

Republic of Uganda

FY2015 Ex-Post Evaluation of Japanese Grant Aid Project  
“The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment  
in the Central Region in Uganda”

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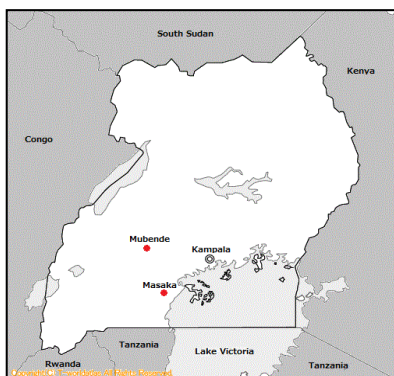
## **0. Summary**

The objective of this project is to enhance the medical services offered by Masaka Regional Referral Hospital (hereinafter Masaka R.R.H.) and Mubende Regional Referral Hospital (hereinafter Mubende R.R.H.), the secondary referral hospitals, by improving the facilities and medical equipment of the both R.R.H.s in the Central Region in Uganda, thereby contributing to the improvement of the local medical referral system.

Uganda has been seeking better access to high-quality medical service by hospitals, with special emphasis on enhancing regional referral hospitals. However, Uganda’s major health indices are still at the most seriously low level worldwide, like other African nations. Thus, the project is highly consistent with Uganda’s development policy and development needs. Also, the project is highly consistent with the aid policy of Japanese government and JICA, since “health and infrastructure” is included in “improvement of basic well-being”, one of the priority areas of the Japan’s Official Development Assistance (ODA) policy for Uganda. Therefore, the relevance of the project is high. The outputs were produced in accordance with the plan, and the project’s cost was within the plan. However, the project’s duration exceeded the plan. Therefore, its efficiency is fair. By improving facilities and equipment, the number of operations and outpatients at both hospitals increased, while the number of deliveries and inpatients as well as the bed occupancy rate also increased at the Maternity Department of Mubende R.R.H., which was supported by the project. Moreover, satisfaction of patients and medical staff also increased due to the improved facilities and equipment. Additionally, the number of patients referred from the lower level hospitals increased at both hospitals. Therefore, the effectiveness and impact of the project are high. On the other hand, the sustainability of the project is fair, since some minor problems in terms of technical aspects and some medium-level problems in the current status of operation and maintenance are observed, although no problems are seen in terms of the institutional and financial aspects of operation and management.

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

## 1. Project Description



Project Locations



Outpatients Department Building  
of Mubende R.R.H.

### 1.1 Background

Uganda is a republic in Eastern Africa. Uganda became independent from Great Britain in 1962 and adopted republicanism in 1963. It covers 241,000 square kilometres, which is about 2/3 the area of Japan, and had a population of about 32.7 million (2008). The country's per capita gross national income (GNI) was USD370 (2007)<sup>1</sup>.

The levels of major health indices in Uganda, similar to those of neighbouring countries in eastern Africa, are among the worst in the world. Infectious diseases such as malaria, tuberculosis, measles, and HIV/AIDS, etc. also prevail in Uganda, and the country also has had cases of Ebola haemorrhagic fever. To improve these circumstances, the Ugandan government adopted measures such as promoting free medical services, enhancing access by increasing medical facilities, and enhancing service delivery by targeting the community level up to the provincial level. Thanks to these measures, outcomes were obtained to a certain extent, such as the access rate to medical facilities within 5km improving from 49% of the total population (1999) to 72% (2004). Conversely, however, in regional referral hospitals and district hospitals those that act as secondary medical facilities, the facilities have become obsolete and the medical equipment and materials are insufficient. In addition, the population growth rate is also high at 3.2% per year; hence, the demand for medical services is expected to increase further in the future.

Under these circumstances, the Ugandan government requested that the Japanese government implement a grant aid project to improve medical facilities and equipment of core hospitals in the Central Region in 2006.

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<sup>1</sup> Preparatory Survey Report

## 1.2 Project Outline

The objective of this project is to enhance the medical services offered by Masaka R.R.H. and Mubende R.R.H., the secondary referral hospitals, by improving the facilities and medical equipment of the both R.R.H.s in the Central Region in Uganda, thereby contributing to the improvement of the local medical referral system.

### <Grant Aid Project>

|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E/N Grant Limit or G/A Grant Amount/<br>Actual Grant Amount | Detailed Design:<br>135 million yen/134 million yen<br>Project:<br>1,741 million yen/1,648 million yen<br>Total:<br>1,876 million yen/1,783 million yen                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Exchange of Notes Date<br>(Grant Agreement Date)            | Detailed Design:<br>November 2009 (November 2009)<br>Project:<br>June 2010 (June 2010)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Implementing Agency                                         | Health Infrastructure Division, Clinical<br>Services, Ministry of Health                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Project Completion Date                                     | October 2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Main Contractors                                            | Construction:<br>The Zenitaka Corporation<br><br>Procurement of Equipment:<br>Nissei Trading Co., Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Main Consultants                                            | Consortium of Nihon Sekkei, Inc. and<br>Earl Consultants, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Basic Design                                                | 【Preliminary Survey】<br>November 2008<br>【Preparatory Survey】<br>October 2009                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Detailed Design                                             | September, 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Related Projects                                            | <ul style="list-style-type: none"> <li>• Technical Cooperation Project “Project on Improvement of Health Service through Health Infrastructure Management” (2011-2014)</li> <li>• Grant Aid Project “The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Western Region in Uganda” (2013)</li> <li>• Grant Aid Project “The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Eastern Region in Uganda” (1/2: 2005, 2/2: 2006)</li> <li>• Japan Overseas Cooperation Volunteers (Masaka R.R.H. “Medical Equipment” (2011, 2012-2014, 2014-), Mubende</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>R.R.H. “Nurse (5S)” (2012-2014), “Medical Equipment” (2014-)</p> <ul style="list-style-type: none"> <li>• The African Development Bank (AfDB): “Support to Health Sector Strategic Plan Project II” (2008-2013)</li> <li>• The World Bank (WB): “Uganda Health System Strengthening Project” (2010-2017)</li> <li>• The U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) (2004-2017)</li> </ul> |
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## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Mayumi Hamada, Foundation for Advanced Studies on International Development

### 2.2 Duration of Evaluation Study

Duration of the Study: August 2015 - October 2016

Duration of the Field Study: October 25, 2015 - December 10, 2015

January 31, 2016 - February 13, 2016

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

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

#### 3.1.1 Relevance to the Development Plan of Uganda

The government of Uganda formulated “The Poverty Eradication Action Plan (PEAP)” in 1997, a comprehensive national development plan, and has been updating it since then. The PEAP III, which was valid during the ex-ante evaluation in 2009, stipulated that the government would seek to improve major health indices such as the child mortality rate and maternal mortality rate, etc. in the priority area of “Human Development”.

In order to address the tasks shown in the PEAP, the Ministry of Health formulated the National Health Policy. The Second National Health Policy (2010 - 2020), which was enacted in 2010 and currently valid, indicates that the referral system from the primary to tertiary levels as well as regional referral hospitals at regional level would be strengthened. Additionally, “The Health Sector Strategic Plan (HSSP I)” (2001 - 2005), HSSP II (2006 - 2010), and “The Health Sector Strategic Investment Plan (HSSIP)” (2010 - 2014) were formulated under the National Health Strategy. In HSSP II, the overall development goal was “the attainment of a good standard of health by all people in Uganda, in order to promote a healthy and productive life”, by improving specific objectives, such as improving the utilisation rate of facilities for

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

<sup>3</sup> ③ High, ② Fair, ① Low

outpatients at hospitals as well as enhancing the ratio of births at health facilities. HSSIP, which took over the overall goal of the HSSP II, made health infrastructure, including R.R.H.s, one of the five investment focus areas.

Thus, the project, which aims to improve R.R.H.s, has been highly consistent with Uganda's national development plan and health sector policy since the time of ex-ante evaluation until that of ex-post evaluation.

### 3.1.2 Relevance to the Development Needs of Uganda

During the ex-ante evaluation, the maternal mortality rate was 550 against 100,000 births (2005) and the infant mortality rate was 79 against 1,000 births (2005)<sup>4</sup> in Uganda's health sector, which shows that Uganda's health status was at the worst level in the world, just like its surrounding countries in East Africa. During the ex-post evaluation, the maternal mortality rate was 343 against 100,000 births (2015, World Bank), while the infant mortality rate was 37.7 against 1,000 births (2015, World Bank). Although Uganda's maternity mortality rate and infant mortality rate have shown a certain tendency towards improvement, it is still serious, considering that Japan's maternal mortality is 5 against 100,000 births, while its infant mortality rate is 2.0 against 1,000 births. Hence, the development needs for improving Uganda's health sector were still high at the time of the ex-post evaluation. Additionally, the Central Region of Uganda, the target area of the project, has high population density and a great need for medical services. However, obsolete facilities and equipment have prevented Masaka R.R.H. and Mubende R.R.H. from providing adequate medical services, as it had been 30 to 40 years since their construction.

Thus, the project has been highly consistent with Uganda's development needs and those of the Central Region from the time of the ex-ante evaluation until that of the ex-post evaluation.

### 3.1.3 Relevance to Japan's ODA Policy

Based on the discussions with the government of Uganda at the Economic Cooperation Policy Dialogue in 1997 and the Project Confirmation Study in 1999, four areas were set as priority areas of Japan's ODA in Uganda. One of the priority areas was "improvement of basic well-being", which includes health infrastructure (ODA Country Data Book 2009). The project aims to enhance the medical services of two R.R.H.s in the Central Region of Uganda by improving facilities and equipment. Therefore, the project's consistency with Japan's ODA policy towards Uganda at the time of the ex-ante evaluation is high, because enhancement of health infrastructure was included in one of the priority areas.

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<sup>4</sup> Ex-ante evaluation

As stated above, this project has been highly relevant to the country's development plan and development needs, as well as to Japan's ODA policy. Therefore its relevance is high.

### 3.2 Efficiency (Rating: ②)

#### 3.2.1 Project Outputs

The project intended to enhance the efficiency of medical activities at Masaka R.R.H. by reconstructing the facilities to integrate the functions of Outpatient Department, Casualty Department, Operation Theatre, and Laboratory, etc., which had been scattered in the premises. At Mubende R.R.H., which was upgraded from district hospital, the project aims to provide additional functions that are indispensable for an R.R.H., in its Outpatient Department, Casualty Department, Operation Theatre, Laboratory, Maternity Department, and Male Ward, etc. The facilities and equipment provided by the project are shown below.

