

Ex-Post Project Evaluation 2013 :
Package I - 4
(Tanzania, Mozambique, Burundi)

September 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

JAPAN ECONOMIC RESEARCH INSTITUTE INC.
ERNST & YOUNG SUSTAINABILITY CO., LTD.

EV
JR
14-13

Preface

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

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

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

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

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

Disclaimer

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

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

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

No part of this report may be copied or reprinted without the consent of JICA.

United Republic of Tanzania

Ex-Post Evaluation of Japanese ODA Grant Aid Project

“The Project for Zanzibar Urban Water Supply Development (Phase I and II)”

External Evaluator: Keisuke Nishikawa

Japan Economic Research Institute Inc.

0. Summary

In this project, water-sources were developed and old pump / distribution stations, as well as pipelines, were improved to provide Zanzibar’s residents in urban and western districts with safe and reliable water. Relevance of this project was high as the project was consistent with the development plan and needs of Zanzibar and was also with one of the priority areas of Japan’s ODA policy. With regard to the effectiveness of the project, while a 24-hour water supply was not realised and the overall improvement in water quality was limited, there were increases in the size of the population with a water supply as well as the amount of the water supply. The quality of water at the source and the minimum water supply pressure were also generally achieved. On the other hand, contributions of the project in economic and social development and stabilisation were limited mainly due to problems in distribution networks. As a whole, the effectiveness and impact of the project was fair. The efficiency of the project was fair as both the project cost and period exceeded the plan after a tender failure occurred for Phase II due to a surge in material costs, followed by the Implementation Review Study to revise the project cost. With respect to operation and maintenance, while there were no particular issues identified in the institutional aspects, there were some problems in technical and financial aspects as well as the current status of operation and maintenance. Therefore, the sustainability of the project was judged to be fair.

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

1. Project Description



Project Location



Welezo Reservoir developed in the project

1.1 Background

Water supply development in the urban and western districts of Zanzibar, comprising the Union Republic of Tanzania, started in the 1920s with the construction of water supply facilities using ground water and springs as water sources. By 1990, the total length of water pipes had reached 100km, water pumping stations and seven water reservoirs had been developed. Due to the lack of funds, however, rehabilitation and expansion of water supply facilities was not implemented and the supply capacities of the old facilities were not meeting the water demand at all. In the urban and western districts, the target areas of this project, the amount of water supplied to residents from existing water supply facilities was not sufficient and the residents were forced to experience restrictions of water supply to certain hours and suspensions of water supply. Moreover, the morbidity rates of waterborne diseases such as cholera were high among the people in the target areas due to inflows of sewerage leading to deterioration of water quality as the distribution pipes became older and the water pressure in the pipes declined. Therefore, an improvement in living environment was an urgent challenge.

Under these circumstances, the Government of Tanzania had an aim to supply safe drinking water stably, including Zanzibar's urban and western districts, to improve basic human needs, a priority area in the country's economic recovery programme.

1.2 Project Outline

The objective of this project was to provide residents in Zanzibar's urban and western districts with safe and reliable water by developing water-sources and improving old pump / distribution stations as well as pipelines.

Grant Limit / Actual Grant Amount	(Phase I) 1,230 million yen / 1,229 million yen (Phase II (original)) 847 million yen / 47 million yen (Phase II (revised)) 1,419 million yen / 1,362 million yen
Exchange of Notes Date / Grant Agreement Date	(Phase I) June, 2006 (Phase II (original)) June, 2007 (Phase II (revised)) February, 2009 / February, 2009
Implementing Agency	Government of Zanzibar: Ministry of Lands, Housing, Water & Energy / Zanzibar Water Authority (ZAWA)
Project Completion Date	(Phase I) March, 2008 (Phase II) August, 2010
Main Contractor	Konoike Construction Co., Ltd. (Phase I and II)
Main Consultant	NJS Consultants Co., Ltd. (Phase I and II)
Basic Design	March, 2005

	(Implementation Review Study: May 2006 and November 2008)
Detailed Design ¹	(Phase I) September, 2006 (Phase II) March, 2009
Related Projects	[Technical Cooperation] The Technical Cooperation Project for Enhancement of Water Supply Management of Zanzibar Water Authority (Phase I: 2008-2010, Phase II: 2011-2015) [Grant Aid] Grant Aid for Grassroots Human Security: Zanzibar Rural Water Supply Project I – IX (FY2003) [Other Donors] Finland, ‘Urban Water Supply Project’ African Development Bank, ‘Rural Water Supply Project’ KfW Bankengruppe, ‘Supporting Sanitation in Zanzibar’ etc.

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

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

Duration of the Field Study: January 7 – 23, 2014 and April 18 – 26, 2014

3. Results of the Evaluation (Overall Rating: C²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of Tanzania

Consistency with the national policy

In Zanzibar, a policy objective to ‘ensure adequate, affordable and economically accessible and sustained water supplies to all people and sectors using environmentally sound water resource management technologies’ was clearly stated regarding the water

¹ Indicating the date when a comparison table of basic design and detailed design was prepared and submitted, following a detailed design study conducted after the Exchange of Notes was signed.

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

³ ③: High, ②: Fair, ①: Low

sector in the ‘Zanzibar Vision 2020’ formulated in 2000. Based on this ‘Zanzibar Vision 2020’, the ‘Zanzibar Poverty Reduction Plan’ (hereinafter referred to as ZPRP) was launched in 2002 to alleviate poverty. One of the key strategies emphasised in the plan was to supply safe water to residents.

‘Zanzibar Vision 2020’ continued to be a valid comprehensive development plan at the time of ex-post evaluation, and the overall positioning of this project has not been changed in the policy context. As a strategy to realise this vision, the Zanzibar Strategy for Growth and Reduction of Poverty (hereinafter referred to as ZSGRP) was formulated following the ZPRP. One of the top priorities in the ZSGRP is to ensure the supply of a sufficient amount of quality water in Zanzibar, which implies that the water supply has high policy significance.

Consistency with the sector policy

The Water Policy, formulated in 2004, stated an objective that all people would be able to use clean and safe water and socio-economic activities would also be promoted. This policy was still effective at the time of ex-post evaluation without any changes in its objective.

As an organisation to implement these national and sector policies, Zanzibar Water Authority (hereinafter referred to as ZAWA), an implementing agency of this project, was established in 2006 and formulated the Strategic Business Plan (hereinafter referred to as SBP) in 2008. A revised SBP was later formulated targeting the 2013-2018 period. The current SBP has a vision to transform ZAWA into the best water service provider in East Africa and has a concrete action plan for the improvement in water supply services by improving the services in general, commercialising service provisions and improving financial performance.

Thus, there has been a high priority at the policy level on stable water supply in terms of quality and quantity throughout the period from planning to ex-post evaluation, and this project can be said to be consistent with these policies.

3.1.2 Relevance to the Development Needs of Tanzania

A survey during the planning stage revealed that existing water supply facilities had deteriorated and that water supply (water sourcing) capacities had been insufficient to meet the growing demand. Some other associated problems such as low water supply pressures and the worsening of the quality of supplied water were also apparent. In the survey, improvements in living environment were identified as an urgent matter to be tackled as the water quality was worsening due to deterioration of distribution pipes and inflows of

sewerage, causing high morbidity rates of waterborne diseases among the residents in the target areas.

While the access to water supply improved after this project as stated below, water demand has yet to be fulfilled even at the time of ex-post evaluation. According to ZAWA, it is estimated that approximately 20% of the urban population has no access to the water supply. Regarding the stability of the water supply, there were still some cases where unstable electricity supply, deteriorated facilities, and insufficient maintenance led to disrupted water supply, and some areas were experiencing insufficient water pressure. Furthermore, ZAWA themselves have recognised the possibility of water contamination due to the inflow of underground water penetrating through damaged pipes, and it is required that quality water be supplied at all times.

The population in Zanzibar's urban and western districts in 2002 was 390 thousand, and it jumped to 594 thousand in the 2012 Census, higher than the projection, showing the annual growth rate of 4.2%. It indicates that the needs for the water supply have grown further as the population had increased.

In light of the above, this project is consistent with the needs for a stable supply of quality water to an increasing population both at the time of planning and ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

In the Country Assistance Program for Tanzania, formulated in June 2000, one of the five priority areas was to 'improve the living environment in urban areas through the development of basic infrastructure' and the need to develop water lines was clearly stated in the program. According to the FY2006 ODA Country Data Book, assistance was to be provided based on this country assistance program in 2006, when this project was being planned.

Therefore, this is regarded as a project that developed infrastructure facilities to stabilise the water supply in the urban areas of the People's Republic of Zanzibar and that crystalized the priority 'to develop basic infrastructure in urban areas'. Based on this judgement, this project can be said to have been highly consistent with Japan's ODA policy at that time.

This project is consistent with the development plan and strategy of Zanzibar both at the time of project planning and ex-post evaluation. The development needs of sufficient and stable supply of quality water have also been high, both at the planning and ex-post evaluation stages. This project, targeting an improvement of living environment by developing infrastructure in urban areas, was also found to be consistent with Japan's ODA

policy at the time of project planning.

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

3.2 Effectiveness⁴ (Rating:②)

The project effects expected during the planning stage can be broadly classified to (1) increases in the population with water supply and the amount of water supply, (2) achievement of stable water supply and (3) improvement in water quality. The following sections describe the achievement of these effects.

3.2.1 Increase in the population with water supply and the amount of water supply

Table 1 and 2 compare planned and actual figures of the population with water supply and the amount of water supply.

Table 1: Changes in the Population with Water Supply (Project Area)

(Unit: Person)

Service area	2002	2009 年	2010	2011		2012	2013
	Plan	Actual (estimate)	Actual (estimate)	Target	Actual (estimate)	Actual (estimate)	Actual (estimate)
Saateni	No details	167,190	186,361	No details	194,747	197,744	206,049
Welezo		169,816	189,288		197,806	200,850	209,285
Dole		34,023	37,925		39,631	40,241	41,931
Kinuni		68,451	76,300		79,733	80,960	84,360
Total	350,000	439,480	489,874	457,000	511,918	519,794	541,625

Source: Data provided by ZAWA

Table 2: Changes in the Amount of Water Supply (Project Area)

(Unit: m³/day)

Service area	2002	2009 年	2010	2011		2012	2013
	Plan	Actual (estimate)	Actual (estimate)	Target	Actual (estimate)	Actual (estimate)	Actual (estimate)
Saateni	No details	9,066	8,666	No details	8,983	9,352	10,720
Welezo		28,680	28,680		20,856	27,264	30,576
Dole		936	4,632		4,632	4,632	4,632
Kinuni		7,920	10,872		10,872	11,832	11,112
Total	40,100	46,602	52,850	54,100	45,343	53,080	57,040

Source: Data provided by ZAWA

⁴ Sub-rating for Effectiveness is to be put with consideration of Impact.

Although the above data was provided by ZAWA, they did not correctly capture reality.

The ‘Population with Water Supply’ in the above table indicates the ‘population with connections to distribution networks with a minimal amount of water supply’. Since the implementing agency estimates that approximately 80% of the entire population in the project area is receiving water, the water supplied population shown in Table 1 is 80% of the total population. Therefore, the figures are not necessarily accurate. However, based on these figures, the actual number of people with water supply in 2011 exceeded the target population, being 112% of the plan.

The amount of water supply shown in the Table 2 is the estimation of pumped water calculated from each well’s electricity consumption and pumping capacity, in addition to the amount of spring water. Judging from the level of achievement in 2011 based on these estimated figures, the amount of daily water supply was 84% of the target.

This project was implemented in two phases; Phase I covered the Saateni and Welezo service areas and Phase II covered the Dole and Kinuni service areas (completed in March 2008 and August 2010, respectively). Due to the project phasing, the amount of water supply in the Saateni and Welezo service areas had already increased by 2010. It can be observed that the amount in the Dole and Kinuni service areas recorded a large increase in 2010.

After the project completion, the population with water supply and the amount of water supply both increased in 2012 and 2013 from previous years, which shows that expanded water supply capacities enabled by this project have been underpinning these increases.

The demand for water in the project area (urban and western districts) was 37,603m³/day in 2011 according to a feasibility study conducted by ZAWA in 2012, showing that the amount of water supply was theoretically larger than the amount of water demand. However, the amount of water supply shown above is the same as the amount of water intake from springs and wells. Therefore, with the consideration of non-revenue water including water leakages⁵ from distribution pipes, it is highly possible that the water demand is greater than the water supply for users.

3.2.2 Stable Water Supply

At the time of planning, the achievement of the following items was expected regarding stable water supply.

- Improvements in the distribution system would enable minimum water supply pressure in over 90% of the project area while it is currently unachieved in

⁵ Although no comprehensive survey has been conducted, it is considered, according to the implementing agency, that 30% to 40% of the water from reservoirs is leaking.

approximately 50% of the area.

- A 24-hour water supply would be realised.
- A leakage rate of approximately 30% in the project area at the time of planning would be reduced to about 21% of the amount of water intake after the project implementation.

According to the implementing agency, the ratios of sub-districts with sufficient water supply pressure were 78% in the Saateni, 75% in the Welezo, 85% in the Dole, and 90% in the Kinuni service areas at the time of ex-post evaluation. It was observed that the sufficient water supply pressure increased in all service areas from approximately 50% recorded during the planning stage. Although it was only in the Kinuni service area that the target ratio of 90% was achieved, other service areas also recorded 83% - 94% of the target rate. Therefore, it can be said that the target has largely been achieved.

On the other hand, a beneficiary survey⁶ has revealed that 68% of the respondents replied that the water pressure had been the same and that 24% of them replied that the pressure had become worse (weaker), while only 9% of them were feeling the improvement.⁷ At the same time, 56% of the respondents replied that the water pressure was acceptable. These results show that while some residents are not satisfied with the weak water pressure, other residents have accepted the unchanged pressures.

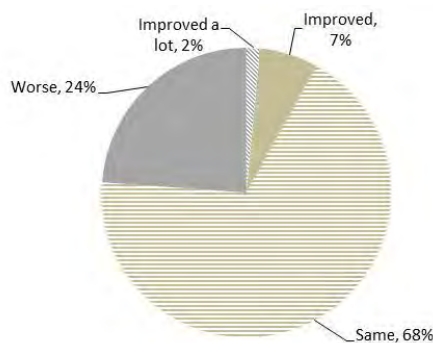


Figure 1: Improvement in Water Pressure

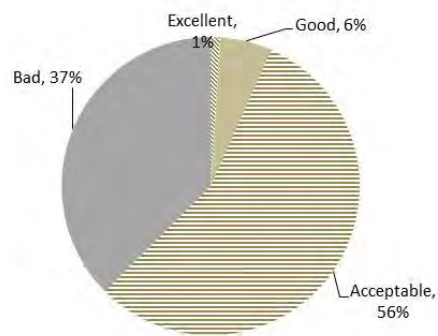


Figure 2: Satisfaction with Water Pressure

With regard to the 24-hour water supply, the data provided by ZAWA indicate that in Saateni, where spring water is the main source, the overall amount of water supply has remained restrained mainly due to declines in the amount of spring water. In this service

⁶ An interview survey with 200 residents receiving water from ZAWA in the Saateni, Welezo, Dole and Kinuni service areas was conducted. The main questions concerned stable water supply, improvements in water quality and water pressure, change in living environment, environmental and social impacts, maintenance conditions, etc.

⁷ The total exceeds 100% due to rounding after the decimal point.

area, the amount of water supply increased only by 18% from 2009 to 2013 while the population with water supply showed a 23% increase during the same period. In other service areas, although the water supply capacities are calculated to be sufficient to achieve a 24-hour water supply to their residents, the 24-hour water supply has not been realised on the part of water users. According to ZAWA, this is due to significant water leakages occurring in the distribution stage after the discharge from reservoirs. During the field survey, several points with leakage to the land surface were spotted.

In Zanzibar, laying records can be found for major pipes after the construction of water supply facilities started in the 1920s, but an entire distribution network is not known as there are no records of other distribution pipes. Therefore, accurate leakage rates cannot be calculated though they are considered to be between 30% and 40%. Also, coupled with the fact that the amounts of water supply and water usage are both estimated figures, no accurate non-revenue water rates have been captured.

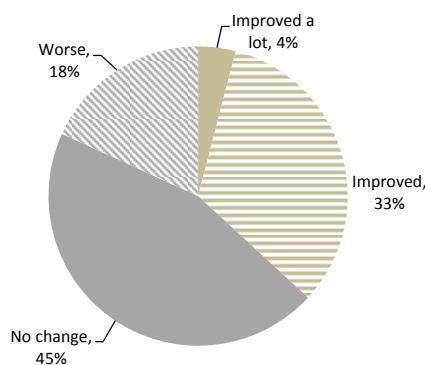


Figure 3: Changes in Water Supply Stability

Under these circumstances, a technical cooperation project ‘The Technical Cooperation Project for Enhancement of Water Supply Management of Zanzibar Water Authority (Phase II)’ being implemented at the time of ex-post evaluation, was collecting the data by setting a pilot area to accurately capture these actual situations.

The beneficiary survey results show that the stability of the water supply has ‘Improved’ for 37% of the respondents, ‘Not changed’ for 45%, and ‘Become worse’ for 18%, indicating that the respondents without feeling any changes account for the largest proportion. The breakdown of the remaining 55% who felt changes demonstrates a much larger proportion of respondents (37%) feeling improvements compared with the respondents (18%) feeling worsened situations. However, there is great variability between the settlements of the beneficiary survey. It is presumed that improvements are seen in the locations with relatively good distribution pipes from reservoirs, while no changes or worsening conditions are observed in the locations without good distribution pipes.

3.2.3 Improvements in Water Quality

In the water analysis of some springs and wells during the project planning, bacteria coliform and other common bacteria were detected, and the quality of water was expected to improve after the implementation of the project.

While ZAWA has its only laboratory at the Saateni Station for water quality inspections, no regular inspections were being conducted. As the laboratory was not equipped with sufficient inspection kits and the test reagent was out of stock, bacteria coliform tests were outsourced to a hospital several times a year. No systematic water quality inspection was established. The results of ad-hoc tests are recorded in the designated form, but no database has been created from the forms. It cannot be said that sufficient water analysis was conducted and it seemed necessary to improve test equipment and advance the development of human resources.

During the ex-post evaluation, ZAWA analysed the quality of water of the 11 wells developed under this project. According to the result of the analysis, there were no wells with infiltration of saline matters and all the wells also cleared Tanzania's criteria for other check items. On the other hand, samples of some non-regular test results from non-project wells were obtained, which showed that water from some wells had rather high electrical conductivity and needed to be treated before use⁸ while many other springs and wells had no problems for use. These results imply that the water quality of the wells developed under this project is generally better than other water sources.

In the beneficiary survey, 96% of the respondents replied that the quality of water supplied by ZAWA had not changed before and after the project. However, 93% of them also commented at the same time that the quality was acceptable. It is inferred that the improvement effect of water quality cannot be felt by water users as the water quality is, even though it is good enough at source, affected by old distribution pipes and infiltration of sewerage at the distribution stage. However, as tap water is normally boiled and used, the water quality has not become a big issue and the users have not particularly expressed their dissatisfactions.

3.3 Impact

3.3.1 Intended Impacts

At the time of project planning, improvements in sanitary conditions, and socioeconomic promotion and stabilisation were expected as project impacts, as indicated below.

- Water-borne diseases such as diarrhoea and cholera will be reduced and the residents' better health will be achieved.
- A supply of safe water will contribute to the development of the tourism sector and will be conducive to the promotion and stability of economic activities in Zanzibar

⁸ Water with impurities has a higher rate of electrical conductivity. Some of the results exceeded Tanzania's standards.

The following tables show changes in water-borne disease data in Zanzibar's urban and western districts during and after the project.

Table 3: Number of Cholera Cases

		2008	2009	2010	2011	2012
Unguja Island	Urban	0	23	0	0	0
	West	0	40	0	0	0
	Other	0	14	243	0	0
	Total	0	77	243	0	0
Pemba Island		48	528	5	0	0
Zanzibar Total		48	605	248	0	0

Source: Health Bulletin 2012 (Ministry of Health, Zanzibar)

Table 4: Dysentery Incidence

		2008	2009	2010	2011	2012
(Unit: %)						
Unguja Island	Urban	0.4	0.4	1.0	0.6	0.2
	West	0.5	0.2	0.2	0.3	0.3
	Total	0.5	0.3	0.5	0.4	0.2
Pemba Island		0.4	0.4	0.4	0.4	0.3
Zanzibar Total		0.5	0.3	0.5	0.4	0.2

Source: Health Bulletin 2012 (Ministry of Health, Zanzibar)

The project area covered urban and western districts in the above tables. No particular relationships between the project implementation and water-borne disease data can be observed, both in terms of annual changes in the same district and comparison with other districts. In the project area, there are approximately 50 other wells of ZAWA in addition to the 11 wells constructed in this project, and water is also supplied from individually-owned wells. Therefore, it was difficult to analyse how this project contributed to the reduction of water-borne diseases. There have not been any cholera cases since 2011, but according to Zanzibar Ministry of Health, this is attributed to the impact of oral cholera vaccination intervention.

With regard to an assumption of tourism sector promotion, contributions of this project are considered to be limited as a 24-hour water supply has not been realised. During the field survey, it has become clear that water is not always supplied even to hotels and restaurants that are playing a central role in the tourism industry. No changes in the amount of water supply were perceived by hotels and restaurants before or after the project. As insufficient water supply conditions have not changed, each facility has its own wells and/or transmission pipes, or fetches water from water kiosks by using their own trucks. The cost of water is lower for the amount obtained from the water supply network,

compared to providing all the water needed through their own routes. Considering that each facility is receiving the same amount of water as before despite the increases in water demand in other parts of the project area due to population increase, this project can be said to be of some help to tourism sector promotion in terms of partial cost reduction. In other words, once a 24-hour water supply becomes a reality, the cost reduction effects for the tourism industry will be a lot larger.

There were no noticeable examples observed regarding the promotion of Zanzibar's overall economy and the stabilisation of residents' economic foundation.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

During the project planning, the environmental impact assessment was not considered to be necessary for this project. The construction work was to be planned not to cause any negative environmental impacts.

According to ZAWA, no issues in relation to the natural environment were identified during and after the construction. In the beneficiary survey, no respondents observed any negative impacts.

During the field visit of the ex-post evaluation survey, no negative impact to the natural environment was observed.

3.3.2.2 Land Acquisition and Resettlement

During the project planning, it was deemed necessary that the implementing agency would fully confirm the construction locations as some of the sites for well development were surrounded by privately-owned land while the majority was government land. This consideration was needed as the accurate drill sites could not be determined in relation to water veins. According to ZAWA, actual well development sites were all within the government land and there were neither resident resettlement cases nor land acquisition cases seen as a result of project implementation. In the beneficiary survey, there were no respondents that reported any resettlement or land acquisition cases. No cases of resettlement or land acquisition were seen during the visits to all project sites in the field survey, and it can be confirmed that there are no issues.

While it is partly difficult to make clear judgements as various indicators are estimated figures, it was observed that the population with water supply increased to a level higher than the target and the amount of water supply from wells and reservoirs also increased to some extent by implementing this project. Although a 24-hour water supply has not been realised due to the leakages caused particularly by deteriorations of the distribution network which

was outside the project scope, water supply capacities were enhanced by developing wells and reservoirs. As for the supply of safe water, it cannot be judged that the supply system improved as a whole as the water quality inspection was not sufficiently organised. But the high quality of water from the wells developed under this project was confirmed. The water users were not feeling improvements in the quality of water due to the deterioration of distribution pipes and infiltration of sewerage in the distribution stage, but they were not showing significant dissatisfaction as the water was normally used after boiling sterilisation.

In respect to the impact of this project, it was difficult to find causality between the project and its contributions to the reduction of water-borne diseases. No typical examples were identified concerning the contribution of the project to socioeconomic promotion and stabilisation. On the other hand, there was neither negative impact on the natural environment nor resident resettlement / land acquisition cases. No particular issues were found in these respects.

In light of the above, a certain degree of project effects particularly in terms of improvements in water supply capacities and supply availability of quality water has been observed. Therefore the effectiveness and impact of the project is fair.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

In this project, facilities such as well pump stations, distribution facilities and some transmission / distribution pipelines were planned and developed, as shown in the table below.

Table 5: Output of the Project (Facilities)

Facility		Item	Number	
			Phase I	Phase II
Well pump station		Well	6	5
		Well pump	6	5
		Electrical equipment	6 sets	5 sets
		Well pump house	6	5
Distribution Facilities	Saateni	Transmission pump	4	-
		Electrical equipment	1 set	-
		Disinfection facility	1 set	-
	Welezo	Reservoir	2	-
		Disinfection facility	1 set	-
	Dole	Reservoir	-	1
		Disinfection facility	-	1 set
	Kinuni	Reservoir	-	1
Disinfection facility		-	1 set	
Transmission pipeline			Approx. 13km	Approx. 11km
Distribution pipeline			Approx. 9.6km	Approx. 10.3km

Source: Implementation Review Report and data provided by JICA

The facilities were developed mostly as planned both in Phase I and Phase II without major changes. Table 6 summarises changes from the original plan, which are minor and have not caused any influences on the achievement of project effects.

Table 6: Changes from the Original Plan

Phase	Changes
Phase I	Shape of chlorination house, Chlorinating equipment, Location of chlorination house, Transformer capacities, Area of recovery pavement, Piping route, Location of well pump installation, Route of transmission pipes
Phase II	Shape of chlorination house, Transformer capacities, Location of well pump installation, Pumping volume at wells

Source: Information provided by JICA

In addition to the development of these facilities, this project had a technical assistance component implemented by four consultants (a total of five man-months), consisting of (1) technical instructions on facilities operations, (2) instructions on institutional strengthening (management class training) and (3) activities to raise awareness on hygienic conditions among the citizens of Zanzibar. As a result of technical instructions on facilities operations, it was confirmed in the ex-post evaluation survey that proper operations and management of each facility and record taking by pump operators were undertaken. Concerning the institutional strengthening and awareness raising, this project covered only introductory training sessions on accounting and finance, personnel management and awareness raising methods. However, it is considered that these activities played a certain role as introductory courses to be carried on to JICA's technical cooperation project that was subsequently implemented at a larger scale.

The Tanzania (Zanzibar) side was scheduled to undertake land acquisition (for four reservoirs, 11 new wells, and transmission / distribution pipelines), fencing works (for four reservoirs and 11 new wells), power line installation (for four reservoirs and 11 new wells) and a disposal of replaced existing pumps (four sets). All the facilities were checked during the ex-post evaluation survey and it was confirmed that fencing works was conducted only at the Saateni Station and one of the new wells (Number: N13). Many of those new well sites already had poles for the fencing works and the fencing materials were already placed within the premises of the well pump stations. But the fencing works itself had not been carried out. According to the implementing agency, it took a longer time to confirm the land sections for those well pump stations. However, from the viewpoint of ensuring safety of water supply, it is considered to be necessary to expedite the installation works, including the reservoirs.



Photo 1: Saateni Station Transmission Pump House



Photo 2: Well (Number N9-2) – Fence not yet installed

3.4.2 Project Inputs

3.4.2.1 Project Cost

This project was implemented in two phases: with Phase I in which the Saateni and Welezo service areas were development and Phase II in which the Dole and Kinuni service stations were developed and soft component was implemented.

The planned and actual project costs were as follows.

