

Kingdom of Tonga

Ex-Post Evaluation of Japanese ODA Grant Aid Project

“The Project for Upgrading and Refurbishment of Vaiola Hospital (Phase II)”

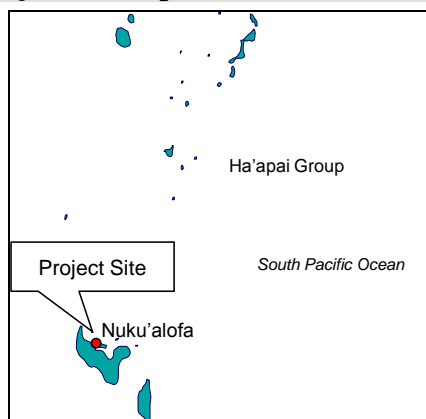
External Evaluator: Keisuke Nishikawa, Japan Economic Research Institute Inc.

0. Summary

In this project, an outpatient department building, etc. were constructed and a nursing school was expanded to improve medical services and strengthen the functions of human resource development in the health sector. The gist of this project was consistent with the development plan and needs of Tonga, as well as the priority areas of Japan’s ODA policy. Therefore, the relevance of this project is high. With regard to project implementation, the project components were implemented mostly as planned, and the project cost and period were within the plan. Consequently, the efficiency is also high. With respect to project effectiveness, while the effects were observed in terms of the improved functions of the hospital, increases in the number of nursing school students and the content-rich education, it was difficult to obtain consistent data concerning the number of general outpatients, which made it impossible to draw quantitative conclusions to show that the project generated sufficient effects. It was confirmed additionally that Vaiola Hospital had been underpinning Tonga’s medical system and activities as the top-referral hospital and also making certain contributions to the improvement of the people’s health. Therefore, the overall effectiveness and impact of this project is fair. In terms of sustainability, some problems were identified in many respects as seen in the need to strengthen organisational and technical aspects, the reduction of maintenance budget in the financial aspect, as well as the time required to procure spare parts, meaning that the sustainability of the project can be judged to be fair.

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

1. Project Description



Project Location



Outpatient Department Building
Constructed in the Project

1.1 Background

Vaiola Hospital (opened in 1971), the development target of this project, has been positioned as the only tertiary medical facility in Tonga, playing a core role in the provision of medical and healthcare services in the country. However, due to the deterioration of hospital facilities and medical equipment as well as an increase in outpatients, not only operating theatres but also the beds for post-surgery recovery and intensive care were not sufficient to provide good medical services to hospitalised patients. In addition to this problem, the hospital had infection risks as the sterile/unsterile areas were not clearly divided in the operating theatres and the main material sterilising room. The hospital also had other safety and environmental problems such as inefficient handling of sterilisation requirements because of the deteriorated steriliser in the main sterilising room, interruptions of proper diagnosis due to troubles of X-ray equipment, and contamination risks due to the insufficient capacity of wastewater treatment tanks receiving wastewater from the entire hospital.

In view of these circumstances, the Government of Tonga drew up the Vaiola Hospital Improvement Master Plan with support from the World Bank, aiming to improve the entire Vaiola Hospital. The improvement policy presented in the master plan was that the entire hospital would be improved with assistance from donors by dividing the construction and renovation work into six work sections. In the first stage of the master plan, the main examination ward, the obstetrics ward, the surgery ward, the septic tank as well as related medical equipment were improved through the grant aid from Japan in 2004. In the second stage, the internal medicine ward, the paediatric ward, and the mental health ward were constructed with assistance from the World Bank.

As the final stage of the master plan, the remaining outpatient, emergency and administration divisions were constructed and renovated, and the related medical equipment was procured in this project.

1.2 Project Outline

The objective of the project was to improve medical services and strengthen the functions of human resource development in the health sector by constructing new hospital facilities such as outpatient department building and expanding the nursing school at Vaiola Hospital.

Grant Limit / Actual Grant Amount	1,998 million yen / 1,717 million yen
Exchange of Notes Date / Grant Agreement Date	Detailed Design: December, 2009 / December, 2009 Construction: May, 2010 / May, 2010
Implementing Agency	Ministry of Health
Project Completion Date	March, 2012
Main Contractors	Construction: Kitano Construction Corp. Procurement: NBK Corporation
Main Consultants	The Consortium of Nihon Sekkei International Inc. and Nihon Sekkei, Inc.
Basic Design	November, 2009
Detailed Design	June, 2010
Related Projects	[Technical Cooperation] Project for Strengthening the Need-Based In-Service Training for Community Health Nurses (2011 – 2014) [Grant Aid] The Project for Upgrading and Refurbishment of Vaiola Hospital (2004 – 2006) [Other Donors] Australia: Non-medical Improvement Part 1 (1999 – 2004), Non-medical Improvement Part 2 (2002 – 2006) Asian Development Bank: Financial assistance (Budget support to the Ministry of Health, 2003) China: Health Centre Construction in Tongatapu (2008 – 2009) World Bank: Vaiola Hospital Improvement Project (2004)

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, 2014 – July, 2015

Duration of the Field Study: October 27 – November 7, 2014 and February 23 – 27, 2015

3. Results of the Evaluation (Overall Rating: B¹)

3.1 Relevance (Rating: ③²)

3.1.1 Relevance to the Development Plan of Tonga

At the time of project planning, Tonga's development plan 'Strategic Development Plan Eight' listed an improvement in healthcare services as one of the eight development goals. Also in the Corporate Plan of the Ministry of Health (2008/09-2011/12), one of six key result areas was the promotion of an improvement plan of Vaiola Hospital. As stated above, this project was implemented in line with the improvement master plan of Vaiola Hospital formulated with the assistance from the World Bank in 2002, and the outpatient department building, dental unit building, nursing school etc. were improved as the final phase of the overall plan³.

