Republic of Congo, was significantly higher than the average value (by country) in 2015–2017, before the project's implementation. Thus, logistics and trade with bordering landlocked countries are seen to be expanding.³⁰

From the results of interviews with two transporters and interviews with six enterprises along Nyerere Road and Mandela Road,³¹ the reduction in the time taken to transport goods was confirmed, but the reduction in transport costs as an effect of the implementation of the project was not confirmed, although it was confirmed to a certain extent.³² Regarding the number of transport trips, interviews with the transporters confirmed an increase in the number of transport trips, but it could not be confirmed that this was an effect of the project. From the interviews with the enterprises along the two roads, it could not be confirmed that the number of transport trips had clearly increased.

From the above, it appears that logistics and trade between Tanzania and the neighbouring landlocked countries have been revitalised. But it is impossible to determine clearly from the findings conducted in this evaluation whether the effects of project implementation have contributed to the revitalisation of logistics and trade between Tanzania and neighbouring landlocked countries.

2) Stimulation of commercial activity through reduced time and costs in freight transport

As indicated in 1) above, although a reduction in transport time was confirmed, a reduction in transport costs was not confirmed from the results of interviews with the six enterprises along the two roads in this evaluation. Four enterprises answered that the frequency of domestic transport increased between 2019 and 2021 after the completion of the project, but the reasons for this were changes in the business environment of each enterprise and the increase in demand. Therefore, it was not confirmed that the commercial activities were stimulated due to reduced time and costs in freight transport.

²⁸ Annual Report 2020/21 of the Bank of Tanzania (p. 23)

²⁹ Kenya, Uganda, Democratic Republic of Congo, Burundi, Rwanda, Malawi and Zambia.

³⁰ Annual Report 2020/21 of the Bank of Tanzania (p. 224). Average export value from 2018 to 2020 from Tanzania to neighbouring countries compared to the average export value from 2015 to 2017; exports to Uganda increased by 338%; to Burundi, by 236%; to Rwanda, by 473%; to Malawi, by 138% and to Zambia, by 138%.

³¹ The survey was conducted in January 2022.

³² Two transporters stated that there had been a reduction in transport costs, which they attributed to improvements at the Dar es Salaam port. Of the six enterprises along the two roads, five were transporting goods out of the country. Three of these five enterprises stated that there had been a reduction in transport costs between 2019 and 2021, but one of them stated that long-term transport costs had increased and the other stated that transport costs had increased in 2021, with no clear identification of a reduction in transport costs.

- 3) Increased economic activity and stabilisation of livelihoods through improved access from low-income areas to the city centre and reduced access time to health facilities

The implementation of the project has reduced commuting time, access time to markets and access time to health facilities.

(Stabilisation of livelihoods) The qualitative survey of residents confirmed that their health concerns have decreased.³³ The survey also revealed that the reduction in commuting time had created more time in their daily lives to enjoy personal activities such as having a leisurely cup of tea or breakfast, doing household chores, preparing for work, and health care.³⁴

(Increased economic activity) When the increase or decrease in income after the project implementation was confirmed for the past three years through the qualitative survey of residents, about half of the valid respondents indicated that their income had increased, while about half also indicated that their income had decreased³⁵. Therefore, there was no evidence of an increase in income after the implementation of the project. Regarding business opportunities, around half (45%) of the valid respondents reported an increase. All of them attributed this to the fact that the project had reduced their commuting time, resulting in more time allocated to work. On the other hand, 30%—six of the valid respondents—stated that business opportunities had decreased, with two stating that their business opportunities had decreased as a result of the project.³⁶ Based on the above statements on economic stabilisation, the results of the qualitative survey of residents conducted in this evaluation suggest that the expression of impact was limited. However, due to the small sample size, it is difficult to judge whether the effect of economic stabilisation is manifested solely based on these results.

In addition to the qualitative survey of residents, we conducted additional interviews with residents in the two wards (Majohe and Kuvule) along Nyerere Road west of the Tazara Intersection, where a relatively large number of low-income residents live and where economic development is assumed to have occurred after project implementation. We selected the target wards based on the analysis of night light intensity (annual average).³⁷

³³All 15 valid respondents indicated that their health concerns had decreased compared to before the project was implemented. Fourteen of them indicated that their health concerns had decreased due to reduced access time to health facilities.

³⁴ Leisure time (8 respondents), doing household chores (6 respondents), preparing for work (1 respondent) and healthcare (1 respondent) (16 valid respondents).

³⁵ For 2019 and 2020, 50% of valid respondents (20 respondents) stated that their income had increased, while 40% stated that it had decreased; for 2021, 45% of valid respondents stated that their income had increased, while 45% also stated that it had decreased.

³⁶ One truck driver stated that after the project implementation, business opportunities decreased due to the construction of footpaths on Mandela Road around Tazara Intersection, which prevented people from parking on the side of the road. One motorbike driver stated that after the project implementation, business opportunities decreased because people no longer opted for motorbike taxis due to the reduced travel time on Nyerere road. For the remaining four respondents, the reason/background for the decrease in business opportunities could not be confirmed.

³⁷ We analyzed the night-time light intensity in six wards (Majohe, Kuvule, Kipawa, Kitunda, Kiwarani and Vinguguti) classified as 'low and middle income' levels in this evaluation. (Source: Charles Cosmas Mkalawa and Pan Haixiao, Dar es Salaam city temporal growth and its influence on transportation, Urban Planning and Transport Research: An Open Access Journal, 2014 Vol. 2, No. 1, 423-446, 2014). A comparison of night light (annual average) before (2017) and after (2021) the implementation of the project in six wards confirmed that the night light increased in all wards,

In the results, as in the qualitative survey of residents mentioned above, less than half of all respondents reported that their income had increased, and half said that business opportunities had improved after the project was implemented. However, in both wards, the time required to reach the Dar es Salaam city centre had significantly decreased from 2–3 hours before the project was implemented to 20–30 minutes. As a result, the two wards have seen an increase in population³⁸ and a corresponding increase in economic activity and expansion of some public services, such as an increase in the number of schools in the wards. Reduced travel time made it easier for retailers to source from the city centre, and suppliers of goods from the city centre also visited the communities more frequently.

From the above, as for the increased economic activity at the time of the ex-post evaluation, the impact of increased income and business opportunities for residents living in the outer urban extension was limited, but a trend towards the revitalisation of the ward economy in the outer area west of Tazara Intersection was confirmed. In addition, we observed the impact on health and stabilisation of livelihoods, such as the enjoyment of leisure time.

4) Improved safety through a reduction in contact accidents within Tazara Intersection

The number of accidents at the Tazara Intersection since 2018 is shown in Table 7; it is impossible to confirm whether the number of accidents had decreased as a result of the implementation of the project, as data before 2018 was unavailable. A comparison between before and after implementation of the project was not possible.

Table 7: Number of accidents at Tazara Intersection

(Unit: number of accidents)

2018	2019	2020	2021
2	0	1	1

(Source: District Transport Officer)

On the other hand, when the safety of the intersection before and after the implementation of the project was confirmed in the qualitative survey of residents, all 20 valid respondents perceived the intersection as ‘dangerous’ before the project was implemented, but all perceived it as ‘safe’ after the project was implemented. All respondents perceived the number of accidents at

which may have stimulated the economy in the wards concerned. Note that nightlight is an indicator of the brightness of the ground at night and has been found to be highly correlated with electrification and gross economic output. Among the six wards, we selected two with relatively low economic development and the largest change in average night light from before the project (Majohe [increased by 174%] and Kuvule [increased by 145%]), and we interviewed additional residents: four residents in Majohe ward and three residents in Kivule ward (May 2022); Majohe ward is located 15–23 km from Tazara Intersection, while Kivule ward is about 13–18 km away. (Source of night-time light data: Earth Observation Group, Payne Institute for Public Policy, Colorado School of Mines, VIIRS Nighttime Day/Night Band Composites Version 1).

³⁸ Prices in the wards were lower than in the city centre, and it was easier for low-income people to live there (resident interviews in the two wards).

the intersection as 'reduced', 17 of whom (85%) indicated that the construction of the flyover and its ancillary facilities under the project had directly contributed to the reduction in accidents. All five minibus operators also indicated that the number of accidents at the intersection had decreased significantly.

From the above, the statistical data did not confirm an apparent reduction in the number of accidents. However, it is assumed that there are a number of accidents that the police were not aware of, and based on the results of the qualitative research and the interviews with minibus operators, it is highly likely that accidents at the intersection have decreased and safety has improved.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Natural Environment

The project did not fall under the large-scale road sector listed in the *JICA Guidelines for Environmental and Social Considerations* (established in April 2004), as we assessed it to have no significant undesirable effects on the environment, and it did not fall under the sensitive characteristics and sensitive areas listed in the guidelines. Therefore, the project was classified as Category B.

During construction, the implementing agency conducted monitoring based on the *Environmental Social Management Plan* prepared by the consultant and the contractor and reported in the *Monitoring of the Implementation of the Environmental and Social Management Plan Report*. According to the report, the implementation of the agency's questionnaire responses and the interview with the consultants, waste management, sewage management and soil pollution countermeasures were adequately implemented to a certain extent, and no significant problems were identified. The report also stated that noise and vibration were addressed by controlling the speed of vehicles.

Regarding post-completion monitoring, the Environmental and Social Management Division of the Infrastructure Planning Department in TANROADS was scheduled to conduct an environmental monitoring survey, but this was not carried out at the time of the ex-post evaluation. This is due to priorities within the agency (there are situations where environmental monitoring before and during project implementation is prioritised), but the implementing agency was aware of the need for implementation and will ensure that it will be carried out (interview with the implementing agency).

2) Resettlement and Land Acquisition

At the time of planning, land acquisition from Tazara Station and the Tanzania Electric Supply Company (TANESCO) was planned without resettlement. At the time of the ex-post evaluation, it was confirmed that the land acquisition and land lease from Tazara Station were

carried out as planned without resettlement. Also, it was confirmed that TANROADS paid compensation to Tazara Station for the acquired land (the fence and gate in Tazara Station, which was included in the project site) and for the land used as the materials storage area during the construction phase. A land-lease fee was paid for the site (Interview with the implementing agency and the consultant's response to the questionnaire and interview).³⁹

No resettlement of residents and no displacement of informal residents occurred within the project.

3) Gender Equality, Marginalized People, Social Systems and Norms, Human Well-being and Human Rights

(Gender Equality) The results of the qualitative survey of residents in this evaluation did not identify any differences by gender in terms of effectiveness.

(Marginalized People) The project aimed to increase economic activity and stabilise the livelihood of low-income groups. As a result, the impact on economic activation was limited, but the impact on health and stabilisation of livelihood, such as enjoyment of leisure time, was confirmed to a certain extent.

(Social Systems and Norms, Human Well-being and Human Rights) Low-income residents who commute to work and school using Nyerere Road saw their commuting time reduced as a result of the project and were able to use the time created to enjoy leisure activities such as drinking tea and having breakfast or doing household chores. It can be considered that being able to lead their daily lives with more time to spare has improved the level of human well-being, and the project has made a contribution in this respect.

4) Other positive and negative impacts.

(Impact on street vendors) Street vendors engaged in commercial activities within Tazara Intersection at the time of the project planning relocated from the vicinity of the Tazara Intersection and engaged in activities elsewhere—for example, near the Buguruni Intersection⁴⁰ as a result of the implementation of the project. The street vendors were categorised as long-term vendors that the district office had approved and short-term, unauthorised vendors. At the time of the ex-post evaluation, no significant problems were identified with the relocation of the short-term, unauthorised vendors, based on site visits and interviews. For long-term street vendors approved by the district office, the relocation destination was unknown and could not be confirmed based on site visits.

(Ensuring the safety of residents in the construction area)

As indicated in 3.2.2.2, various safety measures were taken in the project. These safety

³⁹ Compensation was 1,112 million Tshs. Information on land lease rates was not available.

⁴⁰ Mandera road junction, located a few hundred metres north of Tazara Intersection.

measures were considered to have contributed to ensuring the occupational safety of the construction workers and the residents living near the construction site, including users of existing roads.

Column 2: Zero accidents and zero occupational injuries in the project with Japanese-style safety management in Tanzania.

The project took nearly three years, introduced Japanese-style safety management and was completed with no accident or occupational injury. An overview of the ‘Japanese-style safety management’ implemented in the project is described below.

Daily	Morning meetings before work starts with the participation of all workers, ⁴¹ radio gymnastic exercises, on-site toolbox meetings, ⁴² hazard prediction activities, and clean-up after work
Weekly	Safety patrols by contractor personnel
Monthly	Safety patrols by the client, consultants and contractor personnel
At any time	Education for new entrants, presentation of safety slogans and danger warning signs, meetings with traffic police

sub-contractor for this project had worked on other JICA projects with TANROADS as the client over the past few years and is still undertaking projects for Japanese contractors. The sub-contractor had experience in practising Japanese-style safety management through other JICA projects before the implementation of this project, and these initiatives were not new but familiar to them. Therefore, the sub-contractor was well aware that Japanese contractors are very strict in safety management; and they communicated appropriately with the contractor, sharing the role of educating new entrants verbally. The company representative stated that through the implementation of Japanese-style safety management, safety awareness had been instilled in all workers and that safety had become the role and responsibility of each individual, accidents had decreased as a result, and machine handling had improved through regular inspections. All workers seemed to understand the effectiveness of Japanese-style safety management.



Standing signs informing the public about safe equipment at work



Simulations on safe working practices during morning

(Photo courtesy of Oriental Consultants Global Co., Ltd.)

It is difficult to determine which of the Japanese-style safety management efforts contributed more to the safe implementation of the project. However, the fact that the sub-contractor had a good understanding of the content and importance of Japanese-style safety management through previous JICA projects may have contributed to the safe implementation

⁴¹ Demonstrations on the use of safety equipment and safe working practices were conducted during morning meetings, with a theme set for each meeting, to ensure that all workers were aware of the importance of safety equipment.

⁴² Meetings were held to ensure communication within the workforce about work content, arrangements and problems, and to prevent accidents and disasters.

of the project. The sub-contractor also implemented Japanese-style safety management in non-Japanese contractor projects to the greatest possible extent. Furthermore, the company has a policy of recruiting young employees and training them over a long period, similar to Japanese companies, according to the representative. It is believed that Japanese-style safety management penetrated (or will penetrate) the company's employees through their experience on-site. Therefore, it is thought that Japan's long-standing support in the road sector has contributed to the penetration of Japanese-style safety management in Tanzania.

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

3.4 Sustainability (Rating: ②)

3.4.1 Policy and System

As indicated in Relevance, *Vision 2025*, a development plan with a long-term perspective, is still a valid development plan at the time of the ex-post evaluation. The latest national development plan, *FYDP III*, continues to indicate the need to reduce traffic congestion in Dar es Salaam. It is envisaged that the next strategy following the current transport sector strategy paper, *TSIP III*, will also be in line with *FYDP III*. Based on the above, consistency between the project and national and sector policies has been identified. It is assumed to continue until the near future (around 2025, the period covered by *FYDP III*).