Table 7: Comparison of Original and Actual Project Costs

(Unit: million yen)

		Original	Actual
Phase I		1,230	1,229
Phase II	Original E/N	847	47
	Revised E/N	1,419	1,362
Total	Original E/N	<u>2,077</u>	1,276
	Revised E/N	2,649	<u>2,638</u>

Source: Data provided by JICA

While this project was planned and Phase I was being implemented (before the tender process of Phase II was implemented), material costs surged beyond expectations and Phase II had a tender failure, which led to difficulties in continuing the project implementation. Therefore, the Implementation Review Study for ‘The Project for Zanzibar Urban Water Supply Development (Phase II)’ was conducted and the project costs were re-examined.

The actual cost for Phase I was 1,229 million yen against the planned amount of 1,230 million yen (1,133 million yen for construction and 96 million yen for designing and supervision). The cost for Phase II in the original E/N was 847 million yen, and 47 million yen was actually spent for the implementation of the soft component and for a detailed design study and tender administration when two tender failures occurred. The

cost in the revised E/N after the implementation review study was conducted was 1,419 million yen, and the actual project cost was 1,362 million yen (1,289 million yen for construction and 73 million yen for designing and supervision).

As the judgement in the ex-post evaluation study is based on the comparison of the E/N amount in the original plan and the actual cost at the completion of the entire project, the actual project cost of 2,638 million yen can be judged to have exceeded the original amount of 2,077 million yen (127% of the plan).

The project cost to be borne by the Tanzanian side was planned to be 45 million Tanzanian Shillings (approximately 4.52 million yen). The actual amount of 900 million Tanzanian Shillings was indicated by ZAWA as the cost of inputs, but no judgement could be made as there were no breakdowns specified and it was difficult to make a comparison with the original plan.

3.4.2.2 Project Period

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

The actual project period was respectively as follows.

- Phase I: June 2006 – March 2008 (21.5 months)
- Phase II: June 2007 – August 2010 (37.5 months)

The original E/N for Phase II was signed in June 2007, but the second implementation review study was conducted following two tender failures. 4.7 months were required for this study and the E/N was revised and signed in February 2009, 20 months after the original E/N. Construction works after that progressed smoothly and the efforts were made to have the construction period shortened. However, the entire project was completed in August 2010.

As the evaluation judgement is based on the comparison of the project period in the original plan and the actual period at the end of the project, the project was completed in 50 months (June 2006 – August 2010), exceeding the planned period of 35 months by 43%.

Both the project cost and the project period exceeded the plan. Therefore, the efficiency of the project is fair.

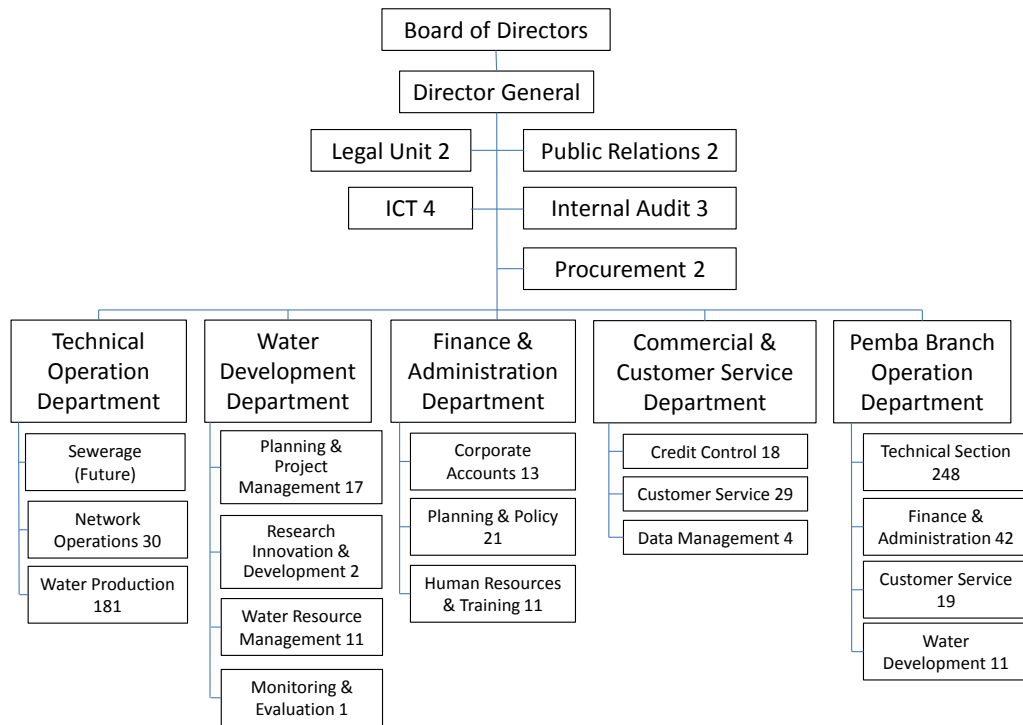
3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The implementing agency of this project at the time of project planning was the Department of Water Development (hereinafter referred to as DWD) of the Ministry of Water, Construction, Energy and Lands, but the corporatisation process was already underway. After that, ZAWA was established based on the Zanzibar Water Authority Act, formulated in 2006. ZAWA at the time of ex-post evaluation was a public corporation providing water supply services in Unguja Island, where the area of this project was located, and in Pemba Island⁹, north of Unguja Island.

The number of ZAWA staff members at the time of ex-post evaluation was 677, of which 356 were assigned in Unguja Island (321 in Pemba Island). ZAWA has five departments: Technical Operation, Water Development, Finance & Administration, Commercial & Customer Service and Pemba Branch Operation. Operation and maintenance work (hereinafter referred to as O&M) in Unguja Island is undertaken by the Network Operations Section (30 members) of the Technical Operation Department for distribution networks, by the Water Production Section (181 members) of the same department for reservoirs and wells, and by the Planning & Project Management Section (17 members) of the Water Development Department for building maintenance. Services such as revenue collection are the responsibilities of the Credit Control Section (18 members) of the Commercial & Customer Service Department. The need to increase the number of staff in the Credit Control Section was pointed out during the project planning (12 at that time), and six staff members had been added by the time of ex-post evaluation. The number of staff in the Customer Service Section was also increased from 12 to 29, showing the strengthening of the authority's structure.

⁹ The People's Republic of Zanzibar consists of Unguja Island, Pemba Island and other surrounding small islands.



Source: Information provided by ZAWA

Note: Figures shown after section names indicate the number of staff

Figure 4: Organisational Structure of ZAWA

During the first half of 2014, when the ex-post evaluation study was being conducted, recruitment of new staff following the retirement of approximately 30 existing staff was carried out by ZAWA. As ZAWA was established by transferring DWD, the majority of the staff members were ex-DWD officers without specific qualifications, according to ZAWA. In the first half of 2014, ZAWA adopted an open recruitment process for the first time since its establishment to hire those who have expertise and/or experiences in the related fields. They actually hired a total of 52 new staff (40 in Unguja Island and 12 in Pemba Island) with academic qualifications in banking and human resource management, or with certificates in piping, statistics, information technology, etc. The efforts to raise average skill levels of the staff through the employment of qualified persons by adopting an open recruitment process can be highly evaluated.

3.5.2 Technical Aspects of Operation and Maintenance

At the time of planning, maintenance techniques of each O&M staff of DWD was thought to be at a certain level.

When the ex-post evaluation survey was conducted, ZAWA had several engineers with engineering knowledge and/or long-time experiences, enabling daily O&M of facilities. However, such engineers were limited, and repairing techniques of breakdowns, laying of

transmission and distribution pipes, planning of O&M plans, data recording and management were not sufficient as a whole. It was felt necessary to develop the capacities further so that O&M activities would be independently implemented in these fields. ZAWA also has recognition that the capacities of respective engineers in maintaining the facilities needed to be enhanced. Also, as there are no standards on the installation of water meters or distribution pipes, etc., leaving them to the construction style of their preference. It will be important to formulate and adhere to a laying standard, in order to maintain a consistent quality in construction.

ZAWA refers to an operation manual prepared in this project and manuals on customer administration system and revenue collection training prepared in JICA's technical cooperation project as necessary. It also has an 'Operation and Maintenance Manual 2012-2013' prepared with assistance from African Development Bank. However, these manuals were not necessarily utilised on a daily basis by all staff members as ZAWA has not conducted its own regular training courses, apart from participating in the courses offered inside or outside the country in JICA's technical cooperation project.

3.5.3 Financial Aspects of Operation and Maintenance

In Zanzibar, no water charges were collected from households in the past, but as the organisational structure was transferred from DWD to ZAWA, it is now required to start collecting the charges from general households gradually from 2008 and become financially independent without receiving subsidies from the government in the future.

ZAWA's financial conditions in recent years are as shown in the table below.

Table 8: ZAWA's Statement of Comprehensive Income

(Unit: million Tanzanian Shilling)

		FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13
Income	Billed Revenue	2,613.3	3,567.4	3,651.5	4,282.8
	Government Subsidies	2,544.0	2,070.1	2,746.5	2,004.0
	Electricity Subsidies	2,585.0	3,215.3	3,311.3	3,897.3
	Other Income	432.3	889.6	1,084.5	1,098.5
	Total	8,174.5	9,742.5	10,793.8	11,282.6
Costs	Electricity Costs	2,585.0	3,215.3	3,334.5	3,897.3
	Payroll & Related Expenses	1,406.3	1,508.9	2,190.5	2,196.8
	Other Expenses	1,476.9	1,652.7	1,926.1	2,435.3
	Depreciation of Fixed Assets	5,120.1	5,252.4	5,157.9	2,024.1
	Depreciation of Intangible Assets	15.2	16.5	18.1	6.9
	Bad Debt	0.0	111.6	3,894.4	1,916.0
	Allocation for Doubtful Debt	0.0	2,452.2	-868.2	295.6
Total	10,603.4	14,209.6	15,653.3	12,772.0	
Total Comprehensive Income		-2,428.9	-4,467.2	-4,859.5	-1,489.4

Source: Data provided by ZAWA

As is evident from the table above, while the water revenues are gradually increasing, the salaries and other expenses are also on the rise, resulting in a continuous inflow of large amount of subsidies from the Government of Zanzibar. The electricity charges for water supply services have also been fully subsidised and the level of subsidies has always exceeded water revenues. According to the Ministry of Lands, Housing, Water and Energy¹⁰, the governing ministry of ZAWA, these subsidies are to be gradually phased down and ZAWA is required to be more financially independent. In the SBP of ZAWA, it is aimed to cover the costs with water revenues by FY2017/18 by reducing operational losses and government subsidies will be reduced by 60% by that financial year¹¹.

Under these circumstances, ZAWA needs to strengthen water revenue collection. The current technical cooperation project has set a target to raise the collection rate to over 30% as one of the project's outputs, and has developed a customer database and improved billing operations¹². In August 2013, ZAWA started an activity called 'katakata' every week to urge non-paying customers to make payment or eventually to stop the water supply¹³. Through this activity, the water revenues increased substantially, recording 883 million Tanzanian Shillings in five months to December 2013¹⁴. This is a 50% increase from the same period of the previous year and it is expected that the annual water revenue will be approximately 50% larger than the previous year if the increases continue at the same pace. However, as there are many voices of dissatisfaction from the users regarding unstable water supply, it is imperative to improve the services at the same time to achieve stable water supply in order to further increase water revenues.

The water tariff, the other factor affecting the turnover, has been decided by the Ministry of Lands, Housing, Water and Energy and ZAWA has had no authorities to determine the tariff level. The authority will be delegated to the Zanzibar Utilities Regulatory Authority established in 2013. In Zanzibar's water supply system, water meters have not been installed except in some areas, as no water charges were collected from households until 2006. ZAWA is in the process of changing the billing structure by moving from a flat rate system to a metered system together with the installation of meters. For the households

¹⁰ It was originally the Ministry of Water, Construction, Energy and Lands at the time of project planning. As a result of government reorganisation, it is the Ministry of Lands, Housing, Water and Energy at the time of ex-post evaluation.

¹¹ However, ZAWA is positioned as a public corporation requiring a large amount of subsidies for some time. It is not clear if the SBP's target will be achieved.

¹² The collection rate was higher than 30% when the mid-term review study of the technical cooperation project was conducted in September 2013, in which this output has been analysed to have largely been achieved.

¹³ If a customer delays in payment for more than 90 days, ZAWA firstly visits the customer's house to request a payment to raise his/her awareness to pay for the bill. In the case of no payment despite the direct request, water supply will be eventually suspended.

¹⁴ The actual value paid as a result of the activities done by the Commercial and Customer Service Department, which is different from the billed revenue in Table 8 (values based on the issuance of water bills)

with a flat rate system, the rate was revised upward from 2,000 Tanzanian Shillings per month to 4,000 Tanzanian Shillings per month.

The O&M expenditure for the project area accounts for approximately 40% of ZAWA's entire O&M expenditure, as shown in Table 9. A proportion of the population in the project area is approximately 45% and the O&M expenditure in this area has not increased substantially after the project implementation.

Table 9: O&M Expenditure in the Project Area and ZAWA as a Whole

(Unit: million Tanzanian Shilling)

	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13
Project Area	3,056	3,155	4,117	4,085
Entire ZAWA	7,933	8,520	9,263	10,936
Proportion of Project Area's O&M to the overall O&M of ZAWA	39%	37%	44%	37%

Source: Data provided by ZAWA

3.5.4 Current Status of Operation and Maintenance

In the ex-post evaluation survey, current statuses and issues of the facilities developed under this project were checked, including the procurement of spare parts and the status of the maintenance plan, and it was analysed with a site survey whether the facilities have been sufficiently maintained.

All the facilities developed under this project were visited during the site survey to see the maintenance conditions of the facilities. It was found that they were largely in good conditions although the meters of some wells were broken and one of the wells was temporarily stopped due to the breakdown of a part. In the past, water supply was frequently disrupted because of the instability of electricity supply, but the status of power supply improved a lot after a submarine cable from mainland Tanzania was opened in 2013. While the details on the number of power cuts and the durations of power cuts were not captured as there were no records available, water supply disruptions due to power cuts have been greatly reduced and no significant negative effects on operations were observed.

An annual maintenance plan for the water supply network, including these facilities, have been formulated with assistance from the African Development Bank, and a team of technicians are inspecting the facilities at least once a month based on this plan.

In spite of the regular O&M of the facilities without major problems based on this maintenance plan, however, mainly due to budget shortage, there is no preventive maintenance mechanism in place to replace pipes and other parts on a regular basis and breakdown maintenance has been the reality. Also, while frequently replaced spare parts are kept in stock, a lack of budget allocation mechanisms to respective departments based

on their budget request has made the procurement of spare parts a time-consuming process when breakdown occurs, leading to an issue of being unable to do repair work immediately after the breakdowns.

The facilities developed under this project have generally been maintained in good conditions despite some issues. However, as an entire water supply service area, there are a number of leakage spots due to the deterioration of distribution pipes, but the overall picture has not been sufficiently understood. As described in 'Effectiveness', leakages of distribution pipes have become chronic and the water from the facilities developed under this project has not fully reached the users. While these problems occur outside the scope of this project, it is important to do as much repair as possible on the distribution pipes so that water supply will become more stable.

No issues were identified in terms of the institutional aspect of O&M of this project as the roles of each department are clear and the number of staff was sufficient. It was also confirmed that efforts were made to employ qualified staff. In relation to the technical aspect, it will be necessary to provide its own training programmes to develop capacities of respective staff members, and to ensure better quality by setting sufficient installation standards of materials and equipment. As for the financial aspect, while the efforts are being made these days to improve revenue collection, it is requested that revenue collection capacities be strengthened and water supply be stabilised to move into the black as the subsidies are expected to phase out. Operation and maintenance conditions of the facilities developed under this project were generally good, but a lot of leakage spots were observed due to the deterioration of distribution pipelines. Therefore, it is required to immediately comprehend the current status of transmission / distribution pipelines and expedite procurement of spare parts.

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, water-sources were developed and old pump / distribution stations, as well as pipelines, were improved to provide Zanzibar's residents in urban and western districts with safe and reliable water. Relevance of this project was high as the project was consistent with the development plan and needs of Zanzibar and was also with one of the priority areas of Japan's ODA policy. With regard to the effectiveness of the project, while a 24-hour water supply was not realized and the overall improvement in water quality was limited, there were

increases in the size of the population with a water supply as well as the amount of the water supply. The quality of water at the source and the minimum water supply pressure were also generally achieved. On the other hand, contributions of the project in economic and social development and stabilization were limited mainly due to problems in distribution networks. As a whole, the effectiveness and impact of the project was fair. The efficiency of the project was fair as both the project cost and period exceeded the plan after a tender failure occurred for Phase II due to a surge in material costs, followed by the Implementation Review Study to revise the project cost. With respect to operation and maintenance, while there were no particular issues identified in the institutional aspects, there were some problems in technical and financial aspects as well as the current status of operation and maintenance. Therefore, the sustainability of the project was judged to be fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Importance of Data Collection and Compilation

In Zanzibar, as the information regarding transmission / distribution pipelines had not been recorded for a long time during the time of DWD, ZAWA does not possess the records of transmission / distribution pipe installation except for some of the major pipes and it is difficult to accurately understand the water supply network. As the customer database is being developed and an installation and leakage status of transmission / distribution pipes is being identified in JICA's technical cooperation project, these efforts need to be strengthened so that ZAWA as a whole will be equipped with basic information. On that basis, it will be important to understand the leakage rates and non-revenue water rates of each district so as to achieve stable water supply services and revenue collection in all districts in the medium to long term.

4.2.1.2 Necessity to Repair/Replace Deteriorated Water Pipes

While this project assisted with water development and installations of main transmission / distribution pipes as part of the entire water supply system in Zanzibar's urban / western districts, the project objective of supplying safe water to residents in a stable manner has not been sufficiently achieved due to the problems with the distribution network. In order to reduce water leakages, it is essential for ZAWA to take a comprehensive view of the entire water supply network and, with support from donors as necessary, to rehabilitate the facilities such as deteriorated distribution pipes which have become bottlenecks.

4.2.1.3 Importance of Developing Human Resources

One of the important factors to improve water supply is to secure staff members with technical knowledge for long periods and cultivate them. It is important to continue hiring the staff with qualifications, as seen for the first time in 2014, provide training courses within ZAWA, and improve data development capacities on transmission / distribution pipelines and customers so that the management capacities of the entire ZAWA in water supply services will be enhanced.

4.2.1.4 Tightening of Security Measures at Facilities

It was found in the site survey of the ex-post evaluation that fencing work (obligation of the Tanzania (Zanzibar) side) had not been implemented at many of the project facilities. From the viewpoint of water supply safety, it is essential to tighten security measures at the facilities to prevent free access by non-authorized personnel. For this purpose, it is necessary to immediately increase the allocation of security officers and install fences around wells and reservoirs as agreed by the two governments.

4.2.2 Recommendations to JICA

At the time of ex-post evaluation, a technical cooperation project on enhancing the capacities of ZAWA's non-revenue water measures and improving revenue collection rates was being implemented as stated above, and the capturing of the current status of transmission / distribution networks was progressing within the framework of this project. While this project covered water development and enhancement of transmission / distribution capacities, it is indispensable to understand the water supply network including distribution networks, the current status of leakage rates and non-revenue water rates, and the customers within the supply areas to improve the entire water supply services. In this context, continuation of the current technical cooperation project, trying to capture these situations by setting a pilot area, seems to be effective so that ZAWA will be able to keep supplying safe water in a stable manner.

4.3 Lessons Learned

4.3.1 Assistance on Capacity Development in Addition to Facility Development

In addition to this project that aimed to enhance the capacities of water supply facilities, a technical cooperation project was implemented to improve management foundation by establishing a revenue collection structure. In order to achieve the improvement of the entire water supply services, efforts to sustain the project effects, i.e. to develop capacities to maintain those facilities and manage the water supply network, in addition to the

development of facilities in this project, are effective as a combination in generating synergetic effects and can be a good reference when formulating similar projects.

4.3.2 Implementation of Project based on the Entire Water Supply Network

Water supply services are a service that functions as a series of network from water intake until distribution. This project supported part of the water intake and distribution system. It was, however, observed that there were some aspects where the project effects were constrained by leakages associated with the deterioration of distribution networks, which was outside the project scope. Since a challenge the Government of Zanzibar had at the time of project planning was particularly on water development in its supply network, it can be said that it was appropriate for this project to put a priority on water development and the installation of main transmission / distribution pipes. However, in order to realise a project design that would achieve that effectiveness and impact, it will be important even in a project with a focus on water intake and transmission to (1) conduct interviews on the installation year, pipe types and leakage spots as well as survey actual installation points with GIS data and estimate non-revenue water rates roughly by capturing flow volumes so that the statuses of distribution networks will be understood as accurately as possible at the time of project planning, (2) thoroughly examine the implementation structure, schedule and financial backups among the stakeholders at the time of planning to have common understandings on the development of other facilities and equipment that had become bottlenecks to achieve the project objective at a higher level.

(End)

United Republic of Tanzania

Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Reinforcement of Transmission and Distribution Facilities in Oyster Bay Substation (Phase I and II)”

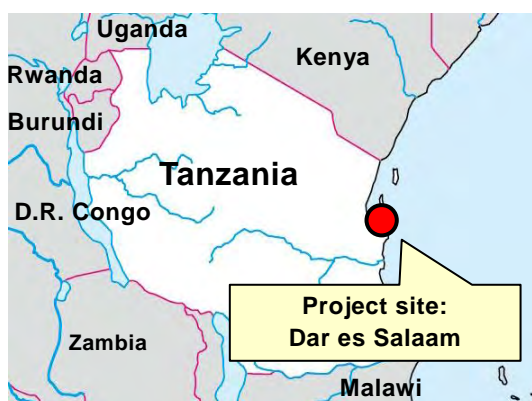
External Evaluator: Hirofumi Azeta,
Japan Economic Research Institute Inc.

0. Summary

The objective of this project was to increase the transmission capacity in Dar Es Salaam in order to ensure stable power supply in the city by constructing a new substation and constructing transmission line between the new and existing substations. This project has been highly relevant to the country’s development plan, and development needs, as well as Japan’s ODA policy. Therefore its relevance is high. It was confirmed that the this project brought about the increase in transmission capacity in Dar Es Salaam, decrease in the electric load of other existing substations, and improvement in power supply including the decrease in power outages, and thus its effectiveness and impact is high. Although the project period was within the plan, the project cost exceeded the plan due to the price increases of materials. Therefore efficiency of the project is fair. Sustainability of the project effect is fair, because of the problems in the financial soundness of the implementing agency. The planned activities in the annual maintenance plan are not completed because of the lack of spare parts.

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

1. Project Description



Project location



Makumbusho Substation developed in this project

1.1 Background

In Tanzania, Tanzania Electric Supply Company Ltd. (TANESCO), which is the sole

electric utility company under the supervision of the Ministry of Energy and Minerals, has developed the power generation facilities and transmission and distribution networks by the support of development partners. However, the capacity of the transmission and distribution facilities including substations had not been fully reinforced because sufficient budget had not been allocated due to the economic turmoil in the early 1980s. The transmission and distribution facilities in urban areas had been overloaded for a long time, which caused power outages very frequently. Thus, electric power transmission losses were huge, power supplies were unstable, and the operational efficiency in transmission facilities was very low.

In Dar Es Salaam, the biggest city in Tanzania, development of transmission and distribution facilities including substations were delayed, as the emphasis was put on the development of electric power generating facilities disproportionately. At the same time, the electric demand was increasing rapidly, according to the economic development and population growth in the city. As a result, transmission and distribution facilities, especially Ilala substation, the key substation in the city, were heavily overloaded and caused many accidents, and power supply in the city was cut for a very long time. The frequent power cuts harmed the daily lives of citizens, paralyzed primary city functions, and damaged economic activities in the city.

This project is a grant aid project to construct a new substation and upgrade transmission and distribution lines, aiming at achieving stable power supplies in Dar Es Salaam, especially in the northern part where power demands were rapidly increasing.

1.2 Project Outline

The objective of this project was to increase power supply to the power users in Dar Es Salaam by constructing New Oyster Bay Substation¹, reinforcing Ubungo Substation and constructing a transmission line (seven km) between the substations.

Grant Limit / Actual Grant Amount	Phase I: 1,813 million yen / 1,792 million yen Phase II: 520 million yen / 474 million yen
Exchange of Notes Date / Grant Agreement Date	Phase I: May, 2008 / - Phase II: March, 2009 / March, 2009
Implementing Agency	Tanzania Electric Supply Company Ltd.
Project Completion Date	Phase I: September, 2010 Phase II: September, 2010
Main Contractor	Mitsubishi Corporation / Takaoka Engineering Co.

¹ New Oyster Bay Substation was renamed as Makumbusho Substation during the project implementation. In this report, it is called as Makumbusho Substation.

	Ltd. (JV) (Procurement, Phase I and Phase II)
Main Consultant	Yachiyo Engineering Co. Ltd.
Basic Design	March, 2007
Related Projects	<p><u>Technical Cooperation</u></p> <ul style="list-style-type: none"> - The Project for Capacity Development of Efficient Distribution and Transmission Systems (2009 - 2014) <p><u>Development Study</u></p> <ul style="list-style-type: none"> - Master plan study on the power sector for major towns (2000 – 2002) <p><u>ODA Loan</u></p> <ul style="list-style-type: none"> - Iringa-Shinyanga Backbone Transmission Investment Project (2010 – 2015) <p><u>Grant Aid</u></p> <ul style="list-style-type: none"> - Dar-Es-Salaam electric power distribution network project (emergency equipment support) (1984) - Dar-Es-Salaam electric power distribution network project (1986-1987) - The project for reinforcement of power distribution network in Dar Es Salaam (1992) - The Project for Power Supply Expansion in Dar es Salaam (1997-1998) - The Project for Power Supply Expansion in Dar es Salaam (Phase 2) (1998-1999) <p><u>Other International Agencies and Donors:</u></p> <p>World Bank</p> <ul style="list-style-type: none"> - Tanzania Energy Development and Access Expansion Project (2007 – 2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hirofumi Azeta, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: August 2013 – September 2014

Duration of the Field Study: January 12 - 25, 2014, April 20 – 26, 2014

3. Results of the Evaluation (Overall Rating: B²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of Tanzania

The needs for infrastructure development for economic growth was emphasized in the Tanzania Development Vision 2025, the national development plan of Tanzania established in 2000, and in the National Strategy for Growth and Reduction of Poverty (NSGRP) in 2005. “Growth and Reduction of Income Poverty” was one of the three main agenda of the NSGRP. This agenda aimed at increasing the living standard of the people, through one of its targets- “provision of reliable and affordable energy to consumers.”

The “National Energy Policy” (2003), the development vision of the energy sector in Tanzania, targeted on achieving stable power supply and increasing the electrification rate in the country. The “Power System Master Plan” (2008), an implementation plan of the “National Energy Policy”, indicated a long-term power generation development plan and transmission and distribution network development plan until 2033.

At the time of ex-post evaluation, “reducing income poverty through promoting inclusive, sustainable, and employment-enhancing growth and development” is one of the main policy objectives of the “Second National Strategy for Growth and Reduction of Poverty” (2010), the national development plan of the government of Tanzania. The strategy targets on enhancing the transmission and distribution network to achieve the increase in the electric power generation amounts and electrification rate in the country. The “Big Results Now!” Initiative, which was started in 2013 to accelerate the “National Five Year Development Plan” (2011/12 - 2015/16), targets increasing electrification rates from 20% to 30% and also increasing per capita electric power consumptions from 97kWh to 236kWh by 2015, and indicate priority projects of generation, transmissions and distributions. This project, which aimed at achieving power supply stability in Dar Es Salaam through increasing transmission capacity and reducing transmission losses, was expected to contribute to the increase in per capita power consumptions. Thus, this project is consistent with the objective of the initiative.

