The Republic of Benin

Ex-Post Evaluation of Japanese Grant Aid Project

The Project of Reinforcement of Lagune Mother and Child Hospital of Cotonou

(Le Projet de renforcement des installations et équipements de l'Hôpital de la Mère et l'Enfant-Lagune de Cotonou en République du Bénin)

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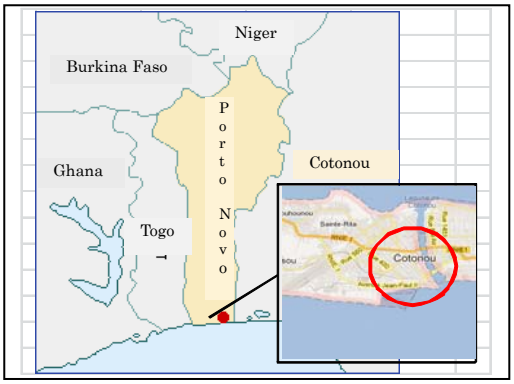
0. Summary

The objective of this Project is to enable the Lagune Mother and Child Hospital of Cotonou (hereinafter referred to as HOMEL) to function as the top referral hospital for maternal and child healthcare by constructing new hospital wards, a delivery ward and providing equipment. This objective was consistent with the development policies and needs of the Government of Benin at the time of the planning and the ex-post evaluation for the Project, and it was in line with Japanese ODA policies toward Benin at that time. Therefore, the project relevance is high. Due to factors such as the strikes by health personnel and changes in the domestic health sector environment, a number of operation indicator targets were not met. However, the quality of medical services improved, benefitting the users of the hospital; the outpatient waiting time for doctor consultations was shortened, and the facility structure was optimized for hospital users. These improvements were possible due to the positive synergy created from this Project being combined with other technical cooperation projects. Since some results were achieved, the effectiveness and impact of this Project could be regarded as fair. While outputs in accordance with the initial plan were achieved, there were three items on the Benin side that were not yet completed and were still being addressed at the time of the ex-post evaluation. Thus the efficiency is low. On the other hand, there were no significant issues regarding operation and maintenance, thus the sustainability of the Project is high.

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

1. Project Description



Project Location Map

New hospital ward and procured medical equipment

1.1 Background

Since starting as a maternal and childcare hospital in 1958, HOMEL gained people's trust as the biggest and oldest "delivery hospital" in Benin. Until 2005, HOMEL served as the departmental hospital (secondary medical facility) for Atlantique and Littoral Departments, but after that, it was positioned as the top referral medical facility in Benin as well as an educational hospital for doctors, midwives, nurses, clinical laboratory technicians and others working in the fields of obstetrics and gynecology and pediatrics.

However, due to the poor condition of its facilities and equipment, it was difficult for HOMEL to adequately fulfill its function as the top referral medical facility, and so remained a secondary level facility. Most of HOMEL's existing buildings were constructed for an electric power company over 50 years ago, and the ventilation and lighting were inadequate for a health facility. With a bed occupancy rate of over 80%, mothers and sick children could not be accommodated in the prescribed wards when there were many deliveries or when there were outbreaks of malaria or other infectious diseases. During these periods, the aisles and corridors were used to accommodate patients as the beds were fully occupied. In addition, there were no consultation rooms for pediatric outpatients, and temporary partitioning of wards was common. This made it difficult to provide safe services in terms of infection control. The equipment was obsolete and inadequate for the number of patients, which made it difficult to provide patients with safe treatment.

The Government of Benin initiated improvements to make HOMEL a sound medical facility but had difficulties due to lack of funding. As a result, taking into account the situation, the Government of Benin filed a request with the Government of Japan for a grant aid program which intended to improve HOMEL facilities and equipment.

1.2 Project Outline

The objective of this project is to enable HOMEL to function as a top referral hospital in the maternal and child healthcare field by construction of new pediatric outpatient department, neonatal ward and delivery ward and upgrading of the medical equipment (such as delivery tables, ultrasonic diagnostic equipment, and high pressure steam sterilizers).

Table 1: Project Outline

Grant Limit/Actual Grant Amount	1,295 million yen / 1,280 million yen
Exchange of Notes (E/N) Date	May 2007
Implementing Agency	Benin Ministry of Health, HOMEL
Project Completion Date	November 2009 (not yet completed for Benin side)
Main Contractor	Contractor: Toda Corporation Equipment procurement: Ogawa Seiki Co., Ltd.
Main Consultant	Nihon Sekkei, Inc., Fujita Planning Co., Ltd. (JV)
Basic Design	November 2005 – July 2006
Detailed Design	January 2007 – March 2007
Related Projects	[Technical cooperation] ■ Dispatch of individual experts: Program Advisor for Maternal and Child Health Program (2008-2010), Medical Equipment Maintenance (2009-2010), Advisor for Maternal and Child Health Program (2010-2012, 2013-2015) ■ JOCV (dispatch of team of volunteers) ■ Total Quality Management Program for Better Hospital Services (from 2009) [Other international organizations, aid agencies, etc.] ■ UNFPA: Technical training in obstetric care for HOMEL obstetricians ■ UNICEF: Basic emergency obstetrical care, ante- and post-natal examinations, nursing training, supervision ■ Swiss Agency for Development and Cooperation: Support for formulation of national health development plans ■ WHO: Overseas training in maternal and child health ■ Belgian technical cooperation: Continuous training in reinforcement of HOMEL's referral function

2. Outline of the Evaluation Study

2.1 External Evaluator

Hiromi Takenaka, Nonprofit Organization HANDS

2.2 Duration of Evaluation Study

Duration of the Study: September 2012 – August 2013

Duration of the Field Study: December 8 – 21, 2012, April 28 – May 4, 2013

3. Result of the Evaluation (Overall Rating: C[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance to the Development Plan of Benin