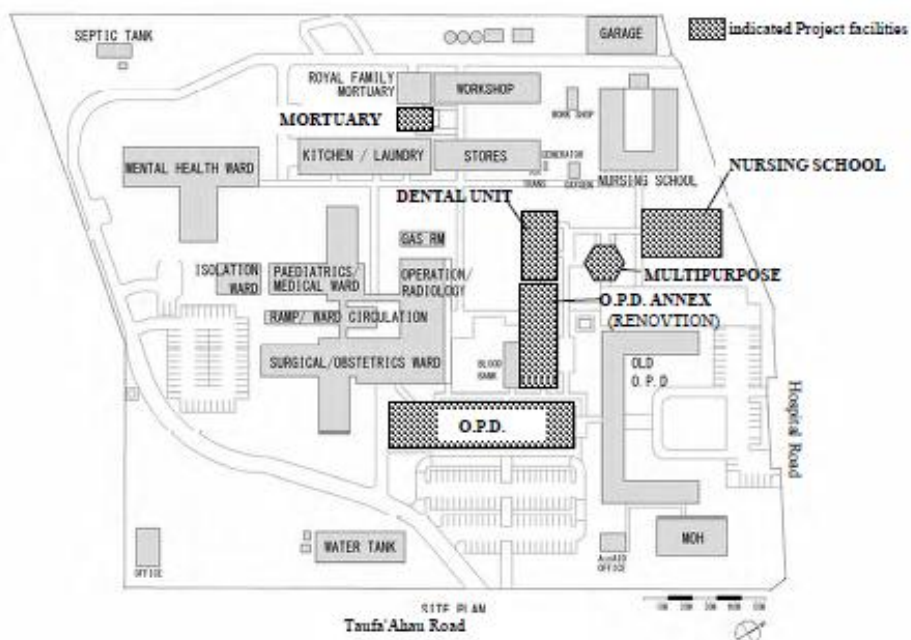
In the 'Tonga Strategic Development Framework (TSDF) 2011-2014', a development plan, effective at the time of ex-post evaluation, 'improved health of people' was the 'Outcome Objective 6' of the nine outcome objectives to improve the domestic network of health services centred around Vaiola Hospital. In the Ministry of Health Corporate Plan (2012/13-2014/15), formulated in accordance with this framework, one of six key result areas is to improve existing infrastructure facilities and to strengthen information and research functions.

In this way, this project, constituting part of the master plan, is consistent with Tonga's development plan both at the time of planning and ex-post evaluation, and is also in conformity to the sector-level strategies.

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

² ③: High, ②: Fair, ①: Low

³ For the development of Vaiola Hospital, 'The Project for Upgrading and Refurbishment of Vaiola Hospital' was implemented in 2004-2006 as a project assisted by Japan, in which the main examination ward, the obstetrics ward, the surgery ward, etc. were developed.



Source: Preparatory Survey Report

Figure 1: Locations of Facilities Developed in the Project (Planned Facilities)

3.1.2 Relevance to the Development Needs of Tonga

Vaiola Hospital has a role to provide primary healthcare services to the residents on Tongatapu Island, where approximately 70% of the total population reside, in addition to a role as the top-referral hospital of Tonga with the population of a little over 100,000. As to the medical care, while primary healthcare has been gradually improving, non-communicable diseases (diabetes, high blood pressure, obesity, etc.) attributable to lifestyle habits have been increasing in recent years, and Vaiola Hospital is expected to respond to these diseases.

However, since a long time had passed since the hospital was opened in 1971, a variety of issues had been pointed out at the time of master plan formulation: scattering of medical examination sections, shortage of operating theatres, infection risks due to unclear sterile/unsterile areas, insufficient treatment capacity of septic tank and risks of contaminant dispersion, etc. It was an urgent challenge to improve these situations at Vaiola Hospital, positioned as the top-referral hospital in Tonga.

At the time of ex-post evaluation, non-communicable diseases such as diabetes, high blood pressure and obesity are major issues in Tonga, and the occurrence of sickness due to poor nutrition of children is also becoming a big issue. The Government of Tonga has focused on the enhancement of primary healthcare and promoted preventative healthcare. In tackling these issues, Vaiola Hospital has been playing a vital role as a top-referral hospital in Tonga as well as a medical facility to provide primary medical

services. It was also confirmed from the interviews that the hospital has substantially contributed to human resource development, particularly of the nurses who would be engaged in awareness-raising activities.

In various locations of the country including Tongatapu Island, while the provision of community-based medical services has been promoted by improving health centres, a number of patients are still receiving primary medical services at Vaiola Hospital.

Table 1: Number of Patients at Vaiola Hospital

Year	2011	2012	2013
Number of outpatients	46,607	53,254	51,103
Number of inpatients	9,791	10,164	9,913

Source: Data provided by the Ministry of Health

Table 1 indicates the numbers of outpatients and inpatients at Vaiola Hospital between 2011 and 2013. While these patient numbers fluctuate from one year to another, it is inferred that Vaiola Hospital has been expected to fulfil the needs of approximately 50,000 outpatients and 10,000 inpatients every year.