The “National Energy Policy” (2003), the development vision of the energy sector, is valid at the time of ex-post evaluation. The “Power System Master Plan” updated in 2012, which is an implementation plan of the “National Energy Policy”, indicates the transmission and distribution development plan, aiming at achieving stable power supply in the country.

The importance of stable power supply through the reinforcement of the transmission and distribution network was identified in the national development policy

² A: Highly satisfactory, B: High, C: Partially satisfactory, D: Unsatisfactory

³ ③: High, ②: Fair, ①: Low

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

3.1.2 Relevance to the Development Needs of Tanzania

At the time of project planning, the Tanzanian economy was rapidly increasing, and the electric power demand in Dar Es Salaam was also expanding following the economic growth and population expansion. On the other hand, Dar Es Salaam suffered from frequent power outage because the existing transmission facilities were heavily overloaded and outdated, as the development of transmission and distribution facilities could not keep up with the rapid growth in power demand. This is mainly because the government planned privatization of TANESCO from 2002, development partners and the government of Tanzania suspended support and investment to TANESCO, and the transmission and distribution network was not fully reinforced.

At the time of ex-post evaluation, the electric power demand in Dar Es Salaam had been rapidly increasing following the economic growth and population expansion. The average economic growth rate in Tanzania is 7%, and the average annual growth in population in Dar Es Salaam is 5.6% from 2002 to 2012. In the Power System Master Plan, the power demand in Dar Es Salaam is expected to increase by 10% until 2020, and thus further development of substations, and transmission and distribution lines are necessary. At the time of ex-post evaluation, power outage still happens very frequently in Dar Es Salaam.

As the power demand in Dar Es Salaam is still increasing and the power outage happens frequently, it is possible to say that there has been a strong need for a stable power supply. Therefore, it is concluded that this project is consistent with the development needs of Tanzania at the time of project planning and ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

At the time of project planning, one of the main agenda of the "Country Assistance Program for Tanzania" was "Improvement of living environment in urban areas through the development of basic infrastructure." The program also mentioned that the basic infrastructure in Dar Es Salaam was not sufficient to fulfill primary city functions, and further assistance would be necessary.

This project, which aimed at enhancing the power supply stability in Dar Es Salaam through developing electric power transmission and distribution facilities were in line with Japan's ODA policy.

In the light of above, this project has been highly relevant to the country's

development plan, and development needs, as well as Japan’s ODA policy. Therefore its relevance is high.

3.2 Effectiveness⁴ (Rating:③)

3.2.1 Quantitative Effects

3.2.1.1 Increase in transformer capacity in Dar Es Salaam

By constructing Makumbusho substation in this project, the transformer capacity in Dar Es Salaam was expected to increase up to the target mentioned in Table 1. The actual transformer capacity in Dar Es Salaam at the timing of ex-post evaluation exceeded the target as indicated in Table 1.

Table 1: Transformer capacity in Dar Es Salaam

Item	At the time of project planning (2006)	Target (2010)	At the time of ex-post evaluation (2012 ⁵)
132/33kV transformer ⁶	350MVA	440MVA	600 MVA
33/11kV transformer	415MVA	445MVA	493MVA

Source: Basic Design Report, Answers to the Questionnaire by the Implementing agency

90MVA out of 600MVA (132/33kV transformer) and 30MVA out of 493MVA (33/11kV transformer) as of 2012 indicated in Table 1 is the transformer capacity added by the establishment of Makumbusho substation.

3.2.1.2 Reduction in the electric load of Ilala substation

It was expected that the electric load on the overloaded 132/33kV transformers of Ilala substation would be reduced by 19% (25MVA), by transferring the load to Makumbusho substation constructed in this project. Before this project, Ilala substation (primary substation) provided electric power to Msasani substation and Oyster bay substation (secondary substations). Upon completion of the project, Makumbusho substation constructed in this project started providing electric power to these secondary substations. By this change, the electric load of Ilala substation was transferred to Makumbusho substation⁷.

⁴ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁵ The most updated information provided by the execution agency during the ex-post evaluation was as of 2012. Evaluation was made based on this information.

⁶ “132/33kV” is a transformer which steps down 132kV electricity to 33kV. Similarly, “33/11kV” is a transformer which steps down 33kV electricity to 11kV.

⁷ Originally, Ilala substation provided electric power to Oyster bay substation and Msasani substation

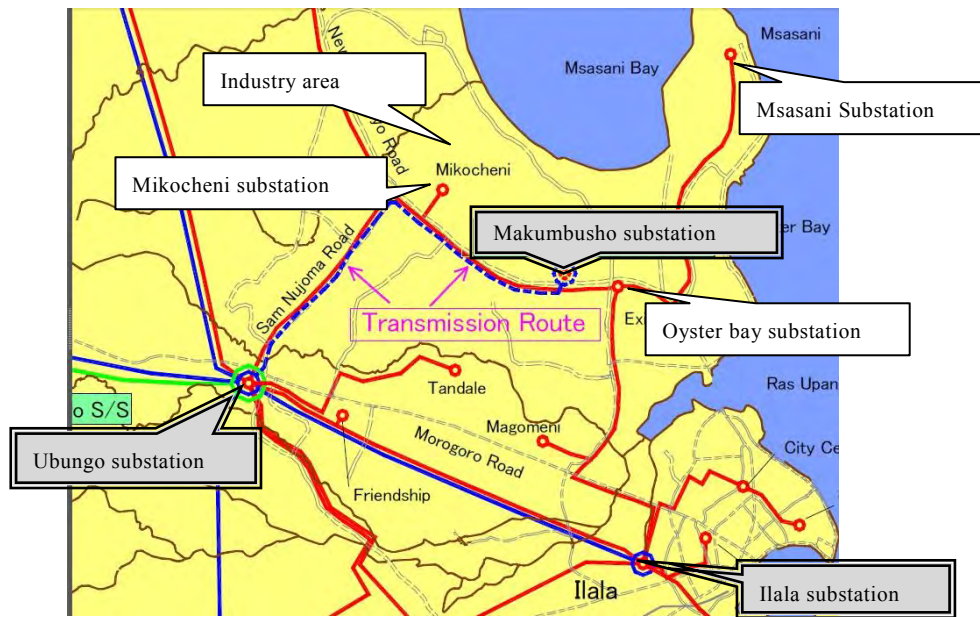


Figure 1: Primary and secondary substations related to this project

The peak demand of Mwasani substation as of 2006 is 9.0MVA and that of Oyster bay substation is 17.5MVA. The electric load, which was supposed to shift from Ilala substation to Makumbusho substation, was therefore 26.5MVA⁸. Similarly, the electric load shifted from Ilala substation to Makumbusho substation as of 2010 is 34.2MVA. Because the basic design study report does not indicate the estimation of electric loads after 2010, the electric load shifted from Ilala substation to Makumbusho substation in 2013 was estimated to be 42.0MVA, based on an assumption that the peak demand of secondary substations increased constantly after 2010.

The electric loads of secondary substation which were shifted from Ilala substation to Makumbusho substation at the time of project planning and at the time of ex-post evaluation are as depicted in Table 2.

(secondary substations). However, at the time of project planning, Ubungo substation, another primary substation in Dar Es Salaam, provided electric power to these secondary substations. In 2006, Ilala substation started providing electric power to these secondary substations again, after two 132/33kV transformers (60MVA) were installed.

⁸ The reduction of the electric load of Ilala substation is 26.5MVA, although it is mentioned as 25.0MVA above.

Table 2: The electric loads of secondary substation shifted from Ilala substation to Makumbusho substation

(Unit: MVA)

	Target at the time of project planning			Ex-post evaluation
	2006 (estimated)	2010 (estimated)	2013 (calculated ⁹)	2013 (Actual)
Msasani substation	9.0	13.9	19.3	15.0
Oyster bay substation	17.5	20.3	22.7	20.0
Total	26.5	34.2	42.0	35.0

Source: Basic Design Report, Answers to the Questionnaire by the Implementing agency

The actual electric load shifted from Ilala substation to Makumbusho substation as of 2013 is 35.0 MVA, which exceed the target at the time of project planning. The peak load of Msasani substation and Oyster bay substation was 15.0MVA and 20.0MVA respectively. However, this is 83% of the calculated target in 2013 (42.0 MVA).

The peak demand of Ilala substation is depicted in Table 3.

Table 3: Peak demand of Ilala substation

(Unit: MVA)

	2006	2007	2008	2009	2010	2011	2012	2013
132/33kV	91	124	178	173	185	184	183	191

Note: The 132/33kV transformer capacity of Ilala substation was 90MVA (72MW) until 2006, and 210MVA (168MW) after 2007. The power factor is 0.8.

Source: Answers to the Questionnaire by the Implementing agency

As the peak demand of Ilala substation as of 2013 is 191MVA, which is within its capacity of 210MVA, Ilala substation is not overloaded. This is due to the fact that the electric load of Msasani substation and Oyster Bay substation was shifted from Ilala substation to Makumbusho substation in 2010. Ilala substation has not experienced power cut (trip) due to overload since 2006.

The information on the electric load of substations and transformers mentioned above was provided by each substation in this ex-post evaluation study, but the same information is not stored in the head office of TANESCO. It is therefore possible to say

⁹ The peak demand of Msasani substation and Oyster Bay substation was estimated up to 2010 in the Basic Design report. The peak demand of Msasani substation increased by 11.5% on average from 2006 to 2010, while the peak demand of Oyster bay substation increased by 3.8%. The peak demand as of 2013 was calculated based on the assumption that the peak demand increased at the same rate after 2010.

that the implementing agency has room for improvement in the information and data management of the substations and transformers.

3.2.1.3 Reduction in transmission loss

At the time of project planning, it was expected that the transmission loss from Ubungo substation to Makumbusho substation reduced from 21.0% to 7.2%.

Because the transmission line between Ubungo substation and Makumbusho substation was constructed as planned, the calculated value of transmission loss between these substations is theoretically 7.2% as planned. The transmission loss rate, measured from the gap between the electric power sent from Ubungo substation and the power received at Makumbusho substation, was 3.1%, reduced by 17.8%¹⁰.

3.2.2 Qualitative Effects

In the ex-post evaluation, the following qualitative effects expected at the time of planning were evaluated as quantitative effects.

- The electric power supply to users (229,000 people) increases according to the enhanced transformer capacity in the city following the installation of 33/11kV transformers at Makumbusho substation.
- The stable operation of Makumbusho substation and its stable power supply is achieved by connecting Makumbusho substation and Ubungo substation by 132kV transmission lines.

The first effect mentioned above is interpreted as the increase in the distribution capacity of Makumbusho substation by installing 33/11kV transformers. As described in Table 1, the distribution capacity in the city exceeded the target. The second effect, the stable power supply by Makumbusho substation, was also achieved through the reduction in transmission losses by connecting Ubungo substation and Makumbusho substation by 132kV transmission lines.

3.3 Impact

3.3.1 Intended Impacts

The intended impacts at the time of project planning were (i) stability in the operation of public facilities and business establishments, (ii) activation of primary city functions and daily lives of citizens, (iii) reduction in the fuel consumptions of in-house power generation facilities, and (iv) reduction in the energy expenses of public facilities and citizens.

¹⁰ The transmission loss rate was calculated from the actual data in January 2014. Because the electric power sent and received were recoded manually, the transmission loss rate might not be accurate.

Through an interview survey with 20 power users, who receive electric power from Makumbusho substation and also from secondary substations connected to Makumbusho substation¹¹, it was identified that power users recognize the increase in the stability of the power supply, such as a decrease in the number of power cuts.



Photo 1: Industrial area where several interviewees are located

Small sized power users which receive power supplies directly from Makumbusho substation answered that the number of power cuts decreased by 93-97%. Large sized power users which receive power supplies from secondary substations answered that the number of power cuts decreased by 90%. In addition, 50% of interviewees answered that the electric voltage was more stable after the project. They also answered that the times and hours that they need to run their in-house power generators decreased as a result.

In addition, it was observed that new business establishments and residence houses were constructed near Makumbusho substation. This is due to the fact that the power supply stability in this area improved after the completion of this project.

At the time of project planning, this project was expected to be a part of the circle of transmission lines surrounding Dar Es Salaam, which was expected to enhance the satiability in the electric power supply in the city. As depicted in Figure 2, a 132kV transmission line between Ubungo substation and Ilala substation was constructed before this project was planned, and the section between Ubungo substation and Makumbusho substation was constructed by this project. The remaining section between Makumbusho substation and New City Centre, and the section between New City Centre and Ilala substation were planned to be constructed by the support of the government of Finland. When completed, the stability of electric power supply in Dar Es Salaam would further improve.

It is therefore concluded that this project contributed to the activation of primary city functions and daily lives of citizens, through achieving stable power supply.

¹¹ Most of the interviewees are manufacturing companies. The number of employees of the interviewees vary from 2-3 to more than 100.

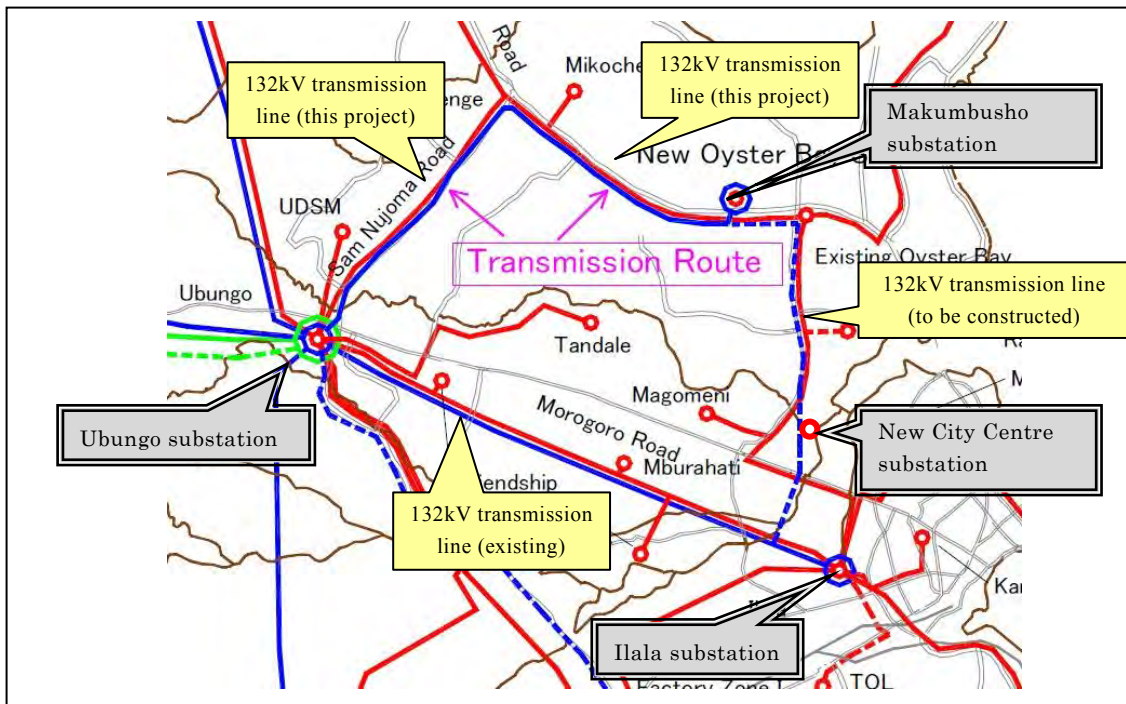


Figure 2: Progress of 132kV circle transmission line development plan in Dar Es Salaam

3.3.2 Unintended Positive Impacts

3.3.2.1 Impacts on the Natural Environment

In this project, environmental impact assessment report was prepared by the implementing agency, which went through technical checks of National Environment Management Council (NEMC), and was approved by the Minister of Environment in 2007. The basic design study report pointed out that (i) it was necessary to consider measures to prevent noises of Makumbusho substation and oil erosion, (ii) transmission lines had to be constructed at the sufficient height and distance to secure public safety, (iii) measures had to be taken to prevent vehicles crashing into transmission poles, and (iv) announcement on the safety distance between transmission lines and residential houses had to be made to neighboring residents.



Photo 2: A transmission pole constructed in road reserves

In this project, sufficient measures were taken to prevent noise and water pollution. Such measures include a three meter high concrete wall, and oil - water separation facilities. Minimum height and offset distance of transmission lines were designed

following the standard in Tanzania. The consultants of this project and the project manager of the implementing agency confirmed that the transmission lines were constructed following the standard.

At the time of planning, construction of crash barriers were considered in order to prevent vehicles crashing into transmission poles. However, as the transmission poles were constructed in road reserves¹² which are several meters away from roads, it was determined to not construct such crash barriers. In the ex-post evaluation, it was confirmed that transmission poles were not constructed near main roads, and any accidents, such as cars crashing into poles, have not happened.

When houses are newly built near the transmission lines, the implementing agency gives a briefing to residents on the safety distance from transmission lines. In case any constructions are made illegally under transmission lines, the implementing agency gives warning to owners upon its three month regular checks and gives orders for removal. When necessary, police execute the orders for removal.

Upon preparing the project completion report (before the completion of the project), the implementing agency confirmed all the comments made in the environmental impact assessment report and that negative impacts on the environment were not made by this project.

3.3.2.2 Land Acquisition and Resettlement

At the time of project planning, the land for the Makumbusho substation (6,400 m²) was owned privately and the government planned to acquire it. The government successfully acquired the land as planned, following the Land Act and Land Acquisition Act and sold it to TANESCO. Upon acquiring the land, the government paid compensations to the private owner and also provided other lands for substitutions. TANESCO then paid the land costs of 310 million TSh to the government. There were not any resettlements, as there were not any residents in the land.

Upon the construction of transmission lines, the implementing agency acquired land of 2,197m² in total, and five households were resettled. The compensation amounts for land were assessed based on the market prices, and determined and paid based on the agreements between owners and the implementing agency, as indicated in Land (Assessment of the value of land for compensation) Regulation 2001. The total compensation amount for land and houses paid to owners were 469 million TSh.

3.3.2.3 Other indirect effects

In this project, the shape of transmission towers employed in this project was

¹² Road reserves are all the state-owned land used for carriageways (paved) and verge (unpaved).

“monopole¹³”. A monopole was employed in Tanzania for the first time in this project. Land acquisition required in case of monopoles is smaller than usual transmission towers, and thus TANESCO employed monopoles in several projects after this.

It was confirmed that the this project brought about the increase in transmission capacity in Dar Es Salaam and decrease in the electric load of Ilala substation, and also that the improvement in power supply achieved by this project activated primary city functions of Dar Es Salaam and the lives of citizens. It was also confirmed that negative impacts on natural environment were not caused by this project, and any problems did not arise in resettlement and land acquisition processes. Based on the above result, it is concluded that this project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating ②)

3.4.1 Project Outputs

The outputs of this project are reinforcement for 33kV distribution facilities, reinforcement for 132kV transmission facilities, and equipment and materials procurement. The first bidding result in August 2008 was canceled, because the lowest bid price exceeded the project budget due to the price increase of construction materials and oil. As a result, this project entered into a second bidding at the same project budget, and the project outputs covered in the bidding was reduced, so that the contract price was within the initial project budget. As a result, a part of 33/11kV distribution facilities was excluded from the project components, and it was determined to be implemented in the second phase. Eventually, this project was implemented through two phases, and the total outputs achieved through two phases are same as the initial plan.

The final outputs and the original plans are compared in Table 4 below.

¹³ A monopole tower is usually employed for transmission lines in urban area. This is mainly because monopole towers do not harm landscape more than usual transmission towers. For the actual shape of a monopole tower, see Photo 2.

Table 4: Comparison of Original and Actual Outputs

	Plan			Actual	
	Before separating project	After separating project scopes		Phase 1	Phase 2
		Phase 1	Phase 2		
Reinforcement for 33kV Distribution Facilities					
A Procurement & Installation of Equipment & Materials for 33kV & 11kV Distribution at New Oyster Bay Substation					
(1) 33kV switchgears	12 feeders	5 feeders	7 feeders	5 feeders	7 feeders
(2) 11kV switchgears	8 feeders	0 feeder	8 feeders	0 feeder	8 feeders
(3) 33kV control & protection panel	4 units	3 units	1 units	3 units	1 unit
(4) 11kV control panel	1 unit	0 unit	1 unit	0 unit	1 unit
(5) 132/33/11kV meter panel	2 units	1 unit	1 unit	1 unit	1 unit
(6) 33/11kV distribution transformer (15MVA)	2 units	0 unit	2 units	0 unit	2 units
(8) Station service transformer (33/0.4kV, 100kVA)	2 units	1 unit	1 unit	1 unit	1 unit
(7) Station service facilities (DC · AC)	1 set	1 set	-	1 set	-
(9) Dead end steel tower (gantry type)	1 set	1 set	-	1 set	-
(10) Earthing system (including conductors)	1 set	1 set	-	1 set	-
(11) Outdoor lighting system	1 set	1 set	-	1 set	-
(12) Fire extinguisher (ABC, portable type)	1 set	1 set	-	1 set	-
(13) 33kV XLPE cables	1 set	1 set	1 set	1 set	1 set
(14) 11kV XLPE cables	1 set	-	1 set	-	1 set
(15) Construction of central building (363m2, one-story building)	1 set	1 set*		1 set*	
(16) Associated civil facilities	1 set	1 set*		1 set*	
Reinforcement for 132kV Transmission Facilities					
B Procurement & Installation of Equipment & Materials for 132kV Transmission at New Oyster Bay Substation					
(1) 132kV feeder equipment	1 set	1 set	-	1 set	-
(2) 132kV switchgear	1 set	1 set	-	1 set	-
(3) 132/33kV main transformers (45MVA)	2 units	2 units	-	2 units	-
(4) 132kV control & protection panels	1 set	1 set	-	1 set	-
(5) Earthing equipment	1 set	1 set	-	1 set	-
(6) Associated civil facilities	1 set	1 set*		1 set*	
C Procurement & Installation of 132kV Lead-out Equipment at Ubungo Substation					
(1) Dead end steel tower (gantry type)	1 unit	1 unit	-	1 unit	-
(2) 132kV lead out equipment	1 set	1 set	-	1 set	-
(3) 132kV switchgear	1 set	1 set	-	1 set	-
(4) Transfer of existing voltage measuring instrument (CVT)	1 set	1 set*		1 set*	
(5) Modification of existing control system	1 set	1 set*		1 set*	
(6) Earthing system	1 set	1 set	-	1 set	-
(7) Associated civil facilities (foundation, etc.)	1 set	1 set*		1 set*	
D Construction of 132kV Transmission Lines (Ubungo Substation to New Oyster Bay Substation)					
(1) 132kV transmission pole foundation	1 set				
(2) 132kV transmission monopole	38 units	38 units	-	38 units	-
(3) Materials for transmission line (conductors, insulators & earthing)	1 set	1 set	-	1 set	-
Equipment & Materials Procurement Plan					
E Procurement of the following equipment & materials					
(1) 33kV lighting arresters	12 units	6 units	6 units	6 units	6 units
(2) 11kV lighting arresters	12 units	0 unit	12 units	0 unit	12 units
(3) Spare parts for equipment & materials, maintenance tools	1 set	1 set	-	1 set	-

*Tanzanian portion

Source: Basic design study report, Project completion report

The planned project outputs were mostly achieved through the first and second phases of this project. In the first phase, only minor changes in project specifications were made, such as changes in the size of basements, changes in the heights of poles, and changes in the location of fences and gates. In the second phase also, major changes were not made. One of the minor changes in the second phase was made on the location of cables.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The project cost planned to be covered by the Japanese side was 1,807 million Japanese Yen, and other costs planned to be covered by the Tanzanian side was 47 million Yen. The planned and actual project cost covered by the Japanese side is compared in Table 5. It indicates that the project costs covered by the Japanese side through the first and second phase, was 2,266 million Yen, which was 25% more than the planned project cost. The increase in the project cost was inevitable, as this was because of the price hike of steel, the main material for the transmission and distribution lines, and oil.

Table 5: Comparison of Original and Actual Project Costs (Japanese Portion)

(Unit: million yen)

Item	Planned	Actual		
		Phase I	Phase II	Total
Constriction cost	541	0	0	0
Equipment cost	1,166	1,715	452	2,167
Detailed Design and Supervision Work	100	77	22	99
Total	1,807	1,792	474	2,266

Note: Actual equipment cost include construction cost

Source: Basic design study report, Project completion report

The actual project cost covered by the Tanzanian side, which was 97 million Yen, exceeded the planned cost, shown in Table 6. The actual project cost does not include the construction costs for removing existing 33kV distribution lines, as it was not identified in the ex-post evaluation study. The reason why the project cost of the Tanzanian side increased is that the land cost, which was not determined to be covered by the government or TANESCO, was covered by TANESCO. TANESCO was also demanded by Tanzania National Roads Agency to pay 41 million (831 million TSh) for the change in the planned location of street light.

The costs for the change in the planned location of the street light include design costs and material costs, as the location of street lights on Sam Nujoma Road were changed because of this project.

Table 6: Comparison of Original and Actual Project Costs (Tanzanian Portion)
(Unit: million Yen)

Item	Plan	Actual
Land creation cost, etc. for new substations	26	17
Construction cost for removing underground infrastructure on 132kV transmission route	16	
Construction cost for removing 33kV distribution lines	5	N/A
Costs for the change in the location of planned location of street light (Design and equipments)		41
Land acquisition cost		39
Total	47	97

Source: Basic design study report, documents provided by the implementing agency

Evaluation on the project cost was made only on the Japanese portion, as a part of actual costs of the Tanzanian portion was not identified in the ex-post evaluation.

3.4.2.2 Project Period

The initial planned project period was 31 months, which was revised to be 33 months until February 2011 upon re-bidding of the first phase of the project¹⁴. Among several project processes, which were implemented in parallel in two project phases, the longest was the construction of 132kV transmission lines, and it was planned to be completed in February 2011. The detailed project schedule of the construction of 132kV transmission line is as indicated in Table 7. The removal of 33kV distribution line was planned to be started after the E/N of the second phase was concluded in March 2009.

Table 7: Detailed project schedule of 132kV transmission line construction

Item	Period
(Tanzanian portion) Removal of 33kV distribution lines on Sam Nujoma Road	March 2009 - October 2009
Construction of foundation for 132kV transmission lines	October 2009 - April 2010
Construction of monopoles	April 2010 - November 2010
Installation of 132kV transmission lines	November 2010 - February 2011

Source: Detail design study report of the second phase

The actual project period of the first phase was 28 months (from May 2008 to September 2010) and the second phase was 18 month (from March 2009 to September

¹⁴ Detailed design survey of the second phase.

2010). The project period in total was 28 months, which was 85% of the planned project period (within the planned project period).

As mentioned above, this project was completed in May 2009, five months earlier than the planned completion date. This was achieved by starting the removal of 33kV distribution lines (Tanzanian portion) before concluding the E/N of the second phase of the project, based on the discussions between the project consultant and the implementing agency. Accordingly, the following project process of the construction of the 132kV transmission line was also completed five month early, and ultimately the project itself was completed ahead of schedule, in September 2010.