##### 3.2.1.1 Facilities

As shown below, the facilities were constructed as planned<sup>5</sup> (Tables 1 and 2). The construction of both R.R.H.s was completed in June 2012. Although there were 8 changes from the preparatory survey and 6 changes from the detailed design, those changes were minor and did not influence the project period<sup>6</sup>.

Table 1: Planned and Actual Output for the Construction of Facilities (Masaka R.R.H.)

| Planned                               |       |                                                                                                            | Actual                                |       |                                                                                                         | Difference |
|---------------------------------------|-------|------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------------------------------------------------------------------------------------------------|------------|
| Building                              | Floor | Contents of the Facilities                                                                                 | Building                              | Floor | Contents of the Facilities                                                                              |            |
| OPD/<br>Casualty<br>Building          | GF    | Casualty Dept., O.P.D.<br>(Surgical)                                                                       | OPD/<br>Casualty<br>Building          | GF    | Casualty Dept., O.P.D.<br>(Surgical)                                                                    | None       |
|                                       | 1F    | O.P.D. (General O.P.D.<br>[Male/Female<br>Consultation, Paediatrics],<br>Specialised Medicine<br>(common)) |                                       | 1F    | O.P.D. (General OPD<br>[Male/Female<br>Consultation,<br>Paediatrics], Specialised<br>Medicine (common)) | None       |
| OP Theatre/<br>Laboratory<br>Building | GF    | Operation Dept.                                                                                            | OP Theatre/<br>Laboratory<br>Building | GF    | Operation Dept.                                                                                         | None       |
|                                       | 1F    | Laboratory, Pharmacy,<br>Lecture Room                                                                      |                                       | 1F    | Laboratory, Pharmacy,<br>Lecture Room                                                                   | None       |
| Toilet<br>Building                    | GF    | Toilet for outpatients,<br>Toilet for staff, Toilet for<br>persons with disabilities                       | Toilet<br>Building                    | GF    | Toilet for outpatients,<br>Toilet for staff, Toilet<br>for persons with<br>disabilities                 | None       |
|                                       | 1F    |                                                                                                            |                                       | 1F    |                                                                                                         |            |
| Related Facilities                    |       | Electric Room, Elevated<br>Water Tank                                                                      | Related Facilities                    |       | Electric Room, Elevated<br>Water Tank                                                                   | None       |

Sources: Preparatory Survey Report and JICA internal document

<sup>5</sup> Questionnaire survey to Masaka R.R.H. and Mubende R.R.H.

<sup>6</sup> Interview with main consultants

Table 2: Planned and Actual Output for the Construction of Facilities (Mubende R.R.H.)

| Planned                            |       |                                                                                                          | Actual                             |       |                                                                                                          | Difference |
|------------------------------------|-------|----------------------------------------------------------------------------------------------------------|------------------------------------|-------|----------------------------------------------------------------------------------------------------------|------------|
| Building                           | Floor | Contents of the Facilities                                                                               | Building                           | Floor | Contents of the Facilities                                                                               |            |
| OPD/<br>OP<br>Theatre<br>Building  | GF    | O.P.D. (General OPD [Male/Female Consultation, Paediatrics], Specialised Medicine), Pharmacy, Laboratory | OPD/<br>OP<br>Theatre<br>Building  | GF    | O.P.D. (General OPD [Male/Female Consultation, Paediatrics], Specialised Medicine), Pharmacy, Laboratory | None       |
|                                    | 1F    | Operation Dept. O.P.D. (Special Clinics)                                                                 |                                    | 1F    | Operation Dept. O.P.D. (Special Clinics)                                                                 | None       |
| Casualty/<br>Maternity<br>Building | GF    | O.P.D. (Surgical), Casualty Dept.                                                                        | Casualty/<br>Maternity<br>Building | GF    | O.P.D. (Surgical), Casualty Dept.                                                                        | None       |
|                                    | 1F    | Maternity Dept.                                                                                          |                                    | 1F    | Maternity Dept.                                                                                          | None       |
| Toilet<br>Building                 | GF    | Toilet for outpatients, Toilet for staff, Toilet for persons with disabilities                           | Toilet<br>Building                 | GF    | Toilet for outpatients, Toilet for staff, Toilet for persons with disabilities                           | None       |
|                                    | 1F    |                                                                                                          |                                    | 1F    |                                                                                                          |            |
| Male<br>Ward                       | 1F    | 36 beds, Treatment Room                                                                                  | Male<br>Ward                       | 1F    | 36 beds, Treatment Room                                                                                  |            |
| Related Facilities                 |       | Electric Room, Elevated Water Tank, Septic Tank, Percolation Trench                                      | Related Facilities                 |       | Electric Room, Elevated Water Tank, Septic Tank, Percolation Trench                                      | None       |

Source: Preparatory Survey Report and JICA internal document

## 3.2.1.2 Equipment

The following equipment was provided to Masaka R.R.H. and Mubende R.R.H. as planned (Tables 3 and 4).

Table 3: Planned and Actual Output for the Equipment (Masaka R.R.H.)

| Dept.           | Planned                                                                                                                                                                 | Actual                                                                                                                                                                  | Difference |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                 | Contents of Equipment                                                                                                                                                   | Contents of Equipment                                                                                                                                                   |            |
| Operation Dept. | Operating table for orthopaedics, C-arm X-ray unit, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Electrosurgical unit | Operating table for orthopaedics, C-arm X-ray unit, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Electrosurgical unit | None       |
| Casualty Dept.  | Suction unit, Operating table, Operating light, Defibrillator, Stretcher                                                                                                | Suction unit, Operating table, Operating light, Defibrillator, Stretcher                                                                                                | None       |
| O.P.D.          | Examination couch, Diagnostic equipment set, Centrifuge, Blood transfusion fridge, X-ray viewer                                                                         | Examination couch, Diagnostic equipment set, Centrifuge, Blood transfusion fridge, X-ray viewer                                                                         | None       |

Source: Preparatory Survey Report and JICA internal document

Table 4: Planned and Actual Output for the Equipment (Mubende R.R.H.)

| Dept.           | Planned                                                                                                                        | Actual                                                                                                                         | Difference |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------|
|                 | Contents of Equipment                                                                                                          | Contents of Equipment                                                                                                          |            |
| Operation Dept. | Operating table, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Pulse oximeter | Operating table, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Pulse oximeter | None       |
| Casualty Dept.  | Suction unit, Operating table, Operating light, Stretcher                                                                      | Suction unit, Operating table, Operating light, Stretcher                                                                      | None       |
| O.P.D.          | Examination couch, Diagnostic equipment set, Centrifuge, Drug                                                                  | Examination couch, Diagnostic equipment set, Centrifuge, Drug                                                                  | None       |

|                 |                                                                         |                                                                         |      |
|-----------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|------|
|                 | refrigerator, Dental chair/unit                                         | refrigerator, Dental chair/unit                                         |      |
| Maternity Dept. | Obstetric bed, Examination table, Incubator, Resuscitator, Suction unit | Obstetric bed, Examination table, Incubator, Resuscitator, Suction unit | None |

Source: Preparatory Survey Report and JICA internal document

### 3.2.1.3 Soft Component

Technical guidance for enhancing the maintenance and operation (clarification of organisational structure for maintenance and seminars on maintaining and operating equipment) was conducted as planned from June to September 2012. The operational and maintenance capacities of the provided equipment by implementation of the seminars were enhanced as planned. On the other hand, “clarification of organisational structure for maintenance” was partially unachieved, as a re-training plan was examined but not decided upon.

The points that were not attained as planned were clarification of the management structure (I-1) and “confirmation of implementation schedule, trainees, and the contents based on a re-training plan” (I-3). As for the former, those who were concerned with the project at Masaka R.R.H.<sup>7</sup> did not think that the names of the responsible persons were confirmed and shared among the hospital staff. However, there were no substantial problems, because Masaka R.R.H. appointed persons in charge of maintenance after the project completion<sup>8</sup>. As for the latter, a re-training plan was considered but not confirmed.<sup>9</sup>

Table 5: Planned and Actual Output (Soft Component)

| Items                                                                                |                                                                                                                  | Confirmatory Method                                                                                                                                                                  | Result                                                                                                                                                                                                                                                                        | Gap                |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| I. To establish a sustainable equipment maintenance system in the targeted hospitals | I-1. To clarify the management system (staffers, chain of command) of medical equipment                          | <ul style="list-style-type: none"> <li>• To confirm the organisational chart of the maintenance system</li> <li>• To confirm the names of the responsible persons</li> </ul>         | <ul style="list-style-type: none"> <li>• An organisation chart for the maintenance structure was formulated.</li> <li>• Names of responsible persons were confirmed (except for Masaka R.R.H., where they were not confirmed or understood among those concerned).</li> </ul> | Partially achieved |
|                                                                                      | I-2. To establish a collaboration system between the hospitals and the Central Workshop <sup>10</sup> of the MOH | • To confirm the formulated organisation and collaboration chart between R.R.H. and the Central Workshop (including the names of the persons in charge) and the chain of its command | • An organisational chart was formulated to show the collaborative system for maintenance between the R.R.H.s and the Central Workshop of the MOH (with description of names of persons in charge)                                                                            | None               |
|                                                                                      | I-3. To consider the                                                                                             | • To confirm the re-training plan and knowledge sharing                                                                                                                              | • It was confirmed that a draft re-training plan was formulated                                                                                                                                                                                                               | Partially achieved |

<sup>7</sup> Questionnaire and hearing at Masaka R.R.H.

<sup>8</sup> Questionnaire and hearing at Masaka R.R.H.

<sup>9</sup> JICA internal document

<sup>10</sup> A section of the MOH that is in charge of maintaining the public hospitals in the Central Region of Uganda



|                                                                                                                                       |                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                           |      |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|                                                                                                                                       | implementation of the re-training plan regarding the operation of equipment in clinical aspects | with the MOH<br>• To confirm the detailed implementation schedule such as expected dates, trainees, and the contents based on the re-training plan                                                                                                                                                                                                                                                                                                                         | and shared with the Ministry of Health.<br>• The detailed implementation schedule such as expected dates, trainees, and the contents were considered but not confirmed.                                                                                                                                                                                                                                   |      |
| II. To strengthen the operation and maintenance abilities of the medical staffers who operate the equipment of the targeted hospitals | II-1.To introduce operational and maintenance methods at the target hospitals                   | <ul style="list-style-type: none"> <li>• To prepare (i) the daily maintenance manual which is necessary for medical staff to conduct regularly</li> <li>• To prepare (ii) the operation manual for equipment in a clinical field, which is necessary for medical staff to use the equipment properly</li> <li>• To confirm understanding of operations and maintenance for medical staff based on the above (i) and (ii) by questionnaire or examination papers</li> </ul> | <ul style="list-style-type: none"> <li>• The daily maintenance manual (i) for medical staff was formulated.</li> <li>• The operation manual for the equipment (ii) for medical staff to use the equipment appropriately was developed.</li> <li>• It was confirmed through examination or questionnaire that the medical staff understood how to utilise the developed manuals ((i) and (ii)).</li> </ul> | None |

Source: Preparatory Survey Report and JICA internal document

Remarks: The confirmatory method was the means of measuring achievements that were set prior to the project's implementation.

