

Republic of the Union of Myanmar

FY2019 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Improving Loikaw General Hospital in Kayah State”

External Evaluator: Tomoko Tamura, Kaihatsu Management Consulting, Inc.

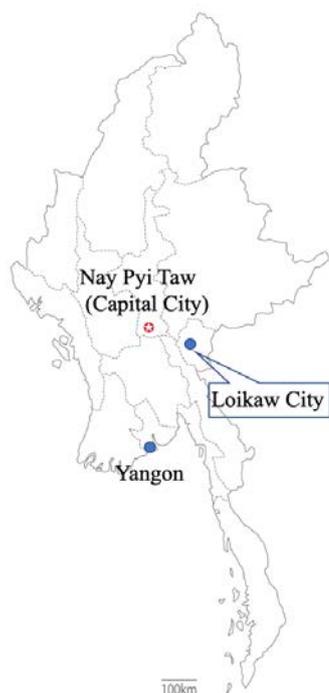
## **0. Summary**

This project was implemented to improve the medical services of Loikaw General Hospital (hereinafter referred to as “the hospital”) in Kayah State by providing facilities and medical equipment.

Improving the quality of health and medical care services was a priority issue in Myanmar from the time of project planning until the time of the ex-post evaluation. There was a need to enhance specialized medical services of the state and regional hospitals in the country. Therefore, the project was consistent with the development policy and development needs of the country. This is highly relevant with Japan's ODA policy of supporting the development of health and medical services to improve the lives of the people. And therefore, the relevance of the project is high. Two buildings were constructed, and medical equipment was procured and installed as planned. Although the project cost was within the plan, the project period was longer than planned; therefore, the efficiency of the project is fair. The numbers for outpatients, in-patients, deliveries, and operations with general anaesthesia, which were the indicators of the effectiveness of the project, increased significantly and achieved their targets. The status of utilization of the facilities and equipment provided by the project is also positive. The expected effects, such as improvement of medical services, hygiene and medical environment; patient satisfaction at the hospital; and rationalization of the referral system, which was expected as an impact of the project, were achieved. The project has achieved its objectives; therefore, effectiveness and impact of the project are high. No problems have been observed in the institutional/organizational, technical and financial aspects of the operation and maintenance of the facilities provided by the project. Although there is a shortage of anaesthesiologists and specialized staff for the maintenance of medical equipment, these are being addressed as priority issues; there is a prospect for improvement. Therefore, the sustainability of the project effects is high.

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

## 1. Project Description



Project Location



Loikaw General Hospital - New West Building



Health Education for Hospital Users

(Photos were taken at the time of the ex-post evaluation.)

### 1.1 Background

At the time of project planning, infectious and perinatal diseases accounted for a high percentage of the disease structure in Myanmar. In addition to this, lifestyle-related diseases and trauma were also increasing, and the disease structure of the country was at a turning point. For this reason, it was urgent to develop the state and regional hospitals that provided specialized medical services in each area of the country, in addition to enhancing primary health care for infectious disease control.

The hospital is the only general hospital in Kayah State, which has a population of approximately 290,000 (2014).<sup>1</sup> This is the only hospital in the state that has specialist doctors and emergency services. Many patients in the southern part of the Shan State, which is next to Kayah State, also visit the hospital. Regardless of these circumstances, its buildings were old and medical equipment was in short supply and obsolete. In addition to these, it had a higher priority for development among the provincial hospitals in the country. Compounding these factors, the hospital was selected for this project.

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<sup>1</sup> Public hospitals in the country are categorized as national hospitals, state/regional general hospitals, district hospitals, township hospitals and station hospitals.

## 1.2 Project Outline

The objective of this project is to enhance medical services of the hospital, which is located in the capital city of Kayah State, by improving its facilities and medical equipment, thereby contributing to strengthening its function as a core hospital of the region.

Grant Limit /Actual Grant Amount	1,945 million yen / 1,572 million yen
Exchange of Notes Date /Grant Agreement Date	March 2014 / May 2014
Executing Agency	Ministry of Health (Changed to the Ministry of Health and Sports on May 25, 2016)
Project Completion	December 2016
Target Area	Loikaw City, Kayah State
Main Contractors	Contractor: TODA Corporation Procurement of equipment: Mitsubishi Corporation
Main Consultants	Yamashita Sekkei, Inc/ ITEC (Joint Venture)
Preparatory Survey	September 2013 – May 2014
Related Projects	· Health System Strengthening Project (November 2014 -- December 2018) · The Project for Human Resource Development of Medical Engineering (May 2018 – April 2023)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Tomoko Tamura, Kaihatsu Management Consulting, Inc.

### 2.2 Duration of Evaluation Study

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

Duration of the Study: July 2019 – June 2020

Duration of the Field Study: October 1 – 11, 2019; November 24 – 30, 2019

### **3. Results of the Evaluation (Overall Rating: A<sup>2</sup>)**

#### **3.1 Relevance (Rating: ③<sup>3</sup>)**

##### **3.1.1 Consistency with the Development Plan of Myanmar**

*National Health Policy 2030* and *National Health Plan 2011-2016*, the health policy and plan of Myanmar at the time of project planning, and *National Health Plan 2017-2021*, the health policy and plan at the time of the ex-post evaluation, aimed to improve the quality of medical services. Hence, the objective of the project, which was to improve the medical services of the hospital by improving facilities and equipment, was consistent with the country's health policy from the time of planning to the time of the ex-post evaluation.

##### **3.1.2 Consistency with the Development Needs of Myanmar**

At the time of planning and ex-post evaluation, it was important to enhance the medical services of the state and regional hospitals which provide specialized medical services in each region, in addition to enhancing primary health care for infectious disease control, as a result of an increase in lifestyle-related diseases in the country.

As described in “Background”, the hospital was a core hospital in the region. However, at the time of planning, the buildings of the hospital were old, medical equipment was seriously in short supply and obsolete. Moreover, there was not enough space in the buildings. It was reasonable to have selected this hospital for assistance from the project, because there was a great need for improvement. The hospital was still the only general hospital in the state at the time of the ex-post evaluation. The hospital was upgraded from a 200-bed hospital to a 500-bed hospital in 2015, indicating its importance in the region. In this way, the project has been consistent with the development needs of the country and Kayah State at the time of planning and ex-post evaluation.

##### **3.1.3 Consistency with Japan’s ODA Policy**

This project fell under the specific program of “improving health and medical services” for supporting the improvement of the livelihood of citizens, which was a priority area in the *Myanmar Economic Cooperation Policy* (April 2012) of the Ministry of Foreign Affairs of Japan. Therefore, the project was consistent with the ODA policy of Japan at the time of planning.

