Republic of the Union of Myanmar

FY2017 Ex-Post Evaluation of Japanese Grant Aid Project
"Project for Upgrading the Health Facilities in Central Myanmar"

External Evaluator: Hiroki Kajifusa, Kaihatsu Management Consulting, Inc.

0. Summary

This project was implemented for the objective of expanding health services and improving access to them, by developing facilities and equipment of Rural Health Centers (hereinafter referred to as "RHCs") and Sub-rural Health Centers (hereinafter referred to as "SHCs") and by upgrading equipment of Township Hospitals and Station Hospitals[1] in Magway Region, thereby contributing to the improvement of the referral system of the townships.

Implementation of this project is consistent with Myanmar's development policy, which is focusing on expanding provision of primary health care and basic services, and with the development needs of renewing health facilities in peripheral areas that are old and damaged, and expanding health services and improving access to the services in areas with low maternal and child health indicators. The project is also consistent with Japan's ODA policy, which aims to support the development of health services to improve people's livelihood. Therefore, relevance of the project is high.

Both facility construction and equipment procurement were carried out as planned, and all minor changes were necessary and appropriate. Both the project cost and the project period are within the plan, and thus efficiency of the project is high.

It was found that this project contributed to the promotion of institutional delivery in the target area, because the number of institutional deliveries at the RHCs in 9 target townships of the project has increased. Safety and functionality of RHC buildings have been improved, and satisfaction of pregnant women and health staff is high in relation to improved services. An increase in antenatal care coverage, and reduction in the rate of home deliveries, also have been realized in the target townships as a whole, and the project created an impact of improved structure for accepting the patients within the townships. It can be said that the higher-quality maternal and child health services became available at the target facilities of this project in general; however, the number of users of services, such as institutional delivery, has not increased from before to after the project in a part of the target RHCs, and medical treatment such as surgery has not been able to be carried out in a part of the target Station Hospitals due to the absence of doctors. This project has achieved its objectives to some extent. Therefore, effectiveness and impacts of the project are fair.

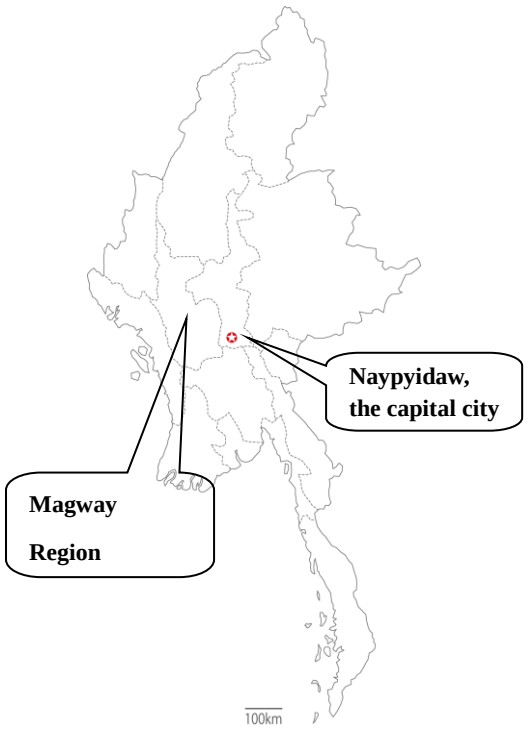
[1] Station Hospitals and Township Hospitals are secondary medical facilities that provide basic curative services, basic medicines, surgery and childbirth delivery services, and accept patients who have been transferred from the lower-levels medical facilities. (Source: Ex-ante evaluation of the project)

There are no cases of defects in or non-use of the equipment upgraded by this project due to the technical and financial problems from the operation and maintenance. However, there are hospitals which are short on doctors or have an inadequate system for replacing parts of the equipment and repairing the facility. Therefore, sustainability of the project is fair.

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

1. Project Description

1.1 Background



Project Location Map

Appearance of a newly-constructed RHC (Standard type)

Appearance of a newly-constructed RHC (Raised-floor type)

Source: The photo on top was taken at the time of the ex-post evaluation by the external evaluator in December 2017 and the one at bottom was taken in September 2014 and provided by JICA.

The Myanmar government was working to improve RHCs and SHCs,[2] increase the number of basic health staff engaged in them, strengthen in-service education, enhance the referral system, in order to improve the condition of basic health services in rural areas by improving access to health services through development of health facilities in peripheral area. In Magway Region, the target area of this project, indicators for maternal and child health were among the lowest in the whole country, and the number of RHCs was insufficient.[3] RHCs and SHCs in the

[2] RHCs and SHCs are primary medical facilities that provide primary health care such as treatment for general injuries, antenatal care and childbirth delivery services, infant health examination, vaccination, etc. in rural areas (Source: Ex-ante evaluation of the project).

[3] They had not reached the Myanmar government's standard level of one center per 20,000 people (as of 2009).

area were found to have cracks in foundations, and uneven or collapsed floors, etc. due to their age, and thus to have a problem of safety. There was heavy rain in the Central Dry Zone of the country including Magway Region in October 2011, and some health facilities were damaged by flooding. Emergency measures were taken at the affected facilities, but there was serious damage, and maintenance and restoration were needed urgently. In order to improve this situation, the Government of Myanmar requested the Japan International Cooperation Agency (JICA) for grant aid to develop facilities and equipment of RHCs and SHCs in Magway Region.

In response to this, JICA conducted a preparatory study of this project from January 2012. This study confirmed that equipment in Station Hospitals and Township Hospitals, which are the upper-level medical facilities of RHCs, were also very old and they were unable to provide adequate services; and thus, this project was implemented for SHCs and RHCs as well as Station Hospitals and Township Hospitals.

1.2 Project Outline

The objective of this project is to expand health services and improve access to them, by improving facilities and equipment in RHCs and SHCs, and by upgrading the equipment of Township Hospitals and Station Hospitals in Magway Region, thereby contributing to improvement in the referral system in the townships. Health indicators in Magway Region performed especially low in health indicators among other regions in Myanmar, and health facilities in the region were damaged by the flood in October 2011.

G/A Grant Limit / Actual Grant Amount	1,256 million yen/ 1,125 million yen
Exchange of Notes Date / Grant Agreement Date	July 2012 / October 2012
Executing Agency	Department of Public Health, Ministry of Health and Sports (Department of Health, Ministry of Health, during the project implementation period)
Project Completion	January 2015
Main Contractors	(Construction) Daiho Corporation (Equipment) Green Hospital Supply, Inc.
Main Consultants	Yamashita Sekkei, Inc. / Nippon Koei Co. Ltd. / Binko International Ltd. (Joint Venture)
Basic Design	January 2012 – December 2012
Related Projects	None

2. Outline of the Evaluation Study

2.1 External Evaluator

Hiroki Kajifusa, Kaihatsu Management Consulting, Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: August 2017 – November 2018

Duration of the Field Study: November 26 – December 9, 2017; April 29 – May 5, 2018

2.3 Constraints during the Evaluation Study

In order to analyze the effectiveness of this project, the external evaluator attempted to collect data on the number of institutional deliveries, people who received health check-ups, and surgeries from 73 target facilities, but some of them did not have the necessary data. There were some facilities, which provided data, but their reliability was low. Therefore, in this ex-post evaluation, the external evaluator analyzed only those target facilities with reliable data. Since only a part of the facilities did not have the data, the result of the analysis shows the general trend of the target facilities; however, it does not exactly show the overall trend. The external evaluator indicated the number of facilities included in the analysis for each result.

3. Results of the Evaluation (Overall Rating: B[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Consistency with the Development Plan of Myanmar

Myanmar Health Vision 2030 (2000-2030), the higher-level plan for the health sector in Myanmar at the time of planning and ex-post evaluation of this project, aims to deliver health care services to all so that the population can improve the condition of their health. The *National Health Plan 2006-2011*, the country's development plan in the health sector, aimed to expand coverage and enhance quality of health care, and promote improved health in rural areas. At the time of the ex-post evaluation, the *National Health Plan 2017-2021* focuses mainly on primary health care and provision of basic services below the level of townships. It also continues to aim at improving maternal, child and newborn's health and expanding health services in rural areas in order to achieve universal health coverage by 2030.[6] In addition to this, the *Five-Year Plan on Reproductive Health* (December 2008) mentions that it is necessary to increase birth attendance by skilled health staff, ante- and postnatal care, and institutional

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[5] ③: High, ②: Fair, ①: Low

[6] Universal health coverage is a state in which everyone can receive services related to appropriate health promotion, prevention, treatment, and rehabilitation at affordable cost. Two points must be met: "Health and medical services are provided close to the population", and "Cost is not a barrier to receiving health care services". (Source: https://www.jica.go.jp/aboutoda/sdgs/UHC.html (in Japanese, accessed on May 31, 2018))

delivery, in order to reduce maternal and infant mortality rates and to achieve Millennium Development Goal (MDG) 5 (i.e., maternal health improvement). In the *Five-Year Strategic Plan for Reproductive Health (2014-2018)* and *National Strategic Plan for Newborn and Child Health Development (2015-2018)* formulated at the time of the ex-post evaluation, improvement and expansion of health infrastructure and improvement in quality of, and access to, services are listed as priority plans to provide services such as the ante- and postnatal care, birth attendance by skilled health staff and neonatal care that are essential for improving maternal and child health indicators.

This project has aimed to expand and improve access to health services in Magway Region, which has low health indicators, through the development of health facilities which are responsible for primary health care and basic services. From the project planning stage through ex-post evaluation, the project is highly consistent with the health sector policy of Myanmar.