At the time of the Basic Design Study, the state of maternal and child health in Benin

[1] A: Very high, B: High, C: Some issues remain, D: Low
[2] ③: High, ②: Medium, ①: Low

was such that the maternal mortality rate was 850 per 100,000 live births (2003) and the under-five mortality rate was 156 per 1,000 live births (2003). This was extremely severe compared with the respective averages of 440 and 60 (2003) for developing countries[3]. To improve the family health situation of the poor and the very poor, the government promoted the "Policies and Strategies for Development of the Health Sector (2002 – 2006)", Benin's national development plan for the health sector, aiming to (1) improve reproductive health and the living conditions of mothers and children in order to promote maternal and child health, (2) enhance the quality of medical treatment and health services and provide appropriate facilities which could be accessed by the mothers and children, (3) improve the quality of health services at regional level, and (4) improve healthcare services for the poor and very poor.

At the time of the ex-post evaluation, the maternal mortality rate was 350 per 100,000 live births (2010) and the under-five mortality rate was 121 per 1,000 live births (2010)[4]. Although the indicators have improved compared to the situation at the time of the Basic Design Study, the situation remains abysmal compared to the averages for other developing countries: 240 for maternal mortality and 66.1 for under-five mortality (2010)[5]. Benin's "National Health Development Plan (2009-2018)" advocates; (1) reducing the maternal mortality rate and under-five mortality rate, (2) addressing infectious diseases, and (3) improving medical service including medical facilities and medical equipment.

Based on the above, maternal and child health and improving the environment to enable the provision of high quality medical services are still regarded as important, thus are relevant to the policy at the time of the Basic Design Study and the ex-post evaluation.

3.1.2 Relevance to the Development Needs of Benin

The Ministry of Health (hereinafter referred to as MOH) is responsible for the health administration, and the administrative system is divided in three levels in the shape of the pyramid: national level, department level, and peripheral level. At the national level, MOH is in charge of planning, coordinating and presiding over healthcare activities. In addition, MOH supervises five health facilities under its direct control; the National University Hospital, the National Tuberculosis Center, the National Center of Neurology and Psychiatry, the National Geriatrics Center, and HOMEL. HOMEL, which used to be the departmental hospital specializing in the care of mothers and children in Atlantique and Littoral Departments, was designated as the top referral facility for maternal and child healthcare in 2006. However, due to the poor condition of its facilities and equipment, it remained a secondary level medical facility. As a result, it could neither fulfill its role as the top referral health facility nor contribute fully

[3] UNICEF (2004) "The State of the World's Children"
[4] World Health Organization (2012) "World Health Statistics 2012"
[5] United Nations Population Fund (2012) "State of World Population 2012"

toward the improvement of maternal and child health or the lives of mothers and children as promoted by MOH.

Through the Project, HOMEL was able to fulfill its function not only as the referral facility in Atlantique and Littoral Departments, but also as the top referral medical facility in the country. As there are no other medical facilities specializing in mothers and children in Atlantique or Littoral Departments, HOMEL functions as the top referral facility as well as the departmental hospital specialized in mothers and children.

In light of the above, it has been confirmed that HOMEL is fulfilling its function as the top referral medical facility for maternal and child health, and it is relevant with respect to the development needs both at the time of the Basic Design Study and at the time of the ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

Benin was proactive in pursuing democratization and economic reform based on the Poverty Reduction Strategy Papers. This was considered to be important for the TICAD[6] process, an initiative led by Japan, to support reform processes with national ownership. It was also important from the perspective of "poverty reduction", a top priority issue in Japan's ODA Charter, to support Benin as one of the poorest countries in the world. Support toward Benin was focused on basic human needs, namely human resources development, health and medical care, agriculture and rural development, which directly contribute to the improvement of the living conditions of the people. In the health sector, improvement of health facilities and medical equipment, and enhancing maintenance management capacity were considered to be priorities, and this Project was in line with these priorities.

This Project was highly relevant to the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness[7] (Rating: ②)

3.2.1 Quantitative Effects (Operation and effectiveness indicators)

3.2.1.1 Operation Indicators

It was expected that HOMEL would function as the top referral medical facility for maternal and childcare through the construction of wards, including a delivery ward and a radiology department, and through the provision of basic minimum equipment needed for these

[6] TICAD (Tokyo International Conference on African Development) was held in 1993 for the first time to promote high level policy dialogue between the heads of African states and development partners. It forms the main international framework for promoting initiatives based on two fundamental principles, African ownership and partnership with international society, towards the promotion of African development.

[7] This rating also takes into consideration the score for impact.

facilities to be operational, and through the replacement of medical equipment which were worn out. The following were taken as operation indicators, all of which were expected to increase; the number of pediatric outpatients, the number of referrals from lower level health facilities, the number of deliveries, and the number of operations. Table 2 below shows the results for each operation indicator.

Table 2: Operation Indicators

Operation indicator	[Reference value] (Year 2004)	[Target value]	[Actual value] (2011)	[Actual value] (2012)	Rate of increase
Number of pediatric outpatients	4,751	Increase from reference value	4,838	6,833	143.8%
Number of referral patients from lower level medical facilities	2,648	Increase from reference value	2,088	2,116	79.9%
Number of deliveries	6,547	Increase from reference value	4,369	4,620	70.57%
Number of operations	3,842	Increase from reference value	2,709	2,632	68.51%

Source: Basic Design Report (reference values), questionnaire responses (actual values)

Although the number of pediatric outpatients increased by 143.8%, other operation indicators did not meet the target, but rather decreased. The following are factors which may have contributed to these results.