As mentioned above, this project has been highly relevant to Myanmar’s development plan and development needs, as well as Japan’s ODA policy. Therefore, its relevance is high.

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<sup>2</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>3</sup> ③: High, ②: Fair, ①: Low

### 3.2 Efficiency (Rating: ②)

#### 3.2.1 Project Outputs

As shown in Table 1, the output of the project was almost as planned. The floor area was slightly reduced because the location and layout of the facility were changed to improve user friendliness and privacy of the users.<sup>4</sup>

Table 1 Main Outputs of the Project <Development of the Facilities>

Item	Structure (plan and actual are the same)	Facilities (plan and the actual are the same)	Floor area (m <sup>2</sup> )	
			Plan	Actual
New East Building	Two stories Reinforced concrete structure	Outpatient departments (general, internal medicine, surgery, ophthalmology, psychiatry, oncology, dentistry), emergency department, diagnostic imaging department, pathology department, blood bank, surgery department, ophthalmology department, operating department.	4,416.98	4,422.98
New West Building	Two stories Reinforced concrete structure	Obstetrics and gynaecology department, physiotherapy department, ENT (ear, nose and throat) department, internal medicine department, etc.	4,349.66	4,349.66
Attached facilities	Reinforced concrete structure	A sloping corridor, guardroom, electricity room, elevated water tank	469.75	433.75
<b>Total</b>			<b>9,236.39</b>	<b>9,206.39</b>

Source: Source for the plan is the report of the preparatory survey of the project, and that for the actual is the project completion report.

As shown in Table 2, output related to the procurement and installation of equipment was as planned apart from the number of adult beds being changed from 39 to 36, and that of Gatch beds<sup>5</sup> from 3 to 6. This change was made because it was agreed that an increase in the number of Gatch beds was necessary to care for patients who have difficulty getting up from a flat bed.

<sup>4</sup> The main changes were as follows: the location of the restroom building, the layout of the general outpatient reception, the location of various rooms in the operating theater, the shape of windows, the location of toilet in labor rooms in the obstetrics and gynecology department, and addition of the slope landing and the waiting room for the obstetrics and gynecology department.

<sup>5</sup> Medical beds that angles of head, waist and knees are adjustable.

Table 2 Main Outputs of the Project <Procurement and Installation of Equipment>

Departments/Usage	Name of the Equipment (plan and actual are the same)	Quantity	
		Plan	Actual
Internal medicine ward	ECG	3	3
Dental department	Dental unit	1	1
Emergency medical treatment	Ambulance (4WD)	1	1
Clinical tests	Blood coagulation meter	1	1
ENT and Ophthalmology departments	Surgical microscope (ENT)	1	1
	Surgical microscope (Ophthalmology)	1	1
Obstetrics and gynaecology and paediatrics departments	Incubators	2	2
	Infant warmers	6	6
Operation and emergency operation (including delivery)	Anaesthesia machines with ventilators	2	2
	Large autoclaves	2	2
	Ceiling-mounted shadow-less lamps	5	5
	Electrosurgical units	3	3
	Endoscope unit (for upper digestive tract/colonoscope)	1	1
	Operating tables	5	5
	Delivery tables	3	3
	Patient monitors	5	5
	Delivery monitor	1	1
	Diagnostic imaging	Film developing machine	1
Ultrasound machine		1	1
Digital X-ray unit		1	1
Other wards, etc.	Adult beds	39	36
	Children's beds	16	16
	Gatch beds	3	6

Source: Source for the plan is the report of the preparatory survey of the project, and that for the actual is the project completion report.



Incubator and Infant Warmer  
in the Pediatric Department

Source of the photos: External Evaluator



Clinical laboratory

In the capacity-building program, hospital staff were provided with guidance on the operation of facilities and equipment, on the maintenance and management of the medical equipment based on daily checklists, and on the procurement of consumables and replacement parts using an equipment

management ledger. This component was implemented in three stages. This was done according to the plan as well.

In light of the above, this project had outputs as planned.

### **3.2.2 Project Inputs**

#### **3.2.2.1 Project Cost**

The project cost on the Japanese side was JPY 1,945 million planned and JPY 1,572 million actual. The project cost on the Myanmar side was JPY 11 million for both planned and actual. The total project cost was JPY 1,956 million planned and JPY 1,583 million actual, which was within the plan (81% of the plan). The actual cost was lower than planned as a result of the bids received for the contract.

#### **3.2.2.2 Project Period**

The project period was planned for 22 months, and the actual period was 31 months from June 2014 to December 2016. The actual exceeded the plan (141%).<sup>6</sup> The extension of the project period was due to the construction of the facility taking longer than planned. This was because securing the necessary personnel for the construction work, such as formwork carpenters and plasterers, was difficult due to the booming of the construction market caused by the rapid increase in public and private investment in infrastructure projects after the democratization of the country.

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

### **3.3 Effectiveness and Impacts<sup>7</sup> (Rating: ③)**

#### **3.3.1 Effectiveness**

##### **3.3.1.1 Quantitative Effects (Operation and Effect Indicators)**

At the time of planning, it was expected that the project would improve the medical services of the hospital, and increases in (a) the number of outpatients, (b) the number of inpatients, (c) the number of deliveries, (d) the number of general anaesthesia operations, and (e) the number of cases referred by lower-level medical institutions, were set as quantitative effect indicators. Indicators (a) to (d) were expected to increase by 10%, and (e) was expected to increase by 35%.<sup>8</sup>

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<sup>6</sup> For calculation of the project period, the starting point was the date the detailed design started, and completion was the date the installation of equipment was completed, for both planned and actual.

<sup>7</sup> Sub-rating for Effectiveness is to be put with consideration of Impacts.

<sup>8</sup> Although the preparatory survey report of this project did not specify the reason for setting the target rate of

As shown in Table 3, among the quantitative effect indicators set at the time of planning, (a) the number of outpatients, (b) the number of inpatients, (c) the number of deliveries, and (d) the number of general anaesthesia operations were achieved far more than expected.

As shown in Figures 2 to 5, indicators (a) to (d) were increasing even before completion of the project. There were three main reasons for these increases. Firstly, the need for medical care at hospitals in the region had been increasing from the time the project was planned. The Senior Medical Superintendent of the hospital and Kayah State Health Director explained that the need increased because of the following reasons: in those days the government started providing medicine at the public hospital free of charge, road conditions in the project area were improved, and the local community increased their understanding of western medicine even though they had depended on traditional medicine in the past. Secondly, in response to this increased need, in 2015 the Ministry of Health and Sports of Myanmar upgraded the hospital from a 200-bed hospital to a 500-bed hospital and expanded its capacity by constructing paediatrics and orthopaedic buildings and increasing the number of medical doctors including specialists. Thirdly, the Technical Cooperation Project of JICA, “Health System Strengthening Project<sup>9</sup>” (hereinafter referred to as the “Technical Cooperation Project”) was started in 2014 with the aim of strengthening the management capacity of the health planning of the Ministry of Health and Sports and the Kayah State; activities related to improving services to the hospital users and work efficiency were implemented. Figure 1 summarizes these inputs.