3.1.2 Consistency with the Development Needs of Myanmar

At the time of planning, the main problems of maternal and child health of Magway Region were considered to be the high rates of infant and children-under-5 mortality as well as the high rate of home deliveries, when compared to the national average.[7] For this reason, it was necessary to improve facilities and equipment at RHCs and SHCs, the health facilities closest to the population, and thus to promote the practice of institutional delivery attended by health staff. However, as mentioned in "1.1 Background" of the project, RHC facilities in the region were in a very poor condition due to their age, and not in a state that could provide adequate services to pregnant women, including institutional delivery, and thus the need for improvement was high. Even after completion of the project, the home delivery rate in Magway Region is higher than that the national average,[8] and thus the need to promote the institutional delivery attended by health staff through RHC development is still high.

If surgery such as caesarean section is necessary, it has to be conducted at a secondary medical facility where a doctor is located because doctors are not assigned in RHCs. However, at the time of planning, Township Hospitals and Station Hospitals, which are secondary medical facilities, could not provide proper medical services due to the age of equipment or absence of a doctor, and thus the need for improvement was high.

Therefore, this project aimed to expand and improve access to health services by improving health facilities at peripheral area such as RHCs and improving equipment at Township Hospitals and Station Hospitals, is consistent with development needs of Myanmar at the time

[7] The infant mortality rate was 20.8 (per 1,000 living births), mortality rate under 5 years old was 27.2 (per 1,000 living births), and home delivery rate was 78.5% in Magway Region (Source: Preparatory Study Report).
[8] The home delivery rate was 41.1% nationwide and 45.5% in Magway Region (2016); and the institutional delivery rate was 29.6% nationwide and 25.5% in Magway Region (2016) (Source: *Public Health Statistics Report 2014-2016*, Department of Public Health, 2017).

of planning and ex-post evaluation.

3.1.3 Consistency with Japan's ODA Policy

In *Economic Cooperation Policy for Myanmar*, revised by the Ministry of Foreign Affairs in April 2012, "Supports for the improvement of the life of citizens" were listed as the foremost priority area, and development of health and medical services was one of the concrete programs for cooperation. From this, the purpose of this project was consistent with Japan's ODA policy at the time of planning.

3.1.4 Appropriateness of the Project Plan and Approach

Two methods were taken for development of RHCs in this project. The first was to rebuild a facility and provide equipment (hereinafter referred to as "newly-constructed RHC"), and the second was to provide equipment without rebuilding the facility (hereinafter referred to as "existing RHC").

As confirmed at the time of the ex-post evaluation, there are at least 7 sites among existing RHCs where no delivery-related equipment procured in this project is used because there is no delivery room and a high risk of collapse of old facilities. There have been no cases of childbirth delivery in these facilities. Although there was no clear description in the documents at the time of planning, since the development of health infrastructure was the national policy at that time, it is considered that equipment for delivery was procured with the expectation that these existing RHCs would set up a delivery room or be rebuilt by the Government of Myanmar after implementation of this project. However, as mentioned above, there are some cases where the delivery room has not been set up nor facilities are rebuilt even at the time of the ex-post evaluation. The procurement of equipment related to childbirth delivery in this project without guarantee of setting up a delivery room and rebuilding the existing RHC by the Myanmar government has left a problem in terms of the effect of the project.

As mentioned above, there were some problems in the plan concerning the improvement of existing RHCs, but there were no problems with the rebuilding of RHCs and improvement of equipment in hospitals, which were the main components of the project. Therefore, it can be said that the plan and approach of the project on the whole were appropriate in general.

In summary, this project has been highly relevant to the Myanmar's development plan and development needs, as well as Japan's ODA policy; and project plan and approach was appropriate in general. Therefore, its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

32 RHC facilities were constructed, and equipment was procured for a total of 73 sites, including newly-constructed RHCs, existing RHCs, Township Hospitals and Station Hospitals in 9 townships in Magway Region.[9] Since the regional government had already constructed the facility at one site of the RHCs where construction was planned at the time of planning, the construction was canceled, and thus only equipment was procured by this project. There was no major change in the plan apart from this.

RHC at the time of planning (Lat Seil RHC)

Newly-constructed Lat Seil RHC (at Ex-post Evaluation)

Health staff caring for a pregnant woman at the RHC (at Ex-post Evaluation)

Operating room at a Station Hospital (at Ex-post Evaluation)

Infant warmer and phototherapy unit in use (at Ex-post Evaluation)

Delivery room of a newly-constructed RHC (at Ex-post Evaluation)

Source: Photograph at the time of planning is taken from a document provided by JICA (taken in June 2012). The photographs at the time of the ex-post evaluation were taken by the external evaluator in December 2017.

In procurement of equipment, details of the content and amount of equipment to be distributed were determined for the purpose of improving the function of the facilities, and it was appropriately distributed. For example, more types and numbers of furniture and equipment for diagnosis and newborns were distributed to the newly-constructed RHCs than existing RHCs.

Any minor changes mentioned above in the plan were appropriate as required, and the main achievements of construction of facilities and equipment procurement were as planned as described below. After installing the equipment, initial operation instruction and guidance were carried out by the procurement company.

[9] The 9 townships were: Pakokku, Seik Phyu, Pauk, Myaing, Salin, Saw, Say Toke Ta Yar, Ya Sa Gyo, and Natmauk.

＜Facility Construction＞

Plan (Total 33 single-storey reinforced concrete buildings)	Actual (Total 32 single-storey reinforced concrete buildings)
29 buildings of standard type (198 m^2 of floor space) Storage room, examination room, labor room, delivery room, recovery room, midwife room, waiting room, rooms for staff (Health Assistant, Public Health Supervisor, Lady Health Visitor)	27 buildings of standard type (198 m^2 of floor space) Storage room, general examination room, labor room, delivery room, recovery room, midwife room, waiting room, rooms for staff (Health Assistant, Public Health Supervisor, Lady Health Visitor), washroom, generator room, public toilet, corridor, terrace
4 buildings of raised-floor type (188 m^2 of floor space) The rooms are the same as the standard type.	5 buildings of raised-floor type (188 m^2 of floor space)[10] The rooms are the same as the standard type.
Building Supplementary Facilities: (1) Electrical equipment (in-house generator equipment, lighting and outlet equipment, lightning protection equipment, etc.), (2) Water supply-discharge and sanitation equipment (sanitation equipment, water supply equipment, drainage equipment, etc.)	Building Supplementary Facilities: (1) Electrical equipment (in-house generator equipment, lighting and outlet equipment, lightning protection equipment, etc.), (2) Water supply-drainage and sanitation equipment (water storage tank, elevated water tank, sewage tank, infiltration tank)

Source: Confirmed by documents provided by JICA and on-site study at the time of ex-post evaluation

＜Procurement of Equipment＞

Plan	Actual
RHCs (49 sites) ・ Examination room (medical staff desk and chair, patient stool, examination table, examination lamp, sphygmomanometer, stethoscope, diagnostic set, cabinets, boiling sterilizer, etc.) ・ Midwife room (medical staff desk and chair, sphygmomanometer, stethoscope, foetus stethoscope, obstetric examination set, midwife kit, etc.) ・ Labor room (labor bed, working table, etc.) ・ Delivery room (delivery table, I.V. stand, examination lamp, delivery instrument set, infant treatment table, etc.) ・ Recovery room (recovery bed, baby cot) ・ Rooms for staff (staff desks and chairs, kits for each staff member, etc.)	Common at newly-constructed and existing RHCs (49 sites) Examination table, sphygmomanometer, stethoscope, instrument cabinet, medicine cabinet, boiling sterilizer, fetus stethoscope, midwife kit, ward screen, delivery table, I.V. stand, normal delivery instrument set, infant weighing scale, labor and recovery bed, kits for each staff
	Newly-constructed RHCs (32 sites) Medical staff desks and chairs, patient stool, examination lamp, diagnostic set, treatment instrument set, treatment trolley, height scale, weighing scale, locker cabinet, obstetric examination set, working tables, cloth basket, infant treatment table, baby cot, diagnostic desk and chair
	Existing RHCs (17 sites) Examination lamp with solar battery
SHCs (281 sites) Equipment for outreach activities (midwife kit)	SHCs (281 sites) Midwife kit was distributed to SHC through each Township Hospital.

[10] At one location, landowner of the planned site did not agreed for the construction, and therefore, an alternative site was selected. Construction method of building for that site was changed from the standard type to the raised-floor type because the alternative site was lowland.

Township Hospitals (9 sites) ・ Operating room equipment (operating lamp (mobile), operating table, caesarean surgery instrument set) ・ Delivery room equipment (infant incubator (warmer), phototherapy unit, suction unit, vacuum extractors (electric / manual), low pressure continuous suction unit, high-pressure autoclave (electrical type), oxygen concentrator, delivery table, labor and recovery bed, instrument set for normal delivery, etc.)	Township Hospitals (8 sites and one General Hospital[11]) ・ Operating room equipment (operating lamp (mobile), operating table, caesarean surgery instrument set) ・ Delivery room equipment (infant incubator (warmer), phototherapy unit, suction unit, vacuum extractors (electric / manual), low pressure continuous suction unit, high-pressure steam autoclave, oxygen concentrator, delivery table, labor and recovery bed, instrument set for normal delivery)
Station Hospitals (15 sites) Similar to the Township Hospitals, but the vacuum extractor is manual type and the high-pressure autoclave is a stove heating type which does not use electricity.	Station Hospitals (15 sites) Almost same items as Township hospitals, but low-pressure continuous suction unit was not procured, and manual vacuum extractors and high-pressure autoclaves of stove-heating-type, which do not use electricity, were procured.