The short-term seminars conducted under the Soft Component were designed to be held repeatedly with the same content so that the medical staff at both R.R.H.s could participate more easily, since they were busy. Repeated participation was encouraged to fix their understanding. Also, the first-class Ugandan medical professionals, such as those working for Mulago National Referral Hospital, teaching at Makerere University, etc., were selected as the trainers, so that the participants could acquire practical and proper equipment operation methods based on actual experience (interview with the main consultants). According to the interviews with the seminar participants, which were conducted as part of the beneficiary survey during the ex-post evaluation, 15 out of 18 participants at Masaka R.R.H. and 11 out of 13 participants at Mubende R.R.H. chose either 5 (very easy to understand) or 4 (easy to understand, to some extent) on a 5-point rating of "To what extent was the seminar easy to understand?" Hence, the seminars above are regarded to have been effective, to a certain extent.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

The actual project cost borne by the Japanese side was 1,783 million yen, which was 95% of the planned figure, i.e., 1,876 million yen, the maximum amount of the Exchange Note (E/N) and the Grant Agreement (G/A). Thus, the cost was lower than planned. This gap resulted from

the difference between the maximum amount of the E/N and G/A and the bidding price of the successful bidder. The cost borne by the Ugandan side was planned to be about 18 million yen<sup>11</sup> for demolishing existing facilities, etc., although the actual amount was not available.

#### 3.2.2.2 Project Period

The project period was from November 30, 2009, to October 10, 2012. It lasted 35.4 months<sup>12</sup>, which was longer than planned (133%), as it was planned to last 27 months, including the detailed design and bidding processes. Major causes of the delay included the delayed commencement of construction works due to the presidential election (1.5 months) as well as delays in the arrival of fittings due to flooding in Thailand (4 months). As for the main obligations of the Ugandan side, there were no delays that led to extensions of the project period.

As stated above, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

### 3.3 Effectiveness<sup>13</sup> (Rating: ③)

#### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

##### 3.3.1.1 Operation Indicators

##### (1) Masaka R.R.H.

Table 6 shows the achievement of the operation indicators for Masaka R.R.H., i.e., the number of operations, outpatients, and casualties (accident cases).

The number of operations at Masaka R.R.H. increased to 19,237 in 2014, i.e., 2.2 times compared with the baseline number of 8,663 in 2007, and 1.5 times the figure in 2012 (12,601), when the construction of the new buildings was completed and they started functioning. Also, the number of both major and minor operations has been increasing every year since 2012. The number of outpatients was 294,481 in 2014, which increased to 1.5 times the baseline data in 2007, i.e., 198,264, and 1.3 times of 2012 (231,035). The number of outpatients has been increasing every year since 2011. The number of casualties (accident cases) increased 6.3 times from 2,792 in 2007 to 17,704 in 2014, showing a drastic increase. Also, it is 1.2 times the figure in 2012 (14,576).

Based on the above, the number of operations, outpatients, and casualties (accident cases) increased compared with the baseline data, and these indicators are regarded to have been achieved.

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<sup>11</sup> Preparatory Survey Report

<sup>12</sup> The contract between the main consultant and JICA was extended until June 30, 2013, due to the delay in the procedures of revising the Authority to Pay (A/P) by the Ministry of Health and the Ministry of Finance.

<sup>13</sup> Sub-rating for effectiveness is to be put with consideration of impact.

Table 6: Achievement of the Operation Indicators (Masaka R.R.H.)

| Indicator                    | Baseline<br>2007 | Target<br>2015                 | Actual<br>2010                  | Actual<br>2011                 | Actual<br>2012     | Actual<br>2013             | Actual <sup>14</sup><br>2014   |
|------------------------------|------------------|--------------------------------|---------------------------------|--------------------------------|--------------------|----------------------------|--------------------------------|
|                              | Baseline<br>Year | 3 Years<br>After<br>Completion | 2 Years<br>Before<br>Completion | 1 Year<br>Before<br>Completion | Completion<br>Year | 1 Year After<br>Completion | 2 Years<br>After<br>Completion |
| <u>Number of Operations</u>  | 8,663            | increase                       | 10,672                          | NA                             | 12,601             | 16,661                     | 19,237                         |
| Major Operation              | NA               | NA                             | NA                              | NA                             | 2,604              | 3,210                      | 3,716                          |
| Minor Operation              | NA               | NA                             | NA                              | NA                             | 9,997              | 13,451                     | 15,521                         |
| <u>Number of Outpatients</u> | 198,264          | increase                       | N/A                             | 187,062                        | 231,035            | 254,944                    | 294,481                        |
| Casualty (Accident cases)    | 2,792            | NA                             | 10,897                          | NA                             | 14,576             | 14,567                     | 17,704                         |

Sources: Ex-ante Evaluation, Preparatory Survey Report, Annual Health Sector Performance Report, and Hearing/Questionnaire Survey in Masaka R.R.H.

Remarks 1: Although the baseline number of operations was 2,491 in the Ex-ante Evaluation, the total number of major and minor operations obtained through hearings at the hospital is shown in the table above. This is because the original figure includes only major operations, according to the Preparatory Survey Report.

Remarks 2: Although the baseline number of outpatients (2007) was 252,969 in the Ex-ante Evaluation, Masaka R.R.H. pointed out that baseline data likely included the figures of not only Masaka R.R.H. but also other hospitals in Masaka District. Therefore, the data from the Annual Health Sector Performance Report 2007/08 was utilised as the baseline data instead.

Remarks 3: Although the baseline data for the number of casualties (accident cases) in 2007 was quoted from the Preparatory Survey Report, the actual data includes casualties other than accident cases, since the data was not available.

## (2) Mubende R.R.H.

Table 7 shows the achievement of the operations indicators for Mubende R.R.H., i.e., the numbers of operations, outpatients, casualties (accident cases), deliveries, and inpatients, as well as the bed occupancy rate.

The number of operations at Mubende R.R.H. increased to 7,465 in 2014, which is 1.2 times of the baseline data in 2007 (6,465) and 1.5 times of 2012 (5,017), when the construction of new buildings was completed and they started functioning. The number of outpatients increased to 103,013 in 2014, which is 1.2 times the baseline data in 2007 (83,620) and 1.2 times that of 2012 (86,715). On the other hand, the data on the number of outpatients for casualties (accident cases) was not available<sup>15</sup>. Also, the numbers of outpatients for the Ophthalmology Department and ENT Department, which were newly established or improved with equipment provisions, have fluctuated by year, and have not necessarily shown clear increases.

On the other hand, the number of deliveries increased to 4,393 in 2014, which is 2.2 times that of 2007 (2,021) and 1.3 times that of 2012 (3,383). Within these figures, the number of normal births increased from 1,045 in 2007 to 3,363 (3.2 times) in 2014, while Caesarean

<sup>14</sup> In the Ex-ante Evaluation, the target figure is shown as the figure in 2015. However, the data in 2014 was utilised in this ex-post evaluation, since it was the latest data available at the time of the survey.

<sup>15</sup> The total number of outpatients for casualties, including non-accident cases, at the time of the ex-post evaluation decreased compared with that of 2007. Although the key staff at the R.R.H. was asked for reasons, no information was available.

sections increased from 963 in 2007 to 1,030 (1.1 times) in 2014. Thus, both types of deliveries increased.

The number of inpatients increased from 8,064 in 2007 to 15,526 in 2014, or by 1.9 times, while it is 1.04 times the figure in 2012 (14,896), when the construction of the facilities was completed. Among those facilities, the number of inpatients at the Maternity Ward, which was improved by the project in terms of facility and equipment, increased from 2,259 in 2007 to 5,089 in 2014, which showed a 2.3 times increase. Although the project also improved the Male Ward, the actual data on the number of inpatients at the Male Ward was not available, as its data was not recorded independently.

Although the bed occupancy rate (occupancy rate of inpatients) of the Maternal Ward has been fluctuating every year, it increased every year starting from 74% in 2012, and increased by 20% to 94% in 2014. The bed occupancy rate in 2010 and in 2011, before the project completion, exceeded 100%, and one bed was shared by more than one patient. As the bed occupancy rate at the Maternal Ward has been increasing without exceeding 100% since the completion of construction and equipment provision, the status has improved compared with before the project.

Hence, the number of operations, outpatients, deliveries, and inpatients increased, and the bed occupancy rate improved at Mubende R.R.H., although the number of casualties by accident was not available. Therefore, these indicators are assessed to have been achieved.