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increase as 10%, it seems that the following (i) negative reasons and (ii) positive reasons were considered. (i) At the time of planning, there was a shortage in the number of medical doctors of the hospital, and it was not known if the shortage would be filled. Therefore, the project did not anticipate the establishment of new clinical departments and was planned assuming that the number of beds at that time would be maintained in the new facilities. (ii) Militants in neighboring Karen State had become inactive and public security in the region had improved. Hence, the number of outpatients at the hospital, which decreased in 2011 and 2012, had tended to increase from 2013. It was anticipated that the number of inpatients would increase as a result.

It is unclear why only indicator (e), the number of cases referred by lower-level hospitals, was expected to increase at a higher rate.

<sup>9</sup> The Technical Cooperation Project was implemented for three years from November 2014 to October 2018. The capacity-building was implemented for the staff of the Ministry of Health and Sports and the staff of the Public Health and Medical Services Departments of Kayah State. Kayah State was selected as a target area because it has a relatively small population and small area, and it is possible to create a model for improving health and medical care services and strengthening administrative capacity in a short period of time. It was also selected because the synergetic effect with this project would be expected.

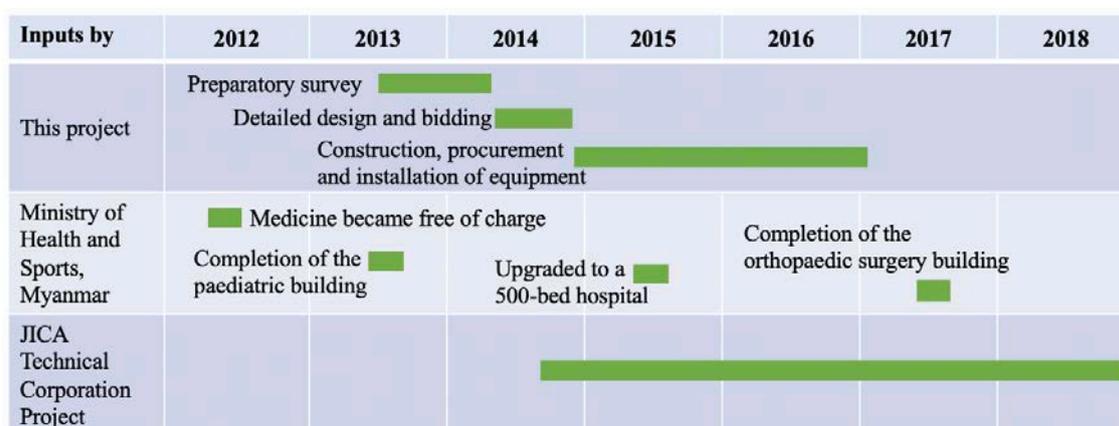


Figure 1 Inputs to the Hospital by this Project, Ministry of Health and Sports of Myanmar and the JICA Technical Cooperation Project

Source: Developed by the External Evaluator

These indicators have been also increasing since the completion of the project. Figure 7 shows the number of operations in the operating theatre provided by the project; Figure 8 shows the number of new outpatients treated in the consultation rooms of the obstetrics and gynaecology, ophthalmology, dentistry, and ENT departments. These figures show that the numbers of users of these facilities were increasing year by year (Figure 8), and the utilization status of the facilities is positive. That of the equipment provided by the project is also positive (Table 4). Therefore, it can be assumed that this project has contributed to the increase in these indicators.

As shown in Figure 6, the level of achievement of indicator (e), the number of cases referred by lower-level medical institutions, was 82%, which was below the target. However, in Myanmar it is possible to visit a general hospital without a referral from a lower medical institution; most outpatients of the hospital visit without it.<sup>10</sup> Therefore, the relationship between the number of cases referred by lower-level medical institutions and the expansion of the functions of the hospital is not very strong, and the significance of this indicator in determining the effectiveness is limited.

<sup>10</sup> For example, the number of referrals from lower-level medical institutions was 818 in 2019; this was only 2% of the number of new outpatients (38,299) in that year.

Table 3 Actual Figures and Level of Achievement of the Quantitative Effect Indicators

Indicators	Baseline (2010 - 2012)	Target in 2019 (3 years after completion)	Actual (2019)	Level of achievement (%)
(a) No. of outpatients	20,706	22,777	68,768	302%
(b) No. of inpatients	8,086	8,895	17,342	195%
(c) No. of deliveries	1,053	1,158	2,659	230%
(d) No. of general anaesthesia operations	566	623	931	149%
(e) No. of cases referred by the lower levels of medical institutions	744	1,000	818	82%



(a) Figure 2 Number of Outpatients



(b) Figure 3 Number of Inpatients



(c) Figure 4 Number of Deliveries



(d) Figure 5 Number of General Anaesthesia Operations



(e) Figure 6 Number of Cases Referred by Lower-Level Medical Institutions

(Data was not collected in 2013 and 2016)

Note: Baseline figures are the data recorded during the years of 2010 and 2012.

Source: Reply from the Hospital to the ex-post evaluation questionnaire



Figure 7 Number of Operations

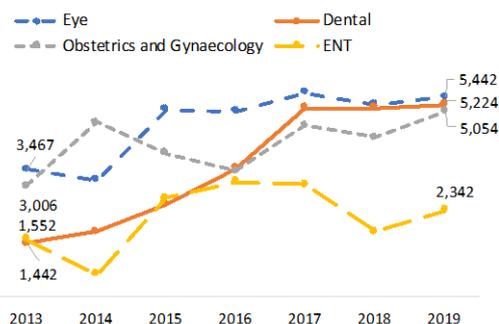


Figure 8 Number of New Outpatients by Treatment Departments

Note: Figure 8 shows the number of ENT patients decreased in 2018. This was due to the absence of a specialist doctor at that time.