From 2009 until the end of 2011, health personnel throughout Benin went on strike almost on a daily basis to improve their working conditions, and HOMEL was no exception. The facilities and equipment provided in this Project were handed over to Benin in November 2009, but HOMEL was not operating fully due to the strikes.

The reason for the decrease in the number of referral patients from peripheral -level health facilities could be explained by the fact that the number of health facilities in Atlantique and Littoral Departments, the departments covered by HOMEL, increased from 77 to 95 by 2011, while the number of health facilities across the country increased from 481 to 702 countrywide. As the number of health facilities increased, cases which could be handled at lower level facilities increased, resulting in the decrease in referrals to HOMEL.

The decline in the number of deliveries could be explained by the free caesarean section policy[8] introduced in selected hospitals. This policy decision was taken in 2008 and was implemented from 2009. Before the free caesarean section policy, many caesarean sections were done at HOMEL as it was the top referral hospital for maternal and child health. However, after 2009, mothers often opted for other hospitals designated for free caesarean sections instead of

[8] Free up to 100,000CFA. 100,000CFA is paid to the medical facility as a subsidy.

HOMEL. The percentage of caesarean sections for delivery increased to around 190% in Atlantique and Littoral Departments, and to around 165% countrywide from 2009. In HOMEL, the proportion of caesarean sections among deliveries has remained at around 40%[9], suggesting that expectant mothers are using hospitals other than HOMEL for caesarean sections.

3.2.1.2 Other Reference Indicators

Although it was not an operation indicator for the Project, "waiting time for consultation for outpatients" was included in the beneficiary survey[10] for the ex-post evaluation. The result showed that 58% of respondents (80 patients) replied that the "waiting time is shorter than before 2009". Those who waited more than 1.5 hours before 2009 was 71%, which declined to 62% in 2012 (refer to Table 3).

Table 3: Waiting Time

	Before 2009	2012
1 hour or less	29%	38%
1.5 hours or more	71%	62%

Source: Beneficiary survey

3.2.2 Qualitative Effects

3.2.2.1 Functions as the Top Referral Facility for Maternal and Child Health

It was expected that the Project would contribute towards making HOMEL the top referral facility for maternal and child health. The Project introduced user-friendly facility designs for mothers and children, as follows; (1) a slope, instead of steps, was installed on the side facing the courtyard and each floor was made accessible by slope, (2) ventilation and lighting of the wards were improved, which made it easier for people in the waiting area, with better air circulation during the hot season, (3) lighting and ventilation for patients rooms were improved. Sufficient number of medical equipment of the same type as those already being used by the health personnel was provided. From these points, it is clear that the quality of services at HOMEL improved, which was also confirmed by the interviews with health personnel of the hospital.

3.2.2.2 Synergistic Effect between the Project and Other Projects

HOMEL introduced 5S gradually through the "Total Quality Management Program for Better Hospital Services (5S-KAIZEN-TQM)"[11] which started at the same time as the handover

[9] The proportion of caesarean section among all deliveries in HOMEL between 2004 and 2012 was 40% (ranging from 32% to 44%). From 2006, the figure was between 40% and 44% (average 42%).

[10] In the beneficiary survey, individual interviews were conducted with 80 HOMEL users (patients) and 20 staff members (medical staff, etc.) based on questionnaires designed for users and staff respectively.

[11] The "Total Quality Management Program for Better Hospital Services" is one of the programs within the framework of the "Asia-Africa Knowledge Co-Creation Program", which was established with the objective to utilize "Japanese style quality control techniques" to improve management of the health facilities and services. The first

of the Project. As a result of the synergy between these projects, awareness of the staff increased on maintenance and management. The staff came to realize that maintenance of the facility and equipment should be done by all staff, not only by the maintenance unit staff, and this has been put into practice[12]. In addition, JICA developed a program for maternal and child health, and an effective combination of various schemes contributed to the improvement of health services provided by HOMEL. These schemes included; dispatch of technical experts (long-term advisors for Maternal and Child Health Program and a short-term advisor for Medical Equipment Maintenance), training courses in Japan, training courses in third countries and dispatch of overseas cooperation volunteers (JOCV) in the field of maternal and child healthcare.

3.2.2.3 Beneficiary Survey

The results of the beneficiary survey revealed that both patients (users) and health personnel positively evaluated HOMEL after the Project (refer to Table 4). The patients' level of satisfaction with the hospital was very high. Whereas approximately 50% of respondents replied that they were "satisfied" with the services before 2009, almost 90% of them replied that they were "satisfied" with the services in 2012. Patients were satisfied on the following points; "quality of medical services", "trust in the hospital", "knowledge and skill of the health personnel", "attention and care of the medical staff", and "equipment". While only 50% of the health personnel replied that the quality of hospital services before 2009 was "good/very good," 85% responded that it was "good/very good" in 2012. The main reasons given were: "receive more patients" and "health personnel could perform their task efficiently with new facilities and equipment". In addition, health personnel also reported that they believed that their services had improved as they received fewer complaints from patients.

Table 4: Patient Satisfaction and Assessment by Health Personnel

Item	Before 2009	2012
% of patients who are satisfied with the hospital	51%	87%
Quality of the hospital assessed by health personnel (100 points)	50 points	85 points

Source: Beneficiary survey

step is to transform the workplace environment with 5S (abbreviation for five words in Japanese that start with S which are: *Seiri* (Organized), *Seiton* (Neat), *Seiso* (Clean), *Seiketsu* (Sanitary) and *Shitsuke* (Disciplined)). In addition, with this technique, a number of small action teams are formed, and periodic meetings are held between teams in order to increase the opportunities for dialogue between personnel, increase transparency, and achieve "visible change" through application of the 5S concept to boost the awareness of each individual.