Table 7: Achievement of the Operation Indicators (Mubende R.R.H.)

| Indicator                    | Baseline<br>2007 | Target<br>2015                 | Actual<br>2010                  | Actual<br>2011                 | Actual<br>2012     | Actual<br>2013             | Actual<br>2014                 |
|------------------------------|------------------|--------------------------------|---------------------------------|--------------------------------|--------------------|----------------------------|--------------------------------|
|                              | Baseline<br>Year | 3 Years<br>After<br>Completion | 2 Years<br>Before<br>Completion | 1 Year<br>Before<br>Completion | Completion<br>Year | 1 Year After<br>Completion | 2 Years<br>After<br>Completion |
| <u>Number of Operations</u>  | 6,465            | increase                       | 9,575                           | 5,745                          | 5,017              | 13,482                     | 7,465                          |
| Major Operation              | N/A              | N/A                            | 1,150                           | 1,379                          | 1,421              | 1,661                      | 2,107                          |
| Minor Operation              | N/A              | N/A                            | 8,425                           | 4,366                          | 3,596              | 11,821                     | 5,358                          |
| <u>Number of Outpatients</u> | 83,620           | increase                       | 66,283                          | 67,340                         | 86,715             | 90,155                     | 103,013                        |
| Casualties                   | 3,883            | N/A                            | N/A                             | 104                            | 333                | 237                        | 171                            |
| ENT                          | 0                | N/A                            | N/A                             | 349                            | 1,342              | 1,023                      | 869                            |
| Ophthalmology                | 0                | N/A                            | N/A                             | N/A                            | 1,255              | 3,086                      | 2,575                          |
| <u>Number of Deliveries</u>  | 2,021            | increase                       | 2,755                           | 3,087                          | 3,383              | 3,944                      | 4,393                          |
| Normal Deliveries            | 1,045            | N/A                            | 1,941                           | 2,326                          | 2,767              | 3,203                      | 3,363                          |
| Caesarean sections           | 963              | N/A                            | 659                             | 761                            | 616                | 741                        | 1,030                          |
| Others                       | 13               | N/A                            | 155                             | -                              | -                  | -                          | -                              |
| <u>Number of Inpatients</u>  | 8,064            | increase                       | 9,110                           | 11,708                         | 14,896             | 14,884                     | 15,526                         |
| Maternity Ward               | 2,259            | N/A                            | 3,110                           | 3,388                          | 3,926              | 4,412                      | 5,089                          |
| Surgical Ward                | N/A              | N/A                            | 2,048                           | 2,404                          | 2,949              | 3,157                      | 2,937                          |

|                               |     |     |     |       |       |       |       |
|-------------------------------|-----|-----|-----|-------|-------|-------|-------|
| Others                        | N/A | N/A | N/A | 5,916 | 8,021 | 7,315 | 7,500 |
| <u>Bed Occupancy Rate (%)</u> | N/A | N/A | 131 | 115   | 98    | 118   | 90    |
| Maternity Ward                | N/A | N/A | 151 | 116   | 74    | 91    | 94    |
| Surgical Ward                 | N/A | N/A | 157 | 128   | 77    | 87    | 76    |
| Others                        | N/A | N/A | N/A | N/A   | N/A   | N/A   | N/A   |

Source: Ex-ante Evaluation, Preparatory Survey Report, Annual Health Sector Performance Report, and Hearing/Questionnaire Survey in Mubende R.R.H.

Remarks: The number of outpatients for casualties includes those for reasons other than accidents, because no data was available for outpatients for casualties (accident cases) at Mubende R.R.H.

Based on the above, the operation indicators at both R.R.H.s are regarded to have been achieved. The reasons for the achievements above are improved work flow lines by constructing new buildings to integrate facilities that used to be scattered around the premises into a certain area, and improved work efficiency, in terms of consultations/examinations and laboratory tests (refer to 3.3.2 for details).

#### 3.3.1.2 Effect Indicators

None.

#### 3.3.2 Qualitative Effects

In order to assess the status of “provision of prompt and appropriate medical services”, which was the expected qualitative effect of the project, an interview survey based on a questionnaire was conducted with outpatients at both R.R.H.s, inpatients at the maternal ward of Mubende R.R.H., and the medical staff who participated in the seminars conducted by the project at both R.R.H.s<sup>16</sup>.

<sup>16</sup> The sample size of the beneficiary survey conducted in this ex-post evaluation was 135. The interview survey based on a questionnaire was given to (1) 84 outpatients (53 at Masaka R.R.H. and 31 at Mubende R.R.H. The proportion of sexes and the generations of the respondents were as follows: 1) Outpatients at Masaka R.R.H.—Out of 53 respondents, 11 were male, 41 were female, and 1 unknown. By age, 11 respondents were in their 20s, 10 were in their 30s, 8 were in their 40s, 10 were in their 50s, 12 were in their 60s, and 2 were aged 70 or older. 2) Outpatients at Mubende R.R.H.—Out of 31 respondents, 14 were male and 17 were female. By age, 10 respondents were in their 20s, 6 were in their 30s, 5 were in their 40s, 4 were in their 50s, 5 were in their 60s, and 1 was aged 70 or older. All of the respondents above were either patients or guardians or attendants of patients who had ever received medical service before the project and received current medical service from Mubende R.R.H.). (2) Inpatients at Mubende R.R.H. (20 inpatients at the Maternity Ward supported by the project. The respondents were limited to the inpatients who had ever received the medical service at the Maternity Department before the project in addition to current services. By sex, 19 were female and 1 was unknown. By age, 4 were teenagers (19 years old), 10 were in their 20s, 4 were in their 30s, and 2 were in their 40s.), (3) 31 medical and maintenance staff who participated in the equipment maintenance and operation seminars conducted as a part of the soft component of the project at both R.R.H.s (18 at Masaka R.R.H. and 13 at Mubende R.R.H.). In order to avoid negative influences on the medical services provided by the hospitals, the outpatient and inpatient respondents were selected in accordance with the advice from the medical staff at each R.R.H., considering the status of patients' health condition and medical treatment. As for the selection of medical staff who participated in the seminar given by the project, both of the R.R.H.s were requested to check the list of participants to determine the staff who were still working for the R.R.H. The interview/questionnaire survey was given to all of the medical staff who were identified and available within the survey period. As the sample size was limited and they were not randomly sampled due to realistic limitations of the survey, there is a possibility that the survey results do not fully reflect the tendencies of the whole group.

### 3.3.2.1 Interview Survey to Outpatients (Masaka R.R.H. and Mubende R.R.H.)

In order to assess the enhancement of the medical services to outpatients brought by the improved facilities and equipment, 84 patients at the outpatient buildings of the two R.R.H.s were asked about the improvements compared with the status before the project, specifically i) the gaps in medical treatment and laboratory tests between what is needed and what is provided, ii) the time needed to wait for medical services, iii) the burden of moving among different places, and iv) the public non-medical facilities (such as washrooms, etc.). The results are shown in Table 8.

All 84 respondents chose either 5 (very much improved) or 4 (improved to some extent) in the five-point assessment in response to all of the aspects described above. Hence, the extent of the improvements by the project is recognized to be high.

Table 8: Have the Following Aspects Improved Compared with the Status before the Project?  
(Outpatients at both R.R.H.s)

(Unit: person)

|                                                                                               | Masaka R.R.H.<br>(53 patients) |    |   |   |   | Mubende R.R.H.<br>(31 patients) |    |   |   |   | Total<br>(84 patients) |    |   |   |   |
|-----------------------------------------------------------------------------------------------|--------------------------------|----|---|---|---|---------------------------------|----|---|---|---|------------------------|----|---|---|---|
|                                                                                               | 5                              | 4  | 3 | 2 | 1 | 5                               | 4  | 3 | 2 | 1 | 5                      | 4  | 3 | 2 | 1 |
| Gap in the medical treatment and laboratory tests between what is needed and what is provided | 9                              | 44 | 0 | 0 | 0 | 2                               | 29 | 0 | 0 | 0 | 11                     | 73 | 0 | 0 | 0 |
| Time to wait for medical service                                                              | 4                              | 49 | 0 | 0 | 0 | 0                               | 31 | 0 | 0 | 0 | 4                      | 80 | 0 | 0 | 0 |
| Burden of moving among different places                                                       | 2                              | 51 | 0 | 0 | 0 | 0                               | 31 | 0 | 0 | 0 | 2                      | 82 | 0 | 0 | 0 |
| Public non-medical facilities (such as washrooms, etc.)                                       | 7                              | 46 | 0 | 0 | 0 | 0                               | 31 | 0 | 0 | 0 | 7                      | 77 | 0 | 0 | 0 |

Source: Interview survey to outpatients in Masaka R.R.H. and Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all

With regards to the responses from respective R.R.H., most of the responses at Mubende R.R.H. were 4, while most of the responses were 4 and some were 5 at Masaka R.R.H. In terms of each aspect, “the gap between the medical treatment and laboratory tests of what is need and what is provided” and “the public facilities which are non-medical facilities” had the largest number of respondents who chose 5. At Mubende R.R.H., as the washrooms and the shower

room at the maternity ward were not often utilised<sup>17</sup>, the respondents may have been thinking about the public facilities other than the washrooms. The washrooms were not well utilised because Mubende R.R.H. prohibited their use by patients and attendants, etc., who failed to utilise flush toilets appropriately, as they were not accustomed to doing so and broke the toilets (hospital staff utilised the toilets at the time of the ex-post evaluation). The shower room was not utilised due to insufficient water supplies. However, the shower room will soon be utilised again, since the water conditions are improving.

Based on the above, the “provision of prompt and appropriate medical services” to the outpatients at both R.R.H.s has improved.

#### 3.3.2.2 Interview Survey to Inpatients (Mubende R.R.H.)

To assess the extent of the improvements in the services provided to inpatients compared with the status before the project, interviews based on a questionnaire were conducted with 20 inpatients at the Maternity Ward at Mubende R.R.H. (only to those who had ever received medical service from the Maternity Department of Mubende R.R.H. before the project in addition to current medical services), who were asked about improvements in the facility and the care at the R.R.H. before and after their delivery. The results are shown in Table 9.

All of the respondents but one, who chose 2 (not so much improved) for the neonatal room, chose either 5 (very much improved) or 4 (improved to some extent) for all the facilities respondents were asked about. In particular, all 20 respondents selected 5 for the Labour Room, while 19 respondents chose 5 for the Delivery Room and Recovery Room in the 5-point assessment. For all of the facilities that the respondents were asked about, the results show many favourable responses, indicating that the Maternity Ward’s facilities had improved significantly.

With regards to improvement of care before and after delivery at Mubende R.R.H., all of the respondents replied either 5 or 4 for the sense of security, the care before delivery, and the care after delivery. In particular, all of the respondents chose 5 for the care after delivery, while 16 out of 20 respondents chose 5 for the care of the new-born baby (while 1 respondent chose 2). Hence, many responses showed that the care had improved (although it cannot be concluded that the results reflect the tendencies of all of the inpatients of the Maternity Ward at Mubende R.R.H. due to the small sample size).

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<sup>17</sup> Observation at the site and interview at Mubende R.R.H.

Table 9: Have the Facilities for Delivery Improved after the Project?

(Unit: person)

|                                    | 5  | 4 | 3 | 2 | 1 | 0 |
|------------------------------------|----|---|---|---|---|---|
| Labour Room                        | 20 | 0 | 0 | 0 | 0 | 0 |
| Delivery Room                      | 19 | 1 | 0 | 0 | 0 | 0 |
| Recovery Room                      | 19 | 1 | 0 | 0 | 0 | 0 |
| New-born Nursery Room              | 15 | 4 | 0 | 1 | 0 | 0 |
| Building (of Maternity Department) | 12 | 8 | 0 | 0 | 0 | 0 |
| Hospital rooms at Maternity Ward   | 13 | 7 | 0 | 0 | 0 | 0 |

Source: Interview Survey to Inpatients of Maternity Ward at Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don't know

Table 10: Has the Care before and after Delivery at the Hospital Improved after the Project?