Source: Reply from the hospital to the ex-post evaluation questionnaire

Table 4 Status of Usage of the Equipment

Departments	Equipment	Indicators	2014	2015	2016	2017	2018	2019
Surgery	Endoscope (upper digestive tract)	No. of equipment owned	-	-	1	1 (+1)	1	1
		No. of usage per year	-	-	-	72	233	303
Internal medicine	ECG	No. of equipment owned	-	-	3(+2)	3	3	3
		No. of tests per year	-	-	3,431	3,439	3,240	3,819
Diagnostic imaging room	Ultrasound machines	No. of equipment owned	-	-	-	- (+1)	-	4
		No. of diagnosis per year	2,253	2,910	3,417	3,674	3,749	4,116
	X-ray unit	No. of equipment owned	-	-	-	- (+1)	-	4
		Number of X-rays taken per year	3,676	8,799	8,080	8,535	9,950	10,763
Ophthalmology	Cataract surgery instrument set	No. of equipment owned	1	1	1	1 (+1)	1	1
		No. of operations per year	80	139	153	168	280	358
NICU	Incubators	No. of equipment owned	2	3	6 (+2)	6	7	6
		No. of patients using the equipment per year	42	90	78	31	72	39
	Infant warmers	No. of equipment owned	4	4	6 (+2)	6	11	11
		No. of patients using the equipment per year	172	177	260	229	148	258
	Phototherapy units	No. of equipment owned	5	6	10 (+3)	11	13	13
		No. of patients using the equipment per year	375	306	240	1,206	1,345	807

Notes:

- The amount of functioning equipment was included in the "No of equipment owned" (equipment that was out of order was not counted).
- Numbers in brackets indicate the amount of equipment procured by this project. The numbers are recorded in 2016 or in 2017 since the equipment was provided at the end of 2016.
- "-" indicates there was no record.

Source: Reply from the hospital to the ex-post evaluation questionnaire

### **3.3.1.2 Qualitative Effects (Other Effects)**

At the time of planning, the project was expected to produce qualitative effects, such as improvement in the quality of medical services and in hygiene and medical environment of this hospital, further enhancement in patient satisfaction and in the motivation of medical staff, and increased placement of doctors. At the time of the ex-post evaluation, interviews were conducted with the senior Medical Superintendent, doctors and nurses of the hospital, and the following qualitative effects of the project were confirmed.

#### **【Improvement of quality of medical services】**

- In the past, beds were placed on the veranda and corridor because the ward was small. We do not have to do this anymore in the new building. The space between the beds in the ward has been increased. As a result, we are now able to carry out nursing care and emergency response without difficulty. (Obstetrics and Gynaecology Department)
- Because we have more equipment, treatment and examinations can be conducted without keeping patients waiting. (Paediatrics Department)
- The endoscope we had previously was frequently out of order, and we could not use it when it was needed. Now, we can use the equipment whenever needed because a new endoscope was provided by the project. Examination and treatment by the endoscope reduced the burden on patients, improved the accuracy of diagnosis, and led to early detection. (Surgery Department)
- Component blood transfusion became available as a result of the introduction of a centrifuge. (Blood Bank)
- Efficiency of testing was improved as a result of the introduction of the semi-automated biochemical analyser and blood coagulation monitor. (Clinical Laboratory)

#### **【Improvement in hygiene and medical environment】**

- The new consultation rooms and wards are well-ventilated, spacious, and well-lit.
- The wards and operating theatres are laid out in a way that allows the hospital to prevent and control hospital infections, to move patients in and out, and to provide nursing care.
- Previously, the clinical laboratory had a blood sampling room and a laboratory in the same room. They are separated in the new building, which facilitates strict hospital infection prevention.
- At the time of planning, the old buildings had deteriorated, and some parts of the concrete frame were exposed. It was dangerous to continue medical activities. This problem was completely solved.

#### **【Improvement of patient satisfaction】**

- Previously, the wards had many patients in large rooms. Now, these wards have smaller

rooms for up to six patients and private rooms. There are also curtains between the beds. Patients' privacy is protected, and their level of satisfaction has improved. Patients need to pay a fee for private rooms; however, they are very popular. Private rooms for obstetrics and gynaecology, internal medicine, and surgery departments are always full.

**【Further enhancement of medical staff's motivation】**

- We were working with even higher motivation than before, and it gives us pleasure to provide better nursing and medical services and contribute to the local community as a result of the wards being expanded and well-equipped by the project.

**【Facilitation of doctors' placement】**

- Senior specialists<sup>11</sup> were assigned to the departments without any senior specialists at the time of planning, including oncology, diagnosis imaging, ENT, ophthalmology and orthopaedics departments as well as clinical laboratory. Compared to the time of planning, the number of specialists has increased from 16 to 19, and that of general physicians has increased from 21 to 60. The number of doctors in total has increased from 37 to 79. This is because the project expanded the facilities, provided the necessary equipment, and developed a working environment suitable for specialists and doctors. In addition, the approved number of staff was increased as a result of the hospital being upgraded to a 500-bed hospital.

The external evaluator interviewed the users of the hospital and obtained the following opinions. There were no complaints (see the column below).

- The wards have more space and are less crowded than before.
- There are specialists and good equipment.
- Doctors and nurses are kind.
- The inpatients receive consultations and blood sampling tests on time and properly.
- Communication with lower-level hospital is smooth. There was no waiting time on admission because it was already informed.
- It is good that we can sit and wait in a specialized outpatient clinic.

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<sup>11</sup> After obtaining the qualification as a specialist, he/she becomes a senior specialist by having 3-5 years of practical experience.

## 【User's Opinion】

### Family member of an inpatient (at the internal medicine ward)

My father was admitted to the orthopaedic surgery department of this hospital due to a fracture, but he was transferred to the internal medicine department because his heart was weakened by the shock at the time of the accident. Information about the transfer was shared properly between these two departments; therefore, he was transferred smoothly. Medical services of the hospital are good. I had my father admitted to the old hospital before, but it was small and crowded at the time. The new wards are spacious and bright and very good.



### Outpatient (at the waiting area of the outpatient department)

I live in Loikaw City and visit this hospital whenever I need a consultation. Before these buildings were constructed, we were using the old building, which was small and crowded. But now, they have more space and patient-friendly design. It is also convenient that, after registration, I can sit and wait until my turn for examination comes.

In the Technical Cooperation Project, a client satisfaction survey was conducted for users of the hospital in February 2018. This report referred to the results of this survey since it shows the users' evaluation of this hospital.

As shown in Figure 9, the majority of the respondents answered “good” or “very good”, and almost no respondents answered “bad” to any of the questions in the survey. It shows that the users highly appreciated the hospital.