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

3.5 Sustainability (Rating: ②)

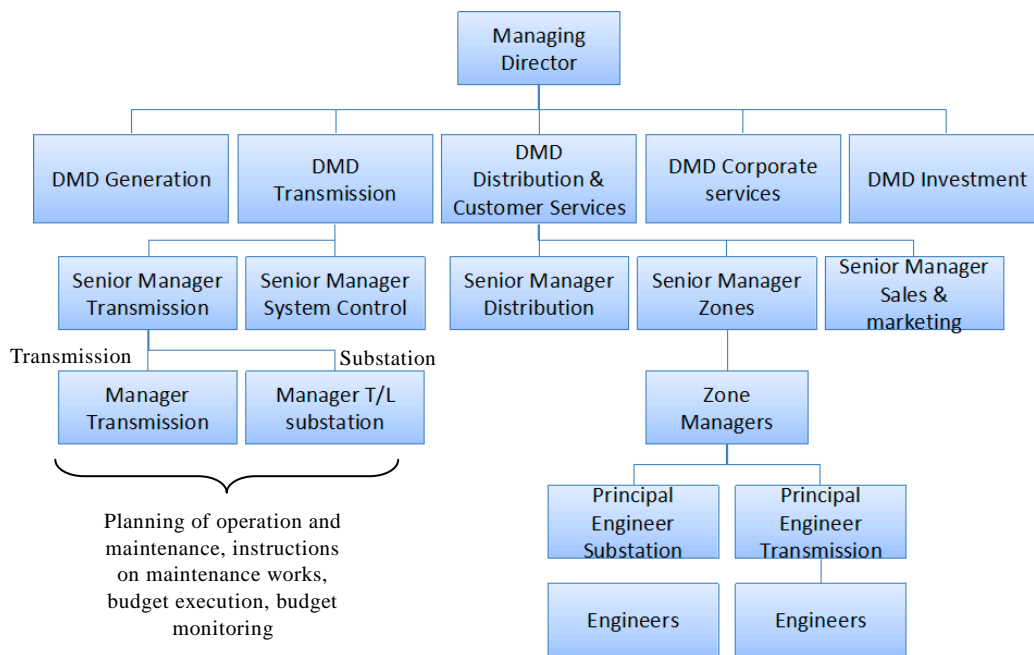
3.5.1 Institutional Aspects of Operation and Maintenance

TANESCO, the implementing agency of this project, is the sole electric utility company in Tanzania (excluding Zanzibar). It has units for generation, transmission and distribution, and the total number of staff members as of December 2013 is 5,936.

At the time of planning, the transmission and substation department was supposed to be responsible for the operation and maintenance of Makumbusho substation. At the time of ex-post evaluation, the Manager Transmission Line Substation under the transmission business unit at head office, which was established in the organizational reform in 2011, is responsible for the planning, budget execution, and budget monitoring of the operation and maintenance of substations. The actual operation and maintenance works of substations are carried out under the responsibility of principal engineers at zone offices¹⁵, by the instruction of the Manager Transmission Line Substation. The responsibilities in the substation maintenance are therefore separated for those of the Manager Transmission Line Substation at the head office and those of principal engineers substations at zone offices.

Similarly, the Manager Transmission at head office is responsible for the planning and budget of the operation and maintenance of transmission lines, while the actual operation and maintenance works of transmission lines are the responsibility of principal engineers transmission at zone offices.

¹⁵ There are five zone offices in Tanzania. The transmission lines and the substation constructed in this project is the responsibility of Dar Es Salaam and Coastal zone office.



Source: Documents provided by the implementing agency

Figure 3: Organization structure of TANESCO (for operation and maintenance)

In the Dar Es Salaam and Coastal zone office, there are twenty engineers and staff members in charge of substations and ten engineers and staff members for transmission. It has been pointed out that the number of the engineers and staff is not enough, because engineers at Dar Es Salaam zone office support other zone offices very often. As a result, they complete only 90% of planned maintenance works of substations¹⁶.

The operation of the Makumbusho substation is the responsibility of the Kinondoni North regional office. At the Makumbusho substation, eleven people (two engineers per shift x four shifts, and three managers) are stationed for 24-hour monitoring, as in the initial plan.

Based on the above, it is concluded that the institutional aspect of operation and maintenance has minor problems, as the number of staff for operation and maintenance is not always sufficient, although engineers and staff were assigned as planned.

3.5.2 Technical Aspects of Operation and Maintenance

Engineers in TANESCO have obtained basic technical skills necessary for the operation and maintenance of transmission lines and substations, through their experiences in actual operations. They also received OJT for the operation and maintenance of Makumbusho substation, which was provided by the Japanese contractors

¹⁶ Source: Interviews with the implementing agency

during the installation and test operation period of this project.

Training on the operation of substations has been provided since July 2012 by TANESCO Training School (TTS), which was established in 2011. All engineers and staff members in Dar Es Salaam and Coastal zone office received training on the planning and practical works of substation maintenance. The durations of training are based on the level of engineers and staff, which vary from four weeks to three months. Engineers and technicians receive four week training, while artisans receive three month training.



Photo 3: TANESCO Training School

Training on transmission and its training curriculum were under preparation at the time of ex-post evaluation. Technical level on transmission has been enhanced through internal OJT and staff dispatches to projects by development partners.

At the time of ex-post evaluation, any transmission lines or substations were not identified, which have problems in maintenance due to the technical problems at TANESCO.

3.5.3 Financial Aspects of Operation and Maintenance

The maintenance budget of TANESCO in 2012 was 58,731 million TSh and the execution was 24,160 million TSh. The basic design study of this project indicated that the annual cost for the spare parts necessary for the maintenance of the substation facilities is 220 million TSh. The annual cost is much smaller than the annual maintenance budget and its un-executed amount, thus it is possible to say that the implementing agency has sufficient budget for the maintenance of the facilities developed in this project.

The maintenance budget and execution of TANESCO is as indicated in Table 8.

Table 8: Maintenance budget and execution of the implementing agency
(Unit: million TSh)

	Budget (mil TSh)	Execution (mil TSh)	Execution rate
2005	11,804	9,263	78.5%
2006	8,289	5,989	72.3%
2007	56,447	5,316	9.4%
2008	42,296	15,136	35.8%
2009	45,033	24,262	53.9%
2010	43,030	25,230	58.6%
2011	41,683	28,675	68.8%
2012	58,731	24,160	41.1%

Source: Documents provided by the implementing agency

The annual budget of the implementing agency is prepared before late December of the previous year. Based on this, the departments in charge of maintenance start preparing the annual maintenance plan, submit the plan to the procurement department in the head office, and then send the procurement requests for equipment. It takes at least five months for the procurement of equipments and materials. Normally it takes seven - eight months, because procurement documents need revisions in many cases. Other reasons for the delays in the procurement process would be the heavy work loads at the procurement department, and that the human resources at the procurement department might not be enough for its work load. As a result, the planned activities in the annual maintenance plan are not completed because of the lack of spare parts, when the departments in charge of maintenance do not have enough stocks of spare parts¹⁷.

In addition, the procurement process of equipments and materials are sometimes suspended because of the lack of available funds at TANESCO due to its deficits. As a result, departments in charge of maintenance cannot obtain spare parts necessary for maintenance. Due to the reasons mentioned above, the execution rate of the maintenance budget is not high.

The income statement and balance sheet of the implementing agency is as in Table 9 below.

¹⁷ It is also pointed out that one of the reasons for the inefficiency in the procurement process is that the specification of procured equipments and materials are not standardized in TANESCO.

Table 9: Income statement and balance sheet of the implementing agency
(Unit: million TSh)

	2010	2011	2012
Revenue	466,477	545,658	820,436
Cost of sales	(492,252)	(753,397)	(1,162,437)
Gross profit/loss	(25,775)	(207,739)	(342,001)
Selling and general administrative expenses	(80,874)	(106,277)	(130,956)
Operating profit/loss	(106,649)	(314,016)	(472,957)
Non-operating income	107,628	282,754	300,808
Non-operating expense	(44,908)	(44,949)	(51,934)
Ordinary profit/loss	(43,929)	(76,211)	(224,083)
Extraordinary profit/loss			
Profit/loss before tax	(43,929)	(76,211)	(224,083)
Income tax	0	0	0
Profit/loss for the year	(43,929)	(76,211)	(224,083)
	2010	2011	2012
Current assets	333,672	425,134	583,511
Non-current assets	2,232,921	2,488,213	2,735,329
Total asset	2,566,593	2,913,347	3,318,840
Current liabilities	486,103	674,968	1,207,967
Non-current liabilities	842,741	1,042,671	1,090,594
Total liabilities	1,328,844	1,717,639	2,298,561
Total equity	1,237,749	1,195,708	1,020,279
Total equity and liabilities	2,566,593	2,913,347	3,318,840

Source: Documents provided by the implementing agency

The revenue of TANESCO has increased following the increase in the amount of electricity sales. However, because the cost of sales has increased more rapidly than revenue, the gross loss of TANESCO has also increased. The cost of sales increased because the amount of electric power that TANESCO purchased from emergency power producers (EPPs) significantly increased, due to the fact that the electricity supply by the power plants of TANESCO could not meet the increasing demands in the country. As a result, TANESCO has constantly purchased electricity from EPPs, not only for emergency cases, although the unit price of power purchase from EPPs are set higher than the unit sales price of TANESCO. In order to cover the deficits from the power purchases from EPPs, the government has provided subsidies to TANESCO (subsidies are included in non-operating profits of TANESCO).

At the end of 2013, the electricity price was increased by 40%, and TANESCO is

expected to achieve net profit of 35,000 million TSh in 2014¹⁸. At the same time, the government significantly reduced the amount of subsidies for TANESCO. However, it is difficult for TANESCO to clear the accumulated losses by the profit in a short time, because no matter if TANESCO achieves the net profit mentioned above, it takes 28 years to clear its accumulated losses of 982,676 million TSh.

TANESCO is aiming at increasing the domestic power supplies by completing several electric power generating plants after 2014, and also by developing pipelines to send domestically produced natural gas to power plants by around 2016, in order to reduce power purchase from EPPs and to improve its financial status.

Based on the above result, it is concluded that there are some problems in terms of financial aspects. As mentioned above, there are some concerns about the procurement of spare parts and the execution of the maintenance budget, although the implementing agency seems to have allocated enough budgets for operation and maintenance. Besides, the implementing agency cannot clear its accumulated losses, although it expects to make net profits.

3.5.4 Current Status of Operation and Maintenance

The maintenance status of the substations and transmission lines constructed in this project is good. There are not any problems which need repair work and which have not been repaired for long time. The transmission lines in Dar Es Salaam and Coastal zone, which experienced problems at least once a year until several years ago, went through replacement of decrepit equipments and parts, and have not experienced any serious problems recently.

However, all the maintenance works included in the annual maintenance plan of TANESCO as a whole have not been implemented, mainly because of the delays in the procurement of spare parts necessary for maintenance works. It is also because of the lack of human resources at Dar Es Salaam and Coastal zone office, which is in charge of the maintenance of Makumbusho substation. Human resources of the zone office are not always sufficient, as it provides support to other zone offices.

Based on the above results, it is concluded that some problems have been observed in terms of financial aspects. All maintenance works are not implemented due to the delays in the procurement of spare parts, and temporary shortages in human resources,

¹⁸ Based on the documents provided by the implementing agency (revised in the ex-post evaluation study). In the document provided by the implementing agency, it prepared a profit forecast based on the assumptions that the electricity rate is increased by 67.87% and that it received subsidies from the government. However, the government decided to increase the electricity rate by 40% and to reduce subsidies significantly. These changes in assumptions were reflected in the profit forecast of this ex-post evaluation study.

however serious problems were not identified in the operations of transmission lines and substations. The financial status of the implementing agency is not strong enough, thus it would not be able to clear its accumulated losses in short term in spite of its expected net profits. Therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project was to increase the transmission capacity in Dar Es Salaam in order to ensure stable power supply in the city by constructing a new substation and constructing transmission line between the new and existing substations. This project has been highly relevant to the country's development plan, and development needs, as well as Japan's ODA policy. Therefore its relevance is high. It was confirmed that the this project brought about the increase in transmission capacity in Dar Es Salaam, decrease in the electric load of other existing substations, and improvement in power supply including the decrease in power outages, and thus its effectiveness and impact is high. Although the project period was within the plan, the project cost exceeded the plan due to the price increases of materials. Therefore efficiency of the project is fair. Sustainability of the project effect is fair, because of the problems in the financial soundness of the implementing agency. The planned activities in the annual maintenance plan are not completed because of the lack of spare parts.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Improvement in the institutional aspects of maintenance

In the implementing agency, the organizational structure for maintenance, responsibilities in maintenance, and budget allocation for maintenance are not consistent among each other. The Manager Transmission Line Substation at the head office has responsibilities in the budgeting and planning of maintenance of substations and gives instructions of maintenance works to zone offices, while actual maintenance works of substations are the responsibilities of zone offices.

As a result, inefficiency in maintenance works was observed because the responsibilities in maintenance are not necessarily clear in the implementing agency. Therefore it is recommended that the implementing agency enhances the coordination among departments and offices in charge of maintenance to achieve efficiency and timeliness in the planning and execution of maintenance works and budget.

4.2.1.2 Improvement in spare parts procurement

The implementing agency has not implemented all the maintenance works indicated in its annual maintenance plan, due to the fact that the materials and equipments necessary for maintenance have not been procured on time. This is mainly because the budget of the implementing agency is approved right before the beginning of next fiscal year, and then the implementing agency starts preparing its annual maintenance plan and procurement plan. Therefore there is room for improvement in the planning aspects of procurement processes.

One of the possible improvements in the procurement planning is setting up a temporary budget for the next fiscal year in July of the previous fiscal year, having it internally approved, and start preparing its annual maintenance and procurement plan for the next fiscal year. In that case, it would be possible for the implementing agency to have the delivery of procured materials and equipments from the beginning of the fiscal year, by starting the preparation of procurement six months before the beginning of the fiscal year, no matter if procurement requires designated periods.

4.2.1.3 Enhancement in the financial soundness of the implementing agency

It is necessary for TANESCO to continue its efforts to improve its financial soundness, as it is not possible for TANESCO to clear its accumulated loss in a short run, in spite of its expected net profits. TANESCO especially needs to make sure that the development of electric power generating facilities are completed on time, so that it can reduce the power purchases from EPPs, which have been the main reason for the recent increase in its cost of sales.

4.2.1.4 Enhancement in the data management of transmission

Although each substation has the electric load data of each transformer in the substation, its monthly report submitted to System Control at the head office indicates the electric load of the substation as a whole and does not include such transformer-wise data. Therefore, it is difficult for the implementing agency to set up a plan for the reinforcement of substations based on transformer-wise electric load data. In the long run, constructing a mechanism to automatically collect data from substations would be possible. However, in the short run, it is recommended to revise the existing monthly report format to include transformer-wise electric load data of each substation. When receiving such data from substations, System Control at the head office is recommended to analyze the data and then give the feedback to Senior Manager Research and Investment regularly, who is responsible for investment planning at TANESCO.

4.2.2 Recommendations to JICA

Development partners, including the World Bank and International Monetary Fund, have provided supports for the enhancement of financial soundness of TANESCO, and monitored the progresses. JICA is recommended to continue its coordination with other development partners including the World Bank to make sure the implementing agency makes progress. It is especially recommended for JICA to monitor the progress of the development of electric power generating facilities to confirm that the implementing agency can reduce or cease the power purchases from EPPs when the generating facilities are completed at the end of 2014, as the power purchases from EPPs are the main reasons for the increase in the domestic electricity costs.

4.3 Lessons Learned

4.3.1 Improvement in the procurement process at the implementing agency

According to the implementing agency, some maintenance works are not implemented as planned due to the delays in procurements, despite that it has sufficient budget for maintenance. When similar problems happens in the infrastructure sector including power sector in Tanzania and other countries, it is desirable to provide training and technical supports for the improvement in budget formulation and procurement processes. Such technical supports would include capacity building for procurement planning and capacity development for the preparation of procurement documents.

4.3.2 Flexibility in revising project implementation schedule by the coordination between Japan and recipient country

In this project, delay in the project implementation was expected when the project schedule was revised upon re-bidding. In the revised project implementation schedule, the longest process of the project implementation was the construction of a 132kV transmission line. The sequence to complete this process was the construction by the Tanzanian side, civil works by the Japanese side, construction of monopoles for transmission lines, and installation of 132kV transmission lines.

In order to shorten the project period, the construction of the Tanzanian portion was started before concluding E/N of the second phase of the project, so that the construction of the Japanese portion could start ahead of the planned schedule, based on the discussions between the project consultant and the implementing agency. By this flexibility in revising project implementation schedule, the project was completed in a shorter period, in spite of the expected delays. As a result of the shortened project period, increase in additional costs such as equipment rental costs or personnel costs were avoided.

When delays in project implementations are expected in other project for any reasons, it is important to keep the flexibility in the project implementation schedule to avoid delays, such as by revising the project schedule of both the Japanese portion and the recipient portion.

(End)

0. Summary

This project, which improved the function of road network by developing the bridges on major secondary trunk roads in Zambezia and Tete provinces, the northern parts of Mozambique, was highly relevant to Mozambique’s development plan and development needs as well as Japan’s ODA policy. Its effectiveness and impact were also high because alleviating vehicle weight limits of the bridges, eliminating traffic closures in rainy season and ensuring traffic safety at target bridges constantly contribute to regional economic growth and improved access to social services. The efficiency of this project is fair because both project cost and project period exceeded the plan by unsuccessful bidding, increase of the price of supplies and change of a part of the project scope. For operation and maintenance, a staff shortage at the implementing agency affects the current maintenance and operation conditions and the management of outsourcing contractors, including their technical aspect. Also, based on the financial aspect, further efforts are required to secure the necessary budget and implement appropriate maintenance and operation as well as to improve the budget allocation schedule in a timely manner. The sustainability of this project is therefore fair. In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Location



Improved Bridge (Licungo Bridge)

1.1 Background

The road network in Mozambique was seriously damaged due to a prolonged civil war and a lack of road maintenance activities. Since the civil war ended in the mid-1990s, an emergency project to improve the road network has been implemented, assisted by foreign countries, and the major trunk

roads have been swiftly rehabilitated. The Mozambique government implemented the road/bridge improvement plan in three phases from 2001. Phase I involved maintaining the road network, implementing high-priority rehabilitation projects of road/bridge and formulating a long-term plan to improve roads. Phases II and III included plans for regular and periodical maintenance activities and rehabilitation of roads/bridges, which were categorized as high priority in phase I.

The projects for the road/bridge improvement plan that had been implemented were mainly for major trunk roads. The target road of phase II was placed on the regional trunk road but the secondary trunk road in the region was still outside the target scope. Conversely, there was a need to secure stable traffic on this road to enlarge the transportation volume of agricultural and mineral produce, which was essential to regional economic growth. To support the road/bridge improvement plan, a “Road Fund”, mainly financed by petroleum tax, was established to generate special revenue for road improvement by the Mozambique government. However, it primarily went to routine work involving maintenance of the existing road network system. Accordingly, most of the rehabilitation and improvement projects for the road network were carried out by donations from foreign countries and international organizations.

Under these circumstances, the Mozambique government requested the assistance of Japanese government with the bridges improvement project, which was part of the secondary trunk road network in the two northern provinces. In response, the Japanese government decided to implement the project with the expectation of substantial contribution to regional development¹.

1.2 Project Outline

The objective of this project is to improve a safe and smooth road network by rehabilitating and constructing bridges on major secondary trunk roads in Zambezia and Tete provinces, the northern parts of Mozambique.



Figure 1: Location of target bridges

Source: Basic design study report
 Note : ● Target bridge ■ Major city ● Port

¹ Basic Design Study Report

Grant Limit / Actual Grant Amount	1,889 million yen / 1,845 million yen
Exchange of Notes Date	May, 2007
Implementing Agency	National Roads Administration (ANE)
Project Completion Date	December, 2010
Main Contractor(s)	Konoike Construction Co., Ltd.
Main Consultant(s)	Chodai Co., Ltd., Nippon Koei Co., Ltd.
Basic Design	August, 2005 - December, 2006
Detailed Design	February - November, 2007
Related Projects	<p>Grant Aid Project</p> <ul style="list-style-type: none"> • “The Project for Reconstruction of Bridges on Main Roads” (1997 – 2000) Construction or rehabilitation of 13 bridges on national roads 1, 282 and 7. • “The Project for Reconstruction of Bridges on Main Roads(Phase 2)” (2000– 2003) Construction or rehabilitation of 14 bridges on national roads 8, 232, 104, 225. <p>Other International Organization</p> <ul style="list-style-type: none"> • World Bank “Roads and Bridges Management and Maintenance Program” (2001 – 2007) (2007 – 2013) • Sweden/EU/Italy “Design and Construction of Zambezi River Bridge, Mozambique” (2005-2009) Construction of 2,340 m long bridge on Zambezi river to connect national road 1

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Ernst & Young Sustainability Co., Ltd.

2.2 Duration of Evaluation Study

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

Duration of the Field Study: January 14 – February 14, 2014, April 22 – May 7, 2014

3. Results of the Evaluation (Overall Rating: B²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of Mozambique

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

³ ③: High, ② Fair, ① Low

The Mozambique's mid-term development plan, "National Reconstruction Plan (PRN)" (1993), at the time of project planning had promoted national reconstruction after the civil war. The target of this plan was cited as "resettlement and reintegration" initially, followed by "reconstruction and development". To achieve this target of this plan, with the focus on improving transportation capability, the government developed the "Roads and Coastal Shipping Project (ROCKS)" (1993-2000) and decided to reconstruct trunk road to the major harbor cities for transportation and the north-south trunk road connecting the capital with main or north harbor cities. In addition, the development plan at the time of ex-post evaluation, "Poverty Reduction Action Plan (PARP)" (2011-2014), set the goal of reducing the poverty rate to 42% to combat poverty and promote improvement of a workforce through comprehensive economic growth and reduction of national poverty and vulnerability. The priority areas of PRAP are as follows: 1) boosting production and productivity in agriculture and fisheries 2) promoting employment 3) human and social development 4) governance and 5) macroeconomic and financial management. Among these priority areas, the importance of developing road network is shown in 1), since it is cited as infrastructure development to boost the agriculture and fisheries sector.

The road and bridge sector at the planning stage developed "Road III", a decade-long plan comprising three phases, in 2000, to improve roads and bridges. Although work to maintain and improve major trunk roads was mainly implemented to facilitate access between major cities, the policy highlights the importance of maintaining secondary trunk roads connecting major regional cities; aiming to redress north-south economic gaps and vitalize regional economic growth by providing the stabilized distribution of products. At the time of ex-post evaluation, the "Road Sector Strategy (RSS)" (2007-2010) is in the process of updating⁴. The plan aims to secure the mobility needed to boost productivity and expand a reliable road network to promote regional development; both of which spawn a strong society and economy. RSS is the basis for the "Integrated Road Sector Program (PRISE)". PRISE is developed every three years and shows an investment plan, including human development, regular and periodical maintenance activities, rehabilitation and renovation of paved and unpaved roads and also construction of new roads.

Accordingly, this project, which implemented the improvement of bridges on major secondary trunk roads, was highly relevant to Mozambique's development plan at the planning stage as well as ex-post evaluation.

3.1.2 Relevance to the Development Needs of Mozambique

The 2004 actual data on transportation in Mozambique⁵ shows that 43.6% and 97.2% depend on roads for freight and passenger transportation, respectively, so improving the road network is expected to contribute to the economic development of the country. The data has not been updated since 2004 but interviews with the implementing agency and Road Fund indicate continuing heavy

⁴ Based on interviews with the Mozambique Road Fund, an updated RSS will follow and continue the current RSS because many plans in RSS (2007-2010) were not implemented due to budget shortfalls.

⁵ Basic Design Study Report

dependence on the road.

The country's economy has been developed around Maputo, the Mozambique capital, in the southern region, meaning the northern region remains behind the curve in terms of economic development. In fact, at the time of the project planning, 67% of roads were unpaved in Zambezia province and 60% in Tete province of the northern region, as compared to the 55% national average⁶. Although both provinces have the potential for further economic growth, with farm products in Zambezia province and mineral resources in Tete province, maintenance of roads and bridges has not been properly implemented for transporting products to major cities. At the time of ex-post evaluation, the levels of unpaved roads in Mozambique and Zambezia province were still 59% and 62%, respectively. Considerable room for improvement also remains in Tete province, although the fact that many foreign companies started up mineral resource businesses led to infrastructure improvement, resulting in a 54% unpaved rate, slightly exceeding the national average of 59%⁷. In addition, at the planning stage, 22% and 49% of total bridges had not been properly maintained in Zambezia and Tete provinces, respectively⁸. Bridges devastated by civil war, flooding, heavy trucks or deterioration hindered transportation to cities as well as regional economic activities. No current data on inadequate bridges is available but a list of bridges is being compiled by the implementing agency, which suggests that they acknowledge the importance of bridges. Thus, the unpaved rates of roads and bridges are still high; hindering smooth transportation at the time of ex-post evaluation. Accordingly, there is still a considerable need to improve bridges.

3.1.3 Relevance to Japan's ODA Policy

The priority aid areas in the Country Program for Mozambique at the time of planning include social sector, agriculture and rural development and human resource development⁹. The social sector indicates that reducing delays in the development of roads and bridges is prioritized for poverty reduction and economic growth; both of which are relevant to Japan's ODA policy.

Considering the above, this project was highly relevant to Mozambique's development plan and needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Effectiveness¹⁰ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

3.2.1.1 Alleviation of the Vehicle Weight Limit

The vehicle weight limit is expected to be alleviated at four bridges (Licungo II, Licungo III, Cuacua I and Cuacua II) after the replacement at this project. At the time of ex-post evaluation,

⁶ Basic Design Study Report

⁷ Report of Transit Ability Condition – second quarter, 2012

⁸ Basic Design Study Report

⁹ 2005 Country data book

¹⁰ Sub-rating for Effectiveness is to be put with consideration of Impact.

the implementing agency confirmed that the strength had been improved and the vehicle weight limit was alleviated from 25 to 48 tons at 3¹¹ bridges (see Table 1 below). Consequently, the traffic of the bridges, which was impassable before the project implementation, is available for heavy trucks year-round.

Table 1 Vehicle weight limit at target bridges

Bridge	Baseline (2005)	Planning target (2010)	Actual (2013)
Licungo II	Limit of 25 tons	Alleviate vehicle weight limit	Limit of 48 tons
Licungo III			
Cuacua I			
Cuacua II			Canceled

Source: Basic design study report and documents provided by the implementing agency

The Cuacua II bridge (Cuacua II), which was canceled under this project, was still limited to a capacity of 28 tons at the time of the ex-post evaluation¹². In fact, the Cuacua I bridge (Cuacua I) is also unavailable for vehicles weighing over 28 tons because Cuacua I and II are adjacent. However, the conditions of Cuacua I and II, which were impassable during certain periods of the rainy season before implementing the project, have far improved. As the capacity of Cuacua II is still limited to 28 tons, Cuacua I is also under the same situation. Thus, a question for the exceeded design of Cuacua I was raised because currently no major issues emerged with the vehicle limitation of 28 tons. However, the project complied with the South African Technical Textile Cluster (SATTC) standard, which set a standard for weight limit of only 48 tons or 9 tons. Since the design for 9 tons was not able to respond the situation, the target bridges of this project were designed for 48 tons. Accordingly, the design of Cuacua I is considered reasonable¹³. Furthermore, ANE explained that the construction of the Cuacua I with the design for 48 ton, as a permanent bridge, has a great significance for future regional economic development.