Although the development of the hospital based on the master plan was completed with the implementation of this project, it was confirmed in the ex-post evaluation study that the current (post-project) facilities at Vaiola Hospital were not sufficiently responding to the needs of medical data management that utilises information technologies at the Ministry of Health, after the master plan was formulated. Therefore, there is a development need of infrastructure for information management with the use of information technologies.

Based on the above, this project has been consistent with the development needs of Tonga both at the time of planning and ex-post evaluation, as this project developed Vaiola Hospital which was continuously positioned as a top-referral hospital as well as a hospital to provide primary health services at the time of ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

In the 'Islanders' Hokkaido Declaration' declared at the Fifth Japan-Pacific Islands Forum Summit Meeting held in 2009, Japan presented 'Support healthcare infrastructure' as one of the action plans for the Pacific region.

As a basic principle of ODA for Tonga, one of the key cooperation areas based on the above declaration was the support to 'enhance healthcare services'. A concrete measure for this area was the implementation of 'The Project for Upgrading and Refurbishment of Vaiola Hospital' (2004-2006), which improved some of the medical wards. This project has followed this series of development.

Therefore, this project is highly consistent with Japan’s key cooperation areas for the Pacific and Tonga at the time of planning.

3.1.4 Appropriateness of Project Planning and Approach

This project was positioned as the last one of the projects implemented in accordance with the improvement master plan of Vaiola Hospital, as stated above. The needs of IT-related facility identified in the ex-post evaluation study did not seem to be a component foreseeable during the master plan formulation. Therefore, it is considered that there were no particular problems in terms of planning and approach of this project.

As described above, this project can be said to have been in line with Tonga’s development plans and needs during the planning and ex-post evaluation, as well as Japan’s ODA policy at the time of planning. Also, there were no problems in terms of the appropriateness of project planning and approach, and the overall relevance of this project is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

The planned project components are as shown in Table 2.

Original

Table 2: Planned Components of This Project

	Major Development
Facility (5,108.6m ²)	O.P.D., Dental unit, Multipurpose space, Nursing school, Mortuary, Outside waiting area and passage with covered roof, New construction of ancillary mechanical room and renovation of O.P.D. annex
Medical Equipment	Procurement and installation of the equipment necessary for the project facilities (Emergency and general clinic, Special clinic, Antenatal, Physiotherapy, Outpatient pharmacy, Dental, Nursing school and Mortuary)

Source: Prepared based on the Preparatory Survey Report

Actual

The facilities (5,153.5m²) and equipment indicated in Table 2 were all implemented mostly as planned, with the following changes as shown below.

Table 3: Changes from the Original Plan

	Changes
Changes from the plan in the preparatory survey	<ol style="list-style-type: none"> 1) Change in the position of Multi-purpose Space 2) Change in the layout around emergency observation room 3) Change in the layout of the water area in the O.P.D. 4) Change in the layout of the area around antenatal reception 5) Change in the layout around the room of medical superintendent on the upper floor of the O.P.D. 6) Change of partition between managers' rooms on the upper floor of the O.P.D. 7) Change in the location of common restroom for the administration section on the upper floor of the O.P.D. 8) Change in the location of eye clinic rooms in the O.P.D. 9) Change in the layout around the staff room in the nursing school 10) Change in the layout in the mortuary 11) Change of the pharmacy's outside window and eaves 12) Change in the shape of the nursing school roof 13) Addition (1 unit) of binocular microscope for the dental unit
Changes after the detailed design study	<ol style="list-style-type: none"> 1) Relocation of elevated water tank 2) Relocation of passage between buildings 3) Relocation of storage attached to the multipurpose space 4) Relocation of manager's room in the O.P.D.

Source: Information Provided by JICA

As shown in Table 3, many changes were made during the implementation of this project, but these were all minor changes without any inconveniences caused, according to the Ministry of Health. During the site survey as part of ex-post evaluation study, no particular inconveniences due to these changes were observed.

With regard to the procured equipment, it was confirmed that most of the key equipment were being used. However, a diagnosis unit at the otolaryngology department, expected to be used at the time of outreach activities, were not being used because there had been no outreach activities conducted yet. This is mainly because there is only one specialist in Tonga, leaving him no time to leave Vaiola Hospital. Also, a sand blaster at the dental technique unit could not be used as the compressor Vaiola Hospital originally had was broken. At the time of ex-post evaluation, while prosthetic teeth were made with an alternative method, it was heard that they could be made more precisely and efficiently by using the sand blaster. Therefore, it is desirable that a new compressor be procured.

In addition to the development items by Japan, Tongan side also implemented the ground levelling of the project site, relocation of electric cables, relocation of water discharge system, renovation of existing O.P.D. etc. before, during and after the project. At the time of ex-post evaluation, no negative influences of implementing these items on the generation of project effects were observed, and it can be said that there were no problems as a whole.



Waiting space in the O.P.D.



Simulation room in the nursing school installed in this project

3.2.2 Project Inputs

3.2.2.1 Project Cost

The cost of this project to be borne by Japan was planned to be approximately 1,998 million yen (76 million yen for the detailed survey and 1,922 million yen for the construction), with another 130 million yen planned as implementation expenses to be borne by Tonga.

Table 4 summarises the actual costs contributed by Japan.

Table 4: Actual Project Costs

(Unit: million yen)

Item		Cost	
Detailed design survey		75.5	
Tender, construction, equipment procurement and installation	Construction	Direct construction	1,242.9
		Other construction	124.1
	Equipment	Procurement	170.5
		Installation	6.0
	Design and Supervision		98.0
	Sub-total		1,641.5
TOTAL		1,717	

Source: Prepared from information provided by JICA

The actual project cost was 1,717 million yen (Japanese side), which was confirmed within the planned amount (86% of the plan). Conversely, the cost borne by Tonga could not be obtained accurately since the data specific to this project had not been sorted out and stored. Consequently, the evaluation of the project cost was based on the comparison of the Japanese portion.