Source: Confirmed by documents provided by JICA and on-site study at the time of ex-post evaluation

＜Initial Operation Instruction and Guidance＞

- Operation method: Equipment specification outline, operation procedure, and checking of function
- Maintenance method: Daily inspection, cleaning and adjustment, and repair of minor problems
- Delivery documents (Operation manuals and contact list for agents and manufacturers)

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost was planned as 1,256 million yen ＜Japan side 1,256 million yen; Myanmar side about 6.2 million kyats (about 620,000 yen)[12]＞. The actual cost was within the plan at 1,125 million yen on the Japanese side (90% of the plan).

3.2.2.2 Project Period

The project period was planned for 30 months from May 2012 to October 2014. The actual project period was 27 months from October 25, 2012 to January 6, 2015 and was within the plan

[11] Pakokku is located at center of the District, the administrative division above the Township, and its General Hospital serves as a Township Hospital, too.

[12] Based on exchange rate at the time of ex-ante evaluation (1 kyat = 0.1 yen) (Source: Preparatory Study Report). According to the explanation of each Township Public Health Office, the breakdown of the project cost of Myanmar side, which was related to construction work, was securing of project sites and land preparation (demolition of existing buildings and tree cutting). They also mentioned that the construction sites of RHCs were located within the premises of existing buildings or donated, and the people around the construction sites conducted demolition of the existing buildings and tree cutting without the payment.

(90% of the plan).

As a result, both the project cost and the project period of this project were within the plan, and therefore the efficiency of the project is high. However, the external evaluator could not confirm the project cost of Myanmar side.

3.3 Effectiveness and Impacts[13] (Rating: ②)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation Indicators)

＜Quantitative Indicators at Planning＞

At the time of planning, the followings were listed as quantitative indicators of this project.[14]

(1) Increase in number of service beneficiaries (persons): Baseline value 0 (2012) → Target value 80,000 (2018)

(2) Number of beneficiaries of facility delivery service (persons): Baseline value 5,800 (2012) → Target value 17,000 (2018)

(3) Number of institutional deliveries at RHCs which have delivery facilities in the townships (cases): Baseline value 34 (2012) → Target value 99 (2018)

However, (1), the number of service beneficiaries, is the population of the jurisdictional area of newly-constructed RHCs which were upgraded from SHCs.[15] It increases regardless of the plan of this project when RHCs are added due to upgrade, and thus it is inadequate as a target value to measure a quantitative effect of this project.[16] (2), the number of beneficiaries of facility delivery service is the estimated number of births in the jurisdictional area of the RHCs which have delivery facilities. However, no township is able to provide information on the number of births in rural areas and the number of RHCs equipped with delivery facilities in time series, which are the basis of calculation; and thus, it is difficult to measure the actual value of a quantitative effect. The actual value of (3), the number of deliveries at RHCs which have delivery facilities in the townships, is available, and is analyzed as follows.

As shown in Table 1, in the document of planning this project, the baseline value (2012) of the number of institutional deliveries in the target area was 34 and the target value (2018) was 99. However, at the time of the ex-post evaluation, when examining the results after 2012, it was 248 in 2012; the baseline value described in the planning document was based on limited information at that time, and very much different from the real value. Therefore, the target value

[13] Sub-rating for Effectiveness is to be put with consideration of Impacts.
[14] Source: Preparatory Study Report
[15] Three to five SHCs are established around one RHC to complement the provision of health services. Five of the RHCs subject to development of this project were upgraded from SHCs and newly constructed.
[16] As reference, the actual value of covered population of the upgraded 5 RHCs in total is 77,517 (2017), which is lower than the target value of 4 sites at the time of planning. The number of RHCs between the target value and the actual value is different; and they are difficult to compare, and currently, there are many sites which have lower number of population than the installation standard of an RHC that is 20,000 people.

set at planning is also inappropriate for measuring the level of achievement.

Table 1　Quantitative Indicator: Baseline, target and actual values

Quantitative Indicator	Baseline	Target	Actual			
	2012	2018	2012	2015	2016	2017
		3 years after completion	At planning	Year of project completion	1 year after completion	2 years after completion
Number of institutional deliveries (cases)	34	99	248	643	857	1,452

Source: Sources of the baseline and target values were Preparatory Study Report and ex-ante evaluation of the project. Source of actual value was the data provided by the 7 townships.

The actual number of institutional deliveries in the target area confirmed at the time of the ex-post evaluation has increased by more than 5 times, from 248 cases at the time of planning (2012) to 1,452 cases at the time of the ex-post evaluation (2017). As described later, the number of delivery facility users has increased in 52% of the RHCs developed by the project, and thus the development of delivery facilities in the project has contributed to the increase in the number of institutional deliveries in the target area. However, as mentioned above, since the target value was inappropriate, it cannot be determined whether the target was achieved.

Although this project targeted 9 townships, at the time of the ex-post evaluation, only 7 townships submitted all actual values from 2012 to 2017.[17] The results in Table 1 are the total number of institutional deliveries at these 7 townships.

＜Additional/Alternative Quantitative Indicators＞

The indicators (1) and (2) shown at the time of planning, as mentioned above, are the covered population of the newly-established RHCs developed by this project. While these indicators show a kind of improvement of access to health services, they do not show the operation status of all the facilities and equipment targeted in this project for producing expected effects. Therefore, the comparative analysis between planning (2012) and ex-post evaluation (2017) was done as follows for RHCs (newly-constructed and existing) and Township Hospitals and Station Hospitals developed by the project by using alternative operation indicators, which show the usage status of facilities and equipment, by which the service improvement was expected according to the contents and functions of these inputs.

[17] 7 townships are Pakokku, Seik Phyu, Pauk, Salin, Saw, Say Toke Ta Yar, and Ya Sa Gyo. Myaing and Natmauk have no data of 2012 as baseline.

- Qualitative Indicators for Target RHCs

Number of delivery facility users[18]

The number of delivery facility users of the target RHCs has increased at 21 sites (52%) out of the 40 valid answers (Table 2). There are many newly-constructed RHCs (19 sites) with increased delivery facility users; 11 of these had no delivery facilities users at the time of planning, and these have been utilized only after this project (increased from 0 persons). In other words, after completion of this project, childbirth delivery has started to be administrated at these RHCs. The total number of users of delivery facilities has almost doubled from 1,237 to 2,205 (Figure 1). It should be acknowledged that active use of newly-prepared delivery facilities has been promoted.

On the other hand, there are 16 RHCs with no users of delivery facilities before and after the project. 11 of these are existing RHCs to which the project provided only equipment. It is explained that childbirth at RHCs has not been administrated because delivery rooms have still not been set up as of the time of the ex-post evaluation and/or the buildings are too old.[19] According to interviews with the Township Public Health Department at the time of ex-post evaluation, there are areas where the preference for home delivery is strong and institutional delivery at RHCs is not promoted well (See Footnote 28). Furthermore, since NGOs provide a subsidy for transportation costs for childbirth at hospitals, there are cases where childbirth is preferred at hospitals rather than at RHCs. This provides background as to why delivery facility users did not necessarily increase at RHCs.

Table 2　Changes in the number of users of delivery facilities

	Sites with No Users	Sites in Decrease	Sites in Increase	
			From 0	From ≧ 1
New (n=27)	5	3	11	8
Exist (n=13)	11	0	0	2
Total RHC (n=40)	16	3	11	10
(%)	40%	8%	28%	25%

Note: "No user" indicates that there were no users before and after the project. The project had 32 newly-constructed and 17 existing RHCs in total (Numbers of RHCs of the two categories is same for other tables).

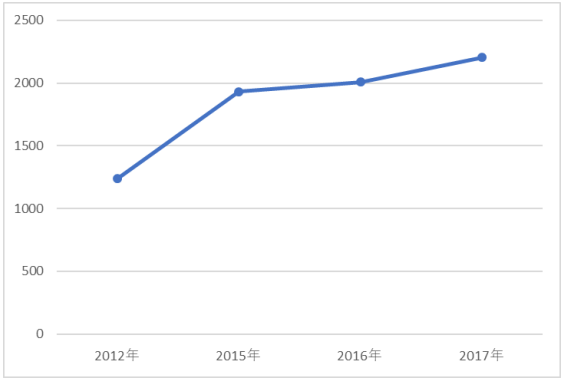


Figure 1　Total number of users of delivery facilities (n=40)

Note: The project had 49 RHCs in total (Number of RHCs in total is same for other tables).

Source: Elaborated by the external evaluator based on the data provided by each township

[18] In this report, facilities to carry out facility delivery such as labor room, recovery room and midwife room, attached to the delivery room, are collectively referred to as "delivery facilities" (a delivery room is a part of delivery facilities). On the other hand, distinctively, a delivery room without other attached rooms or a space secured as a delivery room is called a "delivery room".

[19] Based on interviews at 2 existing RHCs by field visits (both have no delivery room and do not use the delivery table) and answers from each township about the use of the delivery table at each RHC.