3.2.1.2 Increase in Traffic Volume

The project neither originally indicated any increase in traffic volume as an operation and effect indicator nor set any target volume. However, the information on traffic volume before and after the project was available at the implementing agency and was thus used as a reference.

As shown in Table 2, the traffic volume have nearly doubled for the Licungo II bridge (Licungo II), the Licungo III bridge (Licungo III) and more than tripled for the Chueza bridge (Chueza) compared to 2010 (before the replacement or construction) and 2013 (after the replacement or construction). The major factors explaining any increase in these volumes include

¹¹ The replacement of Cuacua II was cancelled in this project, See 3.4.1 output for details.

¹² Cuacua II was replaced with a temporary bridge by the Mozambique government. However, the vehicle weight limit remains at 28 tons. Based on interviews at the time of ex-post evaluation, there are no plans to replace it in the near future due to budget constraints.

¹³ Based on interviews with Road Fund staff

smooth traffic during the rainy season by replacing old bridges and constructing new one as well as the increased traffic volume of pickup trucks and heavy vehicles brought about by strengthening of the bridges. In 2012, flooding which affected the entire northern region caused difficulties of traffic in surrounding area of the target bridges. Accordingly the traffic volume decreased in 2012 compared to levels in 2011 and 2013¹⁴. Although the flood also affected Cuacua I, the traffic volume increased, although no clear explanation for the increase was given by the implementing agency. Unlike in 2012, traffic volume of Cuacua I decreased in 2011, following the completion of the project, due to 2010 road work in Mopeia, a short distance from Cuacua I. This construction led to a temporary increase in traffic volume through construction vehicle traffic, whereupon the traffic volume increased in 2010 before declining in 2011¹⁵. The decrease in 2013 was due to traffic taking detours due to the condition of the connecting road to bridges, which were getting worse since 2013. However, improved road conditions as well as increased traffic volume are expected, based on the fact the implementing agency started rehabilitation work at the time of ex-post evaluation¹⁶.

Table 2 Traffic volume of each target bridge (Average daily traffic volume)

(Unit: Number of cars)

	Licungo II, III				Cuacua				Chueza			
	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013
Car	34	64	32	28	37	23	41	32	14	76	61	74
Pickup Track	9	30	13	51	15	15	32	13	12	51	38	58
Mini bus	11	18	9	34	15	20	22	14	0	0	2	0
Bus	6	4	5	5	2	0	0	0	0	0	0	0
Heavy Vehicle	29	56	31	61	32	32	14	24	24	44	25	35
Tractor	0	2	1	1	0	0	0	2	0	0	0	14
TOTAL	89	174	91	180	101	81	109	85	50	171	126	181

Source: Documents provided by the implementing agency and Road Traffic Reports (2010, 2011, 2012, 2013)

3.2.2 Qualitative Effects

3.2.2.1 No Traffic Closure during the Rainy Season

Before implementing the project, traffic at Chueza was closed during the 2-month rainy season as a portion of the bridge was destroyed in flooding and vehicles had to traverse the riverbed. However, the bridge remains open year-round at the time of ex-post evaluation because of the constructed bridge. Accordingly, the objective at the planning stage, “No closure during the rainy season at Chueza”, was achieved.

The traffic closure of Licungo is not included as an indicator of effectiveness. However, it was checked during the ex-post evaluation. It has become passable during the rainy season, although detours to Mocuba were previously required when traveling from Maganja to Namacurra (forward to Quelimane) in a rainy season¹⁷ as a part of the bridge was submerged.

¹⁴ Based on interviews with staff on the traffic volume analysis of the implementing agency

¹⁵ Based on interviews with staff on the traffic volume analysis of the implementing agency

¹⁶ Based on interviews with staff on the bridges of the implementing agency

¹⁷ Based on interviews at neighboring Licungo bridges during the site visit

Also, the traffic between both sides of towns of Cuacua during the rainy season, which was not possible before implementing the project, became available as of the ex-post evaluation.

3.2.2.2 Trunk Road Safety

Before implementing the project, the temporary bridges or river bed were used since the target bridges were damaged by aging or flooding in rainy season. Then, it caused the safety issues when crossing the bridges. The target bridges of this project were replaced or constructed based on SATCC design and load standards, meaning the safety of all target bridges was improved compared to before the project. Accordingly, the traffic safety targeted at the planning stage was ensured.

Although no information was available on the number of accidents, the beneficiary survey¹⁸, conducted during the ex-post evaluation, showed that 97% of respondents chose “very safe” or “safe”. Respondents explain the main reasons as “The bridge also had improved strength and remained available, even for heavy vehicles, after replacement” and also “There is no problem for traffic during the rainy season and no need to detour, though crossing the bridge in rainy season was not safe before the replacement”.

At Chueza, where the traffic volume tripled compared to the pre-project level, both traffic volume and the number of speeding cars increased¹⁹. Accordingly, at Chueza, which was constructed as a single-lane road, the safety of pedestrians and neighbors²⁰ become relevant issues, particularly due to increasing traffic volume as well as speeding cars, which mean consideration to secure safety and any action minimizing accidents would be required.

3.3 Impact

3.3.1 Intended Impacts

The impact of this project was expected in terms of the following two points at the planning stage:

- To expand the market area and vitalize regional industry as well as economic growth by connecting to major trunk roads.
- To increase traffic convenience to the provincial capital and facilitate access to medical and educational facilities.

The survey at the time of ex-post evaluation confirmed the impacts noted below.

¹⁸ A brief outline of the beneficiary survey: conduct a direct interview around (1) Licungo, (2) Cuacua, (3) Chueza bridges, at neighboring markets and the corner of secondary and major trunk roads, totaling 99 persons (neighboring residents: 67, merchants: 16, pedestrians: 5, truck drivers: 3, other drivers: 8).

¹⁹ Based on interviews at neighboring Chueza and an inspection survey of vehicles during the site surveys

²⁰ Although no data on the number of pedestrians was available, as well as vehicles, a large number of pedestrians also went across the Chueza to move to the other side of the bridge, according to interviews with an implementing agency, areas neighboring Chueza and an inspection at the site survey. Furthermore, as residences and small shops are located near Chueza, it was confirmed that children and shoppers frequently came and went around the area.

3.3.1.1 Vitalization of Regional Economic Growth

No reliable statistical data on regional agriculture and industrial sectors to clarify the vitalization of regional industry was available during the survey. However, based on interviews with pedestrians and merchants near the bridges in Zambezia province at the time of the site survey, replacing Licungo facilitated access between Maganja and Namacurra districts, located in either end of Licungo, which made the transportation of farm products from Maganja, the major rice production area, to Quelimane, the neighboring major city, through Namakura more efficient. Also Cuacua, connecting Mopeia and Luabo district, was assessed as “regional distribution and trade were vitalized with greater availability of basic goods and construction materials, which were brought by heavy vehicle’s availability for traffic.” In Tete province, there is a need to traverse Chueza to transport cotton and timber produced in the south part of Tete province to Tete city, as well as potatoes and beans produced in the northern region to Beira port. Before implementing the project, the temporary bridge was damaged by flooding. Accordingly, the construction of Chueza promoted smooth transportation of the farm products in Tete province²¹.

A beneficiary survey, conducted mainly among residents next to the bridges and bridge users also showed that 93% of respondents realized the positive change in the local economy after the replacement of bridges. For instance, “increase in the number of vehicles transporting food and goods”, “enabling the transport and sale of farm products (beans and rice, etc.) on a wider scale at the market” or “increase in the number of minibuses”. In response to an inquiry on the importance of the bridges for regional economic growth, 93 % of respondents described it as “very important” or “important”.

3.3.1.2 Increase in Traffic Convenience to the Provincial Capital and Improved Access to Social Service Facilities

Based on interviews with the implementing agency, provincial offices and neighbors of the target bridges, the convenience to those neighboring the provincial capital has increased after the bridges were replaced. In Zambezia province, home to Licungo II, III and Cuacua, access to Quelimane, the neighboring city, and other cities with markets has improved. Chueza in Tete province also helps facilitating access to Mutarara, the neighboring city.

Medical and educational facilities and markets are located on either side of each bridge, in Licungo, Cuacua and Chueza. Accordingly, improving accessibility to the other side of the bridge also improves access to such social service facilities. The results of the beneficiary survey also indicates that 99% of respondents acknowledged the easier access to social service facilities as well as neighboring major cities by replacing the target bridges of this project. More accessible facilities were selected by 99 respondents as follows (multiple answers applied): 84 for medical facilities, 82 for markets and 81 for educational facilities. Accordingly, it was concluded that developing the bridges helped increase traffic convenience in the provincial capital and facilitate

²¹ Based on interviews with ANE provincial office staff in Tete province

access to social service facilities, e.g. medical, education or market.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

At the planning stage, the Ministry of Environment of Mozambique (MICOA) concluded that no environmental impact assessment was required for this project because it was considered as having no impact on the natural environment, and the project sites were outside a natural reserve such as a national park. However, MICOA asked the implementing agency to develop an environmental management plan. The implementing agency agreed to develop the plan and receive the approval after the basic design and drawing had been completed by the Japanese side.

According to the implementing agency, there was no environmental impact before and after implementing the project and all the environmental requirements specified in environmental management plan (construction noise, dust management and rubble removal upon completion of the construction) had been fully complied with²².

3.3.2.2 Land Acquisition and Resettlement

The project replaced the existing bridges and constructed new bridge next to existing bridge. It did not involve any resettlement of residents or land acquisition. Based on inquiries made to the implementing agency and site observation, no issues emerged.

The weight limit of Cuacua I is 28 tons, since Cuacua II was not replaced in this project. However, the smooth traffic has been unaffected to date and traffic closures during rainy season have been eliminated, ensuring traffic safety, vitalizing regional economic growth by transporting more supplies and improving access to the provincial capital as well as social service facilities. In this sense, this project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

The project replaced existing bridges and constructed new bridge; both of which were located on the secondary trunk road in Zambezia and Tete provinces. Table 3 below shows a plan/actual comparison.

²² Although the basic design study report indicated that MICOA concluded the environmental impact assessment was unnecessary, the implementing agency confirmed that implementing the assessment was a regular practice and also required for this project.

Table 3 Output plan/actual comparison

Province	Bridge	Construction / Replacement	Plan (Length m)	Actual (Length m)
Zambezia	Licungo II	Replace a temporary bridge	50.25	As planned
	Licungo III	Replace a bridge	80.70	As planned
	Cuacua I	Replace a bridge	110.90	As planned
	Cuacua II	Replace a bridge	44.30	Canceled
Tete	Chueza	Construct a bridge	110.90	As planned

Source: Basic design study report and provided by the implementing agency

In this project, replacing Cuacua II was cancelled. Minor changes were made in the foundation pile and road alignment of Licungo II and III. The major reasons of these changes are as follows.

- Cancelation of replacing Cuacua II: the cancelation was due to a higher-than-expected contract price²³, the rise in the price of supplies and the effect of the realized exchange loss. Accordingly, the cancelation of replacing the bridge was inevitable to comply with budget constraints. The cancellation of replacing Cuacua II was chosen since it would have the lowest impact, considering the aging conditions of the bridges and their expected effectiveness.
- Foundation pile of Licungo II: Following a geological survey, the foundation was located in a deeper layer than expected. Accordingly, the location of the foundation pile was changed.
- Change of road alignment and location of drainage of Licungo III: The bridge location was moved upstream due to certain obstacles found under the ground of the planned area. Despite no change to the bridge length, the connecting road was extended with changes in the location of revetment work and drainage and also the volume of construction works for slope adjustment and vegetation.

The changes on Licungo II and III were considered appropriate in line with the actual circumstances and safety design. As Licungo II and III were effectively used at the time of ex-post evaluation (see 3.2 Effectiveness for more details), these changes did not affect the expected effectiveness.

The Mozambique government was responsible for the following:

- Removal of temporary bridges (Licungo II, Licungo III, Cuacua I)
- Removal of existing bridge (Cuacua I)

Although all temporary bridges had already been removed, the existing Cuacua I bridge (currently an old bridge) has not been removed due to budget shortages²⁴. According to the implementing agency, there was no practice to remove old bridges in Mozambique and the priority was low. Accordingly, no removal plan is expected to be implemented within a couple of years. The old bridge was located downstream of the current Cuacua I and is considered less affected by

²³ The only one bidder participated in this tender and the presented price was much higher than estimated. Accordingly, this tender was cancelled.

²⁴ The edge of the bridge wasn't connected to the road and available to use.

the collapse of the bridge, for instance. However, the removal was agreed to in a Record of Discussion²⁵, meaning immediate action is desirable with the safety environment in mind.



Replaced bridge (Cuacua I)



Constructed bridge (Chueza)

3.4.2 Project Inputs

3.4.2.1 Project Cost

The actual project cost of the Japanese portion was 1,845 million yen, which was lower than the original plan (1,889 million yen). However, given the fact that Cuacua II was outside the target and the original plan showed that the replacement cost of Cuacua II was estimated as 15% of the total cost, the project cost was actually higher than planned. The total planned project cost was 1,895 million yen, including the Mozambican portion of 6 million yen. As the actual cost data of Mozambican portion was unavailable, the plan and actual total cost could not be compared.

3.4.2.2 Project Period

Although the planned period for the project was 34 months, including a detailed design survey and its bidding period, the project actually took 42.4 months; starting from May 28, 2007 through December 10, 2010, which was longer than planned (125% of planned). The main reasons were the need for rebidding due to bid price exceeding the planned price and also the fact that a design change was required for Licungo III due to obstacles found at the construction location of the bridge pier. Unsuccessful bidding was attributable to external factors and the design change of Licungo III was necessary from feasibility and safety aspects, as obstacles emerged after starting the construction work at the site.

As mentioned above, both project cost and project period exceeded the plan. Therefore efficiency of the project is fair.

²⁵ A Record of Discussion is an official document agreed upon and signed by JICA and implementing agencies on a project context during a starting project.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The operation and maintenance (O&M) of roads and bridges in Mozambique are implemented by the maintenance department and each provincial office of the implementing agency, namely, National Roads Administration (ANE). Of the total 487 ANE staff, 173 work at headquarters and 314 at provincial offices. Basically for O&M works on trunk roads and bridges, the maintenance department and provincial offices are responsible for national and regional roads respectively. For the O&M of bridges targeted in this project, Licungo II and III and Cuacua I are under the Zambezia provincial office and Chueza under the Tete provincial office. Each provincial office basically implements periodical maintenance for each road via outsourcing²⁶.

Although the actual maintenance work is conducted via outsourcing, ANE's management system for supervising those contractors is not fully functional due to staff shortages in ANE's provincial offices. In fact, some parts of the target bridges have not been properly maintained (see 3.5.4 Current states of Operation and Maintenance). For instance, Zambezia and Tete provincial offices accommodate only 4 and 7 staff members each for total road lengths of 4,489km and 2,970 km respectively. The staff shortage is not only a problem of the implementing agency but the whole governance office, so it is likely to be difficult to resolve this problem immediately by the implementing agency alone.

Accordingly, staff shortages in provincial offices along with a maintenance management system remain issues for the institutional aspects of O&M.

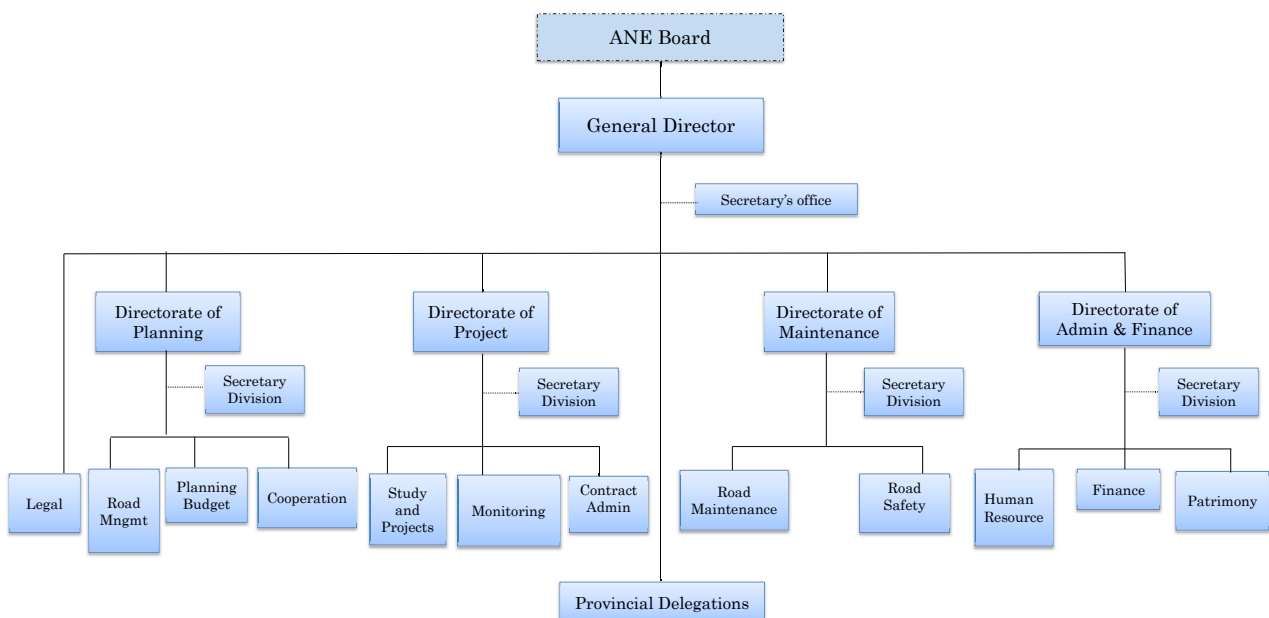


Figure 2: ANE organization

Source: Provided by the implementing agency

²⁶ Outsourcing contractors are selected by open competitive annual bidding.

3.5.2 Technical Aspects of Operation and Maintenance

During the planning stage, the staff at the implementing agency were civil engineers; considered to have proper technical skills for O&M on this project. In fact, the implementing agency confirmed at the ex-post evaluation interview that all staff had skills for basic maintenance work. However, as noted above, staff shortages resulted in improper maintenance for some parts and most of the actual maintenance work depended on outsourcing due to the provincial offices acknowledging that O&M was implemented under the responsibility of the outsourcing contractors²⁷. Moreover, the staff of the ANE headquarters pointed that the technical capacity of outsourcing contractors to implement O&M of bridges and roads with proper knowledge and experiences as well as the extensive future maintenance required with appropriate and suitable equipment was insufficient. Mozambique is still in a developing stage and not having enough experiences to foster outsourcing contractors under the current situation. Although ANE recognizes that it would be effective to provide trainings to foster the technical skills of outsourcing contractors, no such systematic training system exists due to staff shortages and budget constraints.

Accordingly, as described above, for the technical aspect of O&M, although ANE's staff have the proper technical skills required to implement O&M, it is acknowledged that private sector technical skills of outsourcing contractors were insufficient for proper maintenance work.

3.5.3 Financial Aspects of Operation and Maintenance

According to the PRISE developed under national strategies in Mozambique (see Table 4 below), the annual focus is on asphalt paving of national roads. Nevertheless, the budget for maintaining roads and bridges has been also increased.

Table 4 PRISE budget for O&M of road

(Unit: Thousand MZN)

	2012	2013	2014
Operating cost	474,989	909,570	906,181
Training, research	177,964	556,071	271,250
O&M of road / bridge	3,762,418	3,801,015	6,190,356
Construction & rehabilitation of bridges	1,388,133	1,592,472	2,436,806
Rehabilitation of regional roads	392,254	203,865	624,375
Asphaltic pavement	520,103	287,867	837,007
Rehabilitation of national roads	1,125,520	2,725,742	505,245
Asphaltic pavement of national roads	6,992,926	10,901,993	8,074,798
Road safety	305,973	63,290	92,043
Others	0	8,157	0
Total	15,140,280	21,050,042	19,938,061

Source: Provided by Road Fund

²⁷ Based on interviews with directors and deputy directors at each provincial office

The maintenance cost of constructing the new bridge and connecting road at the planning stage was estimated at an average 748,000 meticals²⁸ (MZN) per year. Although detailed information on each target bridge from each provincial office was unavailable, the maintenance budget for the roads and target bridges is shown in Table 5 below.

Table 5: Maintenance budget for roads including target bridges

(Unit: Thousand MZN)

Bridge	2012	2013	2014
Licungo II and III	1,838	2,024	2,841
Cuacua I	1,197	1,138	4,323
Chueza	1,500	4,391	4,351
Total	4,535	7,553	11,515

Source: Provided by the implementing agency

According to the staff of each provincial office, O&M budget for the road, where the target bridges are located, has shown increasing tendency.. However, each provincial office recognizes that the current budget is insufficient for implementing the O&M as planned. For instance, the actual distribution for Zambezia province was 370 million MZN in 2012 for the request of 650 million MZN, while the 2012 distribution for Tete province was 400 million MZN, which is insufficient for appropriate maintenance but only a minimum level.


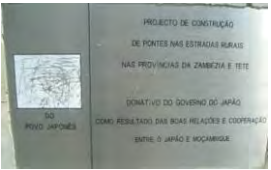






In addition to this budget shortage, another issue is the inability to distribute the budget on a timely basis, which meant shortfalls when funding is required for planned projects. One case to be resolved is the fact that the budget is not distributed until a few months to the end of fiscal year, leaving no time to spend the budget appropriately. Moreover, it is unclear when and where the budget distribution is delayed when interviewed with parties related to budget allocation, namely, ANE, provincial offices and Road Fund. Accordingly, ANE should review the budget distribution process used to determine the cause of delay and discuss resolving those issues for smoother and timelier distribution.

3.5.4 Current Status of Operation and Maintenance

The current status of maintained bridges was surveyed at the time of the ex-post evaluation and is shown on Table 6.

²⁸ About 3,516 thousand yen. Exchange rate: 1MZN=4.70 yen (as of January, 2006)

Table 6: Current status of target bridges at the time of ex-post evaluation

Bridge	Current status		
Licungo II	<ul style="list-style-type: none"> • Main bridge mostly in good condition • Clogged drains • Water pit clogged by grass • Damaged bridge name plate 		
Licungo III	<ul style="list-style-type: none"> • Main bridge mostly in good condition • Clogged drains • Damage to the surface of the connecting road to the bridge • Water pit clogged by grass • Wire stolen in gabion • Damaged bridge name plate 		
Cuacua I	<ul style="list-style-type: none"> • Main bridge mostly in good condition • Graffiti on guardrail • Damage to the surface of the connecting road to the bridge^{Note} • Water pit clogged by grass • Removal of old bridge incomplete • Damaged bridge name plate 		
Chueza	<ul style="list-style-type: none"> • Main bridge mostly in good condition • Water pit clogged by grass • Damaged bridge name plate • A part of rough dirt road to the bridge 		

Source: Based on site visit

Note: The implementing agency started maintenance work on a secondary trunk road which has access to the connecting road. As the connecting road is included in the target project scope, maintenance of the connecting road should be implemented shortly.

As shown above, the target bridges are mostly in good condition. However, the site visit revealed certain maintenance issues, including clogged drains or weeds around the water pit and connecting road. This clogging may lead to damage to the road surface of the bridges, requiring extensive repair. Although the outsourcing contractor explained that for O&M, daily management and periodical inspection were performed as planned, it seemed to require more timely actions

Maintenance Works for Project Bridges

- Implemented inspections and maintenance
- Maintenance of drainage & surface (twice a year)
 - Maintenance of Handrail (once in 5 years)
 - Scouring Protection of River bed and Embankment (After flooding)
 - Pavement Resurfacing (Every 5 years)

Source: Interviews with the implementing agency

suiting each situation, such as more frequent cleaning during the weedy rainy season²⁹.

In addition, the neighbors of the target bridge have concerns over speeding due to the improved bridge condition and increase in traffic. Taking traffic control measures would be difficult to implement by the implementing agency alone. Accordingly, the implementing agency must enforce traffic control in cooperation with police.

Some problems were observed in terms of the institutional, technical and financial aspects of O&M. Therefore the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project, which improved the function of road network by developing the bridges on major secondary trunk roads in Zambezia and Tete provinces, the northern parts of Mozambique, was highly relevant to Mozambique's development plan and development needs as well as Japan's ODA policy. Its effectiveness and impact were also high because alleviating vehicle weight limits of the bridges, eliminating traffic closures in rainy season and ensuring traffic safety at target bridges constantly contribute to regional economic growth and improved access to social services. The efficiency of this project is fair because both project cost and project period exceeded the plan by unsuccessful bidding, increasing the price of supplies and changing part of the project scope. For operation and maintenance, a staff shortage at the implementing agency affects the current maintenance and operation conditions and the management of outsourcing contractors, including their technical aspect. Also, based on the financial aspect, further efforts are required to secure the necessary budget and implement appropriate maintenance and operation as well as to improve the budget distribution schedule in a timely manner. The sustainability of this project is therefore fair. In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

- The old bridge (Cuacua) had not been removed at the time of ex-post evaluation, although its removal was planned after the project under the responsibility of Mozambique. The old bridge is currently unused and aging. If untouched, it may hinder efforts to ensure the safety of neighbors due to the bridge collapsing during the rainy season. The implementing agency needs to strive to secure sufficient budget and remove the old bridge.
- Some cases of inadequate maintenance work, including clogged drains or weeds around the water pit and connecting roads emerged at the time of ex-post evaluation. Accordingly, there is a need to examine the necessary measures such as reviewing the frequency of maintenance work to prevent the serious damages, which require extensive repairs, under the proper O&M .

²⁹ The sites were visited in early February, during the rainy season in Mozambique.

- Though outsourcing contractors are private companies, improving their technical skills as well as enhancing the awareness of provincial offices for management and supervision are critical when implementing appropriate maintenance in future. Thus, it is desirable to establish a framework to manage and supervise the technical skills of outsourcing contractors as well as staff at the implementing agency and to monitor the maintenance status properly. Currently, maintenance work is implemented by outsourcing contractors and provincial offices tend to lack a strong sense of being supervisors. Accordingly, the implementing agency must work to boost the awareness of each provincial office for their supervision tasks.
- Distributing the budget to each provincial office tends to delay which becomes an issue as the necessary maintenance works cannot be implemented in a timely manner. One case highlights an issue to be resolved as the inability to distribute the budget until a few months to the end of the fiscal year, which meant there was no time to spend the budget appropriately. Accordingly, the implementing agency should review the budget distribution process in detail to determine the cause and stage of delay, and try to resolve those issues for smoother and more timely distribution.
- From the safety aspect, neighbors of the target bridges have concerns over speeding due to the improved bridge condition and increased traffic. Since taking thorough traffic control measures would be difficult by implementing agency alone, the implementing agency must enforce them in cooperation with police. In Chueza in particular, there is a need to consider securing space for side walk by setting a boundary for pedestrian safety.

4.2.2 Recommendations to JICA

N/A

4.3 Lessons Learned

- Securing Safety

Chueza was constructed as a single-lane road without securing space for side walk, and there are currently concerns over safety, particularly of pedestrians and neighbors, due to increasing traffic volume as well as speeding cars. Although the implementing agency proposed a double lane at the planning stage due to the expected increase in traffic, a single lane was constructed and no sidewalk was included in the design based on the forecast traffic volume, consistency with the width of the existing road and budget constraints. Safety must be ensured by, for example, setting speed-limit signs or providing thorough instructions on traffic regulations to drivers and residents. However, considerations to ensure the safety, including setting boundaries for side walk, should be taken for the bridges with heavy pavement traffic such as Chueza, despite budget constraints at the planning stage.