3.4.2 Institutional/Organizational Aspect

The implementing agency, TANROADS, was established in July 2000 and is responsible for the development and maintenance of the road network under the supervision of the Ministry of Works, Transport and Communications. The maintenance and management of the trunk roads in Dar es Salaam are the responsibility of the TANROADS Dar es Salaam Regional Office⁴³ (hereafter referred to as the 'DES Regional Office'). The DES Regional Office subcontracts the maintenance of roads and bridges to private contractors and patrols and supervises the work of subcontractors. Based on the reports of the subcontractors and the results of the DES regional office patrols, maintenance performance is recorded using the Road Maintenance Management System⁴⁴ (hereafter referred to as 'RMMS'). Furthermore, RMMS shows the required maintenance costs and the forecast of the required repair period based on the entered maintenance performance record (interview with the implementing agency). The DES Regional Office had 31 staff members at the time of the ex-post evaluation, and two bridge engineers were engaged in the maintenance management of the project. The staff shortage was not identified, and the number of staff is expected to be maintained in the future (interview with

⁴³ At the time of the ex-post evaluation, there were 26 TANROADS regional offices in the country, with each office responsible for construction work and maintenance practices within its jurisdiction.

⁴⁴ Data management systems for road maintenance status

the implementing agency).

3.4.3 Technical Aspect

Manuals for road and bridge maintenance were in place and used daily in the DES Regional Office. In addition, staff had the necessary technical skills for bridge and road maintenance and management in Dar es Salaam City through internal and external training and participation in overseas training.⁴⁵ In addition, as mentioned earlier, at the time of the ex-post evaluation, two bridge engineers were engaged in the operation and maintenance of the project (interview with the implementing agency); no specific problems were identified concerning the technical level of TANROADS, DES Regional Office and the subcontractors (interview with the implementing agency).

3.4.4 Financial Aspect

The revenue and expenditure of TANROADS over the last five years is shown in Table 8. With the exception of 2019/20, there was no negative balance of payments, and the operation and maintenance cost was allocated to a certain extent (for 2019/20, the amount was negative due to outstanding payments (interview with the implementing agency)). On the other hand, the budget allocated to DES Regional Office has been decreasing in recent years⁴⁶ (see Table 9).

Table 8: TANROADS Revenue and Expenditure

(Unit: millions of Tshs)

	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Revenue	1,279,992,145	1,916,758,618	1,908,289,423	1,711,442,755	1,904,113,298
Expenditure	1,267,262,989	1,882,052,925	1,800,481,501	1,812,594,371	1,879,497,135
(Operation and maintenance cost)	441,801,960	454,524,365	483,453,461	495,794,532	609,757,300
Ratio of operations and maintenance cost to the total expenditure	35%	24%	27%	27%	32%
Balance	12,729,156	34,705,693	107,807,922	▲101,151,616	24,616,163

(Source: information provided by the implementing agency)

⁴⁵ Internal training included a two-week course on preventive maintenance and major repair management. As external training, participants attended a two-week technical course on safety conducted by the Engineer Registration Board. As overseas training, engineers from DES Regional Office participated in overseas training in India, South Korea, Sri Lanka and other countries.

⁴⁶ The reasons for the budget decrease could not be identified.

Table 9: Budget for TANROADS DES Regional Office

(Unit: millions of Tshs)

2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
31,218	31,517	31,517	26,619	26,823	27,383.39

(Source: implementing agency).

In terms of the maintenance and management cost, TANROADS as a whole was allocated about 40% of the required cost.⁴⁷ Thus, it was challenging to implement all the needed maintenance and repairs. Some maintenance and repairs were carried out based on priority, including at the DES Regional Office (interview with the implementing agency). Although the maintenance and management cost allocation was approximately 40% of the required amount, when repairs were needed that exceeded the annual budget, the necessary maintenance and repairs were carried out using emergency funds or borrowing from other sources. Thus, it seemed that the required budgetary measures were taken for repairs that would impede traffic (implementing agency interviews). In addition, 60% of the ‘Road Fund’ budget, which covers the cost of road maintenance and management, was allocated to TANROADS, which means that the budget was stable.⁴⁸

However, some aspects were not well maintained, as described below under ‘Status of operation and maintenance’.

The flyover constructed during the project was classified and managed as a ‘road’ at the time of the field study for this evaluation (May 2022), influenced by the fact that it was the first flyover in Tanzania. Therefore, the allocated maintenance cost was also the maintenance cost for the ‘road’. However, the implementing agency has already addressed this issue, and in the financial year 2022/2023, the flyover would be classified as a ‘bridge’, as would the maintenance cost. RMMS would also have a new ‘bridge’ setting, which would be reflected in the maintenance plan, and the maintenance and management cost. Therefore, we would expect the situation to improve⁴⁹ (interview with the implementing agency).

Thus, the financial aspect of operation and maintenance of the project has some issues.

3.4.5 Environmental and Social Aspect

As stated in the ‘Impacts on the Natural Environment’ section above, TANROADS has not

⁴⁷ In DES Regional Office, the allocation was also around 25% of the required budget. The maintenance budget for TANROADS was calculated by the RMMS for the required maintenance cost (unconstrained budget), and then each regional office allocated its own budget for repairs (constrained budget). There was a gap between the unconstrained and constrained budget, and there were budget constraints for bridge and road maintenance in TANROADS; TANROADS has indicated that it would like to increase the maintenance cost to 60% of the required amount in the future.

⁴⁸ 2021/2022 financial year. Based on information from the Tanzania Road Fund Commission website (<https://www.roadsfund.go.tz/en>, accessed 2022.5.1).

⁴⁹ However, TANROADS was underfunded in terms of maintenance and management costs, which may not lead to significant improvements.

been able to conduct any environmental monitoring surveys on the project since its completion, but it will do it in the future (interview with the implementing agency).

3.4.6 Preventative Measures to Risks

At the time of planning, it was planned that the BRT was to be constructed after the completion of the project on Nyerere Road, the location of the flyover. Because the BRT would be constructed between the two bridges, safety needed to be ensured during and after project implementation. At the time of the ex-post evaluation, the contract between the implementing agency, the consultant and the contractor for BRT on Nyerere Road had been signed, and construction was due to start. The contractor will prepare a traffic management plan that would not affect the operation of the intersection, including the flyover. This plan would be reviewed by the consultant and approved by TANROADS. The construction of the BRT will be carried out with consideration for the safety of the flyover (interview with the implementing agency and WB).

3.4.7 Status of Operation and Maintenance

The local consultant confirmed the status of maintenance and management of the bridges and roads constructed during the project through on-site inspection.⁵⁰ As a result, the consultant confirmed that the bridges, roads and ancillary facilities were generally adequately maintained and managed and that there were no problems with vehicle and pedestrian movement.

However, several areas were identified as requiring maintenance and repair (see Table 10). In particular, (1) road markings at the intersection and (2) solar-powered active road studs play an essential role in ensuring the safety of vehicles and pedestrians and should be repaired as soon as possible.

Inspection of the bridges and the roads in the project area were carried out on a daily basis (three times per week). Surveys that required reports were also carried out monthly.⁵¹ In addition, a specialised inspection of the bridge sections was carried out once a year, and reports were produced.⁵² The results of these surveys were entered into RMMS and reflected in the maintenance plan, and where repairs were required, the DES Regional Office used subcontractors to carry out the repairs. The frequency of inspections and repairs on roads and bridge sections was largely as envisaged in the planning process, but the frequency of maintenance and repair of expansion joints and rubber bearings on bridge sections was lower than envisaged at the time of planning, being every year. The implementing agency expressed their willingness to improve in this (interview with the implementing agency).

⁵⁰ Although records of maintenance and inspection of the bridges (flyover) and roads constructed by the project were not available, the evaluator reviewed the periodic road condition survey reports during the visit to the DES Regional Office and confirmed that the implementing agency had conducted periodic inspections and surveys.

⁵¹ It was previously quarterly, but since March 2022, it has been monthly.

⁵² At the time of planning, an inspection was envisaged for every six months.



Lawn between the bridges established during the project



Road markings (markings faded)

(Photo by the evaluator)

Table 10: Areas in need of maintenance and repair

(1)	Fading of road markings at the intersection
(2)	Some of the solar-powered active road studs installed at four locations, two on the east side and two on the west side of the flyover (near the start of the lane towards the flyover), were not functioning, and the light indicating the lanes was partially obscured.
(3)	Faulty night lighting (one location due to a faulty electrical system or faulty light bulbs)
(4)	A slightly curved road traffic sign due to vehicle collision (one location)
(5)	Minor corrosion or damage to part of the net fence.
(6)	Accumulation of rubbish in parts of the road drainage works (does not impair drainage function).

(Source: prepared by the evaluator based on on-site inspection)

Some minor issues have been observed regarding the financial aspect and the current status of the operation and maintenance system. As for the current status of the operation and maintenance system, there are good prospects for resolution. For the financial aspect, the prospect for improvement is low. Therefore, the sustainability of the project effects is moderately low.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project constructed the first flyover in Tanzania in the direction of Nyerere Road at the Tazara Intersection to create a grade separation; the project aimed to alleviate traffic congestion on Nelson Mandela Road (hereinafter referred to as ‘Mandela Road’) and Nyerere Road starting from this intersection. About relevance, the project was found to be consistent with the development plan of Tanzania and the development needs which promoted the development of the transport sector in Dar es Salaam, a critical economic hub in Tanzania. In terms of coherence, the project was consistent with Japan’s ODA policy, according to which infrastructure development is a priority area. The cooperation and coordination with other projects and support

within JICA were also as expected, and the results were confirmed, as well as with other donor projects, as expected. In light of the above, relevance and coherence were high. Regarding efficiency, all outputs were achieved as planned, the project cost was within the plan, and the project period slightly exceeded the plan, so the efficiency was high. Regarding effectiveness, degree of intersection saturation was significantly increased, average intersection transit time was reduced considerably on Nyerere Road, although not on Mandela Road, and Nyerere Road travel time was also significantly reduced when compared to the actual values. In addition, the impact of the project was also observed in terms of stabilising the livelihoods of low-income groups living in the outer-urban extension and improving safety within the intersection. Therefore, the effectiveness of the project's implementation was generally as planned, and effectiveness and impact were high. Regarding sustainability, while no issues were observed in policies and systems or in institutional/organizational and technical aspects, some issues were observed regarding financial aspects and the current status of the operation and management system; the sustainability of the project was moderately low.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

It is desirable to carry out repairs where repairs are needed. Repairs should be carried out as soon as possible, especially for the road markings that are fading and the solar-powered active road studs, which may have a negative effect on safe movement and driving.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Safety measures for works where safety measures are more important with the need to work at height or to control traffic on existing roads

During the construction period of the project, appropriate coordination was made between the implementing agency, TANROADS, the contractor and traffic police regarding traffic control. As a result, traffic control during the traffic management, when the existing roads were closed to traffic and traffic was secured by alternative routes, was properly implemented, and the severe traffic congestion was avoided. In addition, when traffic restrictions were implemented, such as changes to vehicle traffic lanes and right-turn prohibitions for large vehicles, information on the traffic restrictions was broadcast over the radio for several weeks before and after the restrictions were implemented. This is also considered to have contributed to easing traffic congestion. Furthermore, traffic police were deployed throughout the construction period, which was believed

to have contributed to the accident-free completion of the works and, thus, to the efficient implementation of the works. Ensuring safety is extremely important for construction projects that require work at height or that require traffic control on existing roads. Close coordination between stakeholders, as was done in this project, and the implementation of necessary safety measures and appropriate information dissemination to the public are essential for the safe implementation of construction works.

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

The consultant took appropriate measures to diminish uncertainty in the costing process by having multiple persons in charge of verifying, comparing and reviewing the cost with similar projects, checking the costing documents by a third party and exchanging opinions with the contractor. During implementation, meetings with the contractor were held weekly and monthly, and meetings with the client and reports to JICA were held monthly. In addition, quality control meetings were held three times during the construction period with the client, JICA, the contractor and the consultant, and meetings were held as necessary when problems occurred, thus ensuring an appropriate system for supervision.

The JICA Tanzania Office and the Embassy of Japan in Tanzania lobbied the Tanzanian government on fuel tax for subcontractors who were not initially eligible for tax exemption and contributed to the approval of the exemption. The JICA Tanzania Office and the Embassy of Japan in Tanzania also assisted in resolving the issue of delays in fuel tax refunds, resulting in early refunds. Thus, the JICA Tanzania Office provided appropriate support to the consultants and the contractor in implementing the project.

5.2. Additionality

None

United Republic of Tanzania

FY2021 Ex-Post Evaluation Report of Technical Cooperation Project

“The Project for Capacity Development of Efficient Distribution and Transmission Systems”

External Evaluator: Mayumi Hamada

Foundation for Advanced Studies on International Development

0. Summary

This project was implemented to improve the internal human resource development system of Tanzania Electric Supply Company Ltd. (hereinafter referred to as TANESCO) by developing and implementing a training system, introducing quality control activities, establishing a maintenance work model, and standardising technical work procedures. This project, which aimed to contribute to promotion of power supply through human resource development and improvement of maintenance work, was consistent with Tanzania’s development policy and development needs. At the time of planning, this project was also consistent with Japan’s ODA policy. Regarding internal coherence, it was intended to contribute to other JICA grant aid projects at the time of planning, although it is not possible to compare the actual results with the plan’s specific target. As for external coherence, any specific collaboration or coordination with other projects while planning and implementing could not be confirmed. Therefore, relevance and coherence are high. The project purpose and the outputs were mostly achieved by the time the project was completed. In addition, at the time of the ex-post evaluation, the overall goal was achieved although it was not possible to confirm the manifestation of other impacts, such as the number and duration of power outages in Dar es Salaam City. Therefore, effectiveness and impacts are high. Each output was mostly achieved by the time the project was completed. Regarding inputs, the project cost on the Japanese side greatly exceeded the plan, and the project period also exceeded the plan. However, the additional outputs, such as the establishment of a model (Output 4) and the standardisation of work procedures (Output 5)¹, which were not initially anticipated, were achieved. Therefore, efficiency is evaluated to be moderately low rather than low. Although slight issues have been observed in the institutional/organisational aspects for sustaining the project effects, there are good prospects for improvement and resolution. Therefore, project sustainability is high. In light of the above, this project is evaluated to be highly satisfactory.

¹ Both outputs are based on the Project Design Matrix (hereinafter referred to as PDM) Version 4.

1. Project Description



Project location

(Source: Produced by the evaluator)



On-the-job-training (OJT)

of maintaining distribution lines

(Source: Terminal Evaluation Report p23)

1.1 Background

Electricity demand in Tanzania has shown a significant increase along with economic development and population growth. However, TANESCO, which was responsible for supplying electricity to the country, faced various problems in providing a stable supply of electricity. After the Tanzanian government announced plans to privatise TANESCO in the latter half of the 1990s, TANESCO was forced to curb capital investment not only when constructing new power plants, but also when maintaining and repairing existing power facilities. This situation remained until 2006. Many experienced TANESCO engineers quit, new staff recruitment was curtailed, and the scale of training for engineers was reduced. As a result, TANESCO's electric power facilities were not adequately maintained and progressively deteriorated. Under such circumstances, power failures frequently occurred and adversely affected socio-economic activities. In response, in 2005, the Tanzanian government froze TANESCO's privatisation plans. The new TANESCO management team indicated the importance of developing human resources, especially technical human resources, in order to rebuild TANESCO's operations and improve the reliability of its electric power supply.