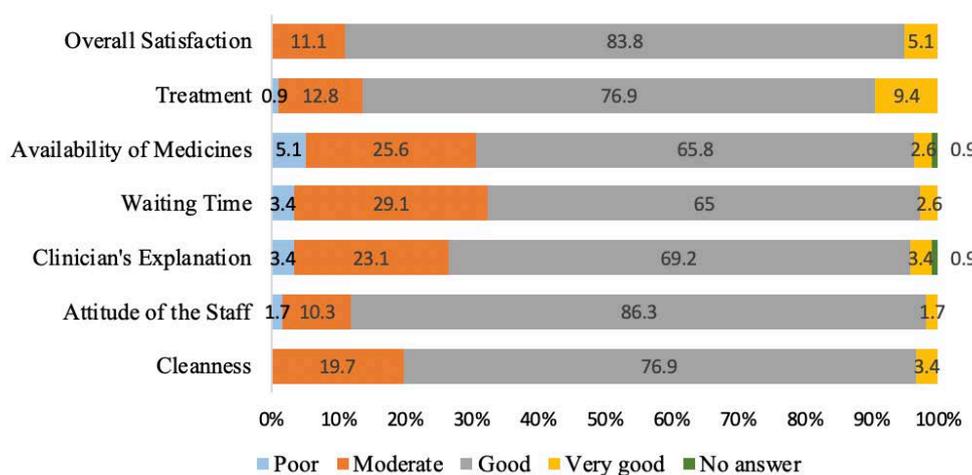


Figure 9 Client Satisfaction Survey (N=117)

Source: Illustrated by the External Evaluator based on the Satisfaction Survey conducted in the Health System Strengthening Project.

As mentioned above, the service of the hospital is improving, and its quality has not been declined due to rapid increase of patients. This is because the capacity of the hospital has been enhanced by the Ministry of Health and Sports increasing the number of staff including doctors and constructing new paediatric and orthopaedic buildings, in addition to the improvement in facilities and equipment implemented by the project. Activities conducted in the Technical Cooperation Project were continuously implemented. They include in-service training conducted at the hospital twice a month voluntarily (the hospital staff call this Continuous Nurses Education and Continuous Medical Education), prenatal and postpartum health education, hospital infection control, 5S activities<sup>12</sup> for improving the work environment, collection of feedback from users,<sup>13</sup> and dissemination of information and communication with the local community using their Facebook Page. Such activities are implemented continuously, contributing to the service improvement at the hospital.



Facebook Page of the Hospital

In September 2019, the hospital received the "Patient Safety Award" from the Ministry of Health and Sports. This showed that the efforts of the hospital to prevent and control hospital infections were highly appreciated.

**【Patient Safety Award】**

In 2019, the Ministry of Health and Sports reviewed the status of hospital infection prevention and control practices at public hospitals across the country. As a result, the hospital's strict infection prevention and control practices by ways of 5S and encouragement of hand washing were highly evaluated. The hospital was evaluated as the top out of the state and regional general hospitals in the country and received the first "Patient Safety Award".



Patient Safety Award Ceremony

<sup>12</sup> The acronym S for the Japanese words of *Seiri, Seiton, Seiketsu, Seiso* and *Shitsuke* (in English Sort, Set in order, Standardize, Shine and Sustain). The practice of 5S means activities that workplaces and organizations work on according to this system.

<sup>13</sup> The hospital has programs of getting feedback from users for improving the services. "Discharge parade" is one of them. They hold this program once a week, inviting patients who were discharged from the hospital on Fridays, along with their families, and listen to their experiences and requests for improvement.

### 3.3.2 Impacts

#### 3.3.2.1 Intended Impacts

##### 【Rationalization of the referral system】

At the time of planning, it was a problem that the hospital, a secondary hospital that was supposed to provide specialized medical services, was unable to fulfil its functions due to aging facilities and equipment. Therefore, as an impact of the project, it was expected that the hospital would restore its function as a secondary hospital and be able to accept patients referred from lower-level medical institutions.

At the time of the ex-post evaluation, in addition to discussions conducted with the Kayah State Health Department and the hospital, a visit was made to a lower-level hospital, Demoso Township Hospital. As a result, it was found that the state has a functioning referral system; referrals to the higher levels of medical institutions are conducted systematically. According to the director of the Township Hospital, Loikaw General Hospital is accepting referred patients promptly and responsibly, and there is good communication between the two hospitals.

In this way, the hospital properly accepts patients referred from lower-level hospitals, and there is no problem with regard to communication and systems for referring patients between different levels of hospitals. In this manner, the hospital has restored its function as a secondary hospital; it is evaluated that rationalization of the referral system, which was expected as an impact in the project, was realized.

##### 【Opinion of a patient referred from the lower-level hospital】

(The interview was conducted with a woman who stayed with the patient at the obstetrics and gynaecology ward)

She gave birth to her third baby by caesarean section this morning. She had a prenatal consultation at a township hospital in Parson, about 5 hours' drive from this hospital. She was admitted here because a physician at the township hospital advised her to undergo a caesarean section operation here. She was glad that the admission took place smoothly because the township hospital contacted this hospital and made an appointment.



#### 3.3.2.2 Other Positive and Negative Impacts

There were no negative impacts on the natural environment, and no resettlement or land acquisition by this project.

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

### **3.4 Sustainability (Rating: ③)**

#### **3.4.1 Institutional/Organizational Aspect of Operation and Maintenance**

##### (1) Medical Service Department of the Ministry of Health and Sports

The Medical Services Department of the Ministry of Health and Sports is responsible for hospital care including his hospital. Under the Department, the Medical Care Division is responsible for the operation of public hospitals nationwide including this hospital, and the Procurement Division is responsible for the procurement and maintenance of medical equipment. The responsibilities and roles of the department and divisions are clear. In recent years, the Medical Service Department has been actively working on strengthening the maintenance system of medical equipment and developing human resources as follows (as of November 2019).

- Under the Procurement Division of the Department, a Biomedical Engineer Section was established for the maintenance of medical equipment, and 17 engineers were assigned.
- A diploma course training for medical engineers is conducted with support from the JICA Technical Cooperation Project, “The Project for Human Resource Development of Medical Engineering”.
- The course plans to train 75 medical engineers by April 2023. At the time of the ex-post evaluation, the first 18 graduates of the course were assigned as medical engineers at four tertiary hospitals in Yangon, Mandalay and Nay Pyi Taw. Graduates will be preferentially assigned to tertiary hospitals, which have a lot of medical equipment, and then to the state and regional general hospitals. Therefore, it will take some more years before a medical engineer will be assigned to this hospital.
- Until a medical engineer is assigned to this hospital, the Medical Services Department is planning to have the medical engineers assigned to Nay Pyi Taw, the nearest city to the hospital, visit surrounding state and provincial general hospitals including this hospital on a regular basis to provide advice on inspection and repair of medical equipment, in addition to conducting regular work at the assigned hospital.
- In order to conclude maintenance contracts with the local agencies of the manufacturers of MRI, CT, digital X-ray machines, etc., the Medical Services Department is making preparation for it such as analysis of cost efficiency and negotiation with them.

In this way, the Ministry of Health and Sports is working on strengthening the systems and organization for the maintenance of medical equipment, and there are no problems with regard to the institutional and organizational aspect of sustainability.