(Unit: person)

|                                        | 5  | 4  | 3 | 2 | 1 | 0 |
|----------------------------------------|----|----|---|---|---|---|
| Sense of security                      | 6  | 14 | 0 | 0 | 0 | 0 |
| Care before delivery (at the hospital) | 15 | 5  | 0 | 0 | 0 | 0 |
| Care after delivery (at the hospital)  | 20 | 0  | 0 | 0 | 0 | 0 |
| Care of new-born baby                  | 16 | 1  | 0 | 1 | 0 | 2 |

Source: Interview Survey to Inpatients at Maternity Ward, Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don't know

### 3.3.2.3 Interview Survey of Medical Staff Who Attended the Seminar Conducted by the Project (Masaka R.R.H. and Mubende R.R.H.)

To determine the improvement of medical services compared with the situation before the project, the following questions were asked to 31 medical staff members<sup>18</sup> who participated in the seminars implemented as a part of the project's soft component: i) efficiency of work due to the change in flow line in the new building, ii) receiving emergency patients, iii) hygiene of beds and infection control, and iv) occurrence of medical accidents and near-misses, etc., at both R.R.H.s. The results are shown in Table 11 and 12.

<sup>18</sup> This is the total number of medical staff members who still remained at the two R.R.H.s after receiving the user training on equipment maintenance and operation from the project, and who were not on official trips or long-term leave at the time of the ex-post evaluation.



Table 11: Have the Following Points Improved after the Project?  
(Medical Staff Who Participated in the Seminar at Masaka R.R.H.)

(Unit: person)

|                                                                                                  | Masaka R.R.H. (18 staff) |    |   |   |   |   |
|--------------------------------------------------------------------------------------------------|--------------------------|----|---|---|---|---|
|                                                                                                  | 5                        | 4  | 3 | 2 | 1 | 0 |
| Efficiency of work for handling outpatients (due to the change in flow line in the new building) | 4                        | 11 | 0 | 0 | 0 | 3 |
| Efficiency of work in laboratory tests (due to the change in flow line in the new building)      | 8                        | 10 | 0 | 0 | 0 | 0 |
| Efficiency of work for handling patients before/after operation (due to change in flow line)     | 13                       | 4  | 1 | 0 | 0 | 0 |
| Receiving emergency patients                                                                     | 10                       | 8  | 0 | 0 | 0 | 0 |
| Hygiene of beds and infection control                                                            | 3                        | 11 | 0 | 2 | 1 | 1 |
| Occurrence of medical accidents and near-misses                                                  | 8                        | 4  | 5 | 0 | 1 | 0 |

Source: Interview Survey to the Medical Staff (participants of the seminar) at Masaka R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don't know

Table 12: Have the Following Points Improved after the Project?  
(Medical Staff Who Participated in the Seminar at Mubende R.R.H.)

(Unit: person)

|                                                                                                  | Mubende R.R.H. (13 staff) |   |   |   |   |   |
|--------------------------------------------------------------------------------------------------|---------------------------|---|---|---|---|---|
|                                                                                                  | 5                         | 4 | 3 | 2 | 1 | 0 |
| Efficiency of work for handling outpatients (due to the change in flow line in the new building) | 4                         | 8 | 0 | 0 | 0 | 1 |
| Efficiency of work in laboratory tests (due to the change in flow line in the new building)      | 7                         | 6 | 0 | 0 | 0 | 0 |
| Efficiency of work for handling patients before/after operation (due to change in flow line)     | 9                         | 4 | 0 | 0 | 0 | 0 |
| Receiving emergency patients                                                                     | 6                         | 7 | 0 | 0 | 0 | 0 |
| Hygiene of beds and infection control                                                            | 3                         | 7 | 1 | 1 | 0 | 1 |
| Occurrence of medical accidents and near-misses                                                  | 6                         | 4 | 3 | 0 | 0 | 0 |

Source: Interview Survey to the Medical Staff (participants of the seminar) at Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don't know

All of the respondents from both R.R.H.s chose either 5 or 4 in the 5-point scale for “Efficiency of work for handling outpatients (due to the change in flow line in the new building)”, “Efficiency of work in laboratory tests (due to the change in flow line in the new building)”, and “Receiving emergency patients”. Also, all of the respondents, except for one who chose 3, selected either 5 or 4 for “Efficiency of work for handling patients before/after operation (due to change in flow line)”. Hence, many respondents recognised that these points

had improved. As for “Occurrence of medical accidents and near-misses”, all of the respondents, except for the one who chose 1, selected 3 or higher. Concerning the occurrence of medical accidents and near-misses, comprehensive information was not available, since no reporting system has been established. However, it is supposed, at least, that no medical accidents or near-misses resulted from the provided equipment<sup>19</sup>. As for “Hygiene of beds and infection control”, on the other hand, the responses varied, i.e., 3 respondents chose 2 and 1 selected 1.

Thus, the efficiency of work and the handling of patients, which are directly connected with improvements in facilities and equipment, such as the efficiency of work in handling outpatients, laboratory tests, and receiving emergency patients, improved after the project, although the quality and efficiency of the tasks for which knowledge and skills are important, in addition to better facilities and equipment, did not necessarily improve.

Additionally, some comments were received from another interview<sup>20</sup> conducted with medical staff at both R.R.H.s, such as “The quality of the equipment provided by the project is high”, “The resuscitator has been helpful to save lives of the patients”, and so on. These comments suggest that the equipment provided has contributed to enhancing the quality of medical services. On the other hand, however, there were some other comments such as “The suction unit sometimes overcharges” and “No electricity back-up system is equipped with the anaesthesia machine”.

#### 3.3.2.4 External Conditions

Several elements could have influenced the medical services of the two R.R.H.s beyond the project’s effects, such as changes in access to the R.R.H.s, the construction of new hospitals nearby, and support from other donors to the R.R.H.s, etc. No significant changes have been observed concerning access to the R.R.H.s, and the number of R.R.H.s in the central Uganda was the same as before. As for the donors’ support to the R.R.H.s, Mubende R.R.H. was one of the target hospitals of the World Bank’s “Uganda Health System Strengthening Project II (2010-2017)” and received some equipment, which is regarded to have had complementary effects on the project and included: 3 incubators, 2 infant warmers, 2 phototherapy units, 4 vacuum extractors (2 electric and 2 manual), 6 weighing scales (1 for infants and 5 for children), 2 instrument sets for basic Caesareans, 2 instrument sets for dilation and curettage, 2 examination couches for gynaecology, etc., as well as furniture<sup>21</sup>.

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<sup>19</sup> Interviews at both R.R.H.s

<sup>20</sup> Two medical staff members from each R.R.H. were interviewed. Interviews were conducted with a nurse, a mid-wife, a senior nurse, and a doctor.

<sup>21</sup> Although Mubende R.R.H. itself received much more equipment from the World Bank project, it was not clear which equipment was allocated to which department. Enquiry on this point was made to Mubende R.R.H., etc. but no further information was available. Therefore, the equipment which is regarded to be used only at obstetrics and gynaecology was picked up from the list of equipment and furniture from the World Bank project to Mubende R.R.H. Thus, there is possibility that more equipment was provided to the Maternity Department, as some other

As stated above, the work flow line was improved through the construction of a new building to integrate some old ones, which used to be scattered around in the premises. The new building improved outpatient examination and laboratory tests, decreased patients' waiting time for examination, made moving around the premises less cumbersome, and narrowed the gap between the needs of the patients and the medical services provided. These factors led to an enhanced reliability of the R.R.H.s from the patient's point view as well. Therefore, 'provision of prompt and appropriate medical services', the qualitative effects of the project expected at the time of planning, is assessed to have been enhanced.

### 3.4 Impacts

#### 3.4.1 Intended Impacts

##### 3.4.1.1 Quantitative Effect

##### (1) Number of Patients Referred from Lower Level Hospital<sup>22</sup>

This project aims to enhance the local medical referral system by improving medical service through improvement of facility and equipment of both R.R.H.s. The number of patients received from lower-level hospitals, which shows the quantitative effect of the expected impact, increased every year, drastically increasing since 2012, when construction of the new buildings was completed, except for at Mubende R.R.H. in 2013. As stated regarding effectiveness, the medical service provided by both R.R.H.s has been enhanced through the project's improvement of facilities and equipment. Hence, it is regarded that increased patient trust brought about by the project led to the increase in the number of patients referred from lower-level hospitals. Thus, it is assessed that the referral system was improved by the project.

Table 13: Number of Patients Referred from Lower-Level Hospitals

(Unit: person)

|                | 2010 | 2011 | 2012  | 2013  | 2014  |
|----------------|------|------|-------|-------|-------|
| Masaka R.R.H.  | 724  | 935  | 2,077 | 3,149 | 3,121 |
| Mubende R.R.H. | N/A  | 116  | 875   | 611   | 669   |

Source: Questionnaire Survey to Masaka R.R.H. and Mubende R.R.H.

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equipment which can be commonly used by different departments was also provided to the Maternity Department of the R.R.H. As for the furniture, there is no information sufficient to judge which one was allocated to the Maternity Department.

<sup>22</sup> At the time of planning, 'Improvement of Secondary Medical Services as a Referral Hospital' was stated as one of the expected indirect effects of the project (Preparatory Survey Report). Also, the Ex-ante Evaluation paper stated that 'the project aims to contribute to improvement of local medical referral system by improving medical service through strengthening functions of both R.R.H.s').

(2) Health Indices in the Catchment Area of Mubende R.R.H.<sup>23</sup>

Maternal mortality ratio, infant mortality rate, and under 5 years old mortality rate—the major health indices in the catchment area of Mubende R.R.H., whose Maternity Department was supported by the project’s improvement of facilities and equipment—did not show significant improvements compared to those indices before the project’s implementation. The improvement of health indices of Uganda such as infant mortality rate and maternity mortality rate was expected as a project’s impact at the ex-ante evaluation. However, it is not possible to assess the project’s impact on the health indices, maternity deaths, and stillbirths at Mubende R.R.H. by analysing these data, since those indices and the number vary depending on other external factors, such as the improvement status of lower-level hospitals, and so on.

Table 14: Health Indices in the Catchment Area of Mubende R.R.H.