3.2.2.2 Project Period

The period of this project was expected to be approximately 28 months from December 2009 (Signing date of the Exchange of Notes for detailed design) till March 2012⁴. The actual project period was also 28 months from December 2009 as planned. According to the project consultant, there was much rain during the final phase of the construction work and it was feared that the construction schedule could be delayed. However, weekly meetings were held with the Ministry of Health to have good coordination among the related parties so that the project would not be delayed.

Based on the above, the outputs of this project were mostly as planned, and both the project costs and period were also within the plan. Therefore, the efficiency of the project is high.

3.3 Effectiveness⁵ (Rating: ②)

3.3.1 Quantitative Effects (Operation Indicators)

It was expected that the number of general outpatients, dental clinic diagnosis, special outpatients, students at the nursing school and exchange programmes with overseas would increase by implementing this project.

Table 5: Operation Indicators of This Project

Indicator	Baseline	Target	Actual	Actual	Actual
	2008	2015	2011	2012	2013
	Baseline Year	3 Years After Completion	Before Completion	Completion Year	1 Year After Completion
General outpatients	66,625	Increase (76,600)	46,607	53,254	51,103
Patients in the dental clinic	26,321	Increase (29,000)	12,064	10,485	11,143
Special outpatients	7,173	Increase	No data	No data	No data
Number of students in the nursing school	92	Increase	120	103	129
Number of exchange programmes with overseas	3	Increase	No data	No data	4

Source: Data provided by the Ministry of Health

⁴ The Exchange of Notes for the construction work was signed in May, 2010.

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

According to the Ministry of Health, the baseline data used at the time of planning were all based on the data when they were manually collected and aggregated, which are not consistent with the data in the health information system introduced after 2010. Also, since the optimal size of O.P.D. and dental unit buildings was calculated based on the number of patients during the peak time of consultation hours, they can cater for the number of patients set as target figures. Moreover, there is a possibility that the target figures were too high since the baseline data set at the time of planning were already far higher than the figures of 2007 or 2009. With these constraints considered, however, the evaluation of quantitative effects was based on the target figures expected at the time of planning in accordance with the usual judgement criteria, while the ‘improvement of medical services’, set as the project objective, was emphasised in this ex-post evaluation study. In terms of the improvement of medical services, medical examinations of outpatients can be performed at Vaiola Hospital. It was also confirmed from the interviews with the Ministry of Health that the medical quality had also improved under the environment where more modernised facilities and equipment were developed and sterile/unsterile areas became clearer. Overall, it can be judged that there are no particular problems.

However, Table 5 shows that the special outpatient numbers have remained unknown and the number of outpatients and dental patients are not only lower than the target figures but also the baseline figures. Nevertheless, the demand has always been met without any patients forced to wait for medical consultations due to insufficient capacities of Vaiola Hospital⁶. Doctors expressed their opinions that they were not feeling any decrease in the number of patients as they were always busy in performing medical examinations during consultation hours. The Ministry of Health admits that insufficient data development system is the major cause of inconsistent data, but it was difficult to prove that the project effects were fully achieved under the constraint where an analysis through data comparison was not possible.

On the other hand, the number of students at the nursing school and the number of exchange programme in 2013 already exceeded the target figures set for 2015, and they are expected to be higher than the target figures even when the 2015 actual figures are confirmed. While the nursing school had not been able to supply required number of nurses at the time of planning due to constraints of the facility size, they became able to increase the number of students after the implementation of this project. It was also confirmed from the interviews and simplified beneficiary survey⁷ that the education

⁶ The population of Tonga has been a little over 100,000 in recent years, and little change has been observed due to the effects of outmigration overseas.

⁷ A questionnaire survey with a total of 51 doctors, nurses and other hospital staff working at Vaiola Hospital

environment has significantly improved in many respects as the students are now able to apply what they learned to actual practices and it is easier for them to do surveys and prepare documents by utilising a computer room. It is also the only nursing school in Tonga, making a significant contribution to the supply of human resources. Regarding the number of exchange/twinning programmes with overseas institutions, programmes with other countries such as Australia expanded after the improvement of facilities and equipment, to develop capacities of Tongan hospital staff members. The key contents of the programmes observed at the time of ex-post evaluation are outlined in Table 6.

Table 6: Outline of Exchange/Twinning Programmes with Other Countries

Name of Programme	Key Contents
Twinning Programme between the Ministry of Health and St. John of God Ballarat, Australia	An exchange programme of staff members between Ballarat Hospital, Australia and the Ministry of Health, Tonga, covering various areas such as emergency medicine, midwifery, health information, etc. An Australia's aid programme going for 22 years
Twinning Programme between the Ministry of Health (Radiology Section) and the Lake Imaging, Ballarat, Australia	An exchange programme to improve capacities of radiology services in Tonga. Commenced in 2013 with assistance from Australia
Twinning Programme between the Ministry of Health (Health Promotion Section) and Nossal Institute Limited, University of Melbourne, Australia	An exchange programme for capacity building on non-communicable disease. Commenced in 2012 with assistance from Australia
Twinning Programme between the Ministry of Health and PPTC, Wellington, New Zealand	A one-month training programme for the trainees undertaking a Diploma in Medical Laboratory Science programme online. Implemented with assistance from New Zealand

Source: Prepared from the information provided by the Ministry of Health

3.3.2 Qualitative Effects (Other Effects)

At the time of planning, the following qualitative effects were expected by implementing this project.