(2) Loikaw General Hospital

Figure 10 shows the organizational structure of the hospital. There were no major changes from the time of planning. Dermatology and forensic departments have been newly established after the planning time.

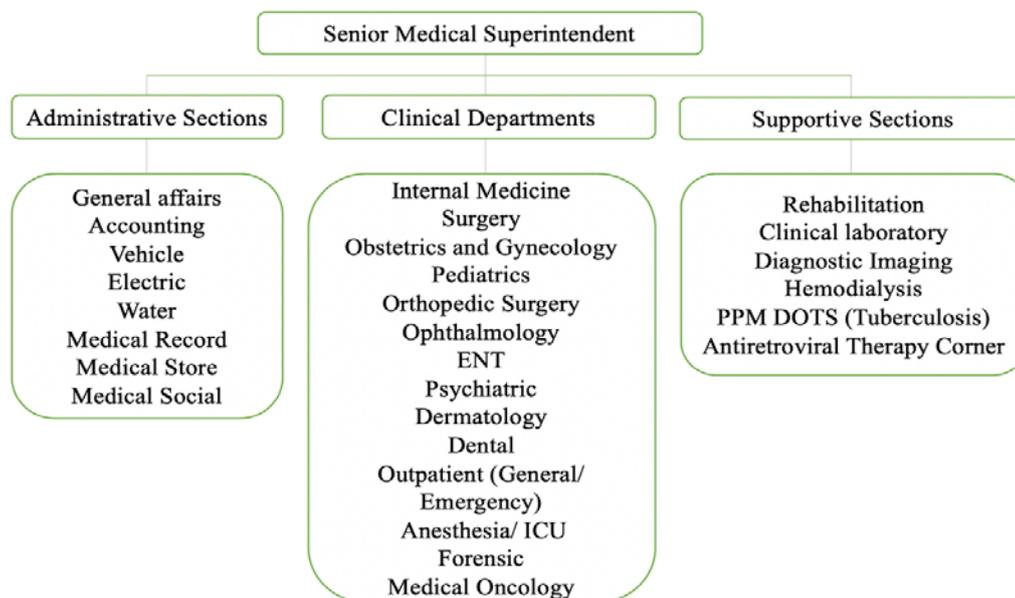


Figure 10 Organization Structure of the Hospital

Source: Reply from the hospital to the ex-post evaluation questionnaire

The hospital has 371 beds<sup>14</sup> and a total of 529 staff (as of August 2019). Since it was upgraded as a 500-bed hospital in 2015, the Ministry has been gradually enhancing the structure for the hospital by dispatching specialists, increasing the number of doctors, and constructing facilities. As Table 5 shows, comparing the time of planning and the ex-post evaluation, the number of doctors increased from 37 to 79, and among them, the number of specialists increased from 16 to 19. The fulfilment rate of the doctors is 37%, which is not adequate. The hospital is continuously requesting the assignment of more doctors. The fulfilment rate of nurses was already high, and their number was only increased by five. The total number of medical technicians, workers in charge of cleaning, washing, ironing, security guards, etc., and auxiliary staff such as general affairs and accounting, also doubled from 86 to 170. The overall fulfilment rate has dropped from 74% to 60% because the approved number of staff at the hospital was greatly increased as a result of it being upgraded to a 500-bed hospital; however, the actual number of staff is increasing only gradually.

<sup>14</sup> The actual number of beds is 371 although the hospital was upgraded to a 500-bed hospital in 2015. It is common in Myanmar that the number of approved beds does not match the actual number of beds. This is because the facilities and human resources are gradually strengthened after the upgrade, and the hospital will have the relevant number of beds after several years.

Table 5 Number of Staff and Fulfilment Rate at the time of Planning and Ex-post Evaluation

Item	At the Time of Planning			At the Time of Ex-post Evaluation		
	No. Approved	No. Appointed	Fulfilment Rate	No. Approved	No. Appointed	Fulfilment Rate
Doctors	104	37	36%	214	79	37%
Nurses	289	275	95%	416	280	67%
Other staff	139	86	62%	252	170	67%
Total	532	398	74%	882	529	60%

Source: Reply from the hospital to the ex-post evaluation questionnaire

The hospital has several operating rooms, including four at the central operating theatre on the second floor of the New East Building, one for the ophthalmic operations, and one for the obstetrics and gynaecology operations. Among these, the main operating rooms and the ophthalmic operating room were well utilized, but the obstetrics and gynaecology operating room was not used at the time of ex-post evaluation.

This is because the hospital currently has only two anaesthetists, who are stationed at the central operating theatre; the hospital cannot allocate an anaesthetist to the obstetrics and gynaecology operating room.<sup>15</sup> Therefore, obstetrics and gynaecology operations, like other surgical operations, are conducted at the central operating theater. It is desirable to use the operating room attached to the obstetrics and gynaecology ward in order to reduce the burden caused by transferring patients from the obstetrics and gynaecology ward or delivery room to the central operating theatre. The hospital has formally requested the Department of Medical Services of the Ministry of Health and Sports to increase the number of anaesthetists. The Health Director of Kayah State and the Department of Medical Services are fully aware of the need to increase the number of anaesthetists and would like to take immediate action.<sup>16</sup>

The Senior Medical Superintendent and her staff at the hospital have responsibility for the operation and maintenance of the facilities and equipment of the hospital. The Head nurses are responsible for the daily cleaning and maintenance of equipment in the respective departments. A civil engineer and electric engineer were assigned to the hospital and in charge of the maintenance of the medical equipment at the time of the capacity-building program of this project. At that time, the engineers regularly visited each department in the hospital and inspected the operation and cleaning status of the equipment at regular intervals according to the daily maintenance checklist introduced by the capacity-building program. However, since

<sup>15</sup> The approved number of anesthetists of the hospital is six, and the appointed number at the time of ex-post evaluation is two.

<sup>16</sup> In the country, earlier it was necessary to complete a doctoral course in order to become an anaesthetist. However, in recent years, in view of the necessity of increasing the number of anaesthetists, a system has been introduced whereby one can obtain the qualification of the anaesthetist by completing a master's program.

mid-2018 when these two engineers were transferred, this inspection has not been carried out. One of the staff members of the Medical Store Section was in charge of contacting agencies of manufacturers of equipment to request repairs; however, this post was also vacant at the time of the ex-post evaluation. At the time of the ex-post evaluation, the status of operation and maintenance of the medical equipment is reviewed at regular meetings conducted by the Senior Medical Superintendent and directors of the hospital. Requests for inspection and repairs to the agencies of manufacturers are made by the Senior Medical Superintendent or the doctors in the departments. In this way, inspections and repairs by agencies of the manufacturers are conducted.