[12] Currently, 5S has been achieved, and HOMEL is focusing on KAIZEN. It is serving as a model hospital in Benin in the field of 5S, in addition to providing maternal and child healthcare. HOMEL acquired ISO9001 certification in three fields in 2009 (ante- and post-natal examinations, deliveries and neonatal ward), and in two more fields in 2011 (clinical examination and operating room).

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1. Contribution to the Reduction in Maternal and Infant Mortality Rates in Benin

By comparing the data from the Basic Design Study with the latest data, it can be seen that the maternal and child health situation has improved in Benin, with the maternal mortality rate decreased by approximately 60%, and the under-five mortality rate decreased by approximately 23% (refer to Table 5). However, as direct causation could not be obtained in this study, it was not possible to determine to what extent HOMEL had contributed to these improvements in maternal and child health indicators.

Table 5: Maternal Mortality Rate and Under-five Mortality Rate

Item	2003	2010
Maternal Mortality Rate (Per 100,000 Births)	850	350
Under-five Mortality Rate (Per 1,000 Births)	156	121

Source: République du Benin Ministère de la Santé "Annuaire des Statistiques Sanitaires 2011"

3.3.1.2. Increase in Consultation Care Income due to Increase in Number of Pediatric Outpatients, Annual Deliveries and Number of Operations

It was expected that the number of patients using HOMEL's services would increase as a result of the upgrading of facilities and medical equipment by this Project, resulting in an increase in medical care income, and in turn contributing to improved fiscal health for HOMEL. However, as previously stated, the nationwide strikes in Benin from 2009 to 2011 by health personnel had a large impact on this. During these strikes, HOMEL provided a minimum level of services, resulting in a decrease in the number of patients using HOMEL. The 2012 data, which is not affected by the strike, indicate that HOMEL made a transition from deficit to surplus and income from consultations and medical care increased. The number of deliveries and number of operations were still lower than the reference value of 2004, but were not decreasing, although the data varied from year to year. The number of pediatric outpatients is on the rise. In summary, a positive trend in its financial status can be seen (see section 3.5.3).

3.3.1.3. Capacity Building of Health Personnel in Benin

HOMEL accepts trainees because it is an educational hospital. The training is conducted in small groups and consists of observation, practical training and discussions with supervisors who closely monitor the trainees. Training opportunities at HOMEL are not limited to just learning practical skills with good facilities and equipment, but trainees also have the chance to learn about "good hospital management" since HOMEL is the top referral facility and a model hospital in 5S. In HOMEL trainees learn that good appropriate service considered satisfactory by the patients is achieved not just through the quality of medical techniques but also through efficient hospital management (source: interviews with HOMEL trainees). In this

way, HOMEL is contributing toward improving the quality of health personnel through capacity building. However, since there was only a slight increase in the number of trainees, from 68 in 2006 to 71 trainees in 2011, HOMEL's contribution in terms of numbers is modest.

3.3.1.4. Improvement in People's Health

In the beneficiary survey, 90% of patients stated that the health of mothers and children in the region have "improved/improved greatly" compared to 2009. The main reasons given were; "satisfied with the service provided by the hospital (21%)", "prevalence of malaria decreased (19%)", "babies quickly recover after being treated when sick (14%)", "rate of mortality has decreased (14%)" and "quality of hospital facilities and equipment improved (14%)". In addition, 78% of the respondents stated that "I and my family act more proactively to improve the health of mothers and children compared to 2009 or earlier"[13].

Regarding the health personnel, 90% of those who responded in the survey stated that they felt the state of healthcare in the region has "improved". In addition, 95% stated that "the hospital encourages preventive care" and 90% stated that "the hospital is now able to provide effective care" noting the changes in the hospital's approach. Furthermore, 78% answered that "residents are now able to proactively act on issues related to improving health".

The results of the surveys of both patients and health personnel confirmed that the facilities and medical equipment provided under this Project contributed to the improvement of healthcare in the region to a certain extent.

3.3.2 Other Impacts

3.3.2.1. Impact on the Natural Environment

The impact on the natural environment of the Project was minimal. There were no reports of improper wastewater disposal, waste contamination or any other issue that could be considered problematic. Wastewater facilities installed for sewage and gray water disposal from the delivery ward and general ward were satisfactory with respect to the wastewater quality level set by the Directorate of Hygiene and Basic Sanitation of the Ministry of Health. Neither breakdowns nor incidents were reported at the time of the ex-post evaluation.

Waste was being sorted and disposed according to the color-coded waste containers.[14]. Each waste container was marked on the floor with tape of the same color, and these waste containers were collected from a fixed location. As was the case at the time of the Basic Design Study, waste was being collected on a routine basis and each type of waste was sorted according to established rules. The volume of waste was at a level which could be well managed by

[13] This positive behavioral transformation could be the effect of the Maternal Education Classes conducted by HOMEL.

[14] Black: general waste, yellow: medical waste without any blood, red: medical waste with blood, and used needles are collected in a dedicated box.

HOMEL.

In addition, it was confirmed that the X-ray equipment procured by the Project was operating without any significant problems.

In light of the above, it could be concluded that there was no notable negative impact on the natural environment.

3.3.2.2. Land Acquisition and Resettlement

Due to the fact that this Project was implemented on the existing hospital site, resettlement of residents and land acquisition were not required. Based on interviews of HOMEL staff during the ex-post evaluation, it was confirmed that there had been no complaint from residents to date.

This project has somewhat achieved its objectives, therefore its effectiveness is fair.