(Unit: person)

|                                                          | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------------------------------------------------|------|------|------|------|------|
| Maternal mortality ratio (per 100,000 live births)       | 994  | 938  | 602  | 916  | 622  |
| Infant mortality rate (per 1,000 live births)            | 13   | 27   | 38   | 27   | 26   |
| Under 5 years old mortality rate (per 1,000 live births) | 70   | 54   | 42   | 23   | 29   |

Source: Questionnaire Survey to Mubende R.R.H.

Remarks: The ex-post evaluation found that the maternal mortality ratio was 343 per 100,000, the infant mortality rate was 38 per 1,000 live births, and the less than 5 years old mortality rate was 55 per 1,000 live births in Uganda (World Bank).

(3) Number of Maternal Deaths and Stillbirths in Mubende R.R.H.

Information on the maternal mortality ratio against the number of deliveries, and the ratio of stillbirths among all of the deliveries at Mubende R.R.H. were collected to examine any changes after the project. No significant tendencies towards improvement were observed. Thus, the impact on these points has not emerged.

Table 15: Number of Maternal Deaths and Stillbirths in Mubende R.R.H.

|                                     | 2007  | 2010  | 2011  | 2012  | 2013  | 2014  |
|-------------------------------------|-------|-------|-------|-------|-------|-------|
| Number of Maternal Deaths (persons) | 96    | 25    | 26    | 19    | 34    | 26    |
| Number of Deliveries                | 2,021 | 2,755 | 3,087 | 3,383 | 3,944 | 4,393 |

<sup>23</sup> At the time of planning, ‘improvement of healthcare indices of Uganda’, such as infant mortality rate and maternal mortality rate, was indicated as one of the expected indirect effects of the project (Preparatory Survey Report). Since the project’s target hospitals are limited to two R.R.H.s in the Central Region, among other hospitals in Uganda, the areas of the health indices were changed to those in the catchment area of the target R.R.H. instead of the whole area in Uganda, in order to check the project’s direct influence. Also, the indices set at the planning stage are regarded to have been directly related to maternity department, for which Mubende R.R.H. was supported by the project. Therefore, assessment on this point was made, focussing on the health indices in the catchment area of Mubende R.R.H.

|                                                              |     |      |     |     |     |     |
|--------------------------------------------------------------|-----|------|-----|-----|-----|-----|
| Maternal Mortality Rate against the Number of Deliveries (%) | 4.8 | 0.9  | 0.8 | 0.6 | 0.9 | 0.6 |
| Number of Stillbirths                                        | 140 | 284  | 256 | 294 | 261 | 329 |
| Stillbirth Rate against the Number of Deliveries (%)         | 6.9 | 10.3 | 8.3 | 8.7 | 6.6 | 7.5 |

Source: Questionnaire Survey in Mubende R.R.H.

#### (4) Death rate of patients for casualties

Analysis was made on the number of patients received for casualties (accident cases) and deaths to examine the effects the improved facility and equipment had on the Casualty Department. The death rate among patients received slightly increased at Masaka R.R.H. since 2012, when the data first became available. However, the death rate of received patients is closely connected with the seriousness of each patient's injury; it should be noted that it also varies depending on such as the improvement of lower-level hospitals' ability to receive patients for casualty, increases in traffic accidents, and so on. At Mubende R.R.H., these data do not exist. Therefore, the effect of improving the Casualty Departments at both R.R.H.s could not be confirmed.

Table 16: Death Rate of Patients for Casualties (Masaka R.H.H. and Mubende R.R.H.)

| Indicator                                                          | Baseline<br>2007 | Target<br>2015                 | Actual<br>2010                  | Actual<br>2011                 | Actual<br>2012     | Actual<br>2013                | Actual<br>2014                 |
|--------------------------------------------------------------------|------------------|--------------------------------|---------------------------------|--------------------------------|--------------------|-------------------------------|--------------------------------|
|                                                                    | Baseline<br>Year | 3 Years<br>After<br>Completion | 2 Years<br>Before<br>Completion | 1 Year<br>Before<br>Completion | Completion<br>Year | 1 Year<br>After<br>Completion | 2 Years<br>After<br>Completion |
| Masaka R.R.H.                                                      |                  |                                |                                 |                                |                    |                               |                                |
| Number of deaths in<br>Casualty Dept.<br>(Accident cases; persons) | N/A              | N/A                            | N/A                             | N/A                            | 137                | 160                           | 209                            |
| Death rate in Casualty<br>Dept. (Accident cases; %)                | N/A              | N/A                            | N/A                             | N/A                            | 0.9%               | 1.1%                          | 1.2%                           |
| Mubende R.R.H.                                                     |                  |                                |                                 |                                |                    |                               |                                |
| Number of deaths in Casualty<br>Dept. (Accident cases;<br>persons) | N/A              | N/A                            | N/A                             | N/A                            | N/A                | N/A                           | N/A                            |
| Death rate in Casualty Dept.<br>(Accident cases; %)                | N/A              | N/A                            | N/A                             | N/A                            | N/A                | N/A                           | N/A                            |

Source: Ex-ante Evaluation, Hearing/Questionnaire Survey in Masaka R.R.H. and Mubende R.R.H.

#### 3.4.1.2 Qualitative Effect

##### (1) Improvement of Medical Services for Approximately 2.55 Million People in the Catchment Area

At the planning stage of the project, 'Improvement of medical services for approximately 2.55

million people in the catchment area'<sup>24</sup> was indicated as one of the expected indirect effects of the project. However, there is a gap between the 2.55 million people, shown as the number of beneficiaries, and the number of patients who actually received medical services from the two R.R.H.s. Hence the number, 2.55 million, does not have substantial meaning as the project's qualitative effect. On the other hand, those who actually received medical services from the two R.R.H.s are the actual number of patients, the data of which have been already covered and analysed as an operation indicator for assessing effectiveness. Therefore, this indicator is not used as a qualitative indicator for assessing impact.

### 3.4.2 Other Impacts

#### (1) Impacts on the Natural Environment

Neither positive nor negative impacts of the project have been observed with regards to the natural environment.

#### (2) Land Acquisition and Resettlement

None.

#### (3) Unintended Positive/Negative Impact

As an R.R.H. is expected to function as an educational institution to accept medical staff as trainees in Uganda, nurses, health workers and laboratory technicians, etc. from local technical schools have been received for training for improving their skills in laboratory tests and medical services<sup>25</sup>. According to the interviews conducted with the staff at both R.R.H.s concerning the change in terms of the number of trainees and the training contents. According to the respondents, the training contents were enhanced by the improved equipment, but information on specific differences or related documents were not available. The project's influence on 'the improvement of the training of medical staff at hospitals in Uganda in terms of operation and maintaining equipment,' i.e., one of the expected effects of this project's soft component, could not be observed.

No negative impacts from the project were observed either.

As stated above, this project has largely achieved its objectives. Therefore, effectiveness and impact are high.

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<sup>24</sup> Preparatory Survey Report

<sup>25</sup> Preparatory Survey Report

### 3.5 Sustainability (Rating: ②)

#### 3.5.1 Institutional Aspects of Operation and Maintenance

Each hospital maintains its facility with its own budget. The Ministry of Health's Central Workshop supervises equipment maintenance for Masaka R.R.H., while Mubende R.R.H. has been responsible for its equipment maintenance since 2013, when the maintenance workshop was established. Maintenance of sophisticated equipment, such as X-ray machine and ICU equipment, etc. is not covered by the Central Workshop, because a specific budget is provided to the hospitals by the Ugandan government or other donors<sup>26</sup>. The Maintenance Unit is responsible for maintenance at Masaka R.R.H., and the Maintenance Workshop is responsible at Mubende R.R.H. It is clear where the responsibilities rest within the R.R.H. and between the R.R.H. and the organizations concerned, although there was a slight change compared to the planning stage.

Basically, maintenance is conducted by the sections mentioned above at each R.R.H. to address a problem upon receiving information about it from another section<sup>27</sup>. Periodic inspection now is conducted at both R.R.H.s over a certain timeframe, which was not routinely done before the project's implementation<sup>28</sup>.

As a part of the project's soft component, an organization chart of equipment maintenance systems in each R.R.H. was formulated, the name of the person responsible for maintenance was confirmed, and the collaborative relationships between the R.R.H. and the Central Workshop were clarified during the implementation period. During the ex-post evaluation, however, the results were not shared among those concerned, and thus, the system did not survive. On the other hand, there were no substantial problems at the time of the ex-post evaluation, because the maintenance structure had been established after members were assigned from each section to the maintenance team, which was to collaborate with the Maintenance Unit at Masaka R.R.H, and after the Maintenance Workshop had been established at Mubende R.R.H.

The Defect Inspection of June 2013, which ranks on a scale from *A* (highest) to *C* (lowest), assessed that securing human resources for the maintenance system at Masaka R.R.H. was an *A* (i.e. human resources are secured) while that of Mubende R.R.H. was a *B* (i.e. there is a room for improvement)<sup>29</sup>. At the time of the ex-post evaluation, the number of maintenance staff at Mubende R.R.H. had increased from one to three. Masaka R.R.H.'s Maintenance Unit also grew, compared to the time of the Defect Inspection. However, the questionnaire survey shows that both R.R.H.s still recognise the number of maintenance staff is still insufficient<sup>30</sup>.

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<sup>26</sup> Questionnaire survey to the Central Workshop, Ministry of Health

<sup>27</sup> Questionnaire and Interview to/at both R.R.H.s and Ministry of Health

<sup>28</sup> JICA internal document

<sup>29</sup> JICA internal document

<sup>30</sup> Questionnaire survey to both R.R.H.s

Table 17: Number of Staff at Masaka R.R.H.

(Unit: person)

|                      | 2011 | 2012 | 2013 | 2014 |
|----------------------|------|------|------|------|
| Management           | N/A  | N/A  | 1    | 1    |
| Medical Staff        | N/A  | N/A  | 160  | 128  |
| Administration Staff | N/A  | 3    | 2    | 2    |
| Maintenance Staff    | N/A  | 3    | 3    | 3    |
| Total                | N/A  | N/A  | 166  | 134  |

Source: Questionnaire Survey to Masaka R.R.H.

Remarks: Above figures include only the staff whose salary is paid by the hospital.

Table 18: Number of Staff in Mubende R.R.H.

(Unit: person)

|                      | 2011 | 2012 | 2013 | 2014 |
|----------------------|------|------|------|------|
| Management           | 0    | 0    | 1    | 1    |
| Medical Staff        | 93   | 88   | 93   | 108  |
| Administration Staff | 2    | 2    | 2    | 3    |
| Maintenance Staff    | 1    | 1    | 1    | 3    |
| Total                | 96   | 91   | 97   | 115  |

Source: Questionnaire Survey to Mubende R.R.H.