The Department of Health of Kayah State and the hospital are aware of the need for a specialist in medical equipment and have requested the Ministry of Health and Sports to assign engineers to this hospital and other hospitals in the state. In response to this, the Medical Service Department would like to assign an engineer as soon as possible.

The maintenance of electricity and water-related facilities and equipment at the hospital is carried out by three technicians at the hospital. The drainpipes of air conditioners and parts of water pumps were replaced, and both were used without any problems. LED lamps, fluorescent lamps, wash faucets, and drains under the basin were replaced or repaired after they were worn out or damaged.

As mentioned above, although the number of staff, including doctors, has been increased at the hospital, there are issues such as a shortage of anaesthetists and the absence of staff specialized in the maintenance of medical equipment. However, there is a prospect of improvement in the future because there are mechanisms to make up for the shortage and absence, and Kayah State Health Department and the Department of Medical Service are planning to respond to these issues as soon as possible.

### **3.4.2 Technical Aspect of Operation and Maintenance**

The hospital has requested the Medical Service Department to assign a specialist to the psychiatric department of the hospital because there is currently no specialist in the department. All other departments have specialists. There was no equipment or were no facilities that were not used or used extremely infrequently due to technical problems.

This hospital regularly conducts an in-hospital training program called the Continuous Nurses Education and Continuous Medical Education, to continuously improve and maintain the knowledge and skills of nurses and doctors. This activity was introduced in the Technical Cooperation Project and is continuing. Lecturers are assigned from among the hospital staff in turn and are sometimes invited from outside.

The Head nurses of the departments are responsible for daily inspection and maintenance of

medical equipment and for reporting any problems when they occur. However, the staff of this hospital, including the Head nurses, had no opportunity to learn about equipment maintenance after the Capacity Building Program of the project was implemented. This is a common issue for public hospitals in the country, and the Medical Service Department intends to improve the knowledge of staff in these hospitals about equipment maintenance by making arrangements for the staff in the Biomedical Engineering Section to visit and advise general hospitals in rural areas.

As described above, there are no technical problems relating to the usage of facilities and equipment, and the Medical Service Department has an intention to work on improving hospital staff's knowledge of maintenance of medical equipment in the future; therefore, there is no problem in terms of technical aspects of sustainability.

### **3.4.3 Financial Aspect of Operation and Maintenance**

The budget and expenditure of the Medical Service Department of the Ministry of Health and Sports have been increasing year by year recently, both in terms of the total amount and the cost for repairs (building and equipment), in view of the necessity. The total expenditure in FY2017-18 (April 1, 2017 to March 30, 2018) was 309,536 million kyats (about JPY 24,678 million<sup>17</sup>). This was a 26% increase over the previous year. Material expenses, such as the purchase of medicines and equipment, and salaries of staff account for the majority of expenditure.

The annual budget and expenditure of the hospital has been increasing in recent years. Comparing the time of planning and the time of ex-post evaluation, it was increased about 3.7 times. It shows that the hospital has been strengthened as necessary as a 500-bed hospital in terms of finance.

The total expenditure for FY2018-19 (October 1, 2018 to September 30, 2019) was 1,956 million kyats (approximately JPY 136 million<sup>18</sup>). This was a 5% increase over the previous year. The items with a large proportion of expenditure were staff salaries and the purchase of medicines. These expenditures were made from the budget allocated by the Ministry of Health and Sports. Donations are frequently offered and used to fund hospital meals and the purchase of equipment, such as oxygen cylinders and wheelchairs. All revenues, such as from paid rooms, are paid to the Ministry of Health and Sports.

The Ministry of Health and Sports allocates a budget for the maintenance and repair of medical equipment and facilities at the beginning of the fiscal year. The hospital can disburse expenditure for the same by obtaining approval from the Senior Medical Superintendent of the

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<sup>17</sup> Converted to JPY at exchange rates of the Central Bank of Myanmar on March 30, 2018.

<sup>18</sup> Converted to JPY at exchange rates of the Central Bank of Myanmar on September 30, 2019.

hospital if the amount is within budget.

The hospital applies for an additional budget from the Department of Medical Services if this budget becomes insufficient. According to the accountant at the hospital, in recent years the hospital applied for an additional budget for the maintenance and repair of medical equipment approximately twice a year, and all applications were approved.

It has been a problem that it takes several months until the application for an additional budget is approved. Furthermore, the repair of the equipment is suspended during this time. However, the situation is improving because the initial budget to the hospitals for the maintenance and repair of equipment was increased from FY2018-19 (October 1, 2018 to November 30, 2019) onwards.<sup>19</sup>

#### **3.4.4 Status of Operation and Maintenance**

Due to an increase in the number of patients, some facilities provided by this project became insufficient. Therefore, some clinical departments were relocated from the project buildings to other buildings.<sup>20</sup> There is no problem with the use of project equipment at the relocated places, or the use of facilities of clinical departments in the project buildings where more space has been made available due to the relocation.

Regarding the Dental department, the number of patients increased (see Figure 8), and the number of dentists increased from one to two after completion of the project. As a result, it became difficult to provide examination and treatment efficiently at the consultation room provided by the project, which has only one dental chair. Therefore, in 2017 the hospital renovated the existing building on the premises, procured and installed three dental chairs, and started dental examinations in the building. The dental chair and related equipment in the consultation room provided by the project were not moved to the building, and it was not utilized for a while. However, the room has been used for dental examinations and oral hygiene education for pregnant women since October 2019. As mentioned above, the operating room at the obstetrics and gynaecology department is not used because the hospital has only two anaesthetists.

The reporting and repairs are carried out according to the set procedure when any problem occurs with equipment. Although some problems were found in the surgical endoscope, the suction machine at the emergency department, and the autoclave at the operating theatre, necessary repairs and replacement of parts were conducted afterward. They were being used

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<sup>19</sup> The initial budget for equipment maintenance for FY2017 was 600,000 kyats, and those for FY2018 and FY2019 were 10 million kyats, which was about 17 times.

<sup>20</sup> The rehabilitation room, the ENT department and the blood bank have been relocated to other buildings. The equipment provided by the project is used at the relocated sites. As a result of the relocation of these departments, the obstetrics and gynaecological department and clinical laboratories, which now have more space, are utilizing the space without any problems.

without interruption at the time of ex-post evaluation. At the time of the first field survey of the ex-post evaluation, there were ten items of equipment that were malfunctioning. The external evaluator pointed out the malfunctioning equipment since she was concerned that the equipment would continue to be used with the problems or that it would take several months for the related department of the hospital to report the problem to the Senior Medical Superintendent. However, the hospital received an inspection visit from an agency of medical equipment in December 2019 and made necessary arrangements for repair and replacements of parts.