- 1) Functions of outpatient and emergency departments will be re-established and the quality of medical services will be improved.

for over five years was conducted. The survey concerned the improvement of medical services, improvement of medical facilities and equipment, improvement of hygienic conditions, improvement effect of the nursing school, improvement in the quality of education and training, position as the disaster rescue base as a result of this project and the maintenance conditions.

- 2) Practical training at the Nursing School will be enriched.
- 3) Efficient and high-quality education, training and workshops will be enabled.

With regard to 1), congestions of the waiting area were eliminated with the expansion of space at the outpatient department, and the emergency department, which used to use part of the outpatient department space, became able to secure its own area. The staff of the emergency department commented that more prompt response to the patients transported in ambulances became possible after the facilities and equipment were improved substantially. Vaiola Hospital, the top-referral hospital in Tonga, has been positioned as a hospital to respond at any time to referrals from health centres in Tongatapu Islands, where the capital Nuku'alofa is located, and also from the regional hospitals in other island groups. According to the Ministry of Health, examinations and treatment are now smoothly performed in various departments and the latest ultrasonic diagnosis equipment is utilised though it was not possible in the past through the overall improvement including the facilities and equipment provided in this project.

Regarding 2), the enrichment of practical training at the nursing school, it was heard that not only the improvement of facilities made it easier to do lectures but also more practical education became possible with actual training with the equipment such as homunculus. The simplified beneficiary survey also showed that 81% of the hospital staff responded that education and training at the nursing school improved, substantially exceeding 19% of the respondents with 'Not really improved'.

As for 3), a seminar room was provided in the O.P.D., which was utilised for training sessions among the hospital staff every Wednesday and various meetings. It was also confirmed that a multipurpose space, constructed in this project, was being utilised for seminars and workshops of nurses and student nurses. It can be said to have become easier to work on capacity development activities for the hospital staff after this project was implemented.

Based on the above, it can be evaluated that the qualitative effects expected at the time of planning have sufficiently been achieved after this project was implemented.

3.4 Impacts

3.4.1 Intended Impacts

At the time of project planning, two impacts of project implementation were expected, which were 'Improvement of the hospital as Tonga's top-referral hospital would improve the health of all Tonga people', and 'Tonga's disaster rescue base would be developed'.

With regard to the improvement of health conditions, Table 7 shows the key

indicators. Since Tonga’s health indicators had already reached a high level in general and slight changes in number would lead to large changes in percentage due to its small population size, little improvement in health indicators can be observed in recent years. Also, as the data have not necessarily been well developed, the indicators after the implementation of this project were not obtained. However, the majority of the hospital staff consider that the reliability as the top-referral hospital is high as shown in the result of the simplified beneficiary survey with the hospital staff demonstrating that 86% of the respondents felt that the credibility and reliability as the top-referral hospital ‘Improved a lot’ or ‘Improved’ (the remaining 14% responded that it was the ‘Same’). It also became clear that 86% of them consider that the quality of medical services improved after the implementation of this project. While it is difficult to show quantitative achievements from the health indicators, it is assumed that this project has made certain contributions to the improvement and sustenance of health conditions of Tongan people.

Table 7: Key Health Indicators

Indicator	2008	2009	2010	2011
Infant mortality rate (per 1,000)	16.4	14.5	21.5	15.2
Perinatal mortality rate (per 1,000 live births)	18.9	13.5	12.4	13.0
Maternal mortality rate (per 100,000)	76.1	114.4	37.1	0
Immunisation coverage (%)	99.5	99.5	99.6	99.8

Source: Report of the Minister for Health (FY2011/2012)

As shown in Table 8, Vaiola Hospital received 37 – 67 patients referred from other hospitals in the country annually in recent years as the top-referral. The main reasons were operations and radiological examinations. However, some patients are further referred to Australia and New Zealand when there are cases in which Vaiola Hospital cannot accommodate.

Table 8: Number of Referrals at Vaiola Hospital

	2009/10	2010/11	2011/12	2012/13	2013/14
Number of domestic referral	53	42	37	45	67
Number of overseas referral	34	27	41	62	47

Source: Data provided by the Ministry of Health

Note: ‘Domestic referral’ shows the number of referrals from health centres and regional hospitals to Vaiola Hospital. ‘Overseas referral’ shows the number of referrals from Tonga to overseas countries.

As for the role as a disaster rescue base, expected as the second impact, it was heard from Vaiola Hospital that the structure of Vaiola Hospital was solid and of high-quality in comparison to other buildings in the centre of capital Nuku’alofa. The simplified

beneficiary survey also showed that 90% of the respondents provided positive responses regarding the quality of the hospital to be used as the evacuation facility at the time of disasters such as cyclones.

Therefore, while there have been no cases where large-scale disasters actually occurred and the residents evacuated or were transported to the hospital, it was confirmed that the majority of hospital staff have positively regarded the role as the evaluation facility since the hospital is a sufficiently large facility with solid structure located in the capital. It is considered that the hospital could well be utilised as the disaster rescue base.

With respect to the hygienic environment of the entire hospital, the implementing agency commented that it improved after this project was implemented. In the simplified beneficiary survey, 86% of the respondents also replied that it improved. It was confirmed that hygienic control improved in terms of structural and non-structural aspects since the efforts to control hygienic conditions (activities of hygiene management committee and the wearing of shoe cover at the pharmacy) were being made in addition to the implementation of this project.