Republic of Mozambique

Ex-Post Evaluation of Japanese ODA Grant Aid Project

The Project for Improvement of Infrastructure and Equipment of Training Schools for
Health Personnel

External Evaluator: Hisae Takahashi, Ernst & Young Sustainability Co., Ltd.

0. Summary

This project, improving facilities and providing equipment at health personnel training institutes/centers in Mozambique nationwide, is highly relevant to the Mozambique's development plan, which emphasizes the health sector in terms of fostering medical personnel and improving medical services, and its development needs as well as Japan's ODA policy. The size and number of classrooms and dormitories were expanded and the number of students and capacity of dormitories were increased at training institutes/centers supported by this project. In addition, multipurpose classrooms were constructed and practical educational equipment was provided, to increase the scope for practical lessons; enabling well-balanced education of theory and practice. Provided equipment including the PCs helped teachers in preparing classes and the number of medical personnel nationwide was boosted with the increase in graduates from training institutes/centers. From this aspect, the effectiveness and impact is high. Although the project cost was lower than planned, the project period was longer than planned. Hence, the efficiency of the project is deemed fair. In terms of operation and maintenance, the current status of facilities and equipment is generally good. Although there is no concern over the technical aspect of teachers, certain issues remain with regard to securing full-time teachers and future financial aspects. Accordingly, the project sustainability is fair. In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Location



Constructed classroom (CFS Massinga)

1.1 Background

After the end of the civil war in 1992 and the reconstruction period supported by international donors, Mozambique has achieved record growth, with an average 9% increase in GDP between 2000 and 2004. However, the Mozambique's health sector showed seriousness of major health indicators compared to neighboring countries, such as, a maternal mortality ratio of 1,000 (per 100,000 live births) in 2000, under-five mortality ratio of 152 in 2004 and infant mortality ratio of 104 (per 1,000 live births) in 2004¹. The government has faced huge challenges in expanding access to primary healthcare², improving the quality of maternal and child healthcare, extending healthcare services to protect against HIV and other infections and increasing the required number of health personnel to respond to the abovementioned challenges. However, 13 nationwide training institutes/centers for health personnel³ (ICS/CFS) face a shortage of the classrooms and dormitories needed to increase student numbers and the equipment and environment for conducting practical lessons, hence prompt expansion and improvement of ICS/CFS to deal with inadequate infrastructure and environment were needed.

Under the above circumstances, the government requested the Government of Japan to cooperate with the project for improvement of infrastructure and equipment for 12 ICS/CFS⁴, whereupon the Government of Japan agreed to provide support to construct facilities of classrooms, multipurpose classrooms and dormitories and also procure educational equipment for practical lessons at 12 ICS/CFS.

¹ Source: Basic Design Study Report

² Primary healthcare indicates the essential healthcare which is universally accessible to all in the community and maintained to provide based on the needs of each local condition.

³ The training centers targeted in this project are those for health personnel mainly at an intermediate level (ICS) and basic level (CFS).

⁴ Grant aid was provided to the remaining ICS Quelimane in 2004 to construct classrooms, a multipurpose classroom and dormitories and procure equipment.



Figure 1: Locations of target facilities

1.2 Project Outline

The objective of this project is to enhance healthcare service by improving the infrastructure and equipment of training institutes/centers for health personnel.

Grant Limit / Actual Grant Amount	1,045million yen / 973million yen
Exchange of Notes Date	July 2008
Implementing Agency	Ministry of Health, Department of Human Resource
Project Completion Date	October, 2010
Main Contractor(s)	Dai Nippon Construction
Main Supplier(s)	Ogawa Seiki Co., Ltd.
Main Consultant(s)	Matsuda Consultants International Co.,Ltd.
Basic Design	February – November 2007
Detailed Design	December 2007 – March 2008
Related Projects	JICA Technical Cooperation Project: “The Project for Strengthening of Capacity on Health Training Institutes”(2005-2008): Strengthen capacity of teaching skill of teachers of health training institutes, “The project for strengthening pedagogical and technical skills of teachers of health training institute” (2012 –

	<p>2015): Supporting efforts to improve the system for training health personnel</p> <p>Grant Aid Project: “The Project for Improvement of the Institute of Health Science of Quelimane”(2004): Construction of classrooms, practical lesson facility, operating facility, lecture hall, student dormitory and staff quarters and equipment procurement</p> <p>Other international institutions, aid organizations: establishment of common funds by sector under sector-wide approach support. The project for support to maintain training centers by the Canadian International Development Agency, Italian Development Cooperation, Danish International Development Cooperation Agency, World Bank, African Development Bank, Finnish International. Development Agency</p>
--	--

2. Outline of the Evaluation Study

2.1 External Evaluator

Hisae Takahashi, Ernst & Young Sustainability, Co., Ltd.

2.2 Duration of Evaluation Study

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

Duration of the Field Study: January 14– February 14, 2014; April 22 – May 7, 2014

2.3 Constraints during the Evaluation Study

Facilities were constructed at five ICS/CFS, and educational equipment for practical lessons was provided to 12 ICS/CFS, including five ICS/CFS as above. However, not all facilities were visited during the study due to time constraints and the fact that ICS/CFS were scattered all over the country⁵. For the planned visit to all five ICS/CFS⁶ where facilities were constructed, ICS Beira and CFS Nhamatanda were not visited due to worsening security. The information required for these ICS and CFE, which were not

⁵ The training centers visited are as follows: ICS Nampula, CFS Pemba, CFS Massinga, ICS Maputo, CFS Chicumbane, CFS Inhambane, CFS Mocuba, CFS Tete.

⁶ ICS Nampula, CFS Pemba, ICS Beira, CFS Nhamatanda, CFS Massinga

included in the sites visited, was obtained by questionnaire or an interview survey at Maputo, the Mozambique capital.

3. Results of the Evaluation (Overall Rating: B⁷)

3.1 Relevance (Rating: ③⁸)

3.1.1 Relevance to the Development Plan of Mozambique

During the planning period, Mozambique's national strategy, "Action Plan for the Reduction of Absolute Poverty for 2006-09 (PARPA II)" was intended to reduce poverty (reducing the incidence of absolute poverty to 50%) through national economic growth, which prioritized the area of regional development. This Plan included the six priority areas including healthcare, which established health-based indicators for maternal and child health, preventing HIV infection, access to health services and also the outpatient ratio of local and urban regions. The "Health Sector Strategic Plan (PESS) 2001 - 2010" also emphasized the improvement in healthcare as key to move poverty reduction forward and sets out five strategies to provide better healthcare services and improve the national health status. The one strategy, "Strengthen of governance capacity at health sector" prioritizes efforts to develop the human capital of health personnel, enhance the capacity of health services in the region and improve and maintain medical technology. The details were described as the expansion and construction of ICS or CFS in the "Human Resource Development Plan (PDRH) 2001 - 2010".

At the time of ex-post evaluation, the "Poverty Reduction Action Plan (PARP) 2011-2014" also aims to reduce poverty incidence to 42% by 2014. One of the priority areas is "human and social development" with the strategic target of improving management to develop health personnel (qualitative improvement in health personnel) in health sector. PESS 2007 – 2012 represents the continuation of PESS 2001 – 2010 and prioritizes ensuring extensive access to and improving quality of the health service. The "National Plan for Human Resource Development (PNDRHS) 2008 – 2015" also shows the strategy for the new construction or extension of training center facilities to increase the number of health personnel (quantitative increase in health personnel). This is based on its roadmap to increase the number of full-time health personnel from 25,683 in 2006 to 45,654 in 2015 continuously to resolve the manpower shortage of health personnel.

As mentioned above, the government of Mozambique emphasized the health sector as key to reduce poverty from the time of planning through ex-post evaluation and

⁷ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁸ ③: High, ② Fair, ① Low

prioritized fostering health personnel and improving medical services. Accordingly, the project, which involves extending and improving the facilities and equipment of training centers, is relevant to the Mozambique’s development plan.

3.1.2 Relevance to the Development Needs of Mozambique

During the planning period, it was needed to provide an additional 40% of existing training courses and corresponding student intake. However, most ICS/CFS lacked sufficient capacity in terms of classrooms and dormitories to provide additional courses or proper equipment and an environment for practical lessons. Accordingly, immediate action was required to expand and improve the training centers. The number of training courses and students at ICS/CFS were continuously on the increase under the PNDRHS program, even at the time of ex-post evaluation. For instance, the training courses provided by ICS/CFS increased from 69 in 2008 to 90 in 2012. The number of graduates also increased from 819 in 2008 to 2,497 in 2012. As shown in Table 1, although the lack of health personnel had improved, the current total remains insufficient except Maputo. From this perspective, the development needs to expand and improve training centers remain high.

Table 1: The number of inhabitants per health personnel

	During the planning period (2007)	After the project (2012)
Doctor	32,434 (16,653)	18,810 (2,568)
Nurse	4,464 (3,816)	4,072 (1,502)

Source: Anuário Estatístico De RHS (Statistical Yearbook of Health Human Resource) 2012

Note: The number shown in parentheses is the data in Maputo.

3.1.3 Relevance to Japan’s ODA Policy

The priority aid areas in the Country Program for Mozambique include “social sector”, “agriculture and rural development” and “human resource development”. The “social sector” indicates priority areas as education, health/medical, water/hygiene and roads/bridges. Accordingly, this project is relevant to the priority aid areas of human resource development and health sector in the Country Program of Japan for Mozambique.

Considering the above, this project has been highly relevant with the Mozambique’s development plan, development needs, as well as Japan’s ODA policy; therefore its relevance is high.

3.2 Effectiveness⁹ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

3.2.1.1 Increase in Number of Students by Expanding a Classroom

ICS/CFS did not have enough capacity of classrooms due to the increased number of students with the implementation of PDRH. In this project, 11 classrooms were newly constructed and two classrooms were rebuilt at five ICS/CFS to accommodate additional 330 students. Table 2 indicates the number of classrooms as well as students at each ICS/CFS, before and after the project implementation. As planned, 11 classrooms were expanded and two were rebuilt, which led to over 330 students being accommodated. From this perspective, the project succeeded in achieving the original target. However, each ICS/CFS currently lacks sufficient classrooms for the increased number of training courses under the country's program involving the quantitative expansion of health personnel. Therefore, most of the confirmed ICS/CFS offer classes on a two- or three-shift system. CFS Massinga currently has six classrooms, including two new classrooms which were built with aid from the Canadian International Development Agency (CIDA) upon completion of this project.

Table 2: The number of classrooms and students at target training centers

	No. of Classrooms ^{Note 1}		No. of Students			
	Before the project	After the project	Before the project	After the project		
	2007		2007	2011	2012	2013
ICS Nampula	9 (270 students)	13 (390 students)	614	908	967	1,113
CFS Pemba ¹⁰	4 (120 students)	5 (150 students)	186	298	316	314
ICS Beira	9 (270 students)	13 (390 students)	609	1,196	1,265	1,370
CFS Nhamatanda	2 (60 students)	4 (120 students)	66	196	272	222
CFS Massinga	2 (60 students)	6 ^{Note2} (180 students)	62	145	235	310

Source: Prepared based on responses to questionnaires to each training center

Note 1: Numbers shown in parentheses indicate classroom capacities.

Note 2: Two out of six classrooms at CFS Massinga were built by CIDA aid upon completion of this project.

3.2.1.2 Increase in Capacity of the Expanded Dormitory

As shown in Table 3, the project planned to build dormitories at five ICS/CFS, which accommodate an additional 400 students. Consequently, the total increased

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

¹⁰ CFS Pemba is expected to increase capacity as two classrooms are under construction thanks to aid from a Spanish NGO.

capacity was 594¹¹, meaning the target was achieved. ICS Nampula, CFS Pemba, and CFS Massinga were visited at the time of ex-post evaluation and an interview survey of ICS Beira was performed. The newly built dormitories of these centers at this project are full to capacity, while the external facility, which was a temporary dormitory before the project commenced, is currently no longer used¹². However, despite the increased dormitory and the achievement of the target, as described in 3.2.1.1, the number of courses and students has continued to increase, even after project completion. Therefore, the capacity of dormitories remains insufficient, except CFS Massinga. Only CFS Massinga accommodates all students properly with newly built dormitories due to the support by CIDA, which could increase the number of students substantially in 2013.

CFS Massinga dormitory built in this project is currently used as a staff room. This is for various reasons: the capacity was limited to 16 students as CFS Massinga was originally a branch of CFS Inhambane. However, after becoming CFS, CIDA built a new dormitory to accommodate the increased number of students and part of the water utility was broken.

Table 3: Capacity of each dormitory

	Capacity before the project	Target (Planned capacity of dormitory by the project)	After the project			Increased capacity by comparison of before and after the project
			2011	2012	2013	
ICS Nampula	246	112	313	345	394	148
CFS Pemba	72	48	N.A.	N.A.	121	49
ICS Beira	391	160	531	582	637	246
CFS Nhamatanda	66	64	129	128	128	62
CFS Massinga	61	16	80	80	150	89

Source: Prepared based on the questionnaire response from each ICS/CFS

Note: The CFS Massinga dormitory was built by CIDA aid upon completion of the project, and has a capacity of 100 students.

3.2.2 Qualitative Effects

3.2.2.1 The Expansion of the Multipurpose Classroom

Multipurpose classrooms were built in CFS Pemba and CFS Massinga as part of this project. Based on interviews with both centers, they became able to implement the same level classes (via practical lessons using equipment) as other ICS/CFS.

¹¹ It includes the number of students accommodated in dormitories, which has a capacity of approximately 100 students, constructed upon completion of this project with the support of CIDA in CFS Massinga.

¹² The reasons include not only resolving the shortage of dormitories but also the funding shortfall for renting external facilities.

Securing a room for practical lessons at ICS/CFS is crucial. Along with providing equipment, establishing multipurpose classrooms helps when giving practical lessons. The deputy head and teachers of CFS Massinga explained that the class used to comprise mainly theory-based lessons due to the lack of multipurpose classrooms before the project. Similarly, in CFS Pemba, the hours of practical lessons were increased after building a multipurpose classroom. Currently, all students can attend a practical lesson in addition to a theory class to prepare for field training at hospitals or medical facilities as with other training institutes.

In fact, the result of a beneficiary survey¹³ shows that 97% of teacher respondents answered “the practical lesson became more effective by installing multipurpose classrooms” and most student respondents also felt that “high-quality practice was possible with multipurpose classrooms.” Accordingly, the effectiveness of building multipurpose classrooms was confirmed.



Multipurpose classroom built in CFS Pemba

3.2.2.2 Improvement of Educational Equipment for Practical Lessons

Based on interviews with each ICS/CFS visited during the ex-post evaluation, the existing equipment was scarce and lacked variety before providing educational equipment for practical lessons at this project. Accordingly, each ICS/CFS has common awareness of the issue concerning the quality of medical education, e.g. the lack of opportunities for students to use equipment and the lack of equipment required for practical lessons.

At the time of ex-post evaluation, many students now have the opportunity to practice with more abundant and varied medical equipment, which was not possible before implementing the project, at all target ICS/CFS. Practice with equipment during field training at hospitals or health facilities is considered necessary for students before contacting patients. Besides, all ICS/CFS can now host classes and practical lessons in line with the curriculum recommended by the Ministry of Health (MoH) with the utilization of the provided educational equipment for practical lessons. For instance, a training course for midwives currently requires 200 hours of theory and 300 hours of practical lessons (500 hours in total). Although some ICS/CFS were unable to provide the required 300 hours of practical lessons due to a

¹³ The survey was implemented among Heads, Deputy Heads or Teachers (47 in total) and students or graduates (84 in total) at 6 ICS/CFS; ICS Nampula, CFS Pemba, CFS Massinga, CFS Tete, CFS Inhambane and ICS Maputo.

shortage of proper equipment before this project, all ICS/CFS reached a level to respond to the required hours of practical lessons without any problem.

The beneficiary survey also shows 98% of respondents recognized that “practical lessons had improved and become more effective” thanks to the provision of educational medical equipment (see Table 4).

Table 4: Improvement in practical lessons by providing medical equipment

	Considerably Improved	Improved	Unchanged	Worsened
Heads, Deputy Heads, Teachers	50.4 %	47.3 %	2.3 %	0 %
Students	57.1 %	40.5 %	2.4 %	0 %

Source: Based on the result of the beneficiary survey

According to the interview survey result, the implementing agency and ICS/CFS consider “high-quality education” as “emphasizing both theory and practice in a balanced way”. This project, providing educational equipment for practical lessons, secures proper hours of practical lesson and helps improve the quality of medical education at ICS/CFS.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Facilitating the Operation and Management of ICS/CFS

It was expected that the operation and management of ICS/CFS could be facilitated by improving the facility capacity (increasing the number of classrooms) and also quality (equipping rooms and equipment for practical lessons) under this project. Based on interviews with heads, deputy-heads and teachers of ICS/CFS and the result of beneficiary survey, provided staff rooms, personal computers (PCs) and projectors promoted effective and efficient preparation of classes for teachers (See Table 5). The continual shortage of teachers in Mozambique can be effectively countered using office equipment to reduce class preparation time, and using a projector to shorten print jobs.

Table 5: Smooth operation and management by improving the scale of facilities

Largely Smoothed	Smoothed	Unchanged	Worsened
38.3 %	53.2 %	8.5 %	0 %

Source: The result of the beneficiary survey

Note: Survey conducted to head, deputy-head and teacher

3.3.1.2 Quality Improvement in Health Personnel

The quality of health personnel candidates at target centers was thought to have increased by improving the educational environment as well as the training curriculum. Due to the absence of rooms for practical lessons and shortage and lack of variety of equipment at most of ICS/CFS before implementing the project, students had to practice field training at hospitals or health facilities; lacking adequate opportunity to engage in practical lessons and meaning they had to deal with patients during their initial field training. Currently, students can have a practice at field training after experiencing adequate practical lesson which has similar to the real situation and after learning theory. Consequently, the service quality of students has seen them increasingly earn a very good reputation from hospitals or health facilities where field training is provided, meaning training centers recognize the contribution made by this project to improving health personnel. In fact, nurses in the provincial hospital in Nampula indicated that a lack of adequate educational equipment for practical lessons at ICS/CFS meant students had to have field training without proper practice and affected the medical service quality; not only of students but also graduates. From this perspective, this project, providing an adequate opportunity for practical lessons, is considered to help improve health personnel.

The beneficiary survey also indicates that over 90% of students having responded as well as ICS/CFS officials recognized the improvement in medical service quality after providing equipment (See Table 6).

Table 6: The improvement in medical service quality by graduates after providing educational equipment

	Considerably Improved	Improved	Unchanged	Worsened	N/A
Heads, Deputy Heads, Teachers	27.7 %	66.0 %	2.1 %	0%	4.3%
Students, Graduates	28.6 %	61.9 %	0 %	1.2 %	8.3 %

Source: The result of the beneficiary survey

3.3.1.3 Increase in Number of Health Personnel per Capita

The shortage of medical personnel is a serious challenge to the health sector in Mozambique. This project anticipated a certain impact from increasing the number of health personnel per capita by assigning ICS/CFS graduates to health institutions. According to Mozambique statistics, the number of inhabitants per health personnel¹⁴ upon completion of this project is improving from the number before implementing the project. For instance, there were 806 and 716 inhabitants per health personnel in

¹⁴ Health personnel include not only doctors and nurses but midwives, technicians and pharmacists.

2008 and 2012 respectively (See Figure 2).

This project constructed facilities such as classrooms and dormitories, which meant an increase in the number of students at ICS/CFS and also further boosted the number of health personnel. ICS/CFS have a virtually 100% placement rate to medical institutions because graduates are required to work for three years in Mozambique medical institutions.

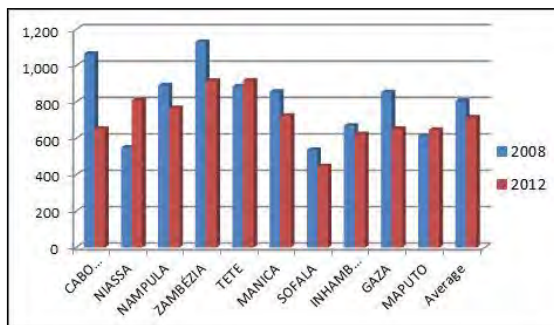


Figure 2: The number of residents per medical personnel

Source: Statistical Yearbook of Health Human Resource (2008, 2012)

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

Based on the result of interviews with ICS/CFS, implementing the project did not exert any environmental impact. Moreover, no claims of noise and vibration were made which could affect the lives of neighboring residents during the construction.

3.3.2.2 Land Acquisition and Resettlement

There was no resettlement of residents or site acquisition during the project, since the planned construction site was sited within existing ICS/CFS.

3.3.2.3 Unintended Positive Impacts

The following are confirmed as other impacts of providing PCs:

- PCs were effectively utilized as tools for implementing an independent study by students and motivated them in their research.
- Teachers utilized PCs to exchange information with teachers in other ICS/CFS, which helped them provide better lessons.

According to the heads and deputy-heads of ICS/CFS at the time of the site visit, PCs are mainly used by teachers for preparing classes, and alternatively for promoting independent study among students or as a tool to exchange information by E-mail from teachers who attended the training conducted by provinces to teachers who did not attend them to share training details.

Therefore, this project has largely achieved planned objectives and its effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

This project comprised the facility construction of five ICS/CFS and procuring educational equipment for 12 ICS/CFS. The planned and actual outputs are shown in Tables 7 and 8.

Table 7: Planned and actual facility construction

Site	Facility	Plan	Actual
ICS Nampula	Classroom bldg.	4 classrooms	As planned except some design changes
	Student dormitory	14 rooms, study room, toilet, shower room, storage	
CFS Pemba	Classroom bldg.	1 classroom	
	Multipurpose classroom	1 classroom, preparation room	
	Student dormitory	4 rooms, toilet, shower room	
ICS Beira	Classroom bldg.	4 classrooms	
	Student dormitory	20 rooms, study room, toilet, shower room, storage	
CFS Nhamatanda	Classroom bldg.	2 classrooms	
	Student dormitory	8 rooms, study room, toilet, shower room, storage	
CFS Massinga	Classroom bldg.	2 classrooms	
	Multipurpose classroom	1 classroom, preparation room	
	Toilet bldg.	-	
	Student dormitory	2 rooms, study room, toilet, shower room, storage	
	Water facility	Water tank, elevated water tank, pump room	

Source: Basic Design Study Report and data provided by JICA

Table 8: Plan and actual major educational equipment for practical lessons

Site	Type	Plan (volume)	Actual
Five centers on Table 7 with the following seven centers (12 in total)	Clinical medical equipment for practical lessons	Crank beds (12), sterilizers (autoclaves) (11), incubators (12), examination lamps (72)	As planned
	Practice model equipment	Manikin (12), muscular model (12), heart model (20), eye model (12), model for auscultation (15), model for blood pressure check (15), model for patient care (11), arm model for intravenous injection (24), muscle injection simulator (brachial region) (30), muscle injection simulator (buttock) (18), delivery simulator (high-function) (3), perineorrhaphy simulator (20), delivery simulator (prevailing model) (6), model for palpation (7), new-born baby model for nurse care training (12)	
ICS Maputo			
CFS Chicumbane			
CFS Inhambane			
CFS Chimoio			
CFS Mocuba			
CFS Tete			
CFS Lichinga			

	Examination equipment for practice	Microscope (with teaching scope) (2), microscope (4), spectral photometer (2), centrifugal machine (3)	
	Information equipment	Printer (3), OHP (15), PC(15), projector (15)	

Source: Basic Design Study Report and data provided by JICA

The facilities were built basically as planned. In the detailed design survey, the equipment featured some changes in the layout of the study room, ceiling finishing material, table/chair set and storage of the dormitory, desk and chair of classrooms, dormitory layouts of ICS Nampula and CFS Massinga and the unit volume, layout and materials of ODA name plates. These changes were required to facilitate student convenience and maintenance and were thus considered adequate. The implementing agency and training centers also confirmed that these changes did not affect the expected effectiveness.

The Mozambique government was responsible for cutting down trees, removing existing structures, improving access roads, installing and increasing the electricity capacity, improving the water system, constructing gates and fences and planting work. All were implemented as planned except for an incomplete fence at CFS Massinga. The Deputy-head of CFS Massinga explained that the fence construction had not started due to budget constraints and was not yet planned. However, the lack of a fence does not present any specific problem.



Constructed student dormitory
(CFS Pemba)



Provided equipment: Upper arm model for injection practice (for repeated intravenous use)

3.4.2 Project Inputs

3.4.2.1 Project Cost

The actual cost for the Japanese portion was 973 million yen, which was lower than the original plan of 1,096 million yen (89% of the original plan). The decrease in cost was due to the bidding price upon receipt of the order. The total project cost was planned as 1,112 million yen, including the Mozambican portion of 15.7 million yen. Given the lack of actual cost data for the Mozambican portion, it was not possible to compare the planned and actual total costs¹⁵. However, all planned work mentioned above was implemented except for the construction of the fence by the Mozambican government, hence the conclusion that most of the planned budget was disbursed.

3.4.2.2 Project Period

The project was scheduled for a period of 29 months¹⁶, including a detailed design survey and bidding period. The project actually took 30.6 months; three months for the detailed design survey (from December 19, 2007 through March 15, 2008) and 27.6 months for the main project (from July 4, 2008 through October 29, 2010), meaning it was longer than planned. The project representative of the implementing agency analyzed the major cause of delay as the time taken for customs clearance of the procured equipment.

Although project cost was within the plan, project period exceeded the plan. Therefore, efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

Operation and maintenance (O&M) are implemented for the facilities developed at this project by the maintenance staff of each ICS/CFS and for equipment provided in this project by staff in charge of the practical room used to store equipment or teachers using the same equipment. Table 9 shows the number of staff for O&M facilities at the time of ex-post evaluation. Based on interviews with each ICS/CFS visited at the time of the ex-post evaluation, although O&M can be handled by existing staff, it is desirable to increase the number of staff to ease the current workload. Centers without maintenance staff generally can only call for service when trouble occurs, which means they need to reply on a system with backward incidence. Accordingly, it would be

¹⁵ The project cost was analyzed for its efficiency based on only the Japanese portion.

¹⁶ The project period indicates the detailed design survey period, including the construction and procurement period.

desirable to consider having a preventive maintenance system.

There are also insufficient teachers, particularly in full-time positions (see Table 10), despite an improvement compared to the number before the project implementation. Under the circumstances, the MoH plans to increase the number of full-time teachers and reduce those working part time, except in specific areas such as information technology or mathematics. The sector plan of the MoH also reflects a similar aim¹⁷.

Table 9: Number of operating staffs of each facility

	Actual	Desired
ICS Nampula	0	2
CFS Pemba	0	2
ICS Beira	2	6
CFS Nhamatanda	0	3
CFS Massinga	2	3

Source: Survey responses from each ICS/CFS

Table 10: Teacher staffing

	Full-time		Part-time	
	Actual	Desired	Actual	Desired
ICS Nampula	46	56	91	100
CFS Pemba	34	32	22	22
ICS Beira	37	61	65	40
CFS Nhamatanda	13	19	20	20
CFS Massinga	12	22	36	46

Source: Survey responses from each training center

Overall, there are insufficient O&M staff and teachers in each training center, which remains a minor issue for the institutional aspect of O&M.