Replacement of parts and repairs in case of wear or damage were conducted properly for the electricity and water-related facility. According to the staff in charge of the facility, they conduct replacement and repairs using locally available parts if the same design as the ones installed in the project is expensive and cannot be purchased with the hospital budget. In doing so, they take into account the original design and colours and try to keep the design concept as much as possible. The buildings and facilities were well cleaned and hygienic.



Well Organized Medicines



Regular Cleaning

The daily checklists brought in by the Capacity Building Program were completed regularly in some departments. However, some staff members did not fully understand the meaning of items on the checklists because they are written in English. They explained that they were completing the forms thinking that they must do what they were told although they do not fully understand the meaning of items in the forms. When the checklists are filled out by each department, the staff with expertise in equipment maintenance and management can visit each department to inspect and confirm the operation status of the equipment utilizing the checklists, which leads to the early detection and repair of malfunctioning equipment. When the external evaluator informed the Senior Medical Superintendent of the hospital about the importance of regular visits and inspections of the departments using the checklists for equipment maintenance, she expressed her intention to assign one of the technicians in charge of the facility maintenance for this work until a staff with the specialty could be allocated.

Sorting and organizing of medical equipment and medicines using the 5S technique

introduced by the Technical Cooperation Project, cleaning of the facility, and practice of good hygiene have been continuously carried on. These efforts are contributing to the sustainable operation and maintenance of the facilities and equipment provided by the project.

No major problems have been observed in the institutional/organizational, technical, financial aspects and current status of the operation and maintenance system. Therefore, sustainability of the project effects is high.

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

This project was implemented to improve the medical services of the hospital in Kayah State by providing facilities and medical equipment.

Improving the quality of health and medical care services was a priority issue in Myanmar from the time of project planning until the time of the ex-post evaluation. There was a need to enhance specialized medical services of the state and regional hospitals in the country. Therefore, the project was consistent with the development policy and development needs of the country. This is highly relevant with Japan's ODA policy of supporting the development of health and medical services to improve the lives of the people. And therefore, the relevance of the project is high. Two buildings were constructed, and medical equipment was procured and installed as planned. Although the project cost was within the plan, the project period was longer than planned; therefore, the efficiency of the project is fair. The numbers of outpatients, in-patients, deliveries, and operations with general anaesthesia, which were the indicators of the effectiveness of the project, increased significantly and achieved their targets. The status of utilization of the facilities and equipment provided by the project is also positive. The expected effects, such as improvement of medical services, hygiene and medical environment; patient satisfaction at the hospital; and rationalization of the referral system, which was expected as an impact of the project, were achieved. The project has achieved its objectives; therefore, effectiveness and impact of the project are high. No problems have been observed in the institutional/organizational, technical and financial aspects of the operation and maintenance of the facilities provided by the project. Although there is a shortage of anaesthesiologists and specialized staff for the maintenance of medical equipment, these are being addressed as priority issues; there is a prospect for improvement. Therefore, the sustainability of the project effects is high.

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

## **4.2 Recommendations**

### **4.2.1 Recommendations to the Executing Agency**

- (1) Sharing expertise of maintenance of medical equipment and conducting inspections by regular visits (recommendations to the Department of Medical Service, Ministry of Health and Sports)

The maintenance of medical equipment has become more important as the amount of equipment at this hospital has been increasing in recent years. This is because, in addition to the equipment provided by the project, the Ministry of Health and Sports has procured equipment at this hospital. At this hospital, the Head nurses of the clinical departments or staff in the Medical Store are taking responsibility for identifying problems with the medical equipment and reporting the same to the Senior Medical Superintendent. However, at the time of the ex-post evaluation, the external evaluator inspected each and every piece of equipment, and found that there were cases where equipment was continuously used even though it had problems, and it took several months for the staff of the clinical departments to report the problem to the Senior Medical Superintendent. The staff members were using equipment without noticing the failure or missed the appropriate timing for reporting of repairs. It is probably because those who are not specialized in the maintenance of equipment are undertaking inspections and reporting the problems. Until one of the medical engineers currently being trained by the Ministry of Health and Sports is assigned to the hospital, it is important for the Ministry and Department to assist the hospital with the effective use of the medical equipment over the long term by creating opportunities for hospital staff to learn specialized knowledge and by making arrangements for medical engineers to visit the hospital for the periodic inspection of equipment and to exchange their opinions. They can utilize resources from the JICA-assisted Medical Engineer Training Program for this purpose.

- (2) Implementation of inspection visits using the maintenance checklist of medical equipment (Recommendation to this hospital)

As described in (1) above, at the time of the ex-post evaluation, there were cases where it took several months for clinical departments to report a problem occurring with medical equipment to the Senior Medical Superintendent. Some clinical departments are completing the checklists for the operation and cleaning status of equipment introduced by the Capacity Building Program of the project. However, they are not utilized effectively. When the checklists are filled out by each department, the staff with expertise in equipment maintenance and management can visit each department to inspect and confirm the operation status of the equipment utilizing the checklists, which leads to the early detection and repair of malfunctioning equipment.

The hospital has requested the Department of Medical Service to assign an engineer who has

knowledge of maintenance of the equipment. Until this assignment is realized, it is recommended to appoint an appropriate person from among existing staff members as the staff member in charge of equipment maintenance or to take up maintenance as one of the topics of the 5S initiatives, and carry out periodic inspection visits to the clinical departments using the checklist. At that time, the checklists, which are currently in English, can be translated into a local language to improve user friendliness, if necessary.

#### **4.2.2 Recommendations to JICA**

None.

#### **4.3 Lessons Learned**

##### **(1) Synergy effect created by JICA's grant aid, technical cooperation projects, and institutional strengthening by the Executing Agency**

At this hospital, the Technical Cooperation Project was implemented in parallel with the provision of facilities and equipment under this project. In addition, the Ministry of Health and Sports upgraded and institutionally strengthened the hospital by assigning specialists and increasing the number of doctors. The needs of the medical service in the region has increased since the project was planned, and the number of hospital users and surgical operations has increased drastically; however, as a result of the above-mentioned interventions, the quality of service provided by the hospital does not decline because the hospital has responded to the increasing needs adequately.

At the time of the ex-post evaluation, the utilization of facilities and equipment provided by the project is positive, and the consultation rooms and wards are kept clean. The level of satisfaction of hospital users is also high. This is the synergy effect created by the grant aid, the Technical Cooperation Project, and institutional strengthening by the Ministry of Health and Sports. In future, JICA can consider taking measures for increasing the effectiveness of a project by referring to the above-mentioned interventions as an example, such as implementing a grant aid and a technical cooperation project at the same time or encouraging the implementation of measures for institutional strengthening of the executing agency.