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

It was considered that this project would not cause any undesirable impact on the natural environment as this project consisted of the development of facilities and the procurement of equipment at the existing hospital.

When this project was implemented, it was planned that the following consideration on the natural environment would be made.

- ✓ Reduction of maintenance cost with the active utilisation of natural energy
- ✓ Treatment of discharged water in accordance with Tonga's standard

The medical waste from the planned facilities was expected to be disposed of at the special facility after it was separated from general waste and treated with a high pressure incinerator.

No negative impacts on the natural environment due to the implementation of this project were observed during and after the project, when checked during the ex-post evaluation study. The wastewater was treated in the treatment plant installed in this project and infiltrated within the premises, which is the planned treatment method and there have been no reports of negative impact on the natural environment. However, medical wastes were being disposed of in the special section in the landfill after they

were separated from general wastes, after the special incinerator recently broke down. While waste management is beyond the scope of this project, it is considered necessary that adequate measures be taken as it is desirable that they get disposed of after incineration.

Regarding the reduction of electricity costs through active utilisation of natural energy, solar panels were installed on the roof of O.P.D. in this project, which were expected to cater for some of the electricity consumption at Vaiola Hospital. While the hospital had not recorded the amount of electricity generated through this photovoltaic generation system and it was not known how much of



Solar panels installed in this project

consumption has been relieved by this system, the Ministry of Health estimated that approximately 20% of the total consumption is generated in this system. As the amount of electricity consumption has been increasing year by year as they have more medical equipment and air conditioners, it can be inferred that the system has a certain role in curbing the payable electricity costs.

3.4.2.2 Land Acquisition and Resettlement

At the time of planning, neither resident resettlement nor land acquisition was expected as the components of this project were to construct facilities and procure equipment within the existing hospital premises. It was confirmed at the time of ex-post evaluation that there were no problems as all the facilities were constructed within the existing premises and no resident resettlement or land acquisition was observed.

In regard to effectiveness, it was not possible to draw the conclusion that sufficient effects were generated since it was difficult to quantitatively demonstrate the indicators as the consistency of data provided by the Ministry of Health was not ensured. However, adequate medical treatment has been provided to all patients and a certain level of effects was observed. Regarding the qualitative effects, improvements in the hospital's functions, enrichment of practical training at the nursing school and its supply of human resources, and the effective utilisation of the facility on the seminars among the hospital staff were confirmed and it is therefore considered that the project effects have been generated.

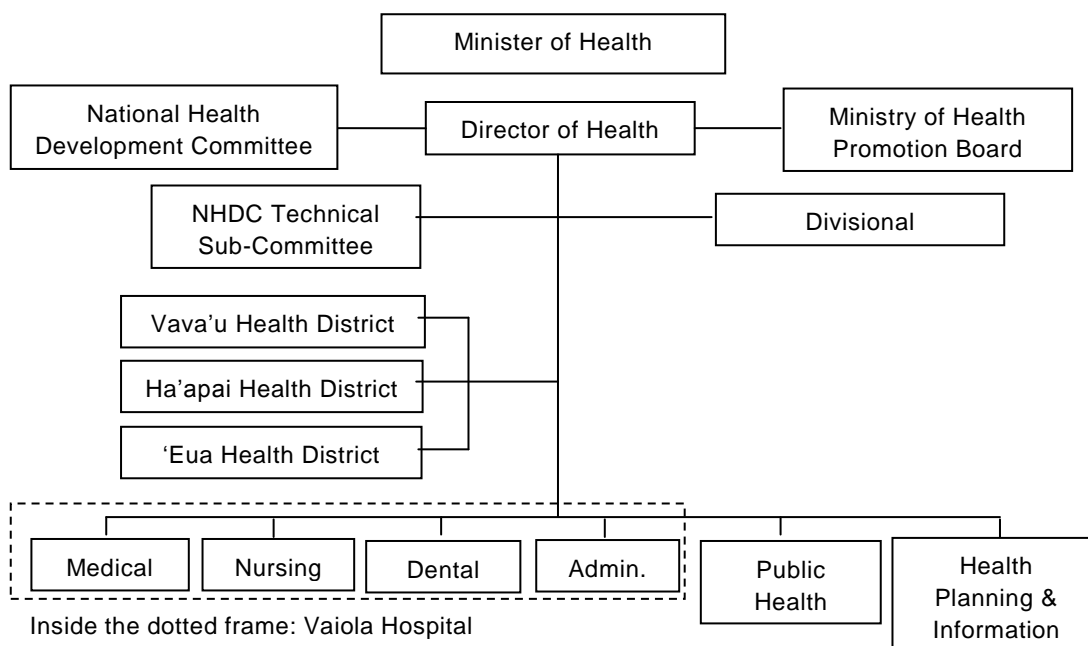
As to the impact of the project, it was assumed that the project underpinned Tonga’s medical structure and activities as the top-referral hospital and made certain contribution to the improvement of people’s health, while some data were not sufficiently developed. Also, no negative impacts on the natural environment have been observed, and no land acquisition or resettlement cases have occurred. Therefore, it is considered that sufficient impact of the project has been generated.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The implementing agency of this project is the Ministry of Health. However, the Ministry of Health and Vaiola Hospital are not clearly divided. For example, the ‘Administration Department’ covers both the administration of the entire Ministry of Health as well as Vaiola Hospital. Also, the building of the Ministry of Health is located within the premises of Vaiola Hospital.