Number of persons who received antenatal care

The number of persons who received antenatal care at target RHCs has been increased at 24 sites (about 60%) out of the 41 valid answers (Table 3). It has increased in 10 sites at existing RHCs. 4 of the newly-constructed RHCs have increased from no antenatal care, and it seems that the new facilities have promoted people receiving antenatal care. Meanwhile, at some sites, the numbers have decreased from before to after the project and others has been no antenatal care both before and after the project. Some of the reasons for this trend are the strong preference of home delivery and the cases where childbirth at hospital is preferred rather than at RHC, as mentioned in the section of "Number of delivery facility users". Another reason is that there have been more outreach activities conducted by Lady Health Visitors and Midwives. The total number of people received antenatal care has increased from 5,700 to 8,223 people, which shows that antenatal care has been promoted (Figure 2).

Table 3 Changes in the number of people who received antenatal care

	Sites with No Antenatal Care	Sites in Decrease	Sites in Increase	
			From 0	From ≧ 1
New (n=27)	0	13	4	10
Exist (n=14)	2	2	0	10
Total RHC (n=41)	2	15	4	20
(%)	5%	37%	10%	49%

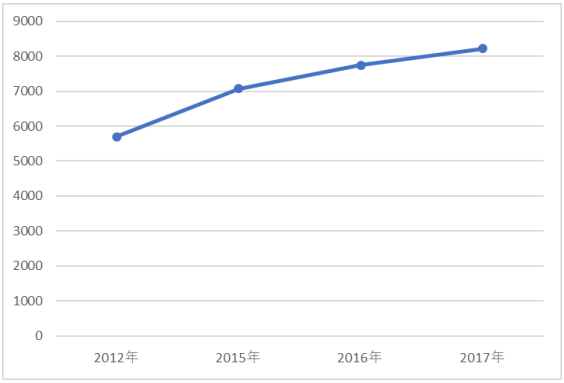


Figure 2 Total number of people who received antenatal care (n=41)

Source: Elaborated by the external evaluator based on the data provided by each township

Number of people who received postnatal care

The number of persons who received postnatal care at target RHCs has been increased at 25 sites (approximately 60%) out of the 41 valid responses (Table 4). There are 8 newly-constructed RHCs that has increased from no postnatal care, and the number has increased in half of existing RHCs. The total number of people has increased from 4,917 to 5,739, indicating that postnatal care has been promoted to a certain extent (Figure 3). The reason fewer people received postnatal care compared to antenatal care is that it is hard for a mother to move so soon after giving birth owing to the distance from home to RHC or difficulty obtaining transportation.

Table 4　Changes in the number of people who received postnatal care

	Sites with No Postnatal Care	Sites in Decrease	Sites in Increase	
			From 0	From ≧1
New (n=27)	1	8	8	10
Exist (n=14)	4	3	0	7
Total RHC (n=41)	5	11	8	17
(%)	12%	27%	20%	41%

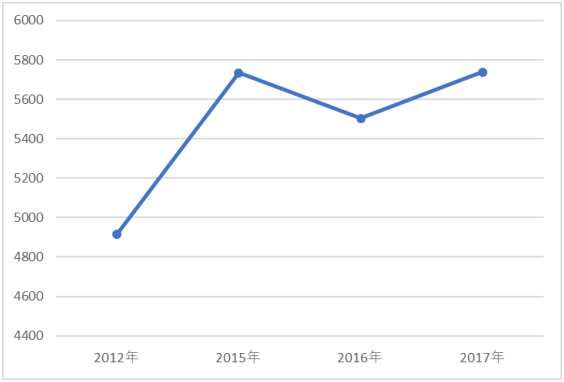


Figure 3　Total number of people who received postnatal care (n=41)

Source: Elaborated by the external evaluator based on the data provided by each township

Number of infant and child care examinees

The number of infant and child care examinees at target RHCs has been increased at 28 sites (about 70%) out of the 40 valid answers (Table 5). There are 7 newly-constructed RHCs that has increased from no examinees, and more than half of the existing RHCs also increased the number of examinees. The total number of examinees has increased from 1,701 to 2,610 (Figure 4). This is due to the fact that with the increase in institutional delivery, examination of newborns, which is not done at home delivery, is carried out immediately after childbirth.

Table 5　Changes in the number of infant and child care examinees

	Sites with No Examinees	Sites in Decrease	Sites in Increase	
			From 0	From ≧1
New (n=27)	1	6	7	13
Exist (n=13)	4	1	0	8
Total RHC (n=40)	5	7	7	21
(%)	13%	18%	18%	53%

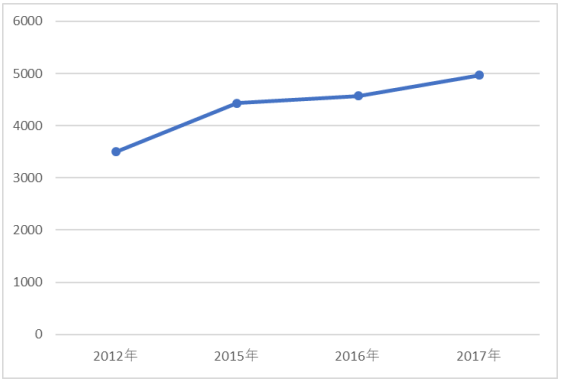


Figure 4　Total number of infant and child care examinees (n=40)

Source: Elaborated by the external evaluator based on the data provided by each township

Number of general outpatients

The number of general outpatients at the target RHCs has been increased at 23 sites (about 60%) out of the 40 valid answers (Table 6). There are 3 newly-constructed RHCs that has increased from no outpatients, 5 newly-constructed RHCs more than has doubled the number of outpatients, and the number has increased in 5 existing RHCs. On the other hand, the number of outpatients has decreased at 17 sites, and the total number of people overall has decreased slightly after completion of the project (Figure 5). The Township Public Health Department is

strengthening training for basic health staff, and the number of days when RHCs cannot be opened has increased in the absence of health staff due to training being held.

Table 6　Changes in the number of general outpatients

	Sites in Decrease	Sites in Increase	
		From 0	From ≧1
New (n=26)	8	3	15
Exist (n=14)	9	0	5
Total RHC (n=40)	17	3	20
(%)	43%	8%	50%

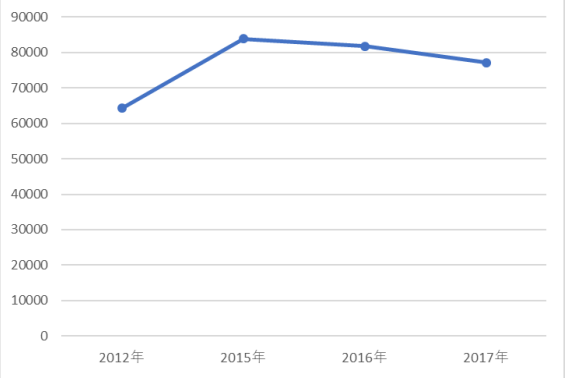


Figure 5　Total number of general outpatients (n=40)

Source: Elaborated by the external evaluator based on the data provided by each township

As mentioned above, as a result of analyzing the facilities that had valid responses out of the 49 RHCs (newly-constructed and existing), it was found that the number of people who received antenatal, postnatal, infant and child cares and general outpatients has increased between 60% and 70% in facilities, and the number of delivery facility users has increased in 52% of facilities. From this it can be said that the use of services of primary health care has been promoted to a certain extent by the operation of facilities and equipment developed in this project as a whole. In particular, in 70% of newly-constructed RHCs the number of delivery facility users has increased and some of them started childbirth delivery for the first time after completion of this project. That shows that this project has promoted institutional delivery at RHCs. However, most existing RHCs have still not carried out childbirth delivery at the facility at the time of ex-post evaluation, and thus promotion of institutional delivery by this project has not been realized at them.

- Quantitative Indicators of Township Hospitals and Station Hospitals

Number of surgeries per month

Among 22 sites with valid answers, out of the 24 hospitals, 15 sites (68%) have increased the number of surgeries per month. 10 hospitals, the largest group, are carrying out up to twice the number of surgeries per month. There are 3 hospitals carrying out more than 4 times the number of surgeries per month, because of an increase in the number of doctors who perform surgery. However, at 4 target hospitals (all are Station Hospitals), no doctors have been deployed since this project was planned and completed, and thus surgery has not been carried out. The total number of surgeries has increased from 4,021 to 7,816, nearly doubling. The decrease in the number of surgical surgeries in 2017 has been affected by a decrease in the number of surgeons

at some hospitals.

Table 7　Changes in the number of surgeries per month

	No Surgeries	Decreased	Increased by <2 times	Increased by 2-4 times	Increased by ≧4 times
Township Hospitals (n=9)	0	1	4	2	2
Station Hospitals (n=13)	4	2	6	0	1
Total (n=22)	4	3	10	2	3
(%)	18%	14%	45%	9%	14%

Note: "No surgery" indicates that there are no surgeries before and after the project. The total number of project target hospitals is 9 Township Hospitals and 15 Station Hospitals (It is same in other tables).

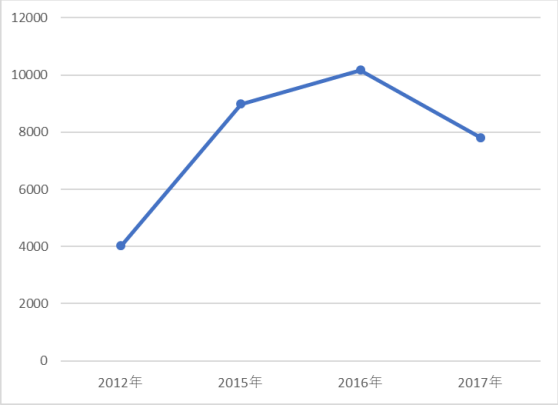


Figure 6　Total number of surgeries per month (n=22)

Note: The total number of project target hospitals is 24 sites (It is same in other figures).