1.2 Project Outline

Overall Goal	The improved operation and maintenance practices are implemented at distribution and substation facilities of TANESCO.	
Project Purpose	The internal system for human resource development is improved and sustained.	
Outputs	Output 1	The training system for distribution and substation facilities of

		TANESCO Training Schools (TTS) is developed.
	Output 2	The artisans, technicians and engineers working for distribution and substation facilities are trained and certified through the training system at TTS.
	Output 3	Introduce Quality Control (QC) activities to TANESCO and promote its activities continuously.
	Output 4	Models of maintenance practices for distribution and substation facilities to utilise knowledge and skills acquired through the technical trainings and QC activities are established.
	Output 5	Technical working procedures for operation and maintenance of distribution and substation facilities are standardised.
Total cost (Japanese Side)		1,047 million yen
Period of Cooperation		August 2009 - March 2016 (Extension period: August 2014 to March 2016)
Target Area		Tanzania
Implementing Agency		TANESCO
Other Relevant Agencies/ Organisations		None
Consultant/ Organisation in Japan		Kinden Corporation
Related Projects		<p>Yen Loan Project</p> <ul style="list-style-type: none"> - Iringa-Shinyanga Backbone Transmission Investment Project (December 2010) <p>Technical Cooperation Project</p> <ul style="list-style-type: none"> - The Project for Capacity Development of Efficient Distribution and Transmission Systems Phase 2 (2021-2024) <p>Grant Aid Projects</p> <ul style="list-style-type: none"> - The Project for Reinforcement of Transmission and Distribution Facilities in Oyster Bay Substation (May 2008) - The Project for Reinforcement of Power Distribution in Dar es Salaam (July 2014) <p>International Organisations and Other Donors</p> <ul style="list-style-type: none"> - World Bank: Tanzania Energy Development and Access Expansion Project (2008-2017), Corporate Management System Project

	<p>(2021-2024)</p> <ul style="list-style-type: none"> - United States Millennium Challenge Corporation (MCC): Tanzania Compact (2008-2013) - STATNETT (Norway): Technical cooperation (2010-2013) - African Development Bank (AfDB): Joint Initiative for Private Sector Development in Africa (2005-2016) (partly co-financed with the Yen Loan “Iringa-Shinyanga Backbone Transmission Investment Project”)
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1.3 Outline of the Terminal Evaluation

Terminal evaluation was conducted twice for this project. Following the recommendation of the first terminal evaluation, “Terminal Evaluation” (January-February 2014), the project was extended to maximise its effects. At the end of the extension period, the second terminal evaluation, “Terminal Evaluation (Part 2)” (August-September 2015), was conducted and is described below.

1.3.1 Achievement Status of Project Purpose from the Terminal Evaluation

The TTS mid-term plan, the implementation of the TTS annual training plan, the development of the OJT and maintenance manuals, and the 5S activities² were reported to have led to improvements not only in individual capacities but also in organisational capacities. And it was judged that the project purpose was almost achieved.

1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation (Including other impacts)

It was assessed that the overall goal was likely to be achieved because the implementation of standardised maintenance work to distribution and substation facilities for all Region Offices was expected to be completed by 2018. On the other hand, it was pointed out that improving the accumulation and analysis of blackout network data at the Region Office level was necessary in order to properly verify the operation status of power distribution. It was also pointed out that enhancing capacity to grasp the causes of distribution network accidents was required in order to properly conduct future maintenance and repair works on distribution and substation facilities.

1.3.3 Recommendations from the Terminal Evaluation

The following three recommendations were made based on the evaluation analysis developed using the Five Evaluation Criteria³.

² The 5S activities (i.e., Sorting, Setting-in-Order, Shining, Standardising, Sustaining the Discipline) is the name of a management method that is utilised for improving and maintaining working environments and commencing manufacturing and service industries.

³ In 2021, it was changed to the Six Evaluation Criteria due to revisions.

1) Strengthen data management systems for maintenance work of power distribution networks, including secondary substations: Strengthening of data management of number and duration of outages by cause (establishment of data collection system and data collection/accumulation after project completion).

2) Link the monitoring and evaluation (M&E) activities conducted jointly by TTS and concerned divisions to supervising activities for the status of adherence to the maintenance guidelines and manuals at Zone⁴ and Region⁵ Offices: Continuation of on-site training effect monitoring of trainees jointly with TTS and concerned divisions and addition of monitoring the status of adherence to guidelines and manuals at the Zone and Region Offices after approval of guidelines, etc., by TANESCO management.

3) Strengthen the organisational structure to deploy standardised maintenance work for distribution networks: Formulation of maintenance plans for distribution, and of preventive maintenance and maintenance management plans for primary and secondary substations related to transformation, and allocation of necessary personnel to the Preventive Maintenance and Maintenance Management Teams at the Zone Offices.

2. Outline of the Evaluation Study

2.1 External Evaluator

Mayumi Hamada, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

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

Duration of the Study: September 2021-November 2022

Duration of the Field Study: February 2021-September 2022 (Implemented through a local research assistant)

2.3 Constraints during the Evaluation Study

Due to the spread of the new coronavirus infection and so on, the planned field survey was cancelled for both the first and second trips and was switched to remote information gathering through a local consultant. The information was collected from the field by a local consultant and the evaluation analysis was conducted by an evaluator in Japan. It took more time than usual to collect the necessary information for the analysis based on the Six Evaluation Criteria due to difficulty obtaining cooperation from the implementing agency regarding the provision of information.

⁴ Geographical segmentation called “zones” in Tanzania. Compared to regions, it does not have administrative authority because it is not an administrative boundary. Tanganyika, or “the mainland,” has the following zones; Central, Coastal, Lake, Northern, Southern Highlands, and Western.

⁵ In TANESCO, Region offices are responsible for site operation (here, “region” does not mean the administrative boundary but a unit of area independently set by TANESCO, which is smaller than the “region” as an administrative boundary). The organisation of TANESCO consists of a vertical relationship (i.e., “headquarters – Zone offices – Region offices”).

3. Results of the Evaluation (Overall Rating: A⁶)

3.1 Relevance/Coherence (Rating: ③⁷)

3.1.1 Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Tanzania

One of the three goals set in Tanzania's long-term development plan, *Tanzania Development Vision 2025* (1998), is "a strong and competitive economy." This goal includes required infrastructure development in all sectors indicated in the plan. The above development plan was effective from the time of planning to the completion of this project. In addition, the project's direction, which aims to improve the maintenance and management of TANESCO's power distribution and substation facilities, contributes to "growth and income poverty reduction" and "quality of life and social well-being improvement," which were two of the three goal clusters shown in *the National Strategy of Growth and Reduction of Poverty (NSGRP: 1st: 2005/06-2009/10, 2nd: 2010/11-2014/15)*. Based on these policy goals, promoting rural electrification and strengthening the national grid were important issues for the electric power sector. Therefore, from the time of planning to the completion of the project, the development policy's consistency is high.

3.1.1.2 Consistency with the Development Needs of Tanzania

At the time of planning, power demand was significantly increasing in Dar es Salaam City and local cities. The national system peak power demand in actual value was 630 MW in December 2007 and 1,041.63 MW in 2016⁸, showing a significant increase from the time of planning.

For 10 years (beginning in the late 1990s), TANESCO, which is responsible for supplying electricity in Tanzania, did not invest in maintenance, reinforcement, or renewal of existing facilities and did not invest in new facilities after the government announced its policy to divide and privatise TANESCO. Experienced and talented personnel left TANESCO, staff training was not conducted, and new recruitment was not implemented. Consequently, the facilities became decrepit, equipment at each substation was chronically overloaded to meet the increasing demand, and power outages frequently occurred because the distribution facilities were insufficiently maintained.⁹ In addition, TANESCO's human resource development needs were maintained even at the time of project completion¹⁰. Therefore, this project is consistent with Tanzania's development needs.

⁶ A: Highly Satisfactory, B: Satisfactory, C: Partially Satisfactory, D: Unsatisfactory

⁷ ④: Very High, ③: High, ②: Moderately Low, ①: Low

⁸ Questionnaire for TANESCO.

⁹ The Ex-ante Project Evaluation Paper (p. 1-2).

¹⁰ Questionnaire for TANESCO.

3.1.1.3 Appropriateness of the Project Plan and Approach

The initial plan of the project was to develop an internal training system for TANESCO. At the time of the Mid-term Review, it was determined that it was necessary to improve the worksite after the training in order to apply the knowledge and skills acquired and improve operation and maintenance although the training had already been developed to a certain extent. For this reason, the need for an improved model for operation and maintenance of distribution and substation facilities (Output 4) and for standardised guidelines and manuals based on the model (Output 5) was recognised and added to the plan.¹¹ This modification to the plan was considered necessary and appropriate in order to ensure the quality of the overall goal (i.e., implementing improved operations and maintenance) and, in turn, enhance sustainability. In addition, during the selection and fostering of participants and trainers at TTS, sufficient consideration was given to ensure that no one was disadvantaged due to gender, religion, place of birth, etc.¹² Therefore, this project's plan and approach are appropriate.

3.1.2 Coherence (Rating: ②)

3.1.2.1 Consistency with Japan's ODA Policy

Japan designated Tanzania as a priority support country in *the DAC New Development Strategy* (1996) with the overall goal of assisting the “formation and promotion of a virtuous cycle of stable economic growth and poverty alleviation.” In addition, infrastructure development was one of the two priority areas of *the Country Assistance Program for the United Republic of Tanzania* (2008), indicating that establishing a transportation system, a water supply system, and a stable electricity supply was necessary. It advocated support for the development of power transmission and distribution networks with stronger maintenance and management in the capital and regional cities.¹³ Therefore, this project was consistent with Japan's ODA policy at the time of planning.

3.1.2.2 Internal Coherence

At the time of planning, this project intended to develop the transmission and distribution network with grant aid in the future, such as the “The Project for Reinforcement of Transmission and Distribution Facilities in Oyster Bay Substation” and the yen loan “Iringa-Shinyanga Backbone Transmission Investment Project,” and to strengthen TANESCO's maintenance and management capacity.¹⁴ At the implementation stage, “the Project for Reinforcement of Power Distribution in Dar es Salaam” (grant aid project) was implemented. In all of the above cases, improving maintenance and management capabilities through this project was intended to improve the maintenance and management of the developed power-

¹¹ The Mid-term Review Report (p. 20-24), Interviews with Japanese experts and JICA staff of that time.

¹² Questionnaire for TANESCO.

¹³ The Ex-ante Project Evaluation Paper (p. 1-2).

¹⁴ The Ex-ante Project Evaluation Paper (p. 3); document provided by JICA.

related facilities, thereby enhancing sustainability. However, the degree of specific effects expected from the collaboration or indicators were not set in advance. According to TANESCO, the maintenance methods improved by this project are being applied nationwide, including in Dar es Salaam. Thus, it can be inferred that this project contributed to improving the sustainability of the facilities developed by these financial cooperation projects. However, it is difficult to confirm specific results in comparison with the plan.

3.1.2.3 External Coherence

From the planning stage to the implementation stage of this project, the World Bank's "Tanzania Energy Development and Access Expansion Project" (2008-2017) was implemented to improve the volume and efficiency of electricity supply, increase access to energy, and develop renewable energy in Dar es Salaam, Arusha, and Kilimanjaro¹⁵. In addition, from 2008 to 2013, the United States Millennium Challenge Corporation (MCC) implemented the "Tanzania Compact," which consists of components in the power, transportation, and water sectors. In the power sector of this project, the objective was to improve and expand electric power services by improving transmission capacity and access to electricity.¹⁶ Although these projects were implemented in the power sector at the same time, specific plans or adjustments were not made regarding the effects of collaboration with this project during the planning and implementation stages.

<Summary of Relevance and Coherence>

This project is highly consistent with the development plan and development needs of Tanzania, and the project plan and approach are appropriate. In addition, there were some JICA projects, with which linkage and coordination with this project were intended at the time of planning and implementation. However, it was difficult to confirm the specific results of collaborations compared with the plan because specific effects expected by the linkage were not sufficiently clarified at planning stage. Regarding cooperation with the organisations apart from JICA, there were some projects, which had the same direction of cooperation with JICA. However, the specific collaboration/coordination were not made. Therefore, the project's relevance and coherence are high.

3.2 Effectiveness and Impacts¹⁷ (Rating: ③)

3.2.1 Effectiveness

Table 1 presents the major PDM revisions made in this project.

¹⁵ <https://projects.worldbank.org/en/projects-operations/project-detail/P101645>

¹⁶ <https://www.mcc.gov/resources/doc/closed-compact-report-tanzania>

¹⁷ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

Table 1 PDM Revisions

PDM	Year	Major points of revision
PDM1	2008	
PDM2	2011	<ul style="list-style-type: none"> - The project purpose of PDM 1 was set as the overall goal (improvement of logic). - Added Output 4 (integration of training results into practice).
PDM3	2012	<ul style="list-style-type: none"> - Overall goal was revised from “The capacity for planning, operation, and maintenance of power systems is strengthened” to “Reliability of power system of TANESCO is improved (improvement of logic) .” - Indicators were corrected.
PDM4	2014	<ul style="list-style-type: none"> - Overall goal was changed from “Reliability of power system of TANESCO is improved” to “The improved operation and maintenance practices are implemented at distribution and substation facilities of TANESCO.” (improvement of logic) - Clarified Output 4’s expression (establishment of a model for maintenance and management of distribution and substation facilities) - Added Output 5 (standardisation of technical procedures for operation and maintenance of distribution and substation facilities)

Source: Produced by the evaluator based on the Ex-ante Evaluation Sheet, the Mid-term Review Report, the Terminal Evaluation Report, and the Terminal Evaluation (Part 2) Report.

Overall, the logic, clarity, and content have improved over the previous version and the changes are mostly appropriate. Therefore, in this ex-post evaluation study, the evaluation was conducted based on PDM4.