The project is expected to install a copy and printing machine at the main ICS, to establish a system to accommodate the printout or distribution of textbooks requested from neighboring ICS/CFS. Currently, machines are located in ICS Nampula, ICS Beira and ICS Maputo. According to the administration staff of each ICS and the staff of the implementing agency, they acknowledge the need to share machines with neighboring centers as required but have not made it in this area. This is because neighboring ICS/CFS are very spread out and any sharing plan may be unrealistic.

3.5.2 Technical Aspects of Operation and Maintenance

Full-time teachers of ICS/CFS had no issues on their capacity to implement medical education, including practical lessons, because almost all staff took a teaching course after being educated in specific areas. Although part-time teachers have insight into specific areas, not all of them took a teaching course. Therefore, every ICS/CFS performs periodical class monitoring by a head or curriculum coordinator and also holds in-house training as required to improve teaching skill. Accordingly, there are currently no technical issues hindering teachers' knowledge and skill to implement practical lessons.

¹⁷ Based on interviews with MoH staff and related to the training center. The MoH developed an Acknowledge Plan (2013-2015) to increase the budget of the sector plan (PNDRHS).

The site visit also showed that an educational equipment manual was attached to each practical room for the installed equipment. According to the staff in charge of the practical room, the manual is utilized as required.

3.5.3 Financial Aspects of Operation and Maintenance

No extensive maintenance and repair will be required for a period of five to six years upon completion of the facilities¹⁸, and current costs are incurred for utility and daily maintenance (paint, change of lighting fixtures or parts of sanitary facilities, etc.).

During the planning period, the total increased amount after implementing the project was expected to be 937,912 Mozambican Meticals¹⁹ (MZN) to cover the maintenance cost of five ICS/CFS. Although the actual maintenance cost of facilities solely supported by this project was unavailable for data comparison at the time of post-evaluation, when confirming O&M cost to each ICS/CFS through questionnaire, all ICS/CFS responding recognized that no proper budget had been secured to ensure adequate maintenance (See Table 11)²⁰. Currently, there has been no incident requiring significant maintenance at each center. However, it would be considered difficult to cover extensive repair work with the current budget. Accordingly, estimating an adequate budget in the early stages and planning to apply for additional funding to provincial health offices distributing the budget, should be considered in case of future large maintenance.

The cost of consumables for procured educational equipment for practical lessons was estimated at about 7,400 thousand yen in total for all 12 ICS/CFS during the planning period. Although the precise cost of maintaining ICS/CFS was unavailable at the time of post-evaluation, the centers visited used equipment effectively and could procure the most of required supply of consumables, except for unprocurable batteries.

Although no major problem for educational practice equipment was confirmed, certain issues remain in the event of future significant facility maintenance.

¹⁸ Based on the material JICA provided

¹⁹ About 4,450 thousand yen. (Exchange rate: 1MZN=4.74 yen) as of March, 2007

²⁰ No expense has been incurred on significant maintenance, due to only a few years having elapsed since completion of the target facility in this project. However, training centers recognized the budget shortage due to their inability to secure sufficient budget to implement adequate maintenance; not only for target facilities but all facilities. Accordingly, each training center responded that the O&M budget for facilities was insufficient.

Table 11: Annual facility budget

Site name	O&M Budget (MZN)			Sufficient / insufficient
	2011	2012	2013	
ICS Nampula	725,191	1,261,030	1,261,030	insufficient
CFS Pemba	N.A. ^{Note}	93,729	N.A. ^{Note}	insufficient
ICS Beira	176,900	163,050	400,838	insufficient
CF Nhamatanda	205,080	71,085	162,643	insufficient
CF Massinga	100,000	150,000	250,000	insufficient

Source: Response to inquiries from each ICS/CFS

Note: Indicate as N.A. due to lack of response from the CFS.

3.5.4 Current Status of Operation and Maintenance

The site visit at the ex-post evaluation was performed for three out of five ICS/CFS where the facilities were constructed at this project, with the remaining ICS Beira and CFS Nhamatanda, excluded for security reasons. All three ICS/CFS were used in good condition, as shown in Table 12.

Table 12: Facility condition of training centers at the time of ex-post evaluation

Center name	Condition
ICS Nampula	Both classrooms and dormitories are generally in good condition but the following flaws emerged: Electric switch damage in the classroom, a broken toilet lid in the dormitory, removed, swollen or broken floor tiles in the dormitory.
CFS Pemba	All classrooms, a multipurpose classroom and dormitories are in good condition.
CFS Massinga	All classrooms, a multipurpose classroom and toilets, etc. are in good condition. No serious flaw has been recorded to date, within a few years of the buildings' completion. The dormitory is now effectively used as a staff room (Details are described in the output).

Most of ICS/CFS visited utilize equipment effectively and maintain it properly. The equipment provided for practical lessons needs no complicated maintenance and is not broken. A case of underutilizing equipment was reported immediate upon completion of the project. However, JICA sent a short-term expert and Japan Overseas Cooperation Volunteers (JOCV), implemented a technical cooperation project²¹ and continuously visited ICS/CFS as a part of technical cooperation project activities, which facilitated the effective and frequent use of equipment.

During the site visit of CFS Mocuba, a lot of underused or unpacked equipment

²¹ The project for strengthening pedagogical and technical skills of teachers of health training institute (2012 – 2015)

emerged, which was due to the lack of space in practical rooms, according to the head and operating staff of multipurpose classroom. However, other training centers tackled this problem by moving elsewhere to use the equipment. From this perspective, the problem is not only one of available space but also their understanding the level of importance of the equipment. To use the equipment more effectively, follow-up activity is required by the MoH or experts in the ongoing technical cooperation projects to facilitate understanding of the importance of utilizing such equipment.

As mentioned above, although most equipment is used effectively, but some are still not utilized due to inadequacy to local specifications. For instance, the project procured training equipment for use with a practical injection model in the form of a permanent glass injector, with maintenance cost in mind, although disposable injectors are generally used in Mozambique medical institutions. Accordingly, it was confirmed that this equipment had not been fully utilized at some ICS/CFS because they recognize it as outdated and unlike the equipment actually used in clinical practices. Also the use of the autoclave (sterilizer) is currently unauthorized in Mozambique due to a different set of criteria governing the sterilizing temperature and not available for practical lessons. In addition, certain digital scales were not used in some ICS/CFS (CFS Pemba, CFS Tete and ICS Maputo²²) due to the lack of button batteries. Although the three ICS/CFS concerned explained the reason for not using this equipment was the lack of the battery, another possibility is that ICS/CFS failed to examine availability properly, considering circumstances whereby other ICS/CFS continued using the scales provided and scales were procured because the consultant confirmed the availability of batteries in Mozambique. There is no equipment currently requiring maintenance – all equipment remains in good condition except for equipment which has been worn out due to frequent usage.

Although certain ICS/CFS require an improvement in the way educational equipment is utilized for practical lessons, the facilities maintained and equipment provided in this project are used effectively and properly maintained except in specific cases.

Some minor problems have been observed in terms of institutional and financial aspect of operation and maintenance. Therefore sustainability of the project effect is fair.

²² The status of equipment usage was only confirmed when ICS/CFS was visited during an ex-post evaluation.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project, improving facilities and providing equipment at health personnel training institutes/centers in Mozambique nationwide, is highly relevant to the Mozambique's development plan, which emphasizes the health sector in terms of fostering medical personnel and improving medical services, and its development needs as well as Japan's ODA policy. The size of classrooms and dormitories were expanded and the number of students and capacity of dormitories were increased at training institutes/centers supported by this project. In addition, multipurpose classrooms were constructed and practical educational equipment was provided, to increase the scope for practical lessons; enabling well-balanced education of theory and practice. The PCs provided helped teachers in preparing classes and the number of medical personnel nationwide was boosted with the increase in graduates from training institutes/centers. From this aspect, the effectiveness and impact is high. Although the project cost was lower than planned, the project period was longer than planned, so the efficiency of the project is deemed fair. In terms of operation and maintenance, the current status of facilities and equipment is generally good. Although there is no concern over the technical aspect of teachers, certain issues remain with regard to securing full-time teachers and future financial aspects. Accordingly, the project sustainability is fair. In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendation to the Implementing Agency

- Implementation of follow-up activities to improve the utilization of educational equipment for practical lessons

Some ICS/CFS did not use educational practice equipment properly. One of the main factors was insufficient recognition of the effectiveness and importance of practical lesson with equipment. Accordingly, the MoH should follow up again for promoting the use of equipment. For follow-up activities, which involve cooperating with an expert in the ongoing technical cooperation project, sending and utilizing JOCV, who has been dispatched to neighboring areas, can be effective.

- Understanding the current status and developing a plan toward assuring sustainability.

The shortage of full time teachers and also future budget related to the adequate education and maintenance has not become serious enough to impair the project's sustainability. However, the continuous future increase in students having to be accommodated to implement PNDRHS requires more teachers. A relatively large maintenance cost also would be needed when considerable time has passed since the facilities were constructed. Maintenance is currently performed in the event of trouble and efforts to establish preventive maintenance should be considered. It is desirable to coordinate ICS/CFS with the MoH and provincial offices to plan actions as required, by estimating the future capacity of student intake and budget and establishing a precise schedule before the situation becomes critical.

4.2.2 Recommendations to JICA

N/A

4.3 Lessons Learned

- Continual support implemented upon completion of the project

Many support projects for procuring medical equipment have encountered problems in terms of inadequate O&M of the equipment provided or underuse of the same. However, this project was recognized for the high usage proportion of the facilities and equipment provided, except for specific cases at certain ICS/CFS. The effective use of medical equipment is contingent on an understanding of its importance. This project ensured continual support upon completion and effectively showcased its importance by sending a short-term expert and a further expert involved in a technical cooperation project and also cooperating with JOCVs at target ICS/CFS. Accordingly, a project to procure medical equipment should consider not only training and workshops during the project for using or maintaining equipment, but also using the support of experts or volunteers upon completion of the project to ensure the continued effective use of equipment.

Republic of Burundi

Ex-Post Evaluation of Japanese Grant Aid Project
'The Project for Rehabilitation of Public Transportation'

External Evaluator: Keisuke Nishikawa
Japan Economic Research Institute Inc.

0. Summary

In this project, public buses and necessary equipment were procured to restore international and domestic public transportation capacities to the conditions of the pre-civil war period. Relevance of this project was high as the project was consistent with the development plan and needs of Burundi and was also consistent with one of the priority areas of Japan's ODA policy. With regard to the project effects, the number of operating routes and the operating distance etc. increased substantially and all the indicators expected at the time of planning generally achieved their targets. In addition, indirect effects of the project were observed in that movements of people and goods were promoted and the people were feeling it safer to move around. Therefore, the effectiveness and impact of the project was also high. The efficiency of the project was fair as the project period exceeded the plan due to the delays in customs clearance and in the construction of the foundation to install vehicle maintenance equipment while the project cost was within the plan. In respect of operation and maintenance, there was a concern on whether the implementing agency would be able to conduct adequate repairs all the time, implement large-scale maintenance of the engines smoothly, procure spare parts promptly to carry out proper repair work as the buses become older. Therefore, the sustainability of the project was judged to be fair.

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

1. Project Description



Project Location (Nationwide)



Buses Provided under the Project

1.1 Background

In Burundi, the economy collapsed due to the civil war that had lasted for more than 10 years since 1993, and infrastructure development and its maintenance was not conducted sufficiently. After the end of the civil war, economic and social revitalization was commenced and the development of rural areas where 90% of the population resided was required. Buses were the major means of transport connecting the capital city of Bujumbura and rural areas, and most of the operations were undertaken by the Office des Transports en Commun (hereinafter referred to as OTRACO).

OTRACO used to have over 100 buses before the civil war and was providing bus services throughout Burundi. However, the operating rates had declined as the buses were not adequately maintained due to the civil war and the vehicles were becoming older. While OTRACO started purchasing new vehicles with its own funds around the end of the civil war, it had only 51 buses at the time of project planning and was providing only low-frequency services between the capital and major cities. Moreover, vehicle maintenance equipment and the facilities had also been deteriorated.

Under these circumstances, public buses and necessary equipment were procured in this project to restore OTRACO's operating routes to the pre-civil war conditions.

1.2 Project Outline

The objective of this project was to improve public transportation capacities within the country and also to neighbouring countries by providing public buses and necessary equipment.

Grant Limit / Actual Grant Amount	1,104 million yen / 902 million yen
Exchange of Notes Date / Grant Agreement Date	July, 2009 / July, 2009
Implementing Agency	Office des Transports en Commun: OTRACO
Project Completion Date	January, 2011
Main Contractor	LOT1: Itochu Corporation LOT2: Ogawa Seiki Co., Ltd.
Main Consultant	Eight-Japan Engineering Consultants Inc. (LOT1 and LOT2)
Basic Design	July, 2009
Detailed Design	October, 2009
Related Projects	[Technical Cooperation]

	<p>The Rehabilitation of Public Transportation Project (2009-2012) [Grant Aid]</p> <p>Public Transportation Reinforcement Project 1981, 1983, 1987)</p> <p>The construction of the bus garage¹ (1985-1986)</p> <p>Project for the construction of the bus garage in Gitega² (1989-1990)</p>
--	---

2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa, Japan Economic Research Institute Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: August 2013 – September 2014

Duration of the Field Study: January 23 – February 9, 2014 and April 12 – 18, 2014

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

3.1 Relevance (Rating: ③⁴)

3.1.1 Relevance to the Development Plan of Burundi

Consistency with the National Development Policy

The Poverty Reduction Strategic Paper (hereinafter referred to as “PRSP”) that was formulated in 2006 served as the upper-level development policy of Burundi at the time of project planning. One of the focal goals in the PRSP is to “promote sustainable and equitable economic growth.” Recovery of infrastructure (including transport infrastructure) that assists production activities was a specific goal within it.

Later in 2011, a long-term plan named “Vision 2025” was formulated. It also aims to improve infrastructure to promote production activities and clearly states improvement of transport infrastructure. In 2012, PRSP was revised as PRSP 2 in which improvement of transportation network is regarded as the key to improvement of access between rural areas and markets, enhancement of competitiveness of production activities and promotion of regional integration.

¹ Translated from the Japanese project name. The official name in French is ‘La construction du garage pour autobus’.

² Translated from the Japanese project name. The official name in French is ‘Projet pour la construction du garage des autobus à Gitega et d'aménagement de trois stations de bus à Bujumbura’.

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

⁴ ③: High, ②: Fair, ①: Low

Consistency with the Sector Policy

When the project was planned, improvement of people's accessibility at the national level was one of the achievement goals by 2010, stated in the Policy Document for the Ministry of Transport, Post and Telecommunications 2006-2010 (April 2006), which was transport sector policy. One of the specific efforts in the policy document was the resumption of OTRACO bus service operations in order to "improve the public transport for population mobility in the country."

When the ex-post evaluation was carried out, in the transport sector's "Sector Policy 2011-2025" which was formulated in November 2013, a major goal was to promote economic activities and the objective was to improve people's domestic mobility at inexpensive rates. As specific means of transportation, establishment of bus stops and increases in OTRACO buses are mentioned.

As described above, the national development policy and transport sector policy show that Burundi has aimed to facilitate population mobility by improving domestic transport infrastructure. This project, with an aim to improve the transport capacity, is highly relevant to these policies.

3.1.2 Relevance to the Development Needs of Burundi

Transport infrastructure was heavily damaged due to the civil war that lasted for more than 10 years after 1993, which hindered economic growth. During the project planning, there was no railway in Burundi, and buses were the major means of transportation for the general public without any other own means of transportation. The national bus company OTRACO and some private bus companies were providing services. However, the services by the latter were available only in and between urban areas and major cities for its profitability. People in the rural areas had no other choice but to depend on OTRACO bus services. As 90% of the population resided in rural areas, improvement of OTRACO bus operations was important. However, the vehicles and facilities of OTRACO that had provided services across the country before the civil war became older, and the operation rate was deteriorating.

Although the nation's economy grew after the civil war was over, the lack of infrastructure that assists production activities has been a consistent problem and one of the structural weaknesses of the national economy. In terms of land transport infrastructure, degradation has been seen in most parts of paved roads and unpaved roads have not been maintained systematically. The bus services are not operated in accordance with the timetable or sometimes canceled particularly in the rainy season which inconveniences

access. Transporting costs of goods are also high, resulting in the isolation of some areas.

As for public transportation services, transportation services between major cities improved thanks to the entry of private bus companies. However, people in rural areas still depend on OTRACO's bus services. Although OTRACO has more buses than before the project implementation, with some provided by the project and others purchased by OTRACO, the number of buses it owns is still insufficient. During the field survey, many residents in rural areas voiced their requests for an increase in the number of bus services.

As described above, OTRACO's bus services have been a critically important means of transportation for people in rural areas since the time of the project planning until the ex-post evaluation. The transport infrastructure remains insufficient, roads need to be maintained properly, and there is much need for further improvement of accessibility through increases in the bus operation frequency.

3.1.3 Relevance to Japan's ODA Policy

Following the 2005 election process for democratization, the governments of Japan and Burundi held economic cooperation policy talks in 2006 and agreed to gradually resume full-scale grant aid and technical cooperation projects. Japan decided the "consolidation of peace" and "improving the basic living environment" as two pillars of support to Burundi to assist national recovery after the civil war and focus on assisting "infrastructure rehabilitation" and "human resources development." As efforts for improving the basic living environment, Japan decided assistance on public transport and infrastructure as the key areas of an economic infrastructure development program.

The improvement of public transportation is part of infrastructure rehabilitation for Burundi that took the first step toward democratization departing from the civil war and the Project is consistent with it. Thus, it is highly consistent with Japan's aid policy. As Japan also conducted human resources development as a related technical cooperation project, 'The Rehabilitation of Public Transportation Project' to enhance the project effectiveness, the two projects are a combination to specifically promote Japan's assistance policy of that time.

The project has been consistent with the direction of Burundi's development policy that is to improve transport infrastructure and facilitate people's mobility in line with the needs for improvement of transport accessibility and infrastructure development since the time of project planning until the ex-post evaluation. The project was to assist infrastructure rehabilitation and improvement of public transportation of Burundi and thus it was in conformity with Japan's assistance policy at the time of planning.

In light of the above, this project has been highly relevant to Burundi's development plan

and development needs, as well as to Japan's ODA policy; therefore, its relevance is high.

3.2 Effectiveness⁵ (Rating:③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

3.2.1.1 Operation and Effect Indicators Assumed at the Time of Project Planning

When the project was planned, the number of buses in operation, operating routes and distance, route coverage rate, and bus passengers (beneficiaries) were estimated to increase through the provision of buses and equipment. Table 1 shows the targets and actual results of those indicators.

Table 1: Trend of Quantitative Indicators of Bus Operation

Indicator	2008	2009	2010*	2011 (year of completion)		2012	2013
	Base year	Actual	Actual	Target	Actual	Actual	Actual
Number of buses in operation	51**	37	123	127	108	101	98
Number of operating route	41	40	82	107	88	90	93
Annual operating distance (1,000km)	804	1,544	1,243	1,960	2,237	2,269	2,415
Route coverage rate (%)***	23 (29/122 communes)	23 (29/122 communes)	65 (85/129 communes)	Data not available	69 (90/129 communes)	69 (90/129 communes)	79 (103/129 communes)
Number of bus passenger (beneficiary, 10,000)	470	470	550	700	570	570	670

Source: Questionnaire response

*Although the project was completed in January 2011, all buses were delivered by November 30, 2010.

**Number of buses possessed. Two were planned to be abandoned and 16 were seriously broken down and 33 were available for operation.

***The figures below the route coverage rate indicate the number of communes with bus routes / number of all communes)

⁵ Sub-rating for Effectiveness is to be put with consideration of Impact.

The details of the number of buses in operation are shown in the table below.

Table 2: Details of Buses in Operation

		2010	2011 (year of completion)	2012	2013
Large bus	Existing bus*	3	3	3	3
	Project bus**	22	22	21	21
Medium-sized bus	Existing bus	3	3	3	3
	Project bus	28	28	28	28
Medium-to-small-sized bus	Existing bus	20	7	2	0
Small bus	Existing bus	7	7	4	4
	Project bus	36	34	33	32
	Technical cooperation project bus***	4	4	4	4
	New bus****	0	0	3	3
Total		123	108	101	98

Source: Questionnaire response

*Existing bus: buses already possessed by OTRACO before the Project implementation

**Project bus: buses provided in the project

*** Technical cooperation project bus: buses purchased in the Rehabilitation of Public Transportation Project, implemented from 2009 until 2012

****New bus: buses independently purchased by OTRACO after the project

There were 108 buses in operation and 88 routes, both achieving 85% and 82% of the target, respectively, in the year of completion (2011). The major cause of the figure below the plan is that OTRACO decided to dispose of seriously broken buses (16 of 51) that had been planned to be repaired for operation because the maintenance cost was estimated to be high. Later, it also disposed of already-existing buses gradually due to high maintenance cost, resulting in a drop from 33 buses in 2008 to 10 buses in 2013. Another reason for the decline of the total number of buses in operation is that five buses provided in the project were also disposed of or became unusable for operation – four met in traffic accidents and one was burnt down by a rebel attack – before the ex-post evaluation.

On the other hand, OTRACO has been purchasing new buses independently – three and two small buses in 2012 and May 2014, respectively.

As described above, although the number of buses in operation decreased due to the disposal of already-existing buses and traffic accidents after the project implementation, the number of operating routes and distance grew gradually after 2011 and there was no specific problem when compared with the project plan. The annual operating distance declined in 2010 because the project had yet to bring about substantial effects as the buses were provided in November of that year. In 2011, when the bus services were operated throughout the year for the first time, the number of routes, route coverage rate and the

number of beneficiaries⁶ increased significantly.

3.2.1.2 Other Operation Indicators

Although the target figure was not established at the time of project planning, operation of international routes as well as the number of passengers on some of the major routes in the country as reference were studied in the ex-post evaluation as part of the purpose of the project was to improve the public transportation capacity to neighboring nations.

Table 3: International Route Operation

Bus Operation Section	Year of service launched	Number of service/week	Average number of passengers
Bujumbura -- Dar es Salaam (Tanzania)	2012	2	40
Bujumbura -- Kampala (Rwanda, Uganda)	2013	3	100
Bujumbura -- Mwanza (Tanzania)	2013	2	80

Source: Questionnaire response

Table 4: Passenger Volume on Major Domestic Routes

(Unit: 1,000 passengers)

Destination	2009	2010	2011	2012	2013
Ngozi (north)	10.4	9.3	27.0	24.1	24.9
Gitega (central)	60.0	52.8	153.5	136.8	141.5
Bururi (south)	9.4	8.5	24.6	21.9	22.6
Chankuzo (east)	40.8	35.8	109.4	93.1	96.2

Source: Questionnaire response

Although the international route services had been discontinued due to the civil war, they were resumed in 2012 using the large buses provided in the project. There were two routes to Tanzania and one route to Rwanda and Uganda at the time of ex-post evaluation. There is a plan to begin the service to the Democratic Republic of the Congo by which Burundi is bordered on the west. This showed that the public transportation capacity has improved through the Project. As for the domestic routes, the number of passengers from the nation's capital, Bujumbura, to major cities increased significantly from the previous year, 2011, and service improvement is also shown in data.

With no specific data on the travel time between cities being available, the change of required travel time from the places of departure to arrival was studied with passengers in the beneficiary survey⁷. It was found that the travel time was shortened by 36% on average.

⁶ The number of beneficiaries is the total of population of communes where the bus route exists, not indicating the actual bus passengers. The total population of Burundi is 8,575,000 (2011, UN estimate).

⁷ The survey was conducted in the interview style with a total of 100 passengers – 60 in the capital of Bujumbura, 20 each in Ngozi, Gitega and Bururi where branch offices are located – on the satisfaction of travel time, improvement of accessibility, service frequency, punctuality, fares and services.

As for punctuality, 71% of passengers responded in the survey that the bus operation was on time whereas 29% responded that it was not on time (delay). The results of the required travel time and punctuality were mostly positive mainly because the bus operation became smooth and bus breakdowns on the road became close to zero. However, there were many rural areas with bad road conditions and the operation became behind the schedule due to such weather conditions as torrential rains, according to the survey results. A certain level of effects in terms of shorter travel time and punctuality emerged in general.

3.2.2 Qualitative Effects

3.2.2.1 Shortening of Maintenance Time

As a qualitative effect, the provision of vehicle maintenance equipment in the project was expected to improve the safety inspections and shorten the maintenance time. Although it was difficult to find out the concrete time required for maintenance in the ex-post evaluation, the provision of such equipment improved the efficiency in operation and maintenance activities, according to the implementing agency. For example, provision of garage jacks led to shorter time of lifting up multiple vehicles and provision of tyre exchangers led to safe and efficient tyre removal and attachment. When the workshop was visited, it was observed that tyre and oil replacement work was performed smoothly with the equipment provided in the project.

Although the number of buses possessed by OTRACO increased remarkably, there was no delay of maintenance work that would hinder bus operation. The provision of such equipment seems to be one of the main reasons for more efficient and steady maintenance and various kinds of work.

3.3 Impact

3.3.1 Intended Impacts

The impacts by the implementation of the project expected at the time of planning, and the results of interviews in the beneficiary survey after the implementation are shown in the table below.

Table 5: Expected Impacts and Beneficiary Survey Results

	Expected impacts (planning phase)	Beneficiary survey results (at ex-post evaluation)
1	<ul style="list-style-type: none"> Recovery of bus routes to the state that they were before the civil war would contribute to improvement of living environment of local residents as 	<ul style="list-style-type: none"> Beneficiaries were asked if they found improvement of access to other places (communes), all passengers responded yes. 71% of respondents said that they were satisfied with the service frequency while the remaining 29%

	a result of improvement of access to hospitals and clinics, schools and other public facilities and market, etc.	was not, requesting more frequent services.
2	<ul style="list-style-type: none"> Improvement of transport capacity would help energize local economy in the capital and rural areas. 	<ul style="list-style-type: none"> Although there was no major change (e.g. opening of major shopping centers, etc.) as a result of resumption of route operation after the provision of buses, 90% of respondents said that they felt some economic changes. Particularly in rural areas, many respondents said that they became able to conduct such commercial activities as selling produce from rural areas to the city and go to the city to buy commodities and sell them at markets in the rural areas.
3	<ul style="list-style-type: none"> Promotion of domestic and international mobility of human and material capital would contribute to consolidation of peace as “dividends of peace” would permeate across the country. 	<ul style="list-style-type: none"> 97% of respondents of the beneficiary survey said that bus services became active to enable them to travel safely after the end of the civil war.

Source: Preparatory Survey Report and Beneficiary Survey Results

Passengers felt the improvement of accessibility as a result of increases in the routes and service frequency. Although some people in rural areas voiced their expectations of further increase in service frequency, 71% of respondents were satisfied, according to the survey results. OTRACO operates school buses in addition to regular bus routes.

Although major economic impacts by the improvement of accessibility were not found out in the ex-post evaluation, transport of goods between cities and rural areas were observed and bus passengers for business were also seen occasionally in the field survey. 90% of respondents said that they felt economic changes after the improvement of bus operation. This shows emergence of certain impacts. In addition, 97% of respondents said that they felt they can travel safely. This shows that travel of people and goods by OTRACO bus was promoted after the end of the civil war and people generally felt that they were in a peaceful environment. Thus, it is fair to say that the Project has contributed to the consolidation of peace.