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

Table 6: Outputs

At Time of Basic Design Study	At Time of Implementation
[Japan side Input Plan] • Construction of hospital wards, delivery ward, and radiology department. • Provision of 61 items of equipment. Procured equipment was either 1) upgrading the existing obsolete equipment or 2) minimum basic equipment for new wards built by the Project. Selection of equipment took into account the operation and maintenance capacity of HOMEL. • Technical support related to operation and maintenance of procured medical equipment.	[Japan side Achievements] • Although there were some minor changes, the Project was implemented as planned. However, there were some inputs which shifted from the Japanese side to the Benin side due to currency exchange rate fluctuations.
[Benin side Input Plan] • Grading and leveling of planned construction site, construction of water supply facilities, construction of wastewater facilities, provision of electrical facilities, provision of telephone facilities, transfer to hospital under this plan, other facilities (plants and outdoor signs, blinds, curtains, general furniture, etc.), hiring additional staff for operating and maintaining facilities and equipment, costs related to operation and maintenance of facilities and equipment.	[Benin side Input Achievements] • The Project was generally implemented as planned but the following three items were still ongoing at the time of the ex-post evaluation: Medical gas piping work, medical gas plant procurement and installation, open roof ceiling atrium.

Source: JICA internal document

As shown in Table 6, the work on the Japanese side was completed, but the following three items were not yet completed at the time of ex-post evaluation; medical gas piping work, medical gas plant (central piping unit and medical gas generating machine), and open roof ceiling atrium.

Regarding medical gas, funds could not be allocated in the budget prior to 2010, and

although funds were allocated in the budget for 2011 and 2012, work was put on hold due to a delay in contract-related procedures with the vendor. A contract was finally signed with a Dutch vendor in September 2012, and as of December 2012 it was reported that the vendor had submitted a bank draft (1% of contract sum). The medical gas installation work has not been done, but because the medical gas piping was delivered with nitrogen inside, it is possible that the pipe may have rusted since it has not been used for an extended period of time. Both the Ministry of Health and HOMEL were fully aware that this issue needs to be urgently addressed[15]. However, the work was not proceeding due to delays by the vendor. It was verified through interviews with Ministry of Health officials that the President of Benin issued instructions in August 2012 to complete all work related to the HOMEL development plan by April 2013, and that discussions were held with the Dutch Ambassador to Benin in February 2013 on how to speed up the work.

Regarding the medical gas plant, a budget allocation was secured in 2011 and a contract was signed with another Dutch vendor, but the vendor did not submit a bank draft equivalent to 1% of the contract sum, resulting in the contract being carried over to the next fiscal year. The contract was signed again with the same vendor in June 2012, and a bank draft (1% of contract sum) was submitted by the vendor, a payment of 30% of the contract amount was paid as the first payment, and a deposit was made in the bank for 60% of the payment amount as of the end of May 2013, and the procedure to issue a letter of credit was in process[16].

An open roof ceiling atrium was planned as an input from the Japanese side but was shifted to the Benin side due to exchange rate fluctuations, and was ongoing at the time of the ex-post evaluation. Since family members taking care of inpatients stay outdoors within the hospital compound, an open ceiling atrium was proposed (a structure without walls, but with a roof to provide some protection against wind and rain) as a means to improve the conditions of these family members who were exposed to the wind and rain. A contract with a local vendor was signed and the roof structure has been built, but the work to install the roof was pending due to problems with the vendor.

3.4.2 Project Inputs

3.4.2.1 Project Cost

As shown in Table 7, the Project actual expenditure was 1,280 million yen compared to the original plan of 1,295 million yen (98.8% of planned), indicating that the Japanese side Project cost was within the original plan. However, the following are areas of concern.

[15] Since the medical gas piping work has not been done, medical gas is being supplied to the neonatal ward by bringing in gas cylinders. This has the inherent risk of the gas cylinder falling over onto the cots or incubators holding the neonatal infants.

[16] 60% of the remaining amount will be paid when the medical gas plant is installed at HOMEL, with the final balance of 10% to be paid one year later.

Regarding the Japanese inputs, some of the work was shifted to the Benin side due to the fluctuation of the exchange rate. Regarding the Benin inputs, only the "installation costs" for the medical gas piping and medical gas plant for which work has not been completed were budgeted in the plan. Since these "installation costs" also include the cost of equipment items which are currently being procured, it is difficult to separate out only the installation costs.

While the costs for Japan came within the planned amount, the total project costs including the costs borne by Benin are expected to exceed the initial planned amount of 1,351 million yen and will be about 1,464 million yen (108.3% of planned amount) due to increases in procurement, installation and other costs for the medical gas and generator, resulting in a slightly higher cost than planned.

Table 7: Comparison of Planned Project Costs and Actual Project Costs

	Planned	Actual	Predicted (Including portion not completed)
Total Project Costs	¥1,351 million	¥1,344 million	¥1,464 million
• Japan side (E/N grant limit)	¥1,295 million	¥1,280 million	¥1,280 million
• Benin side	¥56 million	Approx. ¥64 million*	Approx. ¥184 million**

Source: Project Completion Report
* Excluding portions which are not completed.
** Including medical gas, medical gas plant facilities, etc. During planning, the costs for medical gas and medical gas plant facilities were budgeted under HOMEL upgrade work being independently done by the Ministry of Health. It is difficult to make a simple comparison of the amounts since the content of work covered on the Benin side differs from the initial plan.

3.4.2.2 Project Period

As shown in Table 8, the planned period was 23.5 months, but the work had not been completed at the time of the ex-post evaluation.