3.2.1.1 Achievement of Project Purpose

Table 2 shows the Project Purpose’s indicators and achievement status at the time of project completion. Of the four indicators, improvement was observed in the formulation of a medium-term plan, implementation of a TTS training plan as part of the TANESCO Corporate Business plan, monitoring of QC activities by the M&E team, sharing of the best practices, etc. However, OJT based on the developed guidelines and manuals was not achieved by the time the project was completed. Therefore, it is assessed that the Project Purpose was mostly achieved. In addition, while selecting and fostering participants and lecturers at TTS, sufficient consideration was given to ensure that no participant would be disadvantaged due to gender, religion, place of birth, etc.¹⁸ There were no problems. Although there was no statement in the formulated medium-term plan that stipulated that these considerations should be taken into account, trainees and trainers were selected according to TANESCO’s training needs, regardless of gender, religion, place of birth, etc.¹⁹

¹⁸ Questionnaire for TANESCO

¹⁹ Questionnaire for TANESCO

Table 2 Achievement of the Project Purpose (By Project Completion)

Project Purpose	Indicator	Actual Value (at the time of project completion)	Level of Achievement
Internal system for human resource development is improved and maintained.	<p>a. The mid-term plan for TTS is prepared and approved by the TANESCO management by the 1st quarter of 2013.</p> <p>b. Training Plan for TTS is integrated into the TANESCO Corporate Business Plan by the end of the Project.</p> <p>c. OJTs based on the model maintenance practices and the working guidelines and manuals for distribution and substation facilities are introduced in TANESCO.</p> <p>d. The monitoring and evaluation system confirms the QC activities at the workplace by the end of the project.</p>	<p>a. The TTS mid-term plan (2014-2018) was developed but did not reach approval by management.</p> <p>b. The TTS Annual Training Plan was implemented as a part of the TANESCO Corporate Business Plan. Since 2014, TTS has implemented the training developed by TANESCO and the training developed by this project.</p> <p>c. It was expected that OJT based on the procedure manual prepared in this project would be implemented through the implementation of the maintenance management guidelines and manuals prepared in this project at all offices.</p> <p>d. The M&E team led by the 5S facilitator monitored by visiting Region Offices. Good practices at the Region Office level were shared at the headquarters personnel forum.</p>	③

Source: Terminal Evaluation (Part 2) Report (p. 21-22), questionnaire for TANESCO

Note: Degree of achievement ④ Achieved more than planned, ③ Mostly achieved, ② Partially achieved, ① Not achieved

All of the Outputs' achievements were high. Table 3 shows the achievement status at the time of project completion. At the beginning of the project, only outputs related to the establishment and implementation of an internal training system and the promotion of QC activities were included. However, based on the recommendation in the Mid-term Review, Output 4 and 5 were added. The logic from the Outputs to Project Purpose was first at the output level, a training system was established (Output 1). The established system strengthened the technical capacity of artisan, technicians, and engineers (Output 2), while the QC activities were simultaneously promoted (Output 3). A maintenance work model was established to utilise the knowledge and skills acquired through technical training and QC activities (Output 4). In order to systematically implement the model in actual work, the model was standardised and the contents of the developed guidelines and manuals were reflected into the technical training (Output 5). Through these Outputs' achievements, a practical internal human resource development system related to the maintenance and management of TANESCO (Project Purpose), was established. As an external condition, although some of the trained 5S facilitators retired or resigned, new facilitators were trained for replacement, and there was no negative impact on the achievement of the project purpose.

Table 3 Achievement of Outputs (By Project Completion)

	Output	Achievement	Level of Achievement
1	The training system for distribution and substation facilities at TANESCO Training Schools (TTS) is developed.	By the time the project was completed, the following had been implemented and each indicator had been achieved. Formulation of annual plans and training curriculum, development of teaching materials, assignment of necessary personnel to TTS, establishment of certification systems, procurement of facilities and equipment, design of specialised training courses, etc.	③
2	The artisans, technicians and engineers working for distribution and substation facilities are trained and certified through the training system at TTS. The target number is as follows. - Artisans: 294 distribution workers, 49 substation workers - Engineers: Distribution 157, Substation 49 workers - Specialised training participants: 453	The number of participants by the time of completion is as follows. All of the target values for the indicators were achieved (the number of trainees is the same as the number of certified trainees): - Artisans: 741 persons - Technicians: 323 in distribution department, 99 in substation department Engineers: 168 in distribution department, 51 in substation department • Specialised training - Technicians and engineers: 35 courses, 588 persons - Managers: 2 courses, 45 persons • Practical training at TTS Masaki (before OJT) - Power distribution: 3 courses, 82 persons - Substation: 1 course, 21 persons	③
3	Quality Control (QC) activities are introduced to TANESCO and its activities are promoted continuously.	By the time of completion, the following were implemented and the indicators were achieved: Development of 5S training curriculum, preparation of teaching materials, training of facilitators (20 persons), approval of strategic plan, implementation of 5S training (24 offices in all of Tanzania, 3 power plants, 1 head office), incorporation into general training, and establishment of M & E system and its implementation.	③
4	Models of maintenance practices for distribution and substation facilities to utilise knowledge and skills acquired through the technical trainings and QC activities are established.	By the time of completion, the following had been implemented and the indicators were mostly achieved: Procedure manuals for model maintenance work of the middle-tension (MT) feeder lines and for preventive maintenance work of substations were developed. Based on the procedure manual, OJT for distribution facilities was implemented in a pilot distribution facility at Kinondoni North and then expanded to four districts in Dar es Salaam. Substation OJT was implemented at three substations and expanded to all 25 secondary substations in Dar es Salaam. In order to verify these effects, monitoring was conducted on the number and duration of power outages at four offices in Dar es Salaam and on the number of accidents at the secondary substation in Dar es Salaam.	③
5	Technical working procedures for operation and maintenance of distribution and substation facilities are standardized.	By the time of completion, the following had been implemented and the indicators were mostly achieved: Based on the OJT, a maintenance manual and a distribution construction manual were developed for the distribution department and a substation maintenance guideline was developed for the substation department. The contents of the manuals and guidelines were incorporated into the TTS technical training. By March 2016, a system for checking and supervising the implementation structure of guidelines and manuals had been established.	③

Source: Terminal Evaluation (Part 2) Report (p. 14-21); Questionnaire for TANESCO

Note: Degree of achievement ④ Achieved more than planned, ③ Mostly achieved, ② Partially achieved, ① Not achieved

In light of the above, the project mostly achieved its purpose. Each Output was mostly achieved and contributed to achieving the project purpose; and no external conditions affected the achievement of the project purpose.

3.2.2 Impacts

3.2.2.1 Achievement of Overall Goal

Table 4 shows the achievement of the overall goal at the time of the ex-post evaluation. Indicator d (improvement in the number and duration of power outages) is the situation expected to be achieved as a result of the achievement of the overall goal; therefore, it is analysed in “3.2.2.2 Other positive and negative impacts.” As shown in Table 4, all of the indicators from a to c were achieved. Therefore, the project achieved its overall goal.

Table 4 Achievement of Overall Goal (At the time of the Ex-post Evaluation)

Overall goal	Indicator	Achievement	Level of Achievement
The improved operation and maintenance practices are implemented at distribution and substation facilities of TANESCO.	<p>a. The standardised practices of maintenance of the distribution facilities introduced by the Project are implemented in Dar es Salaam Regions by 2018.</p> <p>b. The standardised practices of maintenance for substation facilities introduced by the Project are implemented at all the substations in Dar es Salaam Regions by 2018.</p> <p>c. Standardized working guidelines and manuals for improved operation and maintenance of the distribution and substation facilities are practised throughout TANESCO by 2018.</p> <p>d. The performance of the distribution network in the Dar es Salaam Regions* is improved:</p> <ul style="list-style-type: none"> - Number of outages by causes - Duration of outage by causes <p>*Baseline data (2013-2014) should be collected.</p>	<p>a. By 2018, standardised maintenance practices of distribution facilities had been implemented at Region Offices in Dar es Salaam and continuously implemented at the time of the ex-post evaluation.</p> <p>b. By 2018, standardised maintenance practices for substation facilities had been implemented at all substations in Dar es Salaam and continuously implemented at the time of the ex-post evaluation.</p> <p>c. By 2018, standardised working guidelines and manuals for improved operation and maintenance of the distribution and substation facilities had been practised at all TANESCO offices and continuously implemented at the time of the ex-post evaluation.</p> <p>(d. is analysed with other impacts)</p>	③

Source: Questionnaire for TANESCO

Note: Degree of achievement ④ Achieved more than planned, ③ Mostly achieved, ② Partially achieved, ① Not achieved

The biggest contributing factor for the achievement of the overall goal is the fact that the establishment of a maintenance model (Output 4) and the standardisation of work procedures (Output 5), which were added after the Mid-term Review, had been achieved by project completion. Table 5 shows the continued achievements of the Outputs and the project purpose after the project's completion. The training has continued mainly in rural areas. OJT is conducted at the time of the construction of new facilities. The content includes feeder lines of 1 to 3 kilometres, which were not covered by this project and which shows further improvement. However, the number of trainees at the time of the ex-post evaluation could not be provided from TANESCO (Output 2)²⁰. The scale of QC activities (Output 3) has been reduced. On the other hand, the training system established in this project (Output 1), the maintenance model for distribution and substation facilities (Output 4), and the standardised technical working procedures for operation and maintenance of distribution and substation facilities (Output 5) were maintained even at the time of the ex-post evaluation. This led to the achievement of the overall goal. Table 6 shows the project purpose's status of continuation after project completion. Although OJT has been implemented based on the guidelines and manuals at the time of the ex-post evaluation, the project purpose has partially continued. However, it cannot be said that it contributed greatly to the achievement of the overall goal.

Table 5 Continuation of Outputs (After Project Completion)

	Outcome	achievement	Level of Achievement
1	The training system for distribution and substation facilities at TANESCO Training Schools (TTS) is developed.	Even at the time of the ex-post evaluation, the curriculum and teaching materials developed were used, and the certification system was maintained. TTS has 30 staff members. In recent years, most of the specialised training has been conducted outside Dar es Salaam, where many construction activities are being carried out, including training on the construction of 1 to 3 km distribution lines.	③
2	The artisans, technicians, and engineers working for distribution and substation facilities are trained and certified through the training system at TTS. (The target number is as follows. - Artisans: 294 distribution workers, 49 substation workers - Engineers: Distribution 157, Substation 49 workers Specialised training participants: 453	After the project was completed, and at the time of the ex-post evaluation, the training programmes were implemented with the same curriculum. The OJT and specialised training are being implemented in rural areas (on feeder lines of 1 to 3 km and so on at the time of construction of new facilities). Neither the actual number of trainees nor the number of training courses could be confirmed because the data could not be obtained. The M&E regarding the application of technology to the trainees' work sites had still been conducted four times a year at the time of the ex-post evaluation.	②

²⁰ The following information was provided by TANESCO in the latter half of November 2022. "For substations maintenance the project covered Dar Es Salaam effectively, though most participants who were trained are currently either retired or left the company but the knowledge shared to few successors is still being shared to others. TANESCO is doing all possible means by utilizing few maintenance staff trained for the program to disseminate the knowledge to other zonal maintenance workshops teams." However, the detailed information and the supporting data could not be confirmed.

3	Quality Control (QC) activities are introduced to TANESCO and its activities are promoted continuously.	After the project was completed, 5S training and M&E training were conducted once. The teaching materials developed during the implementation were still utilised at the time of the ex-post evaluation, when there were 21 5S facilitators engaged in the 5S workshops. 5S activities have been implemented even after the completion of the project, and M&E reports are submitted every year by 10 to 20 Region Offices and power plants nationwide (the number of all Region Offices at the time of the ex-post evaluation was 29). However, only about 50% of the necessary amount is secured for the budget to monitor the visiting style, which is not sufficient.	③
4	Models of maintenance practices for distribution and substation facilities to utilise knowledge and skills acquired through the technical trainings and QC activities are established.	The models of maintenance practices established during the implementation have been maintained even after the project completion. A check and supervision system for manuals and guidelines was established in 2016.	③
5	Technical working procedures for operation and maintenance of distribution and substation facilities are standardised.	At the time of the ex-post evaluation, the manuals and guidelines that were developed have been incorporated into TTS training and applied at the work sites nationwide.	③

Source: Questionnaire and Interviews to TANESCO

Note: Degree of achievement ④ Achieved more than planned, ③ Mostly achieved, ② Partially achieved, ① Not achieved

Table 6 Continuation of Project Purpose (After Project Completion)

Project Purpose	Indicator	Achievement	Level of Achievement
Internal system for human resource development is improved and maintained.	<p>a. The mid-term plan for TTS is prepared and approved by the TANESCO management by the 1st quarter of 2013.</p> <p>b. Training Plan for TTS is integrated into the TANESCO Corporate Business Plan by the end of the Project.</p> <p>c. OJTs based on the model maintenance practices and the working guidelines and manuals for distribution and substation facilities are introduced in TANESCO.</p> <p>d. The monitoring and evaluation system confirms the QC activities at the workplace by the end of the Project.</p>	<p>a. The TTS Training Plan for 2019-2021 was formulated based on the training needs assessment conducted in all TANESCO departments and offices.</p> <p>b. The TTS training plan is not reflected in the TANESCO business plan, but all TTS training is in line with the TANESCO corporate business plan.</p> <p>c. OJT based on the model maintenance practices and the working guidelines and manuals for distribution and substation facilities are implemented at the time of the ex-post evaluation.</p> <p>d. At the time of the ex-post evaluation, some commented that the office environment was improved by continuing QC activities on a regular basis.</p>	②

Source: Questionnaire and Interviews to TANESCO, TANESCO Strategic Plan 2021/22-2025/26

Note: Degree of achievement ④ Achieved more than planned, ③ Mostly achieved, ② Partially achieved, ① Not achieved

3.2.2.2 Other Positive and Negative Effects

1) Impacts on the Natural Environment

At the planning stage, this project was classified as Category C based on JICA Guidelines for Environmental and Social Considerations²¹. This was because the objective of this project was to improve

²¹ JICA Evaluation Division. There was no record in the Ex-ante Evaluation Paper.

the capacity to maintain and manage facilities related to power supply and to develop human resources. Thus, it was believed that there would be almost no undesirable impact on the environment or society. No impact on the natural environment was anticipated, and no such impact has actually occurred²².

2) Resettlement and Land Acquisition

There was no resettlement or land acquisition for this project.

3) Gender Equality

No positive or negative impacts on gender was observed.

4) Marginalised People

No positive or negative impacts on marginalised people was observed. At the time of planning, it was assumed that this project, which could have an impact on the stable supply of electricity to Dar es Salaam and regional cities, would also have an indirect ripple effect on the poor. However, since this survey framework does not envisage large-scale surveys targeting the poor, however, verification on this point was not carried out.

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

No positive or negative impacts on social systems/norms, or people's well-being were observed.

6) Unintended Positive/Negative Impacts

a) Change of outages (number and duration) in the four areas in Dar es Salaam

TANESCO has four Region Offices covering Dar es Salaam: Ilala, Kinondoni North, Kinondoni South and Temeke. Tables 7 to 10 show changes in the number and duration of accidental outages per year for each office. The number of annual accidental power outages shows a decreasing trend except for Kinondoni South. On the other hand, the annual accidental outage duration decreased in Ilala and Kinondoni South but increased in Kinondoni North and Temeke. Thus, common tendency on the change in duration of accidental outages was not observed.

Table 7 Ilala Region Office

	2013/14	2018/19	2020/21
MT feeder lines (number)	42	42	78
Number of accidental outages (times)	381	239	209
Annual number of accidental outages per MT feeder line (cases/year)	9.0	5.6	2.6
Duration of accidental outages (hours)	5,554	598	523
Accidental outage hours per year per MT feeder line (hours)	132.2	14.2	6.7

Source: Produced by the evaluator based on the TANESCO Ilala Region Office questionnaire

²² Questionnaire for TANESCO

Table 8 Kinondoni North Region Office

	2013/14	2018/19	2020/21
MT feeder lines (number)	42	46	48
Number of accidental outages (times)	259	140	147
Annual number of accidental outages per MT feeder line (cases/year)	6.2	3.0	3.1
Duration of accidental outages (hours)	708	1,040	1,316
Accidental outage hours per year per MT feeder line (hours)	16.8	22.6	27.4

Source: Created by the evaluator based on the TANESCO Kinondoni North Region Office questionnaire

Note: Power outage hours for the Kinondoni North Region Office include planned power outage hours, so a simple comparison with other offices is not possible.