Photo 1: Bus terminal in southern Bujumbura



Photo 2: A scene on the bus in operation

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

It was judged that the project would not have any negative environmental impact in comparison to the pre-project period.

No specific negative impact on the natural environment was observed at the time of ex-post evaluation. According to data on fuel consumption per kilometer provided by the implementing agency, positive impacts were observed by contrast, as the fuel consumption of large, medium-sized and small buses provided in the project improved by 7%, 17% and 36 %, respectively, when compared with already existing buses.

3.3.2.2 Land Acquisition and Resettlement

The project was to provide buses and equipment, and the latter was placed on existing premises. As a result, it did not involve any land acquisition or resettlement of local residents and thus there was no problem related to them.

3.3.2.3 Other Impacts

A sticker of national flags of Japan and Burundi, ODA logo, and texts ‘Japan-Burundi cooperation in 2010’ is placed on the buses provided in the Project (see the photo). When a question was asked to the people whether they knew that the buses were provided through an aid project from Japan in the beneficiary survey, 62% responded “Yes” and 38% said “No”. Although “Yes” was not so high, it is still fair to say that the Project had some impacts in terms of Japan’s ODA publicity.



Photo 3: Sticker on the bus

When the project was evaluated in terms of capacity improvement as public transportation, indicators of quantitative effects expected at the time of planning grew significantly after its implementation and the target figure (80% or more) was mostly achieved. Domestic and international accessibility also improved remarkably. Although there was no such effect as construction of major facilities as vitalization of economic activities, such impacts as increase in travel of people and goods and the achievement of safe travel were observed.

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

3.4 Efficiency (Rating:②)

3.4.1 Project Outputs

The table below shows the comparison of planned and actual outputs of the project.

Table 6: Planned and Actual Outputs

Item	Plan	Actual	
		LOT1	LOT2
Large bus (60 passengers)	23	22	—
Medium-sized bus (45 passengers)	29	28	—
Small bus (29 passengers)	36	—	36
Spare parts	1 set per bus	1 set per bus	1 set per bus
Equipment for maintenance workshop	1 set	—	1 set

Source: Preparatory Survey Report and questionnaire response

Note: This project was divided into two lots. Large and medium-sized buses and spare parts were procured in LOT1 and small buses, spare parts and equipment for the maintenance workshop were procured in LOT2.

When the project was planned, it was judged that low-floor and rear-engined buses that were common in Japan were unsuitable due to the local road conditions, and the production cost and period would be high and long if ordered to Japan for large and mid-sized buses as it would be a custom order. Therefore, it was decided to take a knockdown production system in which the lower body would be imported from Japan and the upper body would be built and installed in Kenya. The ex-post evaluation confirmed that the planned procedures were taken and there was no specific quality problem related to the body. Meanwhile, as OTRACO had had experiences of quality problems of small bus bodies it purchased from Kenya, Burundi strongly requested the procurement of buses with high quality. Thus, it was not decided at the time of project planning whether to import finished buses from Japan or take the knockdown production

system. After all, the priority was given to bus quality and endurance, then it was decided that finished buses would be imported from Japan. As the same type of bus was relatively common in Burundi and there were maker-dealers in the country, it was determined that there would be little concern about procurement of parts, which was another major reason for the decision to import them from Japan.

With regard to the difference between the planned and actual number of buses, there was one less large and medium-sized bus each than the plan as shown in Table 6. The reduction of one large and one medium-sized buses in LOT1 was because it was found out during the detailed design of the planning stage that one additional bus for each size was posted when the calculation method to generate needed vehicle numbers was reviewed in consideration of non-operation vehicle rate. Therefore, in the actual procurement, they were reduced by one based on the recalculation. As for the equipment for vehicle maintenance, the number of garage jacks, wheel dollies, and tool sets were added and rigid racks were newly added to the original plan, while acoustimeters and electric chain saws at the Gitega Branch⁸ were removed as it was judged that they could be reused. The review had not led to any specific problem and it was a reasonable change.

Burundi was planned to undertake responsibilities for banking fees, installation of equipment, drawing-in of electric distribution related to installation of vehicle maintenance equipment, disposal of remaining equipment, and securing the budget and personnel necessary for the project implementation and sustainability, and effective use of operation and maintenance system of bus equipment. Although the foundation work of maintenance equipment in the garage was behind the schedule as described later, the contents were carried out mostly as planned.

Large and medium-sized buses provided in the project are equipped with a certain size of luggage space in the lower part and they were used by ordinary passengers with large luggage. However, because small buses procured from Japan, mostly in accordance with specifications, had little luggage storage space, large luggage including hemp bags were put on the aisle. Small buses also had a problem in their seat material being not so durable and easily getting dirty. It was confirmed in the field survey that OTRACO began replacing the seat cover with a more durable one in order to improve their durability.

It seems to have been more desirable that the specifications of luggage space and seat quality of small buses be more suitable for the local conditions that they transport much

⁸ The Gitega branch facility was used as a rehabilitation training facility for more than 6,500 discharged soldiers when the preparatory survey was conducted and it was impossible to check the conditions of workshop and other facilities. It became possible to check the usability of possessed equipment in the detailed design stage.

luggage and there were many unpaved roads.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The following table shows the comparison of planned and actual project cost.

Table 7: Comparison of Planned and Actual Project Costs

(Unit: one million yen)

Item	Plan	Actual	
23 large buses	401	1,073	873.5
29 mid-sized buses	331		
36 small buses	263		
Equipment for vehicle maintenance	78	242.4	
Implementation design and procurement supervision, etc.	31	28.7	
Total	1,104	902.2	

Source: Preparatory Survey Report and completion report

As described in “3.4.1 Project Outputs”, as a result of the review of equipment, (reduction of buses, addition and reduction of items and volume of some equipment) in the detailed design, it was reasonable to reduce 28 million yen from the limit of the Exchange of Note (E/N) as the total equipment cost as the planned cost, and it was decided that the evaluation of the project would be judged on whether the project cost was within 1,076 million yen or not. The tendering of the project was carried out in two lots (LOT1 and LOT2), and the both lots were tendered below the planned bidding price. The total project cost including the implementation design and procurement supervision, etc. was 902 million yen, within the revised plan of 1,076 million yen. The Burundi side injected 87.7 million Burundi francs (approx. 6.14 million yen) for the part it was responsible, which was also below the planned amount of 93.9 million Burundi francs (approx. 7.51 million yen). Thus, the actual project cost borne by both Japan and Burundi sides were 908 million yen in total, which is 87 % of the planned 1,083 million yen in consideration of the reduction as a result of equipment review⁹.

3.4.2.2 Project Period

The project duration was planned to be 14 months including the tender document production and tender periods. The procurement period was intended to be shortened by

⁹ It was 82 percent of the originally planned value of 1,111 million yen.

procuring large and medium-sized buses (LOT1) and small buses and repair work equipment for maintenance (LOT2) concurrently as separate lots.

The procurement was actually divided into two lots to make the actual project period for 15.5 months from September 2009 to January 2011 (LOT1 was until November 2010 and LOT2 was until January 2011). There were delays in both lots for the following reasons that resulted in the actual project period longer than the plan by 11%.

- LOT1: It took 10.5 months, one month longer than the schedule, because of delay in customs clearance of parts sent from Japan at the Mombasa Port in Kenya.
- LOT2: It delayed for various reasons which include; Burundi side's delay in the selection of construction company for workshop construction including the foundation work to install vehicle maintenance equipment, delay in various construction arrangements due to the time required for the appointment of new OTRACO director general after the arrest of the former director general for corruption, delay in the commencement of construction due to the delay of removal of government vehicles other than the ones of the supervising ministry left at the construction site, delay of construction due to the rainy season, and redoing of foundation work for installation of equipment. As a result, it took 11.5 months, 3.0 months longer than the original 8.5-month schedule.

The project cost was slightly lower as a result of review of equipment at the detailed design stage, with the actual cost 84% of the plan. However, the project period was 111% of the plan due to the delay of customs clearance of buses in Kenya and foundation work for vehicle maintenance equipment. Based on the above, although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

3.5 Sustainability (Rating:②)

3.5.1 Institutional Aspects of Operation and Maintenance

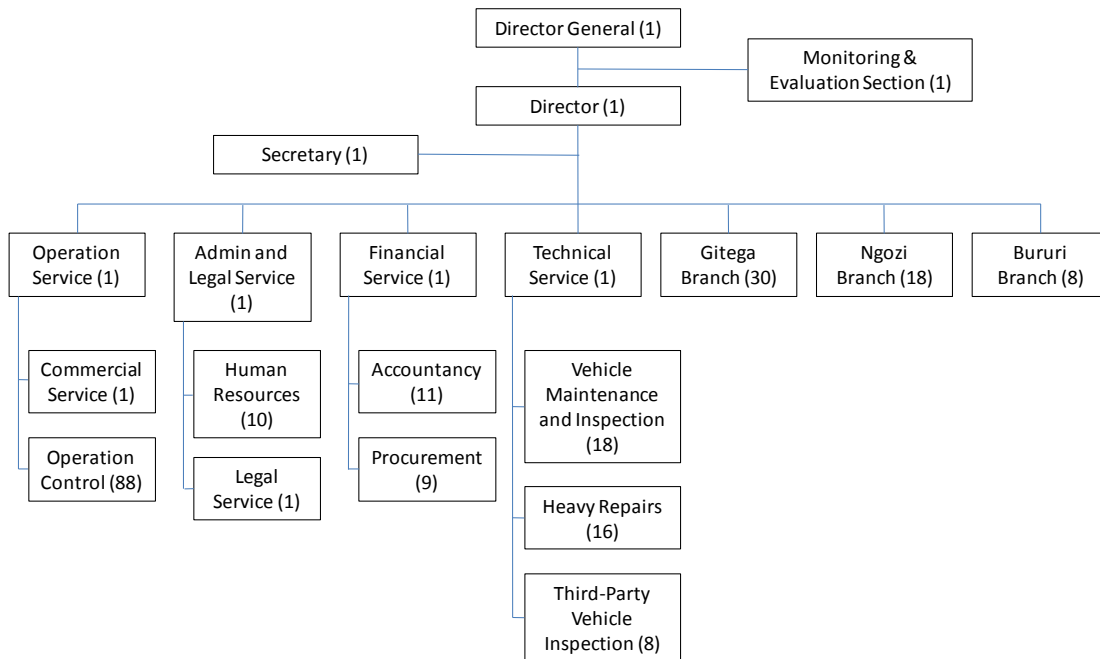
OTRACO, the executing agency of the project, is a public corporation under the supervision of the Ministry of Transport, Public Works and Equipment, and there were 226 employees at the time of ex-post evaluation (as of January 2014). In the O&M section at the Head Office in the capital of Bujumbura, 43 employees in the Technical Service Department (director, 18 employees in maintenance and inspection group, 16 in heavy repairs group and 8 in the third-party vehicle inspection group) are responsible for vehicle maintenance. The Operation Service Department with 90 employees including drivers is responsible for bus operations. Its head office in Bujumbura has a vehicle inspection

facility and the income from the inspections is part of valuable source of income, as described later. The Gitega branch (30 employees) and Bururi branch (8 employees) were reopened in November 2010 and March 2012, respectively¹⁰. The Ngozi branch (18 employees) was opened in 2008 before the project implementation and the head office and three branches cover the nationwide bus network. Gitega, Ngozi and Bururi branches have 13, 7, and 4 buses, respectively, and the Gitega branch is also equipped with a workshop. Bujumbura Head Office and two branches perform regular inspections and simple repair work. However, due to insufficient equipment, major complex repair work is performed at the workshop in Bujumbura.

The bus procurement under the project was considered to require a total of 132 additional employees – 59 drivers, 59 conductors, 7 employees in the Gitega branch, 5 in Bururi and 2 in Ngozi. In reality, a total of 83 employees were newly hired – 69 drivers in Bujumbura, 7 employees in the Gitega branch, 5 in Bururi and 2 in Ngozi. Conductors were outsourced, not being hired officially, due to OTRACO's budget shortage. A total of 21 mechanics who perform bus maintenance work were also hired. Each section and branch offices were interviewed in the ex-post evaluation and it was found out that there was no specific shortage of manpower for performing routine operation. Although conductors are outsourced to contractors, there was no problem related to ticket sales and management.

According to the implementing agency, there were discussions recently held within the government on the privatization of OTRACO that competes with private bus companies on some routes. It was concluded that it would not be privatized, valuing its public nature of providing bus services also in rural areas. Contrary to the discussions, the government budget has been allocated and preparation for opening a branch in Cankuzo Province in the eastern part of the country is underway in order to expand the network and improve the vehicle inspection service described later.

¹⁰ The Gitega branch was used as a disarmament facility and the Bururi branch was used as a specialized occupational training facility for discharged soldiers. Because of delay of handover of the facility, the operation as branches resumed later than planned.



Source: Compiled based on materials provided by the implementing agency

Note: Figures in the parentheses are the number of employees.

Figure 1: OTRACO Organization (as of February 2014)

3.5.2 Technical Aspects of Operation and Maintenance

Although some employees with long working experiences were equipped with maintenance skills at the time of project planning, mechanics' capacity was believed to be insufficient in general because of the influence of the civil war. In the preparatory survey (2009), it was determined that OTRACO mechanics had difficulties in practical maintenance work although they had technical knowledge on it and they had few opportunities of receiving technical training. There was no accumulated data on the number of passengers of each route and it was believed that technical instructions on operation plan and management needed to be provided.

A technical cooperation project, "The Rehabilitation of Public Transportation Project" 2009 to 2012, was implemented to improve the insufficient technical capacities in tandem with this project. Through the technical cooperation project, efforts were made to revise and implement bus operation management plans, revise and implement maintenance plans, instruct vehicle maintenance, establish the statistics section to systematize operation data entry, and improve budget execution management and financial management. These efforts helped to improve capacities of bus operation, data management and vehicle maintenance, according to the terminal evaluation survey of the technical cooperation project, and it was confirmed at the time of ex-post evaluation that they had been steadily performed. The maintenance manual was also improved in the project and it was also confirmed that maintenance work was performed in accordance with it. However, there has been no

specific training since the project was completed in June 2012. Although their technical capacities at the time of ex-post evaluation did not hinder routine inspections or repair work, some concerns still remained over their capacity to smoothly perform proper repair work constantly or major maintenance work of engines when many buses get older concurrently. It is considered that there is need to provide continuing training to the technical staff so that they will be fully equipped with capacities to perform repair work in order to handle such situations.

3.5.3 Financial Aspects of Operation and Maintenance

The project focused on the recovery of public transportation services that was part of basic living for repatriated refugees and other impoverished people as well as rural residents and thus its low profitability was expected from the time of project planning. Thus, an average of 30% of income from bus operation had been injected as the government subsidies every year and it was believed that 20% to 30% of the income from bus operation would be managed with the government subsidies every year after 2009.

Table 8: OTRACO's Financial Conditions

(Unit: million Burundi franc)

	2009	2010	2011	2012	2013
Sales (income from bus operation)	903.5	910.0	2,595.9	3,048.4	3,340.2
Cost of sales	-1,082.8	-1,096.6	-2,037.8	-2,257.6	-3,317.5
Gross margin	-179.3	-186.6	558.1	790.8	22.7
Sales and general administrative expenses	-541.6	-1,280.8	-4,060.7	-4,135.4	-3,562.5
Operating profit	-720.9	-1,467.5	-3,502.6	-3,344.6	-3,539.8
Non-operating income	764.0	1,602.7	3,994.9	3,873.5	3,634.5
Non-operating cost	-17.6	-55.3	-354.0	-253.7	43.3
Current profit	25.5	79.9	138.3	275.2	138.1
Pretax profit	25.5	79.9	138.3	275.2	138.1
Taxes	-8.9	-28.0	-48.4	-96.3	-41.4
Current income	16.6	52.0	90.0	178.9	96.7

Source: Compiled based on materials provided by the executing agency

The income from bus operation grew significantly from 2011 onwards, in line with the project implementation. It grew at a rate higher than expenditure increases (cost of sales) in 2011 and 2012, leading to the improvement of operation balance. The gross margin decreased in 2013 because of increase in cost of sales, affected by a factor such as a rise in fuel cost. The buses provided in the project were posted as non-operating income as an income item and that was depreciated in the sales and general administrative expenses. Thus, the figures account for a large portion. However, because they are depreciated in four

years after the provision, they are not to be posted after 2015. Non-operating income also includes income from vehicle inspection services and government subsidies, and these items play a crucial role in securing current profit. The income from vehicle inspection services increased from 203 million Burundi franc in 2010 to 386 million Burundi franc and 326 million Burundi franc in 2011 and 2012, respectively, after the project implementation.

However, there emerged the need to pay part of the income from vehicle inspection services to the government coffer and the ratio was also raised from 2011 to the current 50% of the profit. As Figure 2 shows, the government subsidy has been on a declining trend and there is some uncertainty of further improvement of financial conditions.

It was confirmed at the time of ex-post evaluation that OTRACO was renting bus terminal sites to private business operators as a parking lot and to establish kiosk sites, in order to diversify income sources to reduce uncertainty risks.

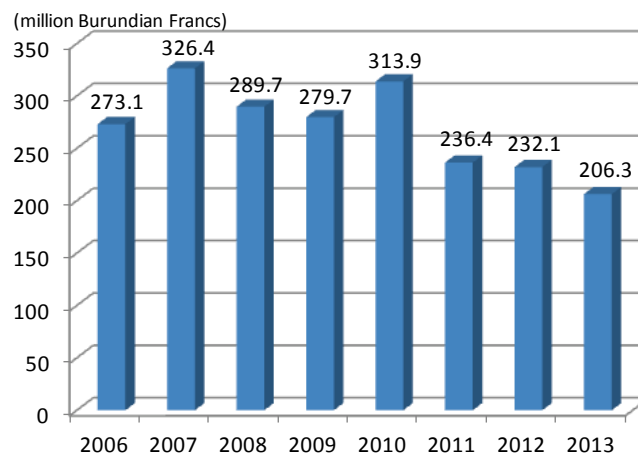


Figure 2: Trend of Government Subsidy

The maintenance budget increased as the number of buses increased because of the project implementation. However, as shown in Table 9, the ratio to the budget declined from approx. 64% before the project implementation to 45~48% and actual expenditures and the ratio to the budget were both lower than the expected maintenance cost in 2011. Because a set of spare parts were also provided together with the buses in the project and because buses were new, this helped curve the maintenance cost spending to contribute to the improvement of financial conditions.

Table 9: Maintenance Budget

(Unit: million Burundi franc)

	2007	2008	2009	2010	2011		2012
	Actual	Actual	Actual	Actual	Plan	Actual	Actual
O&M cost*	958.3	1,007.1	911.1	867.3	1,653.5	1,470.7	1,637.5
Overall budget	1,816.4 (actual income)	1,900.0	1,421.4	1,358.4	3,405.1	3,254.4	3,445.4
Ratio to budget	52.4%	53.0%	64.1%	63.8%	48.5%	45.2%	47.5%

Source: Preparatory Survey Report and materials provided by the executing agency

*Fuel cost included

There had been no stock of some spare parts at the time of ex-post evaluation and there is need to purchase them in a planned manner. However, as described later, no sufficient procurement scheme is established and there is not sufficient budget to purchase parts although the overall financial figure is in black. Against the backdrop, there is a need to further improve the financial conditions for smooth part procurement.

All buses provided in the project will require major maintenance in several years. Although OTRACO has been making efforts to purchase additional new vehicles in 2012 and 2014, as described above, to increase the number of buses it possesses, it is also necessary to gradually accumulate the budget for major maintenance by diversifying the income sources in order to maintain all buses in good conditions.

OTRACO's bus fares that greatly affect sales fluctuations are lower than those of private bus companies from the viewpoint of public nature. Although the fares are lower than those of private bus companies in general, OTRACO has no authority to decide the fares at its own discretion and they are decided by the Ministry of Transport, Public Works and Equipment that supervises OTRACO. Bus fares were raised in September 2013 in response to the sharp fuel cost increase (e.g.: 320 franc to 345 franc in Bujumbura, 4,500 franc to 5,000 franc for a one way ticket between Bujumbura and Bururi). Charter fees were also raised from 45 franc to 50 franc per kilometer per passenger. In the beneficiary survey, 80% of the respondents said that the fares were reasonable and of the remaining 20%, 10 percent each, said that they were too high or too low.

OTRACO's financial conditions improved in general as a result of increases in the operation income after the project implementation and efforts are made to diversify the income sources. However, it may still become difficult to secure surplus in the future for such reasons as the declining government subsidies, uncertain handling of income from vehicle inspection and no authority to decide bus fares without a large amount of surplus. The need for spare part procurement in large quantities and major maintenance work is also forecast, which can be another factor of surplus decline as buses provided in the project get older. Thus, the government subsidies would need to be continued in addition to the efforts to diversify the income of OTRACO on its own as it provides transportation service also in

rural areas as provision of public transportation service where profitability is low.

3.5.4 Current Status of Operation and Maintenance

In the ex-post evaluation, bus maintenance conditions, operation of maintenance equipment, procurement of spare parts, and whether there was a maintenance plan or not, were checked to examine if the effects of the project would be highly sustainable.

3.5.4.1 Maintenance of Provided Equipment

There was a maintenance plan that provides such inspection rules that small buses and other buses need to have engine oil replaced every 3,000 kilometers and every 5,000 kilometers, respectively, and maintenance work was performed in accordance with it. It was confirmed that a spare part replacement record was also kept. The bus maintenance equipment procured for the workshop at Bujumbura Head Office was in good operation in general and maintenance work was performed smoothly.

All branch offices were visited in the field survey to understand the bus operation and maintenance. Although the Gitega branch workshop and Ngozi branch facility were all used, their equipment was not sufficient and there was some broken equipment (brake tester, for example) that was procured in past grant aid project (1989 to 1990) at the Gitega branch. The Bururi branch did not have sufficient maintenance equipment including basics. As Bururi and Ngozi branches performed only simple inspections and repair work and had to send buses to Bujumbura Head Office for others, this led to inefficient bus utilization¹¹. It is important to improve the equipment at these branches and reduce the degree of dependence on Bujumbura Head Office for efficient bus operation.

3.5.4.2 Concerns Specific to Large and Medium-sized Buses

Because the body of large and medium-sized buses was built in Kenya, there was concern over rusting based on experiences in other projects. However, operation instructions were provided for mechanics and drivers by Kenyan business operators at OTRACO and in Kenya smoothly and there were no problems of welding or antirust treatment for the buses provided in the project.

3.5.4.3 Spare Part Procurement

Because large and medium-sized buses are not common in Burundi and there is no direct agent in the country, spare parts cannot be procured domestically and orders need

¹¹ When a bus based at a branch office is sent to Bujumbura Head Office for repair work, it causes additional one to two days of suspension of the operation.

to be placed abroad including Kenya¹². However, due to the insufficient budget, they cannot have a large amount of stock of consumables. It requires a lot of time from order placement to arrival. At the time of field survey, there were actually some buses that were left parked unable to be operated due to the delay in procurement of tyres that became out of stock frequently¹³.

It is important to formulate and implement a procurement plan and allocate budget in order to improve the constant delay of spare part procurement. They have a problem of spare part procurement of large and medium-sized buses not going smoothly in general, not just for tires. Another reason for it is that sufficient procurement route from the Kenyan business operators is not established, and there is urgent need to create an international route to enable quick spare part procurement.

3.5.4.4 Improvement of Road Conditions

Roads in Burundi are mostly unpaved except for main routes and road surface conditions are not so good in many sections. As OTRACO operates many rural routes where the road surface conditions are not good, suspension leaf springs and shock absorbers of their buses are more likely to be damaged and the lower body becomes dirty. This causes major negative impacts on bus maintenance. In the beneficiary survey, 43% of respondents said that road conditions were acceptable, only 4% responded they were good and 53% said that they needed to be improved as they were not good.

As described above, road surface conditions are not good in terms of bus maintenance and comfort of passengers. Although road improvement work is not within the scope of duties of OTRACO, it needs to be requested to the Government of Burundi.

No problem related to the O&M structure was found and the financial conditions were improving in line with the increase in bus operation after the project implementation. However, there remains slight concern over the future increase in maintenance cost when all spare parts provided in the project are used up and major maintenance work is needed later as well as over uncertainties of handling of income from vehicle inspection and the trend of decreasing government subsidies. It was also observed that there has been a delay of procurement because the budget for spare part purchase was not secured sufficiently in advance. Although there were no problems related to the technique of daily O&M, there is still concern whether spare parts can be procured promptly and whether the mechanics are fully equipped with skills to perform repair work properly when buses get older, under the current circumstances of no systematic training after the completion of the technical

¹² There is an agent of small buses in Burundi and parts can be procured relatively easily.

¹³ Operation resumed two to three weeks later after tire replacement.

cooperation project.

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In this project, public buses and necessary equipment were procured to restore international and domestic public transportation capacities to the conditions of the pre-civil war period. Relevance of this project was high as the project was consistent with the development plan and needs of Burundi and was also consistent with one of the priority areas of Japan's ODA policy. With regard to the project effects, the number of operating routes and the operating distance etc. increased substantially and all the indicators expected at the time of planning generally achieved their targets. In addition, indirect effects of the project were observed in that movements of people and goods were promoted and the people were feeling it safer to move around. Therefore, the effectiveness and impact of the project was also high. The efficiency of the project was fair as the project period exceeded the plan due to the delays in customs clearance and in the construction of the foundation to install vehicle maintenance equipment while the project cost was within the plan. In respect of operation and maintenance, there was a concern on whether the implementing agency would be able to conduct adequate repairs all the time, implement large-scale maintenance of the engines smoothly, procure spare parts promptly to carry out proper repair work as the buses become older. Therefore, the sustainability of the project was judged to be fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Establishment of Procurement Mechanism of Spare Parts

Under the gradual improvement in financial conditions with increases in operational revenues, it is important to procure frequently-replaced spare parts such as tyres in advance so that all buses will be utilised without a hitch, while the treatment of revenues from vehicle inspection services and the prospect for government subsidies remain uncertain. With a constraint in mind that there are many spare parts difficult to procure inside Burundi, it is considered necessary to establish a mechanism on scheduled international procurement.

4.2.1.2 Continuation of Government Subsidies

OTRACO provides bus services even in the rural area where private bus companies do not operate due to low profitability. Although the government subsidies for operations in rural areas are gradually reduced, OTRACO cannot set the bus fare at its own discretion and some of the revenues from vehicle inspection services are required to be paid to the government. In order to ensure financial soundness of OTRACO and to enable stable provision of public transportation services in the rural area, it will be necessary to receive a certain level of subsidies from the Ministry of Transport, Public Works and Equipment. Alternatively, if the subsidies will be reduced further, it is considered to be an option to authorize OTRACO to set the bus fare flexibly.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

4.3.1 Specification Settings based on the Local Situation

It seems to have been necessary to allocate sufficient storage space on all buses as a lot of luggage is transported on the medium to long distance bus routes particularly in rural areas. It was also desirable that the seat materials of some buses were easy to clean and had higher durability since the majority of the road was a dirt road. While these measures had been taken on large and medium-sized buses, small buses procured from Japan had issues in the storage space and seat materials. It is important to take the local usage environment into consideration and take necessary measures when similar projects are planned and implemented.

(End)