Source: Elaborated by the external evaluator based on the data provided by each township

Number of deliveries per month

The number of deliveries per month at the target hospitals has increased at 17 sites (74%) out of the 23 valid answers. Many Township Hospitals have increased the number of deliveries per month by up to 5 times, while at Station Hospitals there are many sites that have increased by more than 5 times, indicating that institutional delivery is increasing in hospitals close to rural areas. However, there are no medical staff who can provide birth attendance at 3 Station Hospitals, and there have been no deliveries from the time of planning through ex-post evaluation. The total number of deliveries has increased nearly threefold from 2,770 to 7,841, and it can be said that childbirth delivery has increased remarkably overall.

Table 8　Change in the number of deliveries per month

	No Deliveries	Decreased	Increased by <2 times	Increased by 2-5 times	Increased by ≧5 times
Township Hospitals (n=9)	0	1	3	3	2
Station Hospitals (n=14)	3	2	1	2	6
Total (n=23)	3	3	4	5	8
(%)	13%	13%	17%	22%	35%

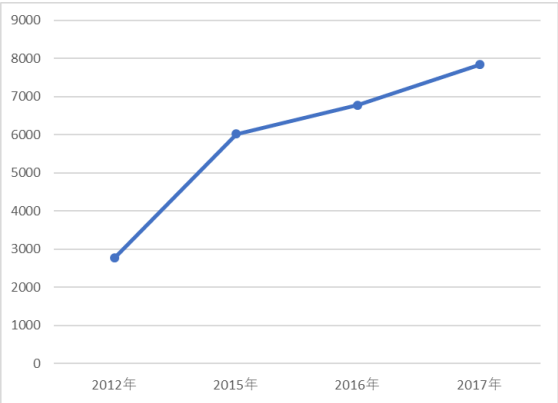


Figure 7　Total number of deliveries per month (n=23)

Source: Elaborated by the external evaluator based on the data provided by each township

Number of caesarean sections per year[20]

The number of caesarean sections per year at the target hospitals has increased at 15 sites (66%) of the 23 valid answers. The background of the increase is the placement of doctors who can perform surgery. However, as with the number of surgeries per month, doctors are not located at 4 Station Hospitals, and caesarean section surgery has not been carried out from planning to ex-post evaluation. The total number of surgeries has doubled from 2,998 to 5,978 cases, and it can be said that the number of surgeries has increased significantly on the whole.

Table 9 Changes in the number of caesarian sections per year

	No Surgeries	Decreased	Increased by <2 times	Increased by 2-5 times	Increased by ≧5 times
Township Hospitals (n=9)	0	1	5	2	1
Station Hospitals (n=14)	4	3	3	3	1
Total (n=23)	4	4	8	5	2
(%)	17%	17%	35%	22%	9%

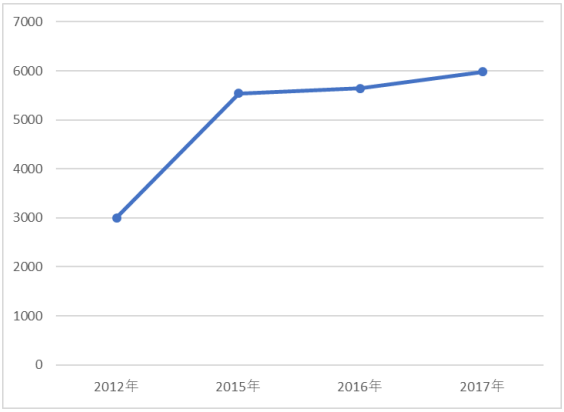


Figure 8 Total number of caesarian sections per year (n=23)

Source: Elaborated by the external evaluator based on the data provided by each township

Based on the above, about 70% of the hospitals with a valid response, out of the 24 hospitals developed by this project, has increased all the numbers, including surgeries per month, deliveries per month and caesarean sections per year, and as a whole it can be said that at the target hospitals the use of medical services has been promoted by the operation of the improved equipment. In addition to the fact that this project enabled accepting and treating more patients at hospitals, the fact that vacancies of doctors were filled after project completion also led to the increase. In these hospitals, the equipment procured was used to help restart medical services such as examination and surgery. Meanwhile, at the Station Hospitals (4 sites) where doctors have not been placed even at the time of ex-post evaluation, promotion of service utilization through operation of the equipment procured by this project has not been realized.

3.3.1.2 Qualitative Effects (Effect Indicators and Other Effects)

＜Quality Improvement of Services＞

At the time of planning, it was mentioned that the quality of services provided at the health

[20] Although it can not necessarily be said that the quality of care was improved only by increasing the number of caesarean sections, a system that foresees deliveries with high risk that cannot be done at RHCs and accepts them at a hospital, is enhanced as mentioned in “3.2.2 Impact”, it is said that the necessary caesarean sections are carried out by doctor's judgement.

facilities supported by this project would improve as a qualitative effect of this project.[21] First, improvement of the quality of services in the newly-constructed RHCs is as follows. Based on the results of RHC visits in the field study of this ex-post evaluation and the qualitative study for beneficiaries, it was found that the following service improvement has been realized in the newly-constructed RHCs.[22]

- It is easier to keep facilities clean

  The earlier RHCs were wooden buildings with brick or wooden floors, but the newly-constructed RHCs were made of reinforced concrete with tiled floors, making it easier to keep the facilities clean and disinfected.

- The risk of infection has reduced

  Since the labor room, delivery room and recovery room are separated in the newly-constructed RHCs, the hygienic condition of pregnant women and newborns has improved, and the risk of infection has reduced compared with home deliveries, where they are kept in the same room both before and after delivery.

- Safety and reliability of childbirth have increased

  RHCs are safer than home birth because there is a team of several health staff at RHCs with the necessary medicine, while only a midwife attends with limited medicine at the time of home delivery. Also, a midwife is often called just before the delivery at home, whilst pregnant women can stay well in advance of the delivery at RHCs, and rest for a while in the recovery room after childbirth, and thus it is safer for pregnant women.

- Privacy has increased

  The newly-constructed RHCs are wider than before. In addition, they are designed to have separate delivery section, the general consultation section, and staff room dedicated to each staff member,[23] so that the room can be used for each purpose. Because it is possible to separate pregnant women and general outpatients, privacy is secured at the time of counseling, such as when discussing results of HIV testing before childbirth, and about contraception, etc.

- It has become easier to control supplies, such as medicine and medical examination tools, as well as user records.

  Facilities were made wider to place furniture such as medicine cabinets in separate rooms, and thus it became easier to organize supplies such as medicine and examination tools, as

[21] Source: Ex-ante evaluation of the project

[22] In this ex-post evaluation, 4 RHCs (two newly-constructed sites and two existing sites) were visited; in the qualitative study, group interviews were conducted to the beneficiaries (RHC staff members / community leaders, and women who experienced birth delivery) at a total of 9 newly-constructed RHCs at each of the townships. . The group interview sites were narrowed down based on RHCs which were constructed as raised-floor type for disaster prevention, RHCs upgraded from SHCs, completed RHCs with 4 health staff professionals, and finally decided after receiving advice from each township. There was a total of 190 people (55 RHC staff members, 46 community leaders, 89 women who had given birth) who participated in the interviews.

[23] 4 professions of Health Assistant, Lady Health Visitor, Public Health Supervisor 2 and Midwife.

well as user records, and to store them hygienically.[24] The number of elderly people, pregnant women, and children who use RHCs, including for health checks such as blood pressure measurement, has increased because of increased storage of drugs and nutritional supplements for general injuries and illness that can be used for outpatient visitors free of charge.

Next, improvement in the quality of services of the target hospitals is as follows. It is recognized that there are cases in these hospitals where better services are possible in surgery and childbirth delivery, utilizing updated equipment. For example, before the project, target hospitals were short on recovery beds for patients who needed rest, warmers for low birth-weight newborns and cold weather, phototherapic units for neonatal jaundice, and thus they used to modify equipment and furniture in hand to compensate for that. However, they lacked functionality. With this project, it became possible to provide appropriate services, using equipment that should have been used originally.

＜Other Qualitative Effects＞

As other effects, it was expected at the time of planning to increase motivation to work of basic health staff working at RHCs, SHCs, Township Hospitals and Station Hospitals, to improve satisfaction of patients with health services at the facility, and to raise willingness for institutional delivery at RHCs.[25] At the time of ex-post evaluation, these effects are confirmed by field visits and qualitative study as follows.[26]

- Increased basic health staff's motivation to work

  As mentioned above, because the facilities of RHCs are larger and cleaner, and the number of equipment and drugs to be used increased, it became possible to provide better health services. This led to basic health staff having confidence to explain the improvement and benefits of medical examination and childbirth at RHCs to the community, and to encourage them strongly to have such services. At the Station Hospitals, in addition to updating the necessary equipment, it is found that as vacancies for doctors were filled, more surgeries were carried out, and more patients were accepted, nurses felt more job satisfaction.

- Increase of patients' satisfaction with health services

  People in the community evaluate positively and are interested in the improved facilities of new and wider RHCs. In recent years, the number of staff in RHCs has increased, and younger and female staff are caring their patients with kindness. This gives a favorable impression to the community. By improving services through the use of new equipment,

[24] It was also reported that they were damaged due to mice and insects before rebuilding.
[25] Source: Ex-ante evaluation of the project
[26] Opinions of beneficiaries (RHC staff and women who experienced childbirth) through field study and group interviews in qualitative study.

patients' trust in RHC staff also increased. It is highly satisfactory that high quality services can be received free of charge, without going to the hospitals outside the village which incurred transport expenses.