Table 8: Comparison of Planned Project Period and Actual Project Period

	Planned	Actual Period
Detailed Design	4.5 months	4 months (E/N detailed design to end of contract)
Bidding	3 months	5 months (E/N construction to contract with contractor)
Work	16 months	25 months (contract with contractor to handing over) Benin side not completed at the time of ex-post evaluation
Total	23.5 months	May 2007 (E/N construction) – Handover November 2009 (2 years 7 months: 31 months (132% of planned period)) Project not yet completed and is 73 months as of May 2013 (311% of planned period).

Source: Project Completion Report

One of the reasons that the Japanese side exceeded the planned schedule was the fact that while test boring was done at the site before starting work, groundwater far exceeding the projected amount was found when the actual work started. As a result, the work needed to carefully proceed with the caisson method[17], resulting in a delay of 3 months or more. Since HOMEL faces a bay, it is considered difficult for even Beninese engineers to assess the

[17] This is a construction method where a reinforced concrete tube- or box-shaped structure (caisson) is made and sunk in the ground when constructing a large structure in water or soft ground.

likelihood of groundwater at the site (source: Ministry of Health officials). In addition, the ground was harder than expected, making it difficult to proceed with the work, and this was compounded by the sluggish supply of cement in Benin during the project period, and a longer than normal rainy season.

As described above in the Project Outputs section, three items were not yet completed at the time of ex-post evaluation; medical gas piping work, medical gas plant, and open roof ceiling atrium. These issues contributed to the project period becoming significantly longer than planned, however, they don't correspond to the decrease of the outputs.

Therefore, the project cost slightly exceeded the planned figure, while the project period significantly exceeded the planned period, thus efficiency of the Project is low.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The Ministry of Health headed by the Minister, consists of the Secretariat headed by the Minister's Secretariat and Vice Minister, and the Technical Directorate, as it was at the time of the Project planning. Before 2005, the Technical Directorate consisted of 9 directorates, which was reorganized into 12 directorates in 2005, and reorganized again into 8 directorates in 2010. HOMEL, being a top referral facility, is under the supervision of the Hospital/Medical Facility Directorate[18] within the Technical Directorate. In addition to HOMEL, the Ministry of Health supervises the National Center of Neurology and Psychiatry, the National University Hospital and the National Tuberculosis Center as they are top referral medical facilities. The Facility/Equipment/Operation and Maintenance Directorate (hereinafter called DIEM) is in charge of construction and maintenance of hospital facilities and equipment, but due to the lack of budget at DIEM, activities for operation and maintenance activities are limited to annual medical inspections and emergency equipment repairs, rather than supporting particular specific facilities.

HOMEL consisted of three departments under the Hospital Director when this project was planned: Medical Service/Medical Technology Department (Obstetrics and Gynecology Division and Pediatrics Division), Financial Management Department and Economic Administration Department. It had 206 beds and a staff of 441. The total number of staff had increased to 527 as of the ex-post evaluation, but this was due to an increase in outsourced staff mainly filling technical positions, and the number of actual staff is decreasing.

Medical policies are discussed, decided and implemented by the Medical Commission of Establishment (MCE) and the Nosocomial Infection Control Committee (NICC). MCE is held by HOMEL and headed by a professor of gynecology and it meets four times each year.

[18] The Directorate formulates standards for quality of medical services at the hospital, sets healthcare costs, and supports healthcare and operations management.

NICC is responsible for providing the guidelines of hospital hygiene policy and the guidelines on the respect for hygienic standards. The section of Management and Quality is responsible for the implementation of quality management process within HOMEL. It ensures the compliance of procedures and regulation based on ISO9001 version 2008 in all areas of activities of HOMEL. Administration Committee, which is authorized with the broadest powers to act in the all circumstances on behalf of HOMEL under the limits of social purpose, is held 3 to 4 times each year. Administration Committee is composed of the representative of the Ministry of Health as a chairperson, the representative of the Ministry of Higher Education as a vice-chairperson, the representative of the Ministry of Finance and the Ministry of Labour, the representative of traditional therapists elected by their peers, the president of CME, two representatives of staff, and the mayor of the commune where the head office of the hospital university is located or his representative.

During the ex-post evaluation, it was confirmed that there were no significant changes in the organizational structure and the new director since the beginning of 2012 has taken over the existing structure.

Regarding the current operation and maintenance of facilities and equipment, there are two electrical technicians, one technician for water supply and wastewater, and one carpenter and one clerk, and the team is headed by a manager who holds two posts, the operation and maintenance section manager and the medical equipment manager, for a total of six members. During the night, maintenance staff could be contacted through an emergency contact network. At the time of the Basic Design Study, it was noted that more maintenance staff were needed; one in charge of the air conditioning facilities, and the other for inventory management. There were no changes in the number of maintenance staff at the time of ex-post evaluation. However, the maintenance manager at the time of Basic Design Study was transferred and one of the Project consultants has been hired by HOMEL through its own fund, and is currently the manager.

Periodic inspection and repair of procured equipment are performed using the equipment ledger and periodic inspection plan formulated as soft components under this Project. Regarding operation and maintenance procedures, two flowcharts have been prepared; one for prevention, and the other for repair procedures in the event of a breakdown, and the users, the health personnel, are acquainted with these procedures. In addition to the daily checkups performed by health personnel, the operation and maintenance department performs periodic inspections, and the health personnel know the mobile phone numbers of the operation and maintenance department staff so that the department can quickly respond in the event of a breakdown.

Though there was no increase in the number of maintenance staff, it has been confirmed that guidelines, equipment ledger and other related documents enabled operation and

maintenance to be performed in a systematic manner.

3.5.2 Technical Aspects of Operation and Maintenance

It was confirmed that there were no issues regarding the skill of health personnel and everyone could use the equipment sufficiently. Most equipment procured in the Project was ones already used by the staff, so the staffs were familiar with the procured equipment.