Remarks: Above figures include only the staff whose salary is paid by the hospital.

With regards to the change in hospital staff from the viewpoint of the management system as a whole hospital, the number of staff (mainly, medical staff) at Masaka R.R.H. decreased beginning 2 years ago, when the data were available, due to transfer and retirement. At Mubende R.R.H., the number has increased over the last four years, although it fluctuated depending on the year. It should be noted that the number of staff at Mubende R.R.H. was smaller than that of Masaka R.R.H. even before the project, and it is still smaller than Masaka R.R.H. after the staff number increased (Table 17 and 18). However, the number of medical staff at Mubende R.R.H. has improved after receiving the support of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) Project (2004-2017), which allocated 29 medical staff (nurses, midwives and clinical officers whose salary is paid by PEPFAR and who will be hired by Mubende R.R.H. as permanent staff after 3 years) beginning in January 2016. According to the beneficiary survey, however, the management staff of both R.R.H.s recognise that the number of hospital staff is still insufficient.

As mentioned above, the division of duties and organisational structure to maintain both the R.R.H.s and the organisations concerned are clear, regular inspection has been conducted at a certain intervals, and the number of maintenance staff has increased, although the number is still small. Although the total number of the hospital staff is insufficient, other donors' support to increase the number of staff is also observed. Therefore, sustainability in terms of the



institutional aspects of operation and maintenance is high.

### 3.5.2 Technical Aspects of Operation and Maintenance

An interview was conducted based on a questionnaire with 31 seminar participants (18 at Masaka R.R.H. and 13 at Mubende R.R.H.) concerning knowledge on equipment operation and maintenance offered through the project's soft component. The result is as follows: regarding the establishment of knowledge and skills acquired through the seminar, 14 of 18 respondents at Masaka R.R.H. and 10 of 13 at Mubende R.R.H. chose either 5 (yes, very much) or 4 (yes, to some extent) on the 5-point rating. On the other hand, there were some comments from the respondents and those who were concerned that the medical staff's capacity of equipment operation and maintenance was not sufficient, due to the increase of those who were not trained resulting from the transfer and retirement of some participants. Thus, the level of knowledge and skills use at the time of ex-post evaluation is rather high. Also, with regards to use of the manuals, all 18 respondents at Masaka R.R.H. and 12 out of 13 at Mubende R.R.H. selected either 5 or 4 on the 5-point rating. Hence, the manuals have been used well.

Table 19: Seminar Participants' Knowledge of Equipment Operation and Maintenance  
(Masaka R.R.H.)

(Unit: person)

|                                                                                                                        | 5 | 4  | 3 | 2 | 1 | 0 |
|------------------------------------------------------------------------------------------------------------------------|---|----|---|---|---|---|
| Do you still remember the knowledge/skills on use/operation and maintenance of equipment acquired through the seminar? | 7 | 7  | 0 | 4 | 0 | 0 |
| Do you still utilize the manual produced and distributed at the seminar now?                                           | 8 | 10 | 0 | 0 | 0 | 0 |

Source: Interview Survey to the Medical Staff (participants of the seminar) at Masaka R.R.H.

Remarks: 5: Yes, very much, 4: Yes, to some extent, 3: Medium, 2: Not so much, 1: Not at all,  
0: I don't know

Table 20: Seminar Participants' Knowledge of Equipment Operation and Maintenance  
(Mubende R.R.H.)

(Unit: person)

|                                                                                                                        | 5 | 4 | 3 | 2 | 1 | 0 |
|------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| Do you still remember the knowledge/skills on use/operation and maintenance of equipment acquired through the seminar? | 3 | 7 | 0 | 2 | 0 | 1 |
| Do you still utilise the manual produced and distributed at the seminar now?                                           | 9 | 3 | 0 | 0 | 0 | 1 |

Source: Interview Survey to the medical staff (participants of the seminar) at Mubende R.R.H.

Remarks: 5: Yes, very much, 4: Yes, to some extent, 3: Medium, 2: Not so much, 1: Not at all,  
0: I don't know

Also, two internal trainers from Masaka R.R.H.'s medical staff were fostered by the JICA Technical Cooperation Project, 'Project on Improvement of Health Service through Health Infrastructure Management' (2011 - 2014), to enhance the medical staff's capacity of operation and maintenance, which complementarily affected the project<sup>31</sup>. Maintenance training at Masaka R.R.H. was delivered by the internal trainer for nurses once (24 participants in 2014), while training was conducted twice at Mubende R.R.H. (once in 2013, and 2014, respectively). At Mubende R.R.H., a person in charge of the Maintenance Workshop and a dispatched Japan Overseas Cooperation Volunteers (JOCV) member were assigned as internal trainers by the hospital. Although both R.R.H.s expressed their intention to continue implementing internal training in the future, specific information on the details of the implemented training and its effects, the schedule and number of trainings planned was not available.

In the meantime, the issues pointed out at the Defect Inspection, which will be explained later in 3.5.4., i.e., Current status of operation and maintenance, have not improved much. Insufficient knowledge and awareness from cleaning companies' cleaners, who are connected to many of the issues, are some of the causes which have prevented the hospitals from executing instruction and guidance, leading to rusted equipment. Also, leaving blood on the floor of the Operation Theatre Building, as observed at Mubende R.R.H., is an issue of infection control, which is a concern regarding the improvement of medical services (i.e. the project objective). Although additional orders of shoes for the Operation Theatre Building were already made and pad provision for pregnant women has been considered at Mubende R.R.H., the countermeasures to prevent infection are not possible to be assessed as sufficient.

Based on the above, sustainability in terms of technical aspects of operation and maintenance is fair, as some minor problems were observed.

### 3.5.3 Financial Aspects of Operation and Maintenance

At the time of the Defect Inspection in June 2013, 'securing maintenance budget was rated as *A* (i.e. budget is secured) at Masaka R.R.H. and *B* (i.e. there is a room for improvement) at Mubende R.R.H. by three-grade assessment.<sup>32</sup> On the other hand, the government budget and expenditure-for-maintenance cost have been increasing every year since 2010, especially at Mubende R.R.H. since 2013, when its Maintenance Workshop was established. Hence, Mubende R.R.H.'s *B* rating from the Defect Inspection is assessed to have already been improved. As for the annual financial balance of both R.R.H.s after 2010, the amount of revenue has been increasing steadily at Mubende R.R.H. every year, while the government budget

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<sup>31</sup> Interview at Masaka R.R.H. The trainers fostered by the technical cooperation project consist of one nurse and one midwife.

<sup>32</sup> JICA internal document

increased except in 2012 and 2013 at Masaka R.R.H. The medical service fee<sup>33</sup> also has been on the increase at Masaka R.R.H. At Masaka R.R.H., a part of the medical service fee has been allocated for maintenance costs in addition to the government budget since 2010, and the amount allocated from medical service fee also increased every year. As the financial balance has been in the black except for 2010 at Masaka R.R.H. and the balance has been zero (i.e. not deficient) at Mubende R.R.H., neither R.R.H. seems to have financial problems as a public hospital.

Table 21: The Government Budget and Financial Balance at Masaka R.R.H.

(Unit: Millions Ugandan Shilling)

|                          | 2010         | 2011         | 2012         | 2013         | 2014         |
|--------------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Total Revenue</b>     | <b>4,839</b> | <b>4,950</b> | <b>4,643</b> | <b>4,385</b> | <b>5,091</b> |
| Government Budget        | 4,551        | 4,612        | 4,298        | 4,072        | 4,742        |
| Medical Service Fee      | 288          | 338          | 345          | 313          | 349          |
| <b>Total Expenditure</b> | <b>4,849</b> | <b>4,624</b> | <b>4,315</b> | <b>4,094</b> | <b>4,764</b> |
| Human Resources          | 2,270        | 2,282        | 2,437        | 2,468        | 2,520        |
| Maintenance Cost         | 56           | 107          | 103          | 123          | 128          |
| From Government Budget   | 46           | 95           | 86           | 101          | 106          |
| From Medical Service Fee | 10           | 12           | 17           | 22           | 22           |
| Others                   | 2,523        | 2,235        | 1,775        | 1,503        | 2,116        |
| <b>Balance</b>           | <b>-10</b>   | <b>326</b>   | <b>328</b>   | <b>291</b>   | <b>327</b>   |

Source: Based on Questionnaire and Interview Survey at Masaka R.R.H.

Remarks: 1 Ugandan shilling was 0.043 Yen (JICA monthly exchange rate, December 2014, JICA web page)

Table 22: The Government Budget and Financial Balance at Mubende R.R.H.

(Unit: Millions Ugandan Shilling)

|                          | 2010         | 2011         | 2012         | 2013         | 2014         |
|--------------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Total Revenue</b>     | <b>2,041</b> | <b>2,337</b> | <b>2,393</b> | <b>3,574</b> | <b>3,926</b> |
| Government Budget        | 2,041        | 2,337        | 2,393        | 3,574        | 3,926        |
| <b>Total Expenditure</b> | <b>2,041</b> | <b>2,337</b> | <b>2,393</b> | <b>3,574</b> | <b>3,926</b> |
| Human Resources          | 958          | 1,408        | 1,502        | 1,807        | 2,138        |
| Maintenance Cost         | 27           | 23           | 27           | 70           | 130          |
| Others                   | 1,056        | 906          | 864          | 1,697        | 1,658        |
| <b>Balance</b>           | <b>0</b>     | <b>0</b>     | <b>0</b>     | <b>0</b>     | <b>0</b>     |

Source: Questionnaire and Interview Survey at Mubende R.R.H.

The Ministry of Health's Central Workshop's maintenance budget<sup>34</sup> also has been increasing every year since 2010. Although the Central Workshop's budget for Masaka R.R.H. and

<sup>33</sup> At Masaka R.R.H., the Private Ward was constructed with the government budget; this was not constructed at Mubende R.R.H. In Uganda, medical services are basically free of charge at public hospitals, except for those at the Private Ward of some of the public hospitals. Thus, only some of the public hospitals which have a Private Ward receive revenue from the medical service fee.

<sup>34</sup> The government-budget amounts in Tables 21 and 22 show the budget allocated by the Ministry of Health. However, the Central Workshop has its own separate budget for maintenance of each hospital.

Mubende R.R.H. increased in 2014 compared to 2010, the amount fluctuated during the years in between, which does not show a consistently increasing tendency. There is no special change foreseen in terms of annual budget, revenue, and expenditure in the future.