- Increased willingness for institutional delivery at RHCs[27]

  The community seems to be more willing to practice institutional delivery, due to collective health education regularly carried out at RHCs, extension of antenatal care, and word of mouth from experienced births at RHCs. Whereas household chores and childcare still have to be done with home delivery, a woman can concentrate on childbirth at RHCs under the care of the staff. It is safer to give birth when receiving treatment from a trained and qualified midwife at a hygienic facility, having good care after childbirth.[28] These benefits have been raising willingness for giving birth at an RHC.

3.3.2 Impacts

3.3.2.1 Intended Impacts

＜Qualitative Effects＞

At the time of planning, this project was expected to contribute to improvement of the referral system in these townships.[29] However, strictly speaking, the referral system has not been established in Myanmar, as patients can go to a higher-level health facility without being referred from lower-level health facilities. Therefore, it cannot be said that this system was improved or strengthened by the effect of equipment procurement by this project. Nevertheless, through this project the health system was strengthened, and it became possible to provide more appropriate services to more patients at Township Hospitals and Station Hospitals. Patients who cannot be treated at RHCs as peripheral health facility can be treated within the same township when higher-level medical facilities accept them. It also can be said that the system for accepting patients within the same township has been established for childbirths with high risk for mothers and children, due to the possibility of these being diagnosed by antenatal care at RHCs, as well as for the case of emergency transport at delivery.

3.3.2.2 Other Positive and Negative Impacts

＜Quantitative Effects＞

This project was implemented with a direction towards the overall goal of improving people's

[27] Among the target RHCs of the qualitative study, there were no births at two sites in 2017. The reasons for not choosing childbirth at an RHC are that: customarily a woman gives birth with family and relatives around, and thus a woman feels hesitant to depend for personal care, including excrement, on RHC staff; it is difficult to go to an RHC after labor pain has started due to road circumstances; it takes time and effort to bring meals for a pregnant woman and attendant to RHCs; it is possible to receive midwife assistance at home if no abnormality is identified in antenatal cares and there is no reason to give birth at hospital; and a woman chooses childbirth at hospital rather than RHC in case of foreseen dystocia and risks. Nevertheless, in all sites, the number of people who received consultations in antenatal care at RHCs has increased, and the interests in the delivery facility are gradually increasing.

[28] Cleaning of the birth canal, sewing of external genitalia, and helping with newborn's washing and lactation.

[29] Source: Ex-ante evaluation of the project

access to primary health care and contributing to improvement of macro indicators on maternal and child health.[30] Looking at the macro indicators for maternal and child health, as shown in Table 10, the indicators for the whole of Myanmar have continuously improved from the time of planning this project (2012) to ex-post evaluation (2016)[31]. The indicators of Magway Region achieved 100% antenatal care coverage, and the number of home deliveries has decreased in about 60% from the time of planning this project (2012). The infant mortality rate and under-five mortality rate also decreased year by year. On the other hand, the maternal mortality rate is flat.

Table 10 Yearly changes in maternal and child health indicators

Indicators	2012 (Planning year)		2015 (Project completion year)		2016 (1 year after completion)	
	National	Magway	National	Magway	National	Magway
Antenatal Care Coverage (%)	-	79.3	-	100.8	-	100.0
Number of Home Delivery (cases)	-	35,735	-	23,756	-	20,602
Maternal Mortality Rate (/1,000 living births)	1.3	1.1	1.0	1.3	0.9	1.1
Neonatal Mortality Rate (/1,000 births)	6.8	-	6.3	-	6.0	-
Infant Mortality Rate (/1,000 living births)	13.9	14.9	11.4	14.3	10.5	12.0
Under-five Mortality Rate (/1,000 living births)	17.9	17.4	14.5	15.8	13.3	14.0

Source: Health Management Information System (for national level of Myanmar), Provided by Magway Region Public Health Department (for Magway Region). The column with "-" means no submitted data.

In order to verify the impacts that this project had on all target townships, the above indicators were analyzed for changes in the target townships from the time of planning (2012) to the ex-post evaluation (2017) as follows. Although, at the time of ex-post evaluation it was attempted to collect the actual values of these indicators from each township, there was no data for 2012 or 2017 and comparative analysis could not be done in some townships. For this reason, the analysis below only covers the townships where the data for both years available with the numbers shown as (n =).

- Antenatal care coverage (n=8): When comparing the planning time and project completion year, this increased in all 8 townships, of which 5 continued to increase from the project completion year. In 2017 all townships achieved 90%-100%.[32]
- Home delivery rate (n=8): Decreased in 6 townships, all of which continually declined after

[30] Source: Preparatory Study Report
[31] At the time of ex-post evaluation, the latest statistics were from 2016.
[32] They exceed the national average of 86.1% for those who received antenatal care once, and 72.3% for those received the care four times (2016) (Source: *Myanmar Demographic and Health Survey 2015-2016*).

project completion. Overall it went from 23%-65% in 2012 to 17% -51% in 2017.[33]

- Number of institutional deliveries (n=6): All 6 townships has continuously increased from planning to ex-post evaluation. In addition to the spread of government guidelines that encourage delivery at hospital for high-risk childbirths and of first and later than fourth time, subsidies from NGOs, such as for transportation expenses for hospital births.[34]
- Maternal mortality rate (n=7): Decreased in 3 townships from the planning time to project completion year. The mortality rate has increased in the other 4 townships, but the reason is unknown.
- Infant mortality rate (n=8): When the planning and project completion year are compared, decreased in 4 townships, in one of which it continues to decrease after project completion. Overall, at the time of planning in 4 townships, this rate ranged from 19 to 42 (for 1,000 living births), much higher than the national indicator (13.9), but in 2016 it tended to improve from 12 to 25 (for 1,000 living births) in 7 townships where it is higher than the national indicator (10.5).
- Child mortality rate under 5 years (n=8): When the planning and project completion year are compared, decreased in 5 townships, and in 2 of them it continued to decline after project completion. At the time of planning, 5 townships performed much worse than the national indicator (17.9) as they had 23 to 59 (for 1,000 living births). 6 townships exceeded the national indicator (13.3) even in 2016. Nevertheless, actual results show the tendency to improve as 14 to 30 (for 1,000 living births) and the difference from the national indicator is reducing.

As mentioned above, antenatal care coverage in Magway Region is now 100%. Even in the target townships, an increase in antenatal care coverage, a decrease in home delivery rate, and an increase in institutional delivery are recognized. It can be said that this is the result of supporting encouragement of institutional delivery at RHCs and hospitals through improvement of basic health infrastructure, as development of RHC facilities and equipment and improvement of equipment at Township Hospitals and Station Hospitals, as well as through diagnosis of delivery risk at antenatal care by RHCs. However, the number of townships that can be said to have reduced mortality rates in maternity, infants and children under 5 years in the region as a result of this improvement is limited. From these, it can be said that the contribution of this project on improving maternal and child health indicators in Magway Region is not remarkable.

＜Others＞

As this project was planned to develop existing health facilities, there was no impact on the

[33] Compared to the *Public Health Statistics 2016*, it is lower in 8 townships than Magway Region (45.5%) and the whole country (41.1%).
[34] It is a conditional benefit for the poor.

natural environment. Most of the newly-constructed RHCs were built on the existing land, and if new land was required it was transferred from the owner through an appropriate procedure. Resettlement did not occur and there were no complaints from residents.[35]

In this way, although the contribution of this project to improving maternal and child health indicators such as maternal mortality rate in Magway Region was not remarkable, the impact, establishment of the system for accepting patients within the township, has been realized.

From the above, this project has achieved its objectives to some extent. Therefore, effectiveness and impacts of the project are fair.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

The Ministry of Health at the time of planning of this project was reorganized into the Ministry of Health and Sports in April 2015 after the project completion, and then the Department of Health in charge of this project was divided into the Department of Public Health in charge of primary health care and the Department of Medical Services in charge of treatment. According to the health administrative division under the Department of Public Health, the Township Public Health Department supervises the services of RHCs and hospitals developed by this project. The director of Township Hospital concurrently serves as the Township Medical Officer (hereinafter referred to as "TMO"), the head of the health administration within the township. There are 4 professionals in RHCs: Health Assistant, the head of the center; Lady Health Visitor; Public Health Supervisor-2; and Midwife. There are 3 to 5 SHCs located around one RHC. This organization is the same as at planning.

Table 11 shows the allocation of health staff in each township in 2017. There are some cases in which a doctor was placed after project completion at a Station Hospital where it was vacant at the time of planning, that is to say, some improvements were seen in the situation, but in general there are insufficient doctors at all townships. 6 townships have more unfilled positions for nurses than for Health Assistants. Even when doctors have been placed, they are often transferred to another hospital for training course to raise their expertise, and the subsequent relocation is often delayed. As described in "3.3.1.1 Quantitative Effects (Operation Indicators)", there are some hospitals that have had insufficient doctors since the time of planning, and that has limited the effectiveness of this project.

[35] Based on the answers by questionnaire to each township and interviews of the health staff in the field study, and on the beneficiary's discussion in the group interviews on the changes between before and after the project, by the qualitative study.