Table 9 Kinondoni South Region Office

	2013/14	2018/19	2020/21
MT feeder lines (number)	2	30	30
Number of accidental outages (times)	N/A	514	648
Annual number of accidental outages per MT feeder line (cases/year)	N/A	17.1	21.6
Duration of accidental outages (hours)	N/A	1,052	804
Accidental outage hours per year per MT feeder line (hours)	N/A	35	26.8

Source: Produced by the evaluator based on the TANESCO Kinondoni South Region Office questionnaire

Note: Data for FY2013 are not available.

Table 10 Temeke Region Office

	2013/14	2018/19	2020/21
MT feeder lines (number)	N/A	N/A	N/A
Number of accidental outages (times)	73	0	57
Annual number of accidental outages per MT feeder line (cases/year)	N/A	N/A	N/A
Duration of accidental outage (hours)	119	20	172
Accidental outage hours per year per MT feeder line (hours)	N/A	N/A	N/A

Source: Produced by the evaluator based on the TANESCO Temeke Region Office questionnaire

(Reference) Table 11 Whole City of Dar es Salaam

	2012	2014	2020/21
Number of accidental outages per year per MT feeder line (times)	14.9	9.4	N/A
Duration of accidental outages per year per MT feeder line (hours)	22.3	5.3	N/A

Source: Terminal Evaluation (Part 2) Report p29, Questionnaire for TANESCO Headquarters/East Zone

The implementing agency commented that in areas where the frequency of power outages decreased, losses in power sales decreased and contributed to increased earnings²³. However, it was not possible to clarify which regions specifically contributed to the increase in revenue and to what extent, since the decline was disproportionate even in the same area.

²³Questionnaire for TANESCO

b) Change of number of outages caused by accidents at secondary substations in Dar es Salaam

Table 12 shows the number of outages due to accidents at secondary substations in Dar es Salaam after project completion. It decreased in Kinondoni North and Kinondoni South, but sufficient data for comparison could not be obtained for other areas. In addition, only Kinondoni North has a large number of cases, but the reason for this could not be clarified.

Table 12 Number of Outages due to Accidents at Secondary Substations in Dar es Salaam

(Unit: cases/year)

	2018/19	2020/21
Ilala	1	N/A
Kinondoni North	65	43
Kinondoni South	1	0
Temeke	N/A	N/A

Source: Questionnaires for TANESCO Ilala, Kinondoni North, Kinondoni South, Temeke Region Office

There were some comments that the preventive maintenance²⁴ promoted by this project led to a decrease in damage to equipment at substations, and trouble caused by such damage decreased due to decreased overload at secondary substations²⁵. However, it depends on each area, according to the above figures.

c) Changes in number of complaints in Dar es Salaam

Regarding the number of complaints from customers (Table 13), no common trend could be found, as the number of complaints decreased in Ilala compared to FY2018, while it increased in Kinondoni North and Kinondoni South. Data for Temeke were not available.

Table 13 Power Outage Complaints

(Unit: cases)

	2018/19	2020/21
Ilala	5,675	2,346
Kinondoni North	28,321	30,234
Kinondoni South	48,543	52,812
Temeke	N/A	N/A

Source: TANESCO Ilala Region Office, Kinondoni North Regional Office, Kinondoni South Office

²⁴ There are two types of maintenance (preservation) for electric power equipment: reactive maintenance, in which repairs are made whenever a failure or accident occurs, and preventive maintenance, which is performed systematically before a failure or accident occurs. The concept of preventive maintenance was introduced by this project. Prior to that, TANESCO's power facility maintenance was limited to reactive maintenance. In reactive maintenance, it is not possible to foresee failures and accidents in advance. Thus, it takes longer than preventive maintenance to identify the causes and consider countermeasures, which require a longer time for restoration. Preventive maintenance makes it possible to identify problems in advance by systematic patrol inspections and periodic inspections, leading to a reduction in sudden failures and accidents and the extension of equipment life (Terminal Evaluation (Part 2) Report p31).

²⁵ Questionnaire for TANESCO

d) Changes in Resident Perceptions on Outages (Dar es Salaam)

Table 14 and 15 show the results of interviews conducted with 20 residents of Dar es Salaam who had lived there since before the project (five people from each area, or 20 people). The respondents' perceptions were that while there was no noticeable change in the frequency of power outages, the duration of power outages was either "very short" or "short," which is increasing, although it is not possible to say with certainty that the trend of the city as a whole can be shown due to the small sample size.

Table 14 Frequency of Outages

(Unit: persons)

	2008	2016	2022
Very rare	2	4	4
Rare	2	9	4
Neither rare nor often	4	6	5
Often	9	1	6
Very often	3	0	1
Do not know	0	0	0
Total	20	20	20

Source: Residents interview in Dar es Salaam City

Table 15 Duration of Outages

(Unit: persons)

	2008	2016	2022
Very short	0	5	6
Short	3	10	4
Neither short nor long	4	5	4
Long	9	0	4
Very long	3	0	2
Do not know	1	0	0
Total	20	20	20

Source: Residents interview in Dar es Salaam City

e) Development of a Team Approach and Improvements in network (system) management and maintenance work through coordination and collaboration among related departments

At the time of the Terminal Evaluation (Part 2), the followings were pointed out as impacts of this project: enhanced understanding on the importance of the team approach through the OJT, coordination made for the OJT between the distribution department and the transmission and substation department, and monthly joint meetings between the Distribution and Customer Service Department and Distribution and Transmission Department at headquarters. At the time of the ex-post evaluation, the status of interdepartmental coordination and collaboration could not be confirmed, in spite of efforts to obtain supporting information.

f) Other

No negative impact was confirmed. Strengthening the data management for the number and duration of outages by cause (establishment of the data collection system and data collection and accumulation after project completion) was recommended as strengthening the data management system of the distribution network including secondary substations. At the time of the ex-post evaluation, data on outages was provided by Region Office level in Dar es Salaam, but not from the Zone or headquarters level, where data sharing was expected. During project implementation, information management was indicated as an issue, but even at the time of the ex-post evaluation, concerns remained about whether different levels are sharing various types of data.

<Summary of Effectiveness and impacts>

This project has achieved the project purpose of improving TANESCO's internal human resource development system. As for the overall goal, the improved operation and maintenance practices of distribution and substation facilities have been confirmed, and the effects have been realised as planned. Therefore, the effectiveness and impacts of the project are high.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Table 16 shows the planned and actual inputs for the implementation at the project completion.

Table 16 The Project's Inputs (By Project Completion)

Input element	Plan	Actual Status
(1) Experts	<ul style="list-style-type: none"> • Long-term: No number listed (chief advisor/power training, business coordination/strengthening training functions) • Short-term: No mention of the number of persons (power transmission and distribution technology/training plan, power distribution plan, system analysis, power supply command, substation equipment, work efficiency improvement [TQM]) 	<ul style="list-style-type: none"> • Dispatch of experts: 15 persons in 11 fields (about 248M/M) • Long-term: 2 persons in 2 fields (139M/M) • Short-term: 13 persons in 9 fields (about 109M/M)
(2) Trainees received	<ul style="list-style-type: none"> • Counterpart training: No mention of the number of trainees (Some counterparts may participate in Group Training Program.) • Third country training (if necessary) 	<ul style="list-style-type: none"> • Training in Japan: 16 people (4 courses) • Third country training: 23 people (3 courses)
(3) Equipment	<ul style="list-style-type: none"> • Training equipment (measuring instruments for maintenance and inspection, equipment for lectures and exercises, system analysis software, etc. Prices not stated) 	<ul style="list-style-type: none"> • Foreign currency portion: 43 million yen, \$235,000 • Local currency portion: 195.891 million Tanzanian shillings
(4) Expenses for strengthening overseas business	No amount stated	85 million yen
Japanese Side Total Project Cost	No amount stated	1,047 million yen

Tanzanian Side Total Project Cost	1. Counterpart arrangement: • JCC: No number listed • Working Group (WG): No mention of number • Task Force (TF): No mention of number	1. Counterpart placement: 81 persons • JCC: 10 persons • WG: 5 persons • TTS staff: 28 persons • TF: 23 persons • 5S facilitators: 13 persons
	2. Provision of land and facilities: Project office and equipment	2. Provision of land and facilities: Project offices and training schools (TTS City Centre and TTS Masaki) Project office and equipment
	3. Local cost burden: No amount stated	3. Local cost burden: 13,256 million Tanzanian shillings (TTS City Centre and TTS Masaki repair work costs, administrative costs related to training, etc.)
		4. Equipment: tools and consumables for maintenance training at the training school (TTS Masaki)

* MM stands for man month.

3.3.1.1 Elements of Inputs

TANESCO mentioned in its reply to the question on the quality, quantity, and timing of the major inputs from Japan, such as the dispatch of experts, equipment, training in Japan, and local costs, on a 5-point scale (five being high, one being low) that it was mostly five. The inputs from the Japanese side were highly evaluated, and no problems were observed. Inputs from the Tanzanian side were mostly carried out as planned, and training facilities were also repaired. No particular problems were observed.

3.3.1.2 Project Cost

The actual cost from Japan was 1,047 million yen, significantly exceeding the planned amount of 501 million yen (209% of the planned amount). However, the main reasons for the overrun of the budget were the addition of Output 4 and Output 5 (establishment of a maintenance management model through introduction and implementation of OJTs and its reflection on training, as well as development of guidelines and manuals for implementation of the model), in response to the result of the Mid-term Review. As a result, the training not only improved maintenance knowledge and skills, but also led to the application of knowledge and skills into the work sites. Although the project cost significantly exceeded the plan, it is assessed moderately low instead of low, in light of the fact that additional outputs that were not originally planned were produced as described above.

3.3.1.3 Project Period

The initial project period was from October 2008 to September 2013 (60 months), while the actual

period was from August 2009 to March 2016 (80 months) (133% of the plan), exceeding the plan. The main reason for this is the addition of Outputs 4 and 5, which is the same as the project cost overrun. In the same manner as the project cost, it is assessed as moderately low rather than low, since these outputs have been produced.

<Summary of Efficiency>

As mentioned above, each output was mostly achieved by the time of project completion. In terms of inputs, the project cost on the Japanese side significantly exceeded the plan, and the project period also exceeded the plan. However, the reason for this is the addition of outputs 4 and 5. Considering these two additional outputs have been produced, it is assessed moderately low rather than low. There were no problems with the quality, quantity or timing of inputs. Therefore, the efficiency of the project is moderately low.

3.4 Sustainability (Rating: ③)

3.4.1 Policy and System

Regarding the policy and system necessary for future continuation in implementing TANESCO's internal human resource development system and operation and maintenance practice at distribution and substation facilities, which were improved by this project, *Tanzania Development Vision 2025*, which was mentioned in the section on Relevance, is valid. In addition, *the National Five-Year Development Plan (FYDP III)'' (2021/22-2025/26)* advocates in its plan for energy sector the enhancement of accessibility and reliability of electricity by expanding power generation capacity as well as the transmission and distribution network. Therefore, sustainability in terms of policy and system is high.

3.4.2 Institutional/Organisational Aspect

As Tanzania's central public power corporation, TANESCO is responsible for power generation, transmission and distribution, supplying power to all areas except Zanzibar Island. This role did not change from the time of planning to the time of ex-post evaluation. In addition, TTS is still responsible for staff training, as it was during project implementation.

Regarding the maintenance and management of MT feeder lines, at the four Region Offices in Dar es Salaam, which was the pilot area of this project, one or more teams were organised for maintenance work consisting of five to six technical staff at each office. These teams carried out the maintenance work introduced by this project. This system is still maintained at the time of the ex-post evaluation. In addition, after the completion of the project, measures were taken to improve the system, including the securing of personnel and equipment at Region Offices nationwide, which were pointed out as necessary during the

terminal evaluation (Part 2) study²⁶.

In this project, in addition to TTS, which conducts training, activities were conducted involving many sections. These included horizontal relationships such as the Department of Distribution and Customer Service and the Department of Substation Transmission (for establishment of model for maintaining transmission and distribution facilities as well as standardisation of work procedures), Human Resource Department of the Headquarters (for implementation of 5S Kaizen Training and its M&E). In addition, the project also involved many sections with vertical relationships such as Region Offices (for implementation of OJTs and actual maintenance work), Zone Offices (for supervision of Region Offices), and the headquarters. Moreover, during implementation, regular meetings among departments were held with an awareness of this horizontal connection. At the time of the ex-post evaluation, it was not possible to confirm the continuation of these activities.

The terminal evaluation study (Part 2) recommended strengthening of the data management system for the maintenance work of the distribution network including secondary substations. Given that information was not smoothly provided at the time of the ex-post evaluation, concerns remain about the data management system within the organisation. However, in the Phase 2 project currently underway, this point may be improved in the future²⁷.

3.4.3 Technical Aspect

This project established a model and standardised its procedures of the operation and maintenance works of distribution and substation facilities. In order for this improved operation and maintenance works to be technically maintained in the future, it will be important to maintain the technical capacity of artisans, technicians, and engineers, who were fostered by the project, to continue OJTs, and to maintain the quality of training into the future.

At the time of the ex-post evaluation, the technical staff who received OJTs are considered to have sufficient knowledge and skills to perform maintenance and management in accordance with the guidelines and manuals. Regarding those who have not received OJT, the views were split on their capacity. Some considered their capacity to be sufficient because the participants in OJT will share their knowledge, while others thought there was a gap between the knowledge and skills of both. However, to fill this gap, guidance is being provided at the level of the Region Office. In addition, at the time of the ex-post evaluation, OJT was implemented mainly as part of the construction of distribution lines in rural areas such as Tanga, Kagera, Mbeya, and Iringa, while it was being implemented in the four areas of Dar es Salaam during implementation. This was because certain results have already been achieved in Dar es Salaam, and the application of the guidelines developed through this project should be expanded to local distribution lines

²⁶ Questionnaire for TANESCO

²⁷ Interview with Phase 2 Expert

of 1 to 2 km in length to improve maintenance management technology²⁸.

In the training during the implementation period, a mechanism for technology dissemination was incorporated in which instructors who had been selected and trained on transmission and distribution technology served as trainers, and technology was passed on in the workplace by training core engineers. In addition, assignment was made so that trainers with sufficient knowledge and skills could guide the artisans, technicians, and engineers engaged in the operation and maintenance of the distribution networks. As for the specialised training, the trainers were assessed as having sufficient knowledge and skills. The M&E team also conducted M&E on the effects of the training (such as the status of addressing the problems set by the trainees). The M&E team was assessed as providing appropriate feedback for the improvement of Region Offices. At the time of the ex-post evaluation, the trained trainers maintained the knowledge they had acquired and used it to conduct the training at TTS. About 70% of the trainers fostered during project implementation (38 persons) and after completion (2 persons) continued to work as trainers at the time of the ex-post evaluation²⁹. Also, at the time of the ex-post evaluation, although the M&E team's capacity to judge the implementation status of the maintenance guidelines and manuals was sufficient, further training was considered necessary for more effective M&E activities³⁰.

At the time of the terminal evaluation, it was judged that the 5S facilitators who were trained to promote QC activities had sufficient skills and knowledge to implement 5S workshops and training, as well as to conduct monitoring at offices. At the time of the ex-post evaluation, it was recognised that the 5S facilitators were maintaining the above skills and knowledge well. Although about half of the trained 5S facilitators have retired, new staff had been assigned and trained, and no problems have arisen³¹.