Excluding some complex equipment, most of the equipment and facilities are being maintained by the staff, and those which cannot be handled by the staff are being outsourced for maintenance. The hospital's facilities and equipment, other than those procured by the Project, were old but being used without any problems.

The soft component of the Project was as follows; 1) promoting awareness on the importance of the operation and maintenance system, 2) enhancing the capacity to build and manage an operation and maintenance system, and 3) preparing and executing annual operation and maintenance plans. In regard to promoting awareness on the operation and maintenance system, it has been well understood by all section managers that the daily checkup and maintenance not only by the operation and maintenance staff, but also by the end user (health personnel) are important, and accordingly this is being put into practice. In addition, the Director of HOMEL participated in the "Asia-Africa Knowledge Co-Creation Program 'Total Quality Management Program for Better Hospital Services'" and learned 5S in Japan and Sri Lanka. This was a contributing factor for strengthening operation and maintenance and for the introduction of 5S. As a result, "5S Time" was scheduled every other Friday, and each section started implementing 5S. In addition, once a month, a meeting for the quality improvement team members, notably doctors, nurses, laboratory technicians, pharmacists, radiologists, clerical workers and midwives, is being held.

Ledgers for equipment and ledgers for maintenance were set up in order to structure the maintenance system and to build capacity. A maintenance manual was also supposed to have been prepared, but this was not possible because the information required for the manual, as well as computers, were destroyed during a fire in the work area during the Project. However, a maintenance flow was established and all staff members are familiar with the flow. For newly joined staff members, training on 5S is being provided and regular, staff-initiated meetings for 5S are taking place every two weeks.

As for the annual maintenance plan and its execution, a plan is being formulated and shared so that all staff in the hospital are well-informed about the activities of the maintenance unit. Before the Project, maintenance costs were handled by the management section and maintenance unit staff were not aware of the cost to maintain facilities and equipment. But now, the operation and maintenance staff are able to utilize the plan knowing the procurement costs.

3.5.3 Financial Aspects of Operation and Maintenance

The Ministry of Finance determines the budget for the Ministry of Health. While the 2011 budget for the Ministry of Health has increased by approximately 150% from 2004, it has decreased by approximately two percentage points as a ratio of the national budget as shown in Table 9.

Table 9 National Budget of Benin and Health Budget

Unit: Million CFA Francs

Fiscal Year	2004	2011
National Budget	547,700	1,099,375
Ministry of Health Budget	45,670	69,153
Budget Ratio	8.34%	6.29%

Source: République du Benin Ministère de la Santé 'Annuaire des Statistiques Sanitaires 2011'

Regarding the financial status of HOMEL, consultation/medical care fees have increased 115% between 2004 and 2012, and overall income has increased by 151% (Table 10). Subsidies from the Ministry of Health used to comprise approximately 30% of the overall income (approximately half of the consultation/medical care fees) until 2009, and this ratio has been increasing since 2010. The reason for this increase is that the Ministry is supporting the improvement of facilities and equipment at HOMEL and these additional costs are added on top of the regular support fund. This additional funding is reflected under "others" in the expenditure figures. In 2012, the financial status turned to surplus from a deficit as a result of the organization of client account and immobilization. Action taken by HOMEL to improve the financial status included; 1) collection of outstanding consultation/medical care fees, (the unpaid amount was reduced to 25 million CFA per year from 50 million CFA per year), and 2) expansion of services by adding two units, cardiology and counseling.

Interviews with the Hospital Director and the operation and maintenance manager revealed that the required funds for operation and maintenance were being allocated in an effort to ensure efficient services without any interruption. In addition, the service life of the equipment was noted in the maintenance plan, and discussions on procuring new equipment were taking place.

Table 10 Financial Status of HOMEL

Unit: Million CFA Francs

		2004		2005		2011		2012	
Income	Consultation Fee	821.62	68.6%	925.02	68.4%	865.82	56.8%	943.92	52.1%
	Ministry of Health	368.40	30.8%	424.95	31.4%	657.21	43.1%	867.57	47.8%
	Subsidies from Other Agencies	4.97	0.4%	0.00	0.0%	0.20	0.0%	0.00	0.0%
	Unpaid Amounts to Vendors	0.93	0.1%	0.61	0.0%	0.00	0.0%	0.00	0.0%
	Fixed Assets	1.94	0.2%	1.53	0.1%	0.00	0.0%	1.98	0.1%
	Total	**1,197.86**		**1,352.11**		**1,523.23**		**1,813.47**	
Expenditure	Personnel	426.37	28.5%	537.38	33.2%	812.75	51.2%	862.23	49.0%
	Drug Cost	206.31	13.8%	170.84	10.6%	92.72	5.8%	131.88	7.5%
	Office Management Cost	2.60	0.2%	3.64	0.2%	179.74	11.3%	1.03	0.1%
	Facility Operation and Maintenance Cost	0.87	0.1%	0.42	0.0%	2.68	0.2%	0.95	0.1%
	Equipment Operation and Maintenance Cost	5.42	0.4%	5.58	0.3%	2.75	0.2%	6.27	0.4%
	New Equipment Procurement Cost	159.38	10.6%	88.37	5.5%	12.23	0.8%	71.77	4.1%
	Consumables	366.96	24.5%	35.13	2.2%	21.11	1.3%	39.15	2.2%
	Public Service Cost	90.96	6.1%	109.25	6.8%	162.69	10.3%	126.75	7.2%
	Other Cost	237.69	15.9%	666.63	41.2%	300.18	18.9%	518.66	29.5%
	Total	**1,496.56**		**1,617.24**		**1,586.85**		**1,758.69**	
	Difference in Income and Expenditures	**-298.70**		**-265.13**		**-63.62**		**54.78**	

Source: Responses to questionnaire

3.5.4 Current Status of Operation and Maintenance

During the Basic Design Study, it was confirmed that although most facilities and equipment were obsolete, they were operational and that the hospital departments were functioning effectively. In addition, weekly and monthly medical statistics were analyzed and posted in the hospital to help improve the services. Regarding cleaning and waste collection, it was verified that these were done in line with standard procedures and that the hospital was clean.