Table 11 Percentage of staff posts filled in each township (2017)

Township	Doctor	Nurse	Health Assistant	Lady Health Visitor	Public Health Supervisor-1	Midwife	Public Health Supervisor-2
Pakokku	41%	67%	88%	100%	20%	97%	92%
Seik Phyu	42%	57%	78%	67%	20%	88%	93%
Pauk	50%	76%	100%	50%	0%	98%	88%
Myaing	57%	88%	92%	92%	50%	94%	72%
Salin	54%	88%	69%	92%	17%	65%	100%
Saw	-	-	73%	45%	14%	98%	62%
Say Toke Ta Yar	67%	70%	44%	63%	17%	87%	54%
Ya Sa Gyo	50%	47%	87%	86%	13%	96%	89%
Natmauk	43%	67%	91%	88%	40%	100%	91%

Source: Calculated by the external evaluator based on document provided by each township. "-" means no data.

The number of posts filled in the 4 professions to be placed in RHCs/SHCs are generally high. The predetermined 4 professionals are placed in 80% of the 32 newly-constructed RHCs. In 7 of them 2 Midwives and 2 Public Health Supervisors have been placed, and they have 6 members in total at one RHC. At the time of planning and project completion, there was concern that the 4 professionals would not be in place at 5 sites upgraded from SHC to RHC, but at the time of ex-post evaluation, the 4 professionals are in place at all 5 sites.[36] In this way, staffing for RHCs/SHCs has improved.

The maintenance and management system for medical equipment procured through this project was also confirmed. When equipment fails, each facility or clinical department that owns the equipment first tries to replace or repair parts locally. If this is not possible, they request for repair to the TMO and bring it to a manufacturer's agent if permission is received. However, the list of agents included in the equipment handover document of this project is not used for inquiries for repair or parts replacement,[37] and they have to look for an agency every time equipment is broken. There are problems in that there is no appropriate agency in Mandalay, which is the nearest city, and it can take time to locate one, and thus there are cases where parts are missing, or the equipment is being used without being repaired (detailed in "3.4.4 Status of Operation and Maintenance").

Regarding the maintenance and management system of the facilities developed by this project, health staff are conducting daily inspections and cleaning.[38] Regular inspections of electricity and water supply and drainage facilities are not implemented. When problems occur, repair is

[36] Data provided by each township

[37] When the external evaluator inquired JICA, it was confirmed that the companies, which procured the equipment, and the staff of the local agent of the companies informed and handed over the contact list for maintenance work to the Ministry of Health and each facility at the time of the delivery of the equipment, together with the information of manufacturing guarantee system of the equipment. However, at the time of the ex-post evaluation, the target facilities did not have this contact list. It seems that the list was not taken over or lost when the person-in-charge of the facility was transferred. When the external evaluator looked into the contact list, it was found that most agencies in the list were located in Yangon, probably, in consideration of their capacity for response for a need of repair and supply of parts; and there were no agencies in Mandalay, which the staff of the target facilities were looking for. The person-in-charge of the target facilities said that it is difficult and not realistic to hand-over equipment or bring down parts from Yangon, which is far from the facilities.

[38] In some cases, RHC hires a community resident as cleaner.

done locally. If it is not possible to complete, it is reported at a monthly meeting by representatives of all health facilities in the township. After that, when the repair is requested to the TMO and budget is secured, a technician for repair is dispatched from the Township Construction Department. For this reason, it often takes time from the occurrence of the problem until the repair. Some RHCs are located in areas where there is no electrician with appropriate skills,[39] and there are cases where only people in the community repair the in-house generators and water supply pumps and change the wiring, but the suitability of this is not assured. For this reason, some RHC staff have wanted regular inspections with specialized electricians (Refer "3.4.4 Status of Operation and Maintenance" for details).

As mentioned above, although the personnel at RHC/SHC tend to be fulfilled with respect to institutional aspects for the operation and maintenance of this project, there are unfilled positions for doctors and nurses at hospitals, and that leads to some of the equipment procured by this project not being utilized. It is a system that allows daily cleaning and inspection of equipment and facilities procured and developed by this project. However, it cannot be said it is adequate for the repair and parts replacement at the time of equipment failure as well as the inspection and repair of electricity-related facility of RHCs, and thus there are some cases in which it has not been able to repair or replace parts. As described above, there are some problems in terms of institutional and organizational aspects regarding the sustainability of the project.

3.4.2 Technical Aspect of Operation and Maintenance

This project procured the equipment, which was used by health staff, doctors and nurses at the time of planning, or those of operable for them. Interviews with the TMO of each township and with nurses and health staff of target facilities at the time of ex-post evaluation revealed that there is no equipment that cannot be operated or routinely cleaned and inspected, and there are no cases of breakage or non-use due to technical problems.

As mentioned earlier, staffing to RHCs/SHCs has increased in recent years, and the number of staff members who have just graduated from university or midwife school has also increased. The Township Public Health Department strives to gain trust from the people by strengthening knowledge and technology by frequently conducting training for inexperienced staff.

As described above, there are no technical problems in sustaining the effects of this project.

3.4.3 Financial Aspect of Operation and Maintenance

The target hospital staff of this project informed that the new administration after democratization places importance on social sector, the budget for the health sector has been increased, and thus the supply of medicines and increase in the number of health care staff are

[39] In some cases, RHC hires a community resident as repair worker.

realized. It is said that the financial situation is improving.

Figure 9 shows the township budget for 2015-2017. It was not possible to obtain the budget amount from all townships, and thus the data obtained from 4 townships was analyzed as examples.[40] The budget amount is increasing in 3 townships. The remaining one also increased in 2016 compared to 2015. Budget size differs for each township, because the number and size of facilities such as hospitals are different.

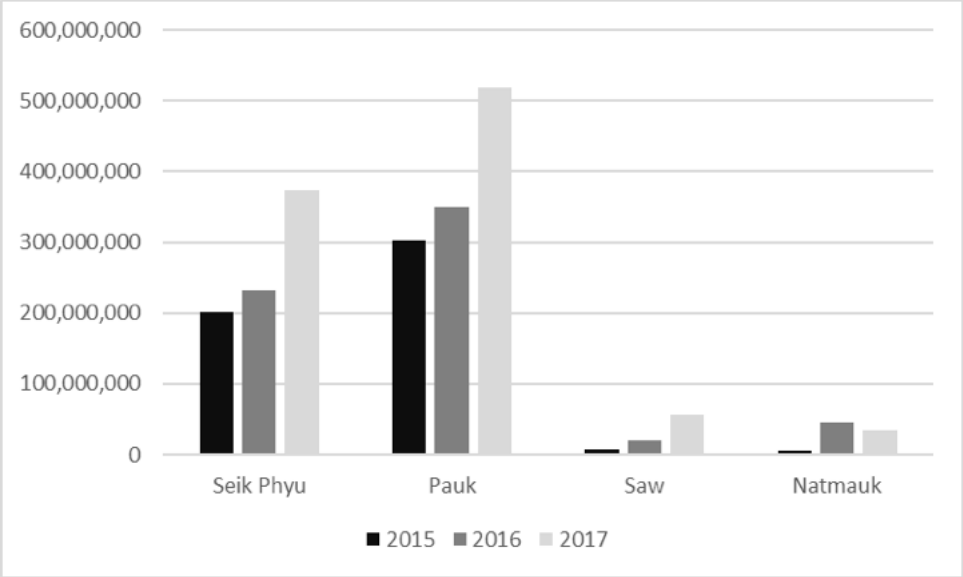


Figure 9 Township Budget Amount (Unit: Kyats)

Repair costs (for buildings and others) at each facility were confirmed. As mentioned in "3.4.1 Institutional / Organizational Aspect of Operation and Maintenance", the repair costs are not allocated to each facility in advance as a budget every year, and when there is a need for repair, it requests to the TMO. As a result, the actual repair costs of RHC allocated from the Department of Public Health varies from year to year. As an example, the actual results of RHC repair expenses for each fiscal year in Seik Phyu Township were 8,228,000 Kyats (2015), 200,000 Kyats (2016), and 580,000 Kyats (2017). Several newly-constructed RHCs have set up community funds to finance repair and smooth operation of facilities and equipment; they have accepted donations from residents and patients, and used them for purchasing regular fuel for in-house generators that are part of RHCs' electric facility. Consumables for diagnosis and delivery attendance used by RHC/SHC health staff are procured by funds and budget of UNICEF, NGOs, and the Ministry of Health and Sports. They are distributed timely and sufficiently.

Equipment repair expenses of Township Hospitals and Station Hospitals are also allocated

[40] 4 townships are Seik Phyu, Pauk, Saw and Natmauk.

based on the application as with RHCs. As a result, the actual results of repair expenses allocated from the Department of Public Health are different every year. As an example, the results of repair expenses for each year at Seik Phyu Township Hospital were 23,935,000 Kyats (2015), 1,100,000 Kyats (2016), and 56,806,000 Kyats (2017). Consumables to be used for surgery and delivery at hospitals are procured under the budget of the Ministry of Health and Sports based upon request, and they are provided in a timely fashion.

Regarding spare parts for procured equipment, as noted in "3.4.1 Institutional / Organizational Aspect of Operation and Maintenance", manufacturers' agents cannot be found in the vicinity, and it is a problem that they cannot be repaired or replaced. Nevertheless, there wre no cases that the repair or replacement could not be done due to lack of budget.

As described above, there is no problem concerning the financial aspect of operation and maintenance for this project.