3.4.4 Financial Aspect

The key to financial sustainability is whether a financial base has been secured to implement the improved operation and maintenance work for transmission and distribution facilities. First, Table 17 shows the budget allocation to TTS.

Table 17 Changes in TTS budget

(Unit: billion Tanzanian shillings)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Training Cost	0.6	1.6	1.9	2.5	4.4	N/A	2.2	2.1	2.2	2.3	2.2
TTS Maintenance and Renovation Costs	4.3	0.2	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A

Source: Produced by the evaluator based on the Terminal Evaluation (Part 2) Report (p36) and Questionnaire to TTS

²⁸ Interview with TTS

²⁹ Questionnaire for TANESCO

³⁰ Questionnaire for TTS

³¹ Questionnaire for TANESCO

TANESCO's budget for training costs at TTS has expanded year by year, reaching a cumulative total of 11 billion Tanzanian shillings (approximately 610 million yen) from 2011 to the time of the terminal evaluation (Part 2). In addition, along with the implementation of this project, TTS bore its own maintenance cost, which amounted to 4.5 billion Tanzanian shillings (approximately 250 million yen).

At the time of the terminal evaluation, there was no data on the budget necessary to implement activities related to the standardisation of maintenance work for distribution and substation facilities at all Region Offices. However, the necessary budget was assessed to have been provided for tools, materials equipment, and cars. At the time of the ex-post evaluation, data on the budget for tools, materials and equipment could not be obtained. Table 18 shows TANESCO's financial status as a whole³². It indicates the financial status in black figure except for fiscal year (FY) 2016 and FY2017.

Table 18 TANESCO Financial Status

(Unit: billion Tanzanian shillings)

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Revenue	1,643	1,562	1,668	1,778	1,881	1,909	1,993
Expenditure	1,638	1,641	1,713	1,769	1,863	1,899	1,979
Balance	5	-79	-45	9	18	10	14

Source: Questionnaire for TANESCO

However, at the time of the terminal evaluation, although the budget for promoting 5S Kaizen activities had been allocated, the budget for the 5S facilitator team to visit monitoring activities was not sufficiently secured. Even at the time of the ex-post evaluation, the budget for visit-type monitoring activities was about 50% of the required amount³³.

3.4.5 Environmental and Social Aspect

As already mentioned in the impact section, the implementation of this project did not have any negative impact on the environment. Judging from the contents of this project, it is believed that it will not occur in the future either. Thus, no problems in environmental and social considerations are observed.

3.4.6 Preventative Measures to Risks

At the time of planning, the risks identified as external factors to be met included the continuation of trained trainers, the establishment and application of reward systems for internal qualifications and internal certification, the securing of funding and investment status, including other development partners, and drastic policy changes in the electric power sector.

During the ex-post evaluation, about 70% of the trained TTS instructors were still engaged in training,

³² Questionnaire for TANESCO

³³ Questionnaire for TANESCO

and about half of the trained 5S facilitators had retired or left their jobs. However, their successors were assigned and trained so that no problem occurred. Although a reward system was not yet established at the time of the ex-post evaluation, it is under consideration within TANESCO³⁴. As for support from other aid partners, the World Bank's "Corporate Management System Project" (2021-2024) is underway with 65 million dollars, and France's AFD's "Grid Modernisation Project" is in the planning stage³⁵. Therefore, no particular problem is observed in terms of risk management.

3.4.7 Status of Operation and Maintenance

Tables 19 and 20 show changes in the maintenance status of substations and MT feeder lines in Dar es Salaam from project commencement to the ex-post evaluation³⁶. At the time of the ex-post evaluation, the maintenance status of the substations and MT feeder lines in Dar es Salaam has improved compared to when the project started. Therefore, no problem is observed in the operation and maintenance.

Table 19 Substation maintenance status

(Unit: places)

	2009	2016	2022
Very well maintained	13	19	32
Well maintained	5	6	1
Neither well nor poor	10	4	2
Poorly maintained	0	0	0
Very poorly maintained	0	0	0
Total	28	29	35

Source: TANESCO questionnaire

Table 20 Maintenance status of MT Feeder Lines

(Unit: places)

	2009	2016	2022
Very well maintained	0	0	196
Well maintained	170	182	0
Neither well nor poor	0	0	0
Poorly maintained	0	0	0
Very poorly maintained	0	0	0
Total	170	182	196

Source: TANESCO questionnaire

<Summary of Sustainability>

Slight issues have been observed in the organisation and system aspects in order to sustain the project effects of this project, but there are good prospects for improvement and resolution. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to improve the internal human resource development system of

³⁴ Questionnaire for TANESCO

³⁵ Interview with TANESCO headquarters

³⁶ Questionnaire for TANESCO

Tanzania Electric Supply Company Ltd. (hereinafter referred to as TANESCO) by developing and implementing a training system, introducing quality control activities, establishing a maintenance work model, and standardising technical work procedures. This project, which aimed to contribute to promotion of power supply through human resource development and improvement of maintenance work, was consistent with Tanzania's development policy and development needs. At the time of planning, this project was also consistent with Japan's ODA policy. Regarding internal coherence, it was intended to contribute to other JICA grant aid projects at the time of planning, although it is not possible to compare the actual results with the plan's specific target. As for external coherence, any specific collaboration or coordination with other projects while planning and implementing could not be confirmed. Therefore, relevance and coherence are high. The project purpose and the outputs were mostly achieved by the time the project was completed. In addition, at the time of the ex-post evaluation, the overall goal was achieved although it was not possible to confirm the manifestation of other impacts, such as the number and duration of power outages in Dar es Salaam City. Therefore, effectiveness and impacts are high. Each output was mostly achieved by the time the project was completed. Regarding inputs, the project cost on the Japanese side greatly exceeded the plan, and the project period also exceeded the plan. However, the additional outputs, such as the establishment of a model (Output 4) and the standardisation of work procedures (Output 5), which were not initially anticipated, were achieved. Therefore, efficiency is evaluated to be moderately low rather than low. Although slight issues have been observed in the institutional/organisational aspects for sustaining the project effects, there are good prospects for improvement and resolution. Therefore, project sustainability is high. In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

It is desirable to strengthen the internal information management system of TANESCO so that data and information, including the results of monitoring within TANESCO, can be shared and appropriately managed at different levels among Region Offices, Zone Offices and Headquarters.

4.2.2 Recommendations to JICA

It is desired that JICA Tanzania Office watch the progress of the Phase 2 project regarding the strengthening of the information management system within TANESCO, and provide support if necessary.

4.3 Lessons Learned

The importance of establishing a data and information management system including the monitoring results

In this ex-post evaluation study, there was difficulty in collecting data from the implementing agency, and it is possible that the data management and sharing system within the implementing agency is not functioning sufficiently. The Terminal Evaluation (Part 2) Report also pointed out the need to strengthen

the data management system for maintenance work, but significant improvements were not seen in this regard after the project's completion.

As in this project, when the horizontal connection of the project spreads across the country and all vertical levels of the implementing agency are involved—from headquarters to intermediate sections such as Zone Offices and field organisations such as Region Offices—it is important for continued effects that information including monitoring results is shared in timely manner with the intermediate sections that provide on-site support as well as the headquarters that makes decisions on overall policies. For this reason, it is essential to sufficiently investigate at the planning stage the counterpart organization's status not only of the maintenance skills of power facilities, but also of the management and sharing status of information, including monitoring capacity and monitoring results. When necessary, a component should be included to strengthen the data and information management system in the plan and deal with it during the implementation stage.

5. Non-Score Criteria

5.1. Performance

5.1.1 Objective Perspective

At the time of planning, it was suggested that the engineers (KAUDA team) trained in past JICA projects in Tanzania should be effectively utilised. A KAUDA team was dispatched to each Region Office to maintain and manage the MT feeder lines in Dar es Salaam. They still support the maintenance work, and these engineers are actually utilised.

During the implementation stage, the Japanese expert team set the motto of this project as “working together, learning together, and growing together as one team,” and enthusiastically engaged with their counterparts and sincerely engaged in project activities. As a result, a close cooperative relationship was established between the core counterparts and the Japanese experts³⁷.

³⁷Terminal Evaluation (1st) Report (p18), Interview with Japanese Expert

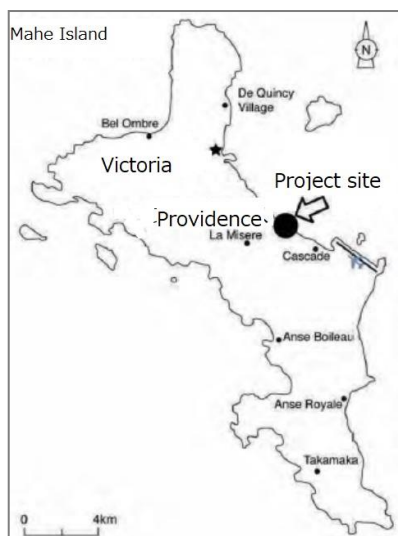
FY2021 Simplified Ex-Post Evaluation Report of Japanese Grant Aid Project

External Evaluator: Maki Hamaoka, Foundation for Advanced Studies on International Development

Duration of the Study: September 2021 - November 2022

Duration of the Field Study: February 15, 2022 - February 28, 2022 and April 30, 2022 - May 7, 2022

Country Name	<Project Name> The Project for Construction of Artisanal Fisheries Facilities in Mahé Island (Phase 2)
Seychelles	



Location of the project site (source: Ministry of Foreign Affairs website¹)

Ice plant constructed by the project (source: field survey)

I. Project Outline

Background	At the time of planning, fisheries were one of the major industries in Seychelles and annual fishery catches were increasing year by year. Under “The Project for Construction of Artisanal Fisheries Facilities in Mahé Island (Phase 1, 2008-2010),” fishing facilities were built in Providence and Bel Ombre to accommodate the increased fishery catches in Victoria Fishing Port and to disperse the concentration of landings. As a result of many sea cucumber fishing vessels moving their bases from Victoria Fishing Port to Providence Fishing Port, the number of fishing vessels using Providence Fishing Port increased, affecting small-scale fishermen’s activities. Victoria Fishing Port had no room for expansion, and rapid development and expansion of other fishing ports in the country was necessary.			
Objectives of the Project	To secure mooring space for the increasing number of fishing vessels and efficient operation of fishing ports and to ensure the quality of marine products by expanding the fishing port and improving fishery facilities at Providence Fishing Port, thereby contributing to the development of the Seychelles fishery industry, including fish processing.			
Contents of the Project	<p>1. Project Site: Providence in Mahé Island</p> <p>2. Japanese Side: (1) Civil facilities: quay No. 1 (96.23 m), quay No. 2 (116 m), access roads, U-turn paving mooring buoys (2) Facilities and equipment: ice plant (ice making machine, ice storage), landing shed,² water supply system, power supply system, lamppost, water drainage system, access road (3) Consulting services/soft component: detailed design, construction management, soft components for operation and maintenance of ice plant</p> <p>3. Seychelles Side: (1) Conducting the Environmental Impact Assessment (EIA) and obtaining the environmental authorizations; (2) Banking Agreements (B/A) and issue of Authorization to Pay (A/P); (3) Application for acquirement of permits and approvals necessary for construction, buildings, and works under the project; (4) Removing obstacles in the construction site and site clearance; (5) Providing facilities for the performance of work; (6) Installing a fence around the ice plant</p>			
Implementation Schedule	E/N Date	March 22, 2016	Completion Date	July 9, 2018 (Handover)
	G/A Date	March 22, 2016		
Project Cost	E/N Grant Limit / G/A Grant Limit: 1,460 million yen, Actual Grant Amount: 1,347 million yen			
Executing Agency	Seychelles Fishing Authority (SFA)			
Contracted Agencies	Main Contractor(s): Penta Ocean Construction Co., Ltd.			
	Main Consultant(s): Joint venture between OAFIC Co., Ltd. and ECOH Corporation			

¹ <https://www.mofa.go.jp/mofaj/area/seychelles/index.html>

² Shaded area for landing fish

II. Result of the Evaluation

Summary

This project was implemented to secure mooring space for the increasing number of fishing vessels, ensure efficient operation of fishing ports, and ensure quality of marine products by expanding the fishing port and improving fishery facilities at Providence Fishing Port, thereby contributing to the development of the Seychelles fisheries industry, including fish processing.

The objectives of this project were in line with the Seychelles' development plans and development needs, and the project was formulated with consideration for small-scale fishermen. In addition, in line with Japan's development cooperation policy, mutual linkage with JICA's assistance in the fisheries sector and collaboration with other donors were sought. Therefore, relevance and consistency are high. Although the number of fishing vessels using Providence Fishing Port is higher than expected and the congestion rate has not been alleviated to the level expected at the time of planning, the congestion at the fishing port has improved since before the project's implementation. In addition, the ice-making capacity has been greatly improved, and the freshness of landed fish is maintained in better condition than before. The project's objective of "securing mooring space for the increasing number of fishing vessels, efficient operation of fishing ports, and ensuring quality of marine products" was achieved through this project's implementation. Regarding the project's expected impact on the development of the fishing industry in Seychelles, an increase in the fish catch at Providence fishing port was confirmed after the project's completion, and it can be said that the project, which improved the fishing port's ice-making capacity and usability, contributed to the development of the fishing industry in Seychelles to a certain extent. The project's implementation has mostly produced the planned effects. Therefore, the effectiveness and impacts of the project are high. The project cost and project period remained within the plan's parameters, and the outputs were mostly achieved as planned. Therefore, the project's efficiency is very high. No issues have been observed in the policy and system or institutional/organizational, technical, financial, environmental, or social aspects, including the operation and maintenance system's current status. (Future) Risks have been well mitigated. Therefore, the sustainability of the project effect is very high.

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

Overall Rating³	A (Highly satisfactory)	Relevance & Coherence	③ ⁴	Effectiveness & Impacts	③	Efficiency	④	Sustainability	④
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<Special Perspectives Considered in the Ex-Post Evaluation/Constraints of the Ex-post Evaluation>

Interviews with fishermen were planned to be conducted with fishermen with whom it would be possible to make comparisons before and after the project's implementation. However, the selection of interviewees was difficult due to the inability to contact the fishermen who had been operating before the project's implementation and to obtain their consent to cooperate in the interviews. In Providence Fishing Port, two of the nine fishermen who agreed to cooperate in the interviews started fishing after the project's completion, so questions regarding pre- and post-project implementation comparisons were excluded. In Victoria Fishing Port, fishermen interviewed during the preparatory survey and fishermen who were in the fishing port during the field survey were asked to cooperate in the interviews, but only 3 vessels agreed to do so.

1 Relevance/Coherence

<Relevance>

- Consistency with the Development Policy of Seychelles at the Time of Ex-Ante Evaluation

Strategy 2017 (2007-2017) identified tourism and fisheries, the two pillars of the economy, as future focus areas to double GDP, with the goal of Seychelles becoming a major seafood processing center in the Indian Ocean. "*The Fisheries Policy (2005)*," a sectoral plan, focused on promoting sustainable fishery development through the development of new fishing ports and the improvement of infrastructure in existing fishing ports. Therefore, the project's objective was consistent with Seychelles' development policy.