At the time of the ex-post evaluation, it was confirmed that the operation and maintenance department was maintaining the facilities and medical equipment provided by this Project. Maintenance work was being implemented based on the guidelines and ledgers prepared by the soft components of the Project, and it was verified that the facilities and equipment were functioning without any issues. Detailed records of the service life and status of the medical equipment were found in the ledger, and procurement plans were formulated for spare parts depending on the level of wear and tear. Health personnel knew the mobile phone numbers of the operation and maintenance staff, so that they could be contacted in the event of a problem. Furthermore, the guidelines, ledger and other tools that were prepared as soft components of this Project were applied not only to the facilities and equipment provided by the Project but to all facilities and medical equipment of the hospital.

Regarding operation and maintenance of facilities and equipment, emphasis is placed on preventive measures. Daily checkups by end users, the health personnel, were in place, as well as periodic checks by the operation and maintenance unit members. The work flow for maintenance, available in graphic form, was well-known among all staff.

In addition, the program on "Total Quality Management Program for Better Hospital Services" which relates to the operation of facilities and medical equipment started in 2009. It was verified that this program has helped to incorporate the operation and maintenance of facilities and equipment into suitable and efficient hospital management.

No major problems have been observed in the operation and maintenance system, therefore, sustainability of the Project effect is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this Project was to enable the Lagoon Mother and Child Hospital (hereinafter referred to as HOMEL) to function as the top referral hospital for maternal and child healthcare by constructing hospital wards, a delivery ward and providing equipment. This objective was consistent with the development policies and needs of the Government of Benin at the time of the planning and the ex-post evaluation for the Project, and it was in line with Japanese ODA policies toward Benin at that time. Therefore, the project relevance is high. Due to factors such as the strikes by health personnel and changes in the domestic health sector environment, a number of operation indicator targets were not met. However, the quality of medical services improved, benefitting the users of the hospital; the outpatient waiting time for doctor consultations was shortened, and the facility structure was optimized for hospital users. These improvements were possible due to the positive synergy created from this Project being combined with other technical cooperation projects. Since some results were achieved, the effectiveness and impact of this Project could be regarded as fair. While outputs in accordance with the initial plan were achieved, there were three items on the Benin side that were not yet complete and were still being addressed at the time of the ex-post evaluation. Thus the efficiency is low. On the other hand, there were no significant issues regarding operation and maintenance, thus the sustainability of the Project is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Completion of the Project

Through the ex-post evaluation field study, it was verified that three inputs from the

Benin side had not been completed. Specifically regarding the medical gas, the gas piping has already been installed, and since it was delivered with nitrogen inside, it is possible that the pipe may have rusted since it has not been used for an extended period of time. If the pipe is rusted, the piping work will need to be done again, meaning that that expenditure will have been wasted. All three items are important to maximize the benefits of this Project, so it is recommended that these issues be dealt with as soon as possible.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

(1) Effective Combinations of Soft Components and Other Schemes

In a hospital improvement project like this one, "soft components" that support operation and maintenance of facilities and medical equipment are very important in terms of sustainability. One of the major factors in enabling the soft components to be adequately utilized in this project is the implementation of additional schemes, such as the "Total Quality Management Program for Better Hospital Services (5S-KAIZEN-TQM)" that started in parallel with the Project, as well as the dispatch of an expert in medical equipment maintenance (short-term). In addition, since 2006, JICA has dispatched Japanese experts such as Program Advisors for the Maternal and Child Health Program, and have sent HOMEL staff to Japan for training (22 staff) and to third countries (35 staff) as part of the "Benin Maternal and Child Health Program". Through an effective combination of these programs and schemes, outputs have been maximized in this Project, and the same approach could be applied to other similar projects.

(2) Confirmation for Counterpart Procurement

Problems related to procurement by the counterpart government have become a bottleneck for this Project. When equipment needs to be procured by the counterpart government and the equipment is procured from overseas, as is the case in this Project, it is advisable to review the counterpart agency's experience and guidelines (including the measures to be taken in case the procurement was not fulfilled in a timely manner.) and assess the feasibility of counterpart procurement.

(3) Mobilizing Support of the Entire Organization

It was confirmed through the ex-post evaluation field study that three Benin side inputs had not been completed. For this Project, submission of the required documents (bank draft) to the counterpart by the Dutch vendor became a bottleneck. In the current situation, it

was difficult for DIEM to break this deadlock on their own, so support of other Ministry of Health offices was required. It would be important to confirm whether there exits an appropriate system in place to facilitate smooth procurement, in addition to verifying the past procurement experiences.

(4) Considerations while Setting Operation Indicators

While setting operation indicators, it is often effective to use indicators associated with actions or phenomenon at facilities which could be described as “XYZ increases”. But for a health facility improvement project, it is not always desirable to have an indicator which “increases”. There are cases in which progress and improvement of services provided at a lower level health facility and educational activities in the community could result in the early detection and treatment at lower level facilities. Moreover, the patients might not have to be treated at the referral health facilities if there were an increase in the number of lower level health facilities. Therefore, while setting indicators, it is important to review the development policies of the whole sector and any factors that might influence the project. This will help to identify appropriate indicators to assess the quantity and quality of the service provided by the health facility.