Table 23: Budget of the Central Workshop of the MOH for Maintenance

(Unit: Millions Ugandan Shilling)

|                     | 2010       | 2011       | 2012       | 2013       | 2014       |
|---------------------|------------|------------|------------|------------|------------|
| <b>Total Budget</b> | <b>128</b> | <b>128</b> | <b>380</b> | <b>476</b> | <b>680</b> |
| Masaka R.R.H.       | 10         | 7          | 4          | 11         | 15         |
| Mubende R.R.H.      | 7          | 5          | 3          | 9          | 11         |
| Other Hospitals/HCs | 63         | 77         | 312        | 430        | 541        |
| Others              | 48         | 39         | 61         | 26         | 113        |

Source: Questionnaire Survey to Central Workshop of the MOH

As stated above, the sustainability in terms financial aspect of operation and maintenance is high.

#### 3.5.4 Current Status of Operation and Maintenance

An interview survey based on a questionnaire was conducted at both R.R.H.s with the medical staff who participated in the equipment operation and maintenance seminar organised as a part of the soft component of the project. Some questions were asked on the status of equipment maintenance at the time of ex-post evaluation compared to before the project. As the results, 25 out of 31 respondents rated either 5 (very much improved) or 4 (improved to some extent) on the 5-point assessment. Thus, many of the medical staff who participated in the equipment maintenance seminar at both R.R.H.s recognize that the status of operating and maintaining equipment improved compared to before project implementation.

Table 24: Has Maintenance of the Provided Equipment Improved Compared to Before?

(Medical staff who participated in the seminars at both R.R.H.s)

(Unit: person)

|                | 5  | 4  | 3 | 2 | 1 | 0 |
|----------------|----|----|---|---|---|---|
| Masaka R.R.H.  | 5  | 10 | 0 | 1 | 0 | 2 |
| Mubende R.R.H. | 6  | 4  | 3 | 0 | 0 | 0 |
| Total          | 11 | 14 | 3 | 1 | 0 | 2 |

Source: Interview Survey to the Medical Staff (participants of the seminar) at Masaka R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don't know

##### 3.5.4.1 Current Status of Equipment Operation and Maintenance

As for the equipment provided, although it was mostly well utilized, some of the equipment

was out of order (1 electrosurgical unit, 1 pulse oximeter at Masaka R.R.H., and 1 out of 2 autoclaves, vertical, at Mubende R.R.H.), unused due to unavailability of spare parts (water softener<sup>35</sup> at Mubende R.R.H.), used without some spare parts due to unavailability (operating lights without bulbs at Mubende R.R.H., and hand-washing water steriliser at Masaka R.R.H.), or underused although it was not broken (C-arm X-ray unit at Masaka R.R.H.). The incubator at Mubende R.R.H., which had not been used at the time of the Defect Inspection since the fatal accident, was used at the time of ex-post evaluation, because knowledge on how to use it was internally shared afterwards.

#### 3.5.4.2 Current Status of Facilities Operation and Maintenance

With regards to the facilities, the toilet was not used by the patients at Mubende R.R.H. because it was clogged with paper, and the patients and attendants broke the toilet because they were not accustomed to using a flush toilet. Thus, Mubende R.R.H. decided to limit toilet use to the hospital staff only. The patients use vault toilets, which existed at the premises before the project. The shower room at the Maternity Ward has not been used either, due to water supply problems on the Ugandan side. However, the water supply problem is expected to be solved soon.

Meanwhile, the issues pointed out at the Defect Inspection had not improved much at the time of ex-post evaluation. At the time of the Defect Inspection, considerable numbers of problems occurred at both R.R.H.s because the advice given at the time of the handover was not followed afterwards. Consequently, at the time of the Defect Inspection, some advices were given by the inspector to the R.R.H.s, such as do not excessively wash the room floor, which leads to exfoliation of the PVC sheets on the floor, rust on metallic materials, and short circuiting of electric appliances; do not use detergent which leads to rust on metallic materials to wash the floor; do not put equipment directly on the floor in order to avoid damage; and do not flush non-excretions to avoid clogging the toilets<sup>36</sup>. However, according to the questionnaire and interview survey conducted at the time of ex-post evaluation, the status of these factors has not improved (Table 25).

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<sup>35</sup> According to the interview conducted at Mubende R.R.H., there was an explanation for why the water softener was not used: the required salt and reagent were not available at the local market. Although the inspector at the Defect Inspection notified the R.R.H. that the salt available at the local market can be substituted [JICA internal document], the R.R.H. still recognized that the equipment could not be operated without Japanese salt

<sup>36</sup> JICA internal document

Table 25: The Status at the Time of Ex-Post Evaluation of the Issues Pointed Out at the Defect

| Inspection                                                                                               |               |                |
|----------------------------------------------------------------------------------------------------------|---------------|----------------|
| Issues pointed out                                                                                       | Masaka R.R.H. | Mubende R.R.H. |
| Do not excessively wash the floor with water, but use a mop                                              | 2             | 3              |
| Wax the PVC sheets                                                                                       | 1             | 3              |
| Do not use acidic liquid detergent                                                                       | 1             | 3              |
| Do not put equipment directly on the floor                                                               | 3             | 4              |
| Do not throw stuff into water closet of the toilet and sink except for filth originally designed for use | 2             | 3              |

Source: Questionnaire Survey to Masaka R.R.H. and Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don't know

As mentioned above, many of the issues are related to cleaning. Cleaning of the hospital facilities is outsourced to cleaning companies. Specific instructions on to improve the problems pointed out at the Defect Inspection depend on each R.R.H.; sufficient instruction has not been given to the cleaners at Masaka R.R.H., but instruction/guidance was given to the cleaners at Mubende R.R.H., though the cleaners have not executed the instructions. Among the issues raised, the use of acid detergent is difficult to change, as the detergent's use is designated by the government. However, improvement is expected if the detergent is appropriately diluted before use or ethanol (diluted by 70 - 90%) is used. However, the latter option is practically impossible for hospitals to execute, as ethanol is not supplied<sup>37</sup>.

Also, it was observed that patient blood was left on the floor of the Operation Theatre along the route of the patient entrance to the operating room at Mubende R.R.H. The number of shoes for the Operation Theatre is also insufficient. Although an order for additional shoes has been made, countermeasures for infection control are regarded to be insufficient.

Thus, medium-level problems have been observed in terms of the current status of operation and maintenance.

As stated above, some minor problems in terms of the technical aspect of the operation and the maintenance system, and some medium-level problems in terms of the current status of operation and maintenance have been observed. Therefore the sustainability of the project's effects is fair.

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<sup>37</sup> Interview at Mubende R.R.H.

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

### **4.1 Conclusion**

The objective of this project is to enhance the medical services offered by Masaka R.R.H. and Mubende R.R.H., the secondary referral hospitals, by improving the facilities and medical equipment of the both R.R.H.s in the Central Region in Uganda, thereby contributing to the improvement of the local medical referral system.

Uganda has been seeking better access to high-quality medical service by hospitals, with special emphasis on enhancing regional referral hospitals. However, Uganda's major health indices are still at the most seriously low level worldwide, like other African nations. Thus, the project is highly consistent with Uganda's development policy and development needs. Also, the project is highly consistent with the aid policy of Japanese government and JICA, since "health and infrastructure" is included in "improvement of basic well-being", one of the priority areas of the Japan's Official Development Assistance (ODA) policy for Uganda. Therefore, the relevance of the project is high. The outputs were produced in accordance with the plan, and the project's cost was within the plan. However, the project's duration exceeded the plan. Therefore, its efficiency is fair. By improving facilities and equipment, the number of operations and outpatients at both hospitals increased, while the number of deliveries and inpatients as well as the bed occupancy rate also increased at the Maternity Department of Mubende R.R.H., which was supported by the project. Moreover, satisfaction of patients and medical staff also increased due to the improved facilities and equipment. Additionally, the number of patients referred from the lower level hospitals increased at both hospitals. Therefore, the effectiveness and impact of the project are high. On the other hand, the sustainability of the project is fair, since some minor problems in terms of technical aspects and some medium-level problems in the current status of operation and maintenance are observed, although no problems are seen in terms of the institutional and financial aspects of operation and management.

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

### **4.2 Recommendations**

#### **4.2.1 Recommendations to the Implementing Agency**

##### **(1) Improvement of the Issues Pointed Out at the Defect Inspection**

The status of the issues pointed out at the Defect Inspection has not improved much (e.g. wipe the floor with a mop in order to avoid excessive washing, wax the PVC sheets, avoid using strong acid detergent, avoid putting equipment directly on the floor, etc.), which leads to equipment rusting among other problems. Mubende R.R.H.s is considering some countermeasures, such as using pallet to avoid putting equipment directly on the floor. In addition, it is necessary for both R.R.H.s to take immediate action to improving the problems pointed out at the Defect Inspection, including diluting acid detergent appropriately and using

ethanol (70–90% concentration) and so on, among others.

#### (2) Improvement of Infection Control and Awareness Raising

It was observed at the time of on-the-spot check the number of shoes for the Operation Theatre Building was insufficient, and some blood was left on the floor of the Operation Theatre Building along the entrance route to the operation room at Mubende R.R.H. For this, it is confirmed that the R.R.H. has ordered additional shoes for the Operation Theatre and now is considering providing pads to pregnant women, etc. In addition, it is necessary for Mubende R.R.H. to establish a cleaning system which enables quick action to prevent blood being left on the floor and raise the hospital staff's and cleaners' awareness of infection control.

#### 4.2.2 Recommendations to JICA

None

#### 4.3 Lessons Learned

##### - Minimizing Risks of Nosocomial Infection in Tandem with Technical Cooperation

The project was implemented with the aim of enhancing medical services by improving the R.R.H.s' existing facilities and equipment provisions. However, there are still some concerns in terms of infection control, such as blood being left on the floor of Operation Theatre Building. Since the project is a grant-aid project, knowledge and awareness of infection control, which largely influence medical service enhancement, are uncontrollable external risks that affect the project's outcomes. However, in addition to improving the maintenance skills of the equipment, it is vital for enhancing medical services by using the improved facilities and provided equipment to improve knowledge and raise awareness among those who are concerned. Those include medical staff members who provide medical services, cleaners who are outsourced, and management staff members who make decisions on strengthening internal structure. Therefore, in order to improve medical services, it is necessary for JICA to combine a grant aid project with technical cooperation starting from the planning stage to enhance capacity of medical staff and so on, including enhancement of knowledge and awareness of the staff on infection control and so on, instead of support by a grant aid alone.