- Consistency with the Development Needs of Seychelles at the Time of Ex-Ante Evaluation

As of 2016, annual fishery catches in Seychelles amounted to about 270,000 tons, of which catches from small-scale fisheries accounted for 4,135 tons. Catches by artisanal fisheries are mainly landed at Victoria Port on Mahé Island, and these catches were increasing annually. This increase led to congestion inside Victoria Fishing Port, lost catches due to a decline in landing efficiency, a decrease in moored vessels' safety, and problems such as declining freshness owing to catches exceeding refrigeration facilities' capacity. The rapid development and expansion of other fishing ports in the country was required, and the expansion of Providence Fishing Port, which was the second largest fishing port in the country, was consistent with the Seychelles fishery sector's needs.

In addition, whereas Victoria Fishing Port, the largest fishing port in the country, is mainly used by large fishing vessels, Providence Fishing Port is mainly used by small-scale fishermen. In this regard, it can be said that the project was formed in consideration of socially vulnerable groups, assuming the effects of the project, such as "making it easier for small-scale fishermen to use quay and port facilities," "making it easier to refuel small fishing boats and replenish water and ice," "making it easier to obtain ice necessary for long fishing trips," "eliminating the need to maintain fishing gear and nets under the hot sun by installing landing shed," and "enabling fresh fish to be shipped to local markets and improving profits for small-scale fishermen."

<Coherence>

- Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation

This project fully aligned with Japan's aid policy for Seychelles. Japan's ODA policy for Seychelles included the fishery sector as a priority area for development cooperation with Seychelles, and its policy was to provide assistance in the fishery sector, including the utilization of

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

⁴ ④: Very High ③: High, ②: Moderately low, ①: Low

fishery resources and port development to diversify the Seychelles economy and strengthen bilateral relations in the fishery sector.⁵

- Internal Coherence

The project utilized lessons learned from Phase 1. In Phase 1, delays in obtaining permission to use land the Ministry of Land Use and Housing owned led to significant project delays. The ex-post evaluation of Phase 1 led to the lesson that the project should be implemented on land with prior permission for land use or on land the implementing agency owned. This project was planned to use land which SFA owned. In this way, the project had a certain degree of interconnection with JICA's support for other projects in terms of utilizing the lessons learned from the previous phase.

- External Coherence

Regarding consistency in support that development cooperation agencies other than Japan provided, it was confirmed that this project and the support the Fisheries Partnership Agreement (FPA) provided between the EU and the Seychelles government are mutually complementary. The Seychelles government signed the FPA with the EU in 2013 to construct fish processing facilities in Providence Fishing Port, which had been built in the previous phase of Japanese grant aid. Because these facilities were only buildings and did not include equipment such as ice making machines, there was no overlap between EU support and this project. Rather, the facility expanded and improved in this project and the EU-supported fish processing facilities complement each other and therefore effectively utilize the facilities each organization supports. Furthermore, the Seychelles government and the EU signed a new six-year Sustainable Fisheries Partnership Agreement (SFPA) in February 2020, which provides for fishing opportunities for EU-flagged vessels, financial compensation from the EU, and support for Seychelles' fishery sector.

To meet the increasing demand for ice, the SFA installed one ice plant at Providence Fishing Port in 2020 with SFPA funds. This was not planned at the time of planning, but as stated in "Effectiveness", Providence Fishing Port users' improved satisfaction with ice sales is a synergistic effect of the project and EU support.

<Evaluation Result>

The objective of this project was consistent with Seychelles' development plan and development needs, and the project was formed with consideration for small-scale fishermen. In addition, the objective of the project was consistent with Japan's development cooperation policy and the project has internal coherence in that it was mutually linked with JICA's assistance in the fisheries sector, and external coherence in that it was linked with assistance from other donors. In light of the above, the relevance and coherence of the project are high.⁶

2 Effectiveness/Impacts⁷

<Effectiveness>

<Quantitative Effects>

The objective of this project, "to secure mooring space for the increasing number of fishing vessels, efficient operation of fishing ports, and ensure quality of marine products," was mostly achieved.

The first indicator, "reduction of congestion rate," showed a certain level of improvement compared to before the project's implementation although it did not reach the planned value because the number of fishing vessels using Providence Fishing Port was higher than assumed at the time of planning.

For the second indicator, fish-catch-landing volume (tons/year), data for three years after the project was not available⁸, so we compared data for 2020, two years after the project, to the target. The actual result in 2020 was 495 tons compared to the target of 292 tons, which is a high level of achievement (170%) because the tuna industry has been booming since 2015 and the number of longline fishing vessels⁹ using Providence Fishing Port has been increasing.

The third indicator, "ice sales at the fishing port," indicates the amount of ice sold from ice plants procured in Phase 1 and this project. The actual results far exceeded the target value, so the achievement level is very high. According to the SFA's explanation, the plate ice the plants produced, procured through JICA projects, is thick and lasts longer, and the number of fishing vessels coming to Providence Fishing Port to purchase ice is increasing every year. The ice machines operate 24 hours a day, 7 days a week, but the supply of ice from the ice machines procured in Phase 1 (2 ice machines, 5 tons/day for each) and the ice machines procured in this project (2 ice machines, 5 tons/day for each) cannot keep up with the ever-increasing demand. As stated in External Coherence, the SFA added one ice plant at Providence Fishing Port in 2020 to increase ice-making capacity and meet the increasing demand for ice.

⁵ Japan's ODA data by country (2015)

⁶ Relevance: ③, Coherence: ③

⁷ When providing the sub-rating, Effectiveness and Impacts are to be considered together.

⁸ The SFA is stepping up the procedures and means with regards to the collection of data as to ensure that all required data are captured. The fish-catch landing is being collected by another department (Fisheries Statistics and Economics) and this department is working on addressing the data for ports managed by SFA to be more readily available via a new data management system which is being worked on and to be implemented in 2023.

⁹ A longline is a fishing method in which multiple ropes with baited hooks are connected at regular intervals. The depth at which the ropes are set depends on the species of fish, and they are set in the middle or bottom layer. (source: <https://www.msc.org/jp/what-we-are-doing/our-approach-JP/fishing-methods-JP/longlines>)

Quantitative Effects

Indicator	Baseline 2015 Baseline Year	Target 2021 3 Year(s) after Completion	Actual 2018 Completion Year	Actual 2019 1 Year after Completion	Actual 2020 2 Years after Completion	Actual 2021 3 Years after Completion
Indicator 1 Quay congestion rate (%)	191 ^{Note1}	100 ^{Note2}	n.a.	95 ^{Note3}	n.a.	141 ^{Note4}
Indicator 2 Fish-catch-landing volume (tons/year)	150	292	237	338	495	n.a.
Indicator 3 Ice sold at the fishing port (tons/month)	125	375	509	524	524	524

Source: Prepared by the evaluator based on the preparatory survey report (2015), documents provided by JICA and the SFA

Note 1: The baseline value is the number of active fishing vessels (23), calculated based on the mooring survey and baseline survey during the preparatory survey in 2015, and divided by the number of vessels in the quay design (12).

Note 2: The target value is the number of vessels in port (moorings)/planned moorings in 2021 (39). The number of vessels in port is the sum of 23 active vessels in 2015, 11 vessels that were expected to move from Victoria Fishing Port, and 5 vessels that fish processing companies purchased.

Note 3: The actual number of vessels after one year of completion is the number of moored fishing vessels at the time of the final inspection in July 2019 divided by the number of vessels planned to be moored.

Note 4: The evaluator calculated the congestion ratio by dividing the actual results three years after the project’s completion by the planned number of moored vessels. The actual value was the average (55 vessels) of three measurements, taken on February 15, 2022 (54 vessels), May 3, 2022 (56 vessels), and May 4, 2022 (55 vessels).

<Qualitative Effects>

The evaluator verified the effects assumed at the time of the planning of the project “mooring space for fishing vessels is secured at Providence Fishing Port, and efficient fishing port operations and quality assurance of marine products were promoted” as follows: (a) improvement of work efficiency in the fishing port through guidance and management of the use of fishing port facilities (changes in time for berthing at the landing shed, landing time, preparation time, and waiting time before berthing), (b) improvement of safety for vessels and fishermen by optimizing the rate of quay congestion at Providence/Victoria Fishing Port, and (c) provision of appropriate amount of ice to fishermen through operation and maintenance of ice plants and improvement of the system (recognition of fishermen for the provision of ice).

(a) Improvement of work efficiency

As previously stated, the improvement in work efficiency is limited because the congestion rate has not eased to the expected level. At Providence Fishing Port, three of the seven vessels interviewed indicated that the time to berth at the landing site before and after the project implementation decreased, two indicated that it increased, and two did not know; at Victoria Fishing Port, two indicated no change and one indicated that it increased. Regarding time for going fishing, three of the seven vessels in Providence Fishing Port reported a decrease after the project completion, three reported no change, one reported that it depended on the number of vessels in port and the time required to get ice, and for Victoria Fishing Port, one of the three vessels reported no change, one reported an increase, and one reported that it depended on the situation. Although congestion at the fishing port has eased compared to before the project implementation, it has not reached the level expected before the project’s implementation, and the interview results indicate that work efficiency has not improved as much as expected. One of the main reasons the congestion rate has not improved is that approximately 40% of the moored fishing vessels are non-operational.¹⁰ Most of the inactive fishing vessels have ceased operations due to engine failure. Because Providence Fishing Port has no place where the vessels can be salvaged and repaired¹¹, they remain moored in the port. Currently, the SFA has no legal authority to move these inactive vessels, but this situation is expected to improve, as the SFA will be able to move inactive vessels forcibly once the “Providence Fishing Port Management Plan”¹² is officially implemented in December 2022.

In addition, although there is a bit congestion due to unloading of sea cucumber catches when it is seasonal in the landing sheds, with proper coordination among the Pier Masters and boat owners in the Providence Fishing Port, the port runs smoothly and there is less congestion than before.

(b) Improvement of safety for vessels and fishermen by optimizing the rate of quay congestion at Providence/Victoria Fishing Port

According to the SFA, no collisions were reported before or after the project’s implementation in the Victoria or Providence fishing ports.¹³ In Providence Port, 32 CCTV cameras were installed in 2021 to monitor collisions and attempted collisions in the port and the waters near the port. In addition, as part of the Providence Fishing Port Management Plan, a port safety plan is partially in effect, and the SFA is working to ensure safety in the fishing port. For example, all fishing vessels are required to notify the pier master (the person responsible for coordinating port operations and shore use) 12 hours before entering the port. Through these controls, efforts are made to secure berths and moorings and avoid congestion in the port. Currently, as stated above, the SFA does not have the legal authority to move inactive fishing

¹⁰ At the time of the field survey on May 3, 2022, 20 of the 56 moored fishing vessels were inactive. Five of these vessels were Indian-flagged vessels that had been illegally capturing dolphins, and the remaining 15 had been inactive for over a year. The number of moored vessels minus the inactive vessels is 39, which is the planned number.

¹¹ The SFA is working to reduce congestion in the port, with small internal rules in place for fisherman compliance, such as the need to formally submit a letter to the SFA to request repair work in advance.

¹² SFA submitted the final draft in 2017. It is currently being revised and will enter into force in December 2022. A standard operation procedure (SOP) has been developed and partially implemented for users of the fishing port regarding security, control, and mooring associated with the plan. Under the plan, the fishing’s operation port will be outsourced to a private organization and the SFA will be the management body/facilitator that will facilitate communication and consultation on management and improvements. SFA will organize consultative meetings with the boat owners prior to fully implement the Port Management Plan by December 2022.

¹³ Source: Answers to the questionnaire from SFA

vessels, but users appreciate this recent improvement in safety at Providence Fishing Port. Their appreciation is one of the reasons the number of users of Providence Fishing Port is increasing.

(c) Provision of appropriate amount of ice to fishermen through operation and maintenance of ice plants and improvement of the system (recognition of fishermen for the provision of ice)

After the project's completion, fishermen using Providence Fishing Port are more able to obtain the necessary amount of ice in a timely manner than before the project's implementation, and fishermen's satisfaction with ice supply is generally high.¹⁴ Five of the seven vessels¹⁵ that responded to the interviews indicated that the amount of ice available before the project was not sufficient, and three of the three vessels in Victoria Fishing Port indicated that it was not sufficient. After the project's completion, three of the nine vessels interviewed at Providence Fishing Port stated that they had enough, and four stated that they had some whereas at Victoria Fishing Port, two of the three vessels stated that they did not have enough and one stated that they had some. The results of the interviews with fishermen indicate that Providence Fishing Port has been able to provide an adequate amount of ice to fishermen since the project's completion. In fact, the sufficiency of available ice is also reflected in fishermen's satisfaction with ice sales. At Providence Fishing Port, seven of the nine vessels interviewed were "very satisfied," one was "satisfied," one was undecided, and one was dissatisfied. At Victoria Fishing Port, two of the three vessels interviewed were undecided, and one was dissatisfied. In Providence Fishing Port, the majority of those interviewed were satisfied with the current ice supply. At Providence Fishing Port, in addition to obtaining the right amount of ice in a timely manner, the installation of landing sheds has enabled fishermen to sell fish to fish processing companies and mongers while maintaining the marine products' freshness, thereby increasing sales of seafood products.

In light of the above, regarding the project's effectiveness, although the improvement of congestion at Providence Fishing Port has not reached the planned level, improvement has occurred from the time of planning, and further improvement is expected when the Providence Fishing Port Management Plan is officially implemented in December 2022. In addition, ice-making capacity has improved significantly, ensuring the freshness of landed fish. Therefore, the objective of "securing mooring places for the increasing number of fishing vessels, efficient fishing port operations, and ensuring the quality of marine products" has been achieved.

<Impacts>

<Impact Status>

The project's impact, which was assumed at the time of planning, is "development of the Seychelles fisheries industry, including fish processing." Due to the gap between the project's implementation and the expected effect to link the project targeting Providence Fishing Port and the development of the entire fishery industry in Seychelles in a causal relationship, the ex-post evaluation focused on the changes in fishery catches and processing by the fishermen at Providence Fishing Port to verify the impact. It was confirmed that the fishery catches at the small-scale fishery in Victoria Fishing Port has been decreasing whereas the catch in Providence Fishing Port has continued to increase because vessels moved from Victoria Fishing Port to Providence Fishing Port, as was assumed at the time of planning, but it is also likely that the expansion of fishing facilities due to this project and the opening of fish processing facilities in the Providence area have led to an increase in catch at Providence Fishing Port.

Annual Catch at Small-scale Fisheries in Seychelles

Unit: MT

	2015	2016	2017	2018	2019	2020
Mahé Island	2,706	2,005	3,777	3,667	3,873	3,020
Victoria Fishing Port ^{Note}	1,095	598	969	813	914	549
(Percentage of total Seychelles catch)			22%	19%	21%	16%
Providence Fishing Port			125	237	338	495
(Percentage of total Seychelles catch)			3%	6%	8%	14%
Total of Seychelles	3,214	2,516	4,356	4,187	4,411	3,460

Source: Documents provided by the SFA

Note: Prior to 2016, SFA statistics included the Providence Port catch in the Victoria Port catch.