Source: Prepared from the Ministry of Health Corporate Plan (2012/13-2014/15)

Figure 2: Organisation Structures of the Ministry of Health and Vaiola Hospital

At the time of ex-post evaluation, the Ministry of Health had 769 staff members and the table below shows the staff numbers by function. Of these, the total number of

Vaiola Hospital staff is 632 in four departments of administration, dental, medical services and nursing.

Table 9: Ministry of Health Staff Number (2015)

	No. of Staff	Percentage
Administration	78	10%
Health Planning / Information	25	3%
Public Health	112	15%
Dental	32	4%
Medical Services	160	21%
Hospital Nurses (including the nursing school)	362	47%
TOTAL	769	100%

Source: Data provided by the Ministry of Health

The maintenance section, a total of nine staff headed by the medical superintendent, is in charge of the maintenance of facilities and equipment at Vaiola Hospital. An electrical engineer concurrently serves as a biomedical technician and one plumber post (two posts assigned) has been vacant. Also, an Australian expert, supported by Australian aid, was permanently positioned as the biomedical engineer. The number of staff in the maintenance section decreased from the planning period despite the expansion of facilities and the increase in equipment through this project, and no particular measures have been taken. Therefore, the existing staff members have not necessarily been able to accommodate the needs of repair received from various departments, and it was considered important to secure sufficient number of staff. It was heard that cleaning work has been outsourced to an external private company, and casual workers will be employed for painting and repair work when necessary.

3.5.2 Technical Aspects of Operation and Maintenance

An inspection at the time of ex-post evaluation did not detect any particular concerns regarding the technical aspects of utilising the equipment as the equipment procured in this project were being used by doctors, nurses and technicians without any problems.

Regarding the maintenance of the hospital facilities, no particular issues were observed in terms of the basic technical skills of the staff in the maintenance section, supervised by a well-experienced mechanical supervisor. As for the maintenance capacity of medical equipment, technical skills are not sufficient without any qualified personnel or well-experienced technician in the Ministry of Health. However, it was confirmed at the time of ex-post evaluation that one Tongan technician was being trained at a specialised institution in Australia under the Australian assistance. It is

hoped that the skills will be improved and the capacity and the structure to manage medical equipment will be strengthened in the future.

Regarding other training, no systematic training has been conducted for maintenance, but a programme on biomedical equipment has been conducted annually at the Fiji National University with the Australian support. It was planned that a technician of the Tongan Ministry of Health would participate in this training programme.

3.5.3 Financial Aspects of Operation and Maintenance

Revenues from fees collected for hospitalisation or examination contribute to the budget of the Ministry of Health, but basically, as medical care and medicines have been traditionally free of charge, the majority of the budget is allocated by the government. At the time of planning, there was a plan to collect medical charges to reduce financial burden once the overall project for upgrading Vaiola Hospital was completed, but this plan has never been implemented even by the time of the ex-post evaluation. The government has continued to bear all the costs of medical care and medicines.

The overall budget of the Ministry of Health and its maintenance budget in recent years are shown in Table 10.

Table 10: Total Budget and Maintenance Budget of the Ministry of Health

(Unit: 1,000 Pa'anga)

Financial Year	2008/09	2009/10	2010/11	2011/12
Budget of the Ministry of Health	21,580	21,375	22,500	22,596
(of which Vaiola Hospital's revenue)	(506)	(1,000)	(1,000)	(1,000)
Maintenance budget	1,321	1,500	1,200	975
(Proportion of maintenance budget against the total budget)	(6.1%)	(7.0%)	(5.3%)	(4.3%)

Source: Report of the Minister for Health, Data provided by the Ministry of Health

While the Ministry of Health budget has been gradually increasing from previous years, the maintenance budget has been decreasing both in terms of the absolute amount and the proportion against the total Ministry of Health budget. The maintenance section also expressed their views that the budget was always insufficient. When the support for the redevelopment of Vaiola Hospital was provided, there was an agreement with the World Bank to set the maintenance budget at 7% of the total Ministry budget, which was once achieved in the FY 2009/10. However, it has declined to 5.3% then to 4.3%. It is essential to stop this trend as the hospital facilities have been expanded and the medical equipment increased, and allocate sufficient amount of budget.

It is assumed that medical equipment needs to be gradually replaced as they reach their durable life, but there was no plan for the replacement of medical equipment. There was also a concern on the renewal of equipment in the future as the average inspection and repair costs as well as the amount needed for the equipment replacement were not calculated and budgeted accordingly.

3.5.4 Current Status of Operation and Maintenance

During the site survey of this ex-post evaluation study, it was confirmed that all the facilities developed in this project were being used and most of the equipment, apart from the diagnosis unit at the otolaryngology department and the sand blaster at the dental unit, were also being used. There were no problems observed with the utilisation of the equipment manuals as they were stored in the biomedical workshop etc. and used when necessary.

No written maintenance plan has been formulated but a weekly inspection of facilities was being conducted by the maintenance section staff. While there were no major problems observed in terms of the operation and maintenance of facilities at the time of ex-post evaluation, maintenance management contract of elevators which had been installed even before this project was implemented has not been renewed since 2012, after the maintenance contract with an agent in New Zealand was terminated.

The medical equipment would be repaired if they had any trouble or broke down, but it was observed that those repairs were not recorded properly. As a countermeasure of such situations, the Australian expert introduced the 'Maintenance Assist', a programme suite widely used in the world for maintenance management. On the other hand, however, contracts of periodic maintenance management of biomedical equipment were not deemed realistic as there were no agents in Tonga that could undertake the management and an overseas agent would be too expensive.