In the interviews with fishermen about their fishing income before and after the project's implementation, four of the nine vessels at Providence Fishing Port indicated an increase, four indicated a decrease, and one indicated no change. Two of the four vessels attributed the increase in fishing income to an increase in fish-catch-landing volume, and two vessels attributed it to an increase in their catch's wholesale price. The four vessels that experienced a decrease cited lower profits due to increasing commodity prices and fuel costs, even though the wholesale price of fish was almost the same as before. Three of the four vessels with increased fishing income were semi-industrial longline vessels (average length 14-23 m), which are classified as medium-sized vessels, one was a lavenir boat (average length 7-11 m), which is classified as a small-scale vessel, and two of the four vessels with decreased income were of the semi-industrial type. Therefore, it can be said that there is no difference in fishing income before and after the project's implementation depending on the type of fishing vessel. In Providence Fishing Port, the number of fishermen who reported an increase in fishing income and of those who reported a decrease were equal, and as already noted in the evaluation constraints, due to the small number of interviews, it is not possible to conclude that fishing income increased for fishers as a whole. However, certain impacts were identified, such as improved ice supply leading to increased catches at Providence Fishing Port and the installation of landing sheds leading to maintained freshness of landed fishes. Some fishermen have used profits from increased fishing income to purchase food and expand their fishing activities.¹⁶

¹⁴ Source: Interviews with boat owners, answers to the questionnaire from SFA

¹⁵ Interview results from two of the nine boats/vessels interviewed were not applicable because they began using the Providence Fishing Port after the project's completion.

¹⁶ Source: Interviews with 4 boat owners (three longline vessels and one lavenir boat in Providence Fishing Port)

<Other Positive and Negative Impacts>

The EIA study for the project was conducted in accordance with the Seychelles' Environment Protection (Impact Assessment) Regulations, 1996. The SFA prepared the EIA report, and the Ministry of Environment, Energy, and Climate Change received it in July 2016 and subsequently approved it.¹⁷ Conditions such as a strict ban on stockpiling within 15 meters of the sea, provision and maintenance of roadside drains and culverts, and no direct discharge of wastewater into the sea were fulfilled.¹⁸

As shown below, no negative impacts were identified regarding the natural environmental aspects.

Water Quality: In response to the expected water pollution in the surrounding area due to the construction of the quays, the construction equipment that minimizes water pollution was used as planned and anti-pollution membranes were installed. There is no inflow of cooling wastewater from the ice making machines into the port or of domestic wastewater from the port into the sea. The SFA and the contractor regularly tested water quality during construction, and the SFA did so after the project's completion, and they confirmed that there were no water quality problems.

Soil: During construction, the contractor performed adequate maintenance of heavy equipment to prevent soil contamination due to oil leakage from heavy equipment on site.¹⁹

In terms of environmental and social impacts (land acquisition and resettlement), there were no negative impacts because the project was an expansion of an existing fishing port on land the executing agency owned and did not involve land acquisition or resettlement.²⁰ (Name of applicable guideline: JICA Guidelines for Environmental and Social Considerations (2010), Environmental Category: B)

No other positive or negative impacts were generated that we did not anticipate at the time of planning.

<Evaluation Result>

Regarding the project's effectiveness, the congestion rate has not reached the level expected at the time of planning because more fishing vessels used Providence Fishing Port than expected at the time of planning, but the freshness of landed fish has been maintained in better condition than before due to the improved ice-making capacity. Overall, the project's objectives of "securing mooring sites for the increasing number of fishing vessels, efficient operation of the fishing port, and ensuring the quality of fishery products" were achieved through the project's implementation. In addition, the project's expected impact on the development of the fishing industry in Seychelles was achieved to a certain extent, as the increase in catch after the completion of the Providence Fishing Port project was confirmed, and the project seems to have contributed to its development to a certain extent. Therefore, the effectiveness and impacts of the project are high.

3 Efficiency

Both the project cost and project period were within the plan (compared to the plan: 92% and 96%, respectively). The outputs were completed as planned except for the installation of the fence around the ice plant, which was one of the Seychelles' obligations and was completed one year after the project's completion due to the time required to measure the fence's perimeter. As a result of the above, the project's inputs (cost and period) were efficient in relation to the outputs, and the efficiency of the project is very high.

4 Sustainability

• Policy and System

Vision 2033 (2019) identifies six pillars: (i) good governance, (ii) people at the center of development, (iii) social cohesion, (iv) innovative economy, (v) economic transformation, and (vi) environmental sustainability & resilience.²¹ In the National Development Strategy 2019-2023, which is linked to Vision 2033, fisheries are included as one of the areas of focus in (4) innovative economy among the above six pillars.

The sector plan, *the Fisheries Policy (2019)*, aims to provide effective, efficient, transparent, and accountable service delivery through a participatory approach to ensure long-term sustainable fisheries and aquaculture management and conservation so that the sector continues to play a key role in the country's sustainable development and the Seychelles nation's socioeconomic well-being.²² The policy points out that inadequate infrastructure support — including markets, ice making plants, repair and landing areas, and aging fishing vessels — are the main hindrances to business growth, better fisheries practices, value chain development, and fish products. In response to this challenge, one of the implemented policies is "infrastructure support and value chain development," which states that the government will facilitate the development of onshore infrastructure connecting fishers, businesses, and markets with those that support value-adding and product development to increase in-country processing, improve net gain in the sector, capture more landings of the catch taken within national waters, and increase exports consistent with international standards.²³

In light of the above, sustainability in terms of policy and system necessary for ensuring project effects is ensured.

• Institutional/Organizational Aspect

SFA's Fishing Port Operations and Management Department handles the operation and maintenance of Providence Fishing Port. Currently, Providence Fishing Port is operated and maintained by 19 people: one port manager, one pier master, two fuel attendants, three ice plant operators, two ice plant technicians, seven contracted security guards²⁴, one cleaner, and two handy men. At the time of the first field survey in February 2022, salesclerks with no proper knowledge and expertise doubled as ice plant operators. The SFA subsequently hired three operators with technical knowledge in April 2022. When new ice plant operators are assigned, they receive technical training on ice plant operation and safety aspects from representatives of a private maintenance company the SFA has contracted who was maintenance advisor and was trained by a Japanese technician in the soft component for ice plant operation and maintenance has during the project's implementation. In addition, the port manager previously served as port manager for several ports, but in March 2022, a dedicated fishing

¹⁷ Source: Documents the consultant provided

¹⁸ Source: Documents the consultant provided

¹⁹ Source: Answers to the questionnaire from SFA

²⁰ Source: Preparatory survey report and answers to the questionnaire from the consultant

²¹ Source: *Vision 2033 (2019)*

²² Source: *The Fisheries Policy (2019)*

²³ Source: *The Fisheries Policy (2019)*

²⁴ This will phase out gradually with SFA introducing its own internal employed security officers for accountability, transparency and control.

port manager was assigned to Providence Fishing Port.

In light of the above, the SFA has the necessary organization and structure in place to sustain the project effects.

• Technical Aspect

Fishing port facilities (quays, roads, etc.) are visually inspected. No specific problems were observed during the field survey. Daily maintenance, such as securing the path between the ice storage and the compressor in the event of water retention as well as draining the front of the ice storage, is being properly implemented.

The ice plants are operated and maintained according to the basic rules stipulated in the operation and maintenance guidance for the ice plants prepared through the soft component. Daily ice plant operation is properly recorded in operation logbooks as explained to the SFA technicians during the soft component's implementation.²⁵ In addition, maintenance and inspections of the ice plants are conducted monthly, semi-annually, or annually, depending on the nature of the inspections, through a contract between the SFA and a private maintenance company. Based on the above, the SFA has the technical capabilities necessary for the operation and maintenance of the facilities developed by the project, and the technical sustainability is high.

• Financial Aspect

The SFA became a financially autonomous parastatal organization in January 2019. The SFA has maintained a surplus from the time of planning to the time of the ex-post evaluation although the SFA has not received any budget from the government since then. Providence Fishing Port also remained profitable from the time of planning to the ex-post evaluation. In particular, revenue from ice sales has increased more than 10-fold since the project's completion. SFA is selling ice in 3 bags dimensions: 15 kg, 25 kg and 50 kg, and the price of ice sold for fishing boats has been maintained at 0.6 SCR per kg. This is due to the government policy to maintain the unit price of ice sales as a measure to support small-scale fishermen in order to ensure food safety, since the price of ice affects the purchase and price of fresh fish. Although revenues from ice sales are sufficient for the operation of ice plants, there is a new effort to conduct some more analyses and to try and advise the government to revise this rate to ensure SFA's operational expenses.

In addition, as stated in "External Coherence," the Seychelles government signed a six-year SFPA with the EU in February 2020, which includes financial support for the Seychelles fishery sector; for the six years from 2020 to 2026, the EU will contribute €5.3 million annually, of which €2.8 million is to be used to support Seychelles' fishery policy. With financial support from SFPA, one ice machine was installed at Providence Fishing Port in 2020. In addition, to alleviate congestion at Providence Fishing Port, a fishing port consisting of a mooring area, ice plant, and gear warehouse was constructed in the northern part of Mahé Island, and a fishing port consisting of an ice plant, landing shed, and gear house is under construction 8 km south of Providence Fishing Port, scheduled to open in December 2022. In addition, ice plants have been installed at several other ports, including Victoria Fishing Port. Therefore, it was confirmed that the finances for infrastructure development are secured.

In light of the above, the financial resources of the SFA necessary to sustain the project effects have been secured, and the financial sustainability is high.

Profit and Loss Sheet for the SFA

Unit: Thousand SCR

Year	2015	2016	2017	2018	2019	2020	2021
(1) Revenues							
(a) Government fund	100,857	124,359	142,488	152,525			
(b) Other revenues	217,540	234,360	125,302	170,619	226,464	266,822	312,371
Total revenues	318,397	358,719	267,791	323,144	226,464	266,822	312,371
(2) Expenses							
(a) Personnel expenses	17,962	21,724	20,721	26,305	45,445	61,712	71,126
(b) Office expenses	6,021	14,879	16,416	16,430	12,191	22,519	24,561
(c) Maintenance expenses	45,259	53,201	74,417	71,071	50,525	69,849	74,106
(d) Travel expenses	1,170	1,467	148	520	3,783	439	948
(e) Research expenses	9,402	8,001	12,558	18,056	17,236	15,717	5,908
(f) Other expenses	21,043	25,086	18,228	20,144	7,233	13,027	14,861
Total expenses	100,857	124,359	142,488	152,525	136,413	183,263	191,510
Net balance (1)-(2)	217,540	234,360	125,302	170,619	90,051	83,559	120,861

Source: Documents provided by the SFA

²⁵ Source: Answers to the questionnaire from SFA and direct observation during field survey

Profit and Loss Sheet for Providence Fishing Port

Unit: Thousand SCR

	2015	2016	2017	2018	2019	2020	2021
Expenditure							
Personal cost	192,000	192,000	192,000	192,000	192,000	192,000	288,000
Electricity	2,852,036	2,751,130	2,802,066	2,711,729	2,817,531	2,842,037	2,813,988
Water	346,392	321,481	340,652	313,771	343,094	316,877	310,493
Maintenance cost for facilities	102,000	102,000	102,000	102,000	102,000	102,000	102,000
Total Expenditure	3,492,428	3,366,611	3,436,718	3,319,500	3,454,625	3,452,914	3,514,481
Income							
Sales of ice	366,000	366,400	366,900	3,662,340	3,775,596	3,775,704	3,774,600
Rental fee for Fishermen's gear storage	201,600	201,600	201,600	201,600	201,600	201,600	201,600
Electric supply for Refrigerated container	259,200	259,200	259,200	259,200	259,200	259,200	259,200
Drinking water	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Total income	851,800	852,200	852,700	4,148,140	4,261,396	4,261,504	4,260,400
Balance	-2,640,628	-2,514,411	-2,584,018	828,640	806,771	808,590	745,919

Source: Documents provided by the SFA

• Environmental and Social Aspect

Water quality monitoring, the subject of environmental monitoring on the Seychelles side after the project's completion, has been regularly conducted; as of September 2021, the Seychelles Bureau of Standard had found no particular water quality problems. Because domestic wastewater is treated at a sewage treatment plant, there was no inflow into the sea from the time of the preparatory survey, and little impact on the environment, such as water and soil pollution, was expected. In this regard, no impact on water quality is expected in the future.²⁶

• Preventative Measures to Risk

At the time of planning, no risks related to the facility's operation after the project's completion were assumed. Also, no new risks were assumed at the time of the ex-post evaluation.

• Current Status of Operation and Maintenance

The facilities and equipment procured under the project have been consistently well maintained since the project's completion. No problems have arisen in obtaining spare parts or dealing with facility breakdowns. During the second field survey, the evaluator visited other fishing ports that were constructed through Japanese grant aid in the past and found that the ice plants that were procured a long time ago are still in use,²⁷ so good maintenance of the facilities and equipment procured under the project can also be expected in the future. At the time of the final inspection, it was confirmed that the water pressure in the two water supply facilities installed under the project was low. The SFA increased pressure through the Public Utilities Corporation (PUC), the agency in charge of water supply. During the second field survey, the water supply facilities were checked and found to have been improved to a level that would not interfere with use. SFA is working on other options to control their own water supply at Providence Fishing Port: SFA plans to install two 10,000 liter water storage tanks at Providence Fishing Port and use pumps to speed up the water supply and pressure to the fishing boats, which will be completed in 2022.

<Evaluation Result>

No issues have been observed in the policy and system or institutional/organizational, technical, financial, environmental, or social aspects, including the operation and maintenance systems' current status. (Future) Risks have been well mitigated. Therefore, the sustainability of the project effects is very high.

III. Recommendations & Lessons Learned

• Recommendations to Executing Agency

Improvement of Congestion at Providence Fishing Port

The SFA needs to take strict measures to reduce congestion in Providence Fishing Port by implementing the Providence Fishing Port Management Plan as planned. In particular, the SFA should take strict measures such as moving inactive fishing vessels that are obstructing the smooth navigation of fishing vessels in the fishing port to other locations instead of leaving them inactive.

It is also desirable to ensure that zoning is implemented according to the size and mode of operation of the vessels that are to be covered by the Providence Fishing Port Management Plan that separates mooring areas in the future to improve operational stability and work efficiency.

• Recommendations to JICA

None

• Lessons Learned

None

²⁶ Source: Preparatory Survey Report, answers to SFA's questionnaire and direct observation during the field survey

²⁷ Facilities such as ice plants constructed in Anse à la Mouche Fishing Port procured under "The Coastal Fisheries Development Project" (1994) and in Bel Ombre Fishing Port under "The Project for Construction of Artisanal Fisheries Facilities in Mahé Island" (2008).

IV. Non-Score Criteria

- Performance
- Objective Perspective

Although JICA has no office in Seychelles and has limited opportunities to monitor directly the status of the facilities that have been constructed, the JICA Kenya office regularly confirms with the SFA via email the problems identified during the final inspection, such as insufficient flow and pressure in the public water supply system in Providence Fishing Port and the status of the fishing port utilization. In March 2022, the national staff of the JICA Kenya office visited Providence and Victoria Fishing Ports to confirm the current status.

- Additionality
None



Fishermen taking ice from an ice storage
(source: field survey)



Fishermen landing their catch in the landing shed
(source: field survey)