There were issues in terms of the procurement of spare parts for the facilities and equipment that a long time was required to coordinate with agents or contact manufacturers. It was also pointed out from the hospital staff that other issues could be found that a long time was required to get the budget allocated after the application was submitted, and that the maintenance section did not have sufficient authority to execute the budget and had to go through time-consuming approval process.

Based on the above, the current status is that a maintenance plan has not been formulated, and it cannot be said that a preventative maintenance system has been in place as the repairs are made only when the equipment has troubles, except periodic inspections of the facilities. The current status of maintenance can be said to be generally satisfactory, but concerns are felt regarding the responses when equipment

break down more frequently as there are issues in terms of periodic maintenance management and the procurement of spare parts.

Small problems were identified in all aspects of operation and maintenance. The organisational structure for operation and maintenance cannot be said to be sufficient and it is considered that the staff numbers need to be increased. While there are no particular issues regarding the technical capacity to maintain the facilities, capacity needs to be developed on the management of medical equipment. With regard to financial aspects, the maintenance budget has been gradually decreasing, making the maintenance section facing the shortage of budget. The maintenance status is generally satisfactory, but no preventative maintenance system has been implemented and a long time is required for the procurement of spare parts.

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

4. Conclusion, Recommendations and Lessons Learned

4.1 Conclusion

In this project, an outpatient department building, etc. were constructed and a nursing school was expanded to improve medical services and strengthen the functions of human resource development in the health sector. The gist of this project was consistent with the development plan and needs of Tonga, as well as the priority areas of Japan's ODA policy. Therefore, the relevance of this project is high. With regard to project implementation, the project components were implemented mostly as planned, and the project cost and period were within the plan. Consequently, the efficiency is also high. With respect to project effectiveness, while the effects were observed in terms of the improved functions of the hospital, increases in the number of nursing school students and the content-rich education, it was difficult to obtain consistent data concerning the number of general outpatients, which made it impossible to draw quantitative conclusions to show that the project generated sufficient effects. It was confirmed additionally that Vaiola Hospital had been underpinning Tonga's medical system and activities as the top-referral hospital and also making certain contributions to the improvement of the people's health. Therefore, the overall effectiveness and impact of this project is fair. In terms of sustainability, some problems were identified in many respects as seen in the need to strengthen organisational and technical aspects, the reduction of maintenance budget in the financial aspect, as well as the time required to procure spare parts, meaning that the sustainability of the project can be judged to be fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Strengthening of Maintenance Structure

It is expected that the items and the expenses required for maintenance of facilities and equipment will increase as a series of projects specified in the master plan for the redevelopment of Vaiola Hospital were completed. However, no additional staff member has been hired for that purpose and there has even been a vacant position. It is desired that the structure be established promptly. Also, the maintenance budget has recently decreased, falling short of the target of 7% and not enabling the implementation of preventative maintenance of facilities and equipment. Therefore, it is important to formulate a maintenance plan, calculate and secure necessary amount of budget every year (including the accumulation of replacement fund for equipment renewal), and make the budget execution process easier to enable smooth procurement of spare parts. To be more specific, the ‘Maintenance Assist’ as described in ‘3.5.4 Current Status of Operation and Maintenance’ can be utilised to formulate a maintenance plan, calculate the amount annually required and secure the maintenance budget. It is also important to raise awareness within the government to enable the Ministry of Health and its departments to have stronger authority to execute the budget independently.

Development of Consistent Data

When the project effects were to be measured in this study, the basis of the figures obtained at the time of project planning was unclear, which did not make it possible to compare the data with the ones submitted at the time of ex-post evaluation. There were also some cases found where the basic data on the operation of the hospital were not well developed. In providing healthcare and medical services, it is essential to develop basic data and strengthen the structure to collect and develop consistent data so that objective recognitions and responses will become possible.

4.2.2 Recommendations to JICA

Monitoring of Operation and Maintenance Status

With regard to the maintenance of medical equipment, which was pointed out as an issue in this project, an expert was dispatched with the assistance of Australia, assisting with the establishment of maintenance system and the capacity development of the staff concerned. Japan supported the development of the facilities and equipment of Vaiola Hospital twice, in which there were a number of equipment procured. Therefore, it is important to closely coordinate with the Australian expert and monitor the equipment

for their effective utilisation.

4.3 Lessons Learned

Periodical Confirmation and Flexible Review of the Overall Plan

This project was implemented in accordance with the master plan concerning the overall development of the hospital. As the overall plan proceeds, it was considered necessary to improve the structure, technique and budget for the operation and maintenance of expanded facilities and increased equipment. As the overall plan was practically divided into four phases and implemented, it was considered to have been desirable to regularly check the strengthening status of these aspects so that future operation and maintenance would not be faced with concerns. If sufficient measures have not been taken, necessary capacity development support can be provided in addition to the development of facilities and equipment, or the project can be downsized to fall within the operation and maintenance capacities. It is assumed necessary to regularly check and flexibly modify the planned components in a long-term project.

Monitoring of Project Effects

In the ex-post evaluation of ‘The Project for Upgrading and Refurbishment of Vaiola Hospital’, conducted in 2010-2011, a recommendation was made to the implementing agency that the maintenance section be improved. However, the recommendation cannot be said to have been sufficiently implemented. In order to promote the generation of project effects and enhance the sustainability of generated effects, it was thought meaningful that JICA’s department in charge or the overseas office regularly conducted monitoring activities for a certain period of time; at least till an ex-post evaluation study was conducted. Through such monitoring activities, actual actions promoted by the implementing agency can be expected. Therefore, it is desirable that the project be followed after the completion of the project.

(End)