3.4.4 Status of Operation and Maintenance

＜Facility of the Newly-Constructed RHCs＞

The newly-constructed RHCs have been well organized and cleaned, and maintenance inside the buildings is in good condition. A poster of the cleaning method established in this project and a sign board to prevent entering into the room before it is dried are continuously in place, and staff explained that they routinely clean and dry the delivery room and disinfect with disinfectant.

As a problem of the building at the time of ex-post evaluation, there are several facilities where doors and windows cannot be opened or closed correctly due to broken metal fittings and deterioration of installation.[41] This is due to the wood used being insufficiently dried, and people in the community had tried to open and close in the wrong way because the shape and design of the metal fittings are not common locally, and the same bracket for replacement cannot be obtained. Because they cannot lock-up the facilities properly, some are concerned about theft, and there are facilities of which cash was stolen, but particular measures are not taken.

Regarding the in-house generators procured for the newly-constructed RHCs, 6 of 10 sites visited during the field study and the qualitative study have used regular fuel, exchanged the batteries as necessary, and continued to use them without problems. However, at the time of defect liability inspection of the project, many newly-constructed RHCs have used low-quality non-regular fuel available on the street for in-house generators, causing clogging of the filter and problems in operation.[42] Even at the time of ex-post evaluation, it was reported in 7 townships that the generators are not in operation in cases where regular fuel is expensive, the

[41] Based on the answers from the TMOs, visual inspection by field study, and the group interviews in the qualitative study.

[42] Source: Document after the project completion, provided by JICA

required fuel amount is not affordable due to the inefficient and large amount of fuel consumption, and they are not used because they cannot exchange ignitor or battery.[43] Due to malfunction of the generator, there are problems such as where examination lamps and boiling sterilizers cannot be used, no lighting at the time of power outage or nighttime, and water supply pumps unable to be operated. If this is not improved, there is concern that the deterioration in quality of services becomes usual.

＜Procured Equipment＞

The equipment procured through this project is mostly used well in all facilities. In the Station Hospitals, there are cases where the fuel heating autoclave and vacuum extractor of suction manual are kept and prepared so that they can be used for frequent power outages, even where electric power was supplied after the project completion. However, the utilization of part of the equipment has the following problems.[44]

- Equipment repair / parts replacement: Out of the developed hospitals, there are some cases where parts are not procured for vacuum extractors of suction electric, operating lamps and oxygen generators which require repair or parts replacement. The vacuum extractors of suction electric which were provided only to Township Hospitals have one of the two glass bottles damaged and only one bottle is available to use at 4 of all 9 hospitals, but they have not been replaced. The examination lamps with solar battery provided to the existing RHCs require replacement of the battery, as they became weak. However, the battery cannot be exchanged at 8 out of the 17 sites. The background to these problems is that the replacement parts cannot be obtained locally or at the manufacturers' agency.
- Daily cleaning: Some hospitals have not practiced sufficient daily cleaning for equipment that has fewer cases and thus is not used frequently, such as recovery beds, newborn warmers, and phototherapy unit. However, they are cleaned at the time of use, and obstacles to medical services have not been reported.
- Unused instruments: In both newly-constructed and existing RHCs, there are some facilities in which diagnostic and delivery tools procured through this project are unopened. The main reason they have not used procured instruments is they have still been using what they used from before, or there is continuous supply of disposable tools from the government and others. In some cases, they are accustomed to use disposable kits and the boiling sterilizer cannot be used because the facility is not electrified.[45]

[43] Based on the answers from the TMOs and the group interviews in the qualitative study. How many newly-constructed RHCs are in such situations was questioned to each township, but there was no clear answer obtained and it was not possible to grasp the whole picture.
[44] In addition to visual inspection at the field study, a checklist was prepared for each facility regarding the equipment provided, and the answers were collected from the TMO in order to confirm the utilization status of the equipment.
[45] These facilities have used disposable instruments.

- No installation of delivery room at existing RHCs: There are at least 7 sites in the existing 17 RHCs where equipment and instruments related to delivery and neonatal treatment are not utilized due to the fact that the building is too small to install a delivery room. According to reports from TMOs, 5 of them are already undergoing or planning the rebuilding, and if they are completed they will be able to use the procured equipment.[46]

In this way, although the operation and maintenance status of this project is generally good, there are cases where it is impossible to repair equipment and replace spare parts, and thus they do not fulfill the original function adequately. In some of newly-constructed RHCs, there are problems in the maintenance of the generator, and thus they cannot secure services such as response to emergency and nighttime.

From the above, because of the problems in the institutional / organizational aspect and the operation and maintenance status of this project, the sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented for the objective of expanding health services and improving access to them, by developing facilities and equipment of RHCs and SHCs and by upgrading equipment of Township Hospitals and Station Hospitals in Magway Region, thereby contributing to the improvement of the referral system of the townships.

Implementation of this project is consistent with Myanmar's development policy, which is focusing on expanding provision of primary health care and basic services, and with the development needs of renewing health facilities in peripheral areas that are old and damaged, and expanding health services and improving access to the services in areas with low maternal and child health indicators. The project is also consistent with Japan’s ODA policy, which aims to support the development of health services to improve people's livelihood. Therefore, relevance of the project is high.

Both facility construction and equipment procurement were carried out as planned, and all minor changes were necessary and appropriate. Both the project cost and the project period are within the plan, and thus efficiency of the project is high.

It was found that this project contributed to the promotion of institutional delivery in the target area, because the number of institutional deliveries at the RHCs in 9 target townships of the project has increased. Safety and functionality of RHC buildings have been improved, and satisfaction of pregnant women and health staff is high in relation to improved services. An increase in antenatal care coverage, and reduction in the rate of home deliveries, also have been

[46] When confirmed with TMOs and the applicable RHCs, 2 of the existing RHCs have no plans for expansion and remodeling or relocation. In one of them, the entire village land is under the control of the Ministry of Defense and it is difficult to rebuild and relocate it.

realized in the target townships as a whole, and the project created an impact of improved structure for accepting the patients within the townships. It can be said that the higher-quality maternal and child health services became available at the target facilities of this project in general; however, the number of users of services, such as institutional delivery, has not increased from before to after the project in a part of the target RHCs, and medical treatment such as surgery has not been able to be carried out in a part of the target Station Hospitals due to the absence of doctors. This project has achieved its objectives to some extent. Therefore, effectiveness and impacts of the project are fair.

There are no cases of defects in or non-use of the equipment upgraded by this project due to the technical and financial problems from the operation and maintenance. However, there are hospitals which are short on doctors or have an inadequate system for replacing parts of the equipment and repairing the facility. Therefore, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

The following points are recommended.

(a) In existing RHCs there are facilities that did not utilize equipment and instruments related to delivery and neonatal treatment procured by this project. Although there are already prospects for rebuilding at 5 sites, there are still no plans for rebuilding at 2 sites. It should be recommended to the Department of Public Health that they transfer equipment and instruments that are not used in existing RHCs without rebuilding plans to other facilities and utilize them. For example, neonatal treatment equipment can be utilized in Station Hospitals that have not been provided with it, and delivery-related equipment can be used in other RHCs with an old delivery table in a delivery room. When transferring equipment and instruments, it is necessary to contact JICA and obtain approval.

(b) There are 4 Station Hospitals supported by this project where doctors have still not been placed at the time of the ex-post evaluation, and patients cannot be accepted at the higher-level medical facility of RHC which this project aimed at. The health staff working in the area feel that there are few doctors to transfer to hospitals in inconvenient rural areas, and it is important for the Department of Public Health to investigate the causes of long-term lack of doctors in these hospitals and to place doctors immediately.

(c) There are cases where the health facilities cannot repair equipment procured in this project and exchange spare parts to fulfill the original function adequately, but these facilities are unaware of where to contact for repair and parts replacement. It is desirable that the Department of Public Health investigate these situations, identify those who can repair, dispatch them to each facility, and promptly procure and exchange parts. Similar measures

are also desired for breakage of door and window metal fittings, deterioration in installation, and malfunctions of in-house power generators in the newly-constructed RHCs.

(d) In the newly-constructed RHCs of 7 townships, in-house power generators are no longer in operation, because it is difficult to purchase expensive regular fuel, fuel efficiency is low, and the ignitor and battery cannot be replaced. This causes inconvenience at times of power outage and nighttime delivery, and also affects water supply facilities indispensable for hygiene management, and thus the quality of health services will deteriorate. On the other hand, there are some RHCs that manage community funds and continuously use their in-house generators without problems, purchasing regular fuel or replacing parts. Through the leadership of TMOs, it is desirable to share such good practice within the township and between townships and lead to resolution of problems.

4.2.2 Recommendations to JICA

It is desirable for JICA to monitor the status of improvement regarding the recommendations to the executing agency.

4.3 Lessons Learned

When assistance by the project is only procurement of equipment, it is necessary to confirm the infrastructure, in which the equipment is used, are adequately developed.

In this project, the main input was for construction of new RHCs, but some facilities were only provided equipment without constructing new buildings. In these existing RHCs, it is found that childbirth delivery was not carried out and the donated equipment was not utilized in many cases. Some of the reasons would be, but not limited to; there was a problem with the safety of the building, and/or the delivery room was not in place. In the case of a cooperation plan that does not improve infrastructure but only procures equipment, it is necessary to procure equipment on condition that the infrastructure is well established so that the procured equipment can be utilized in the facilities, or that the rebuilding plan of the facility is implemented promptly after completion of the project.

It is recommended that the contact list for maintenance of the procured equipment has information on local agencies that are in the nearest cities, to which the target facility able to inquire without much difficulties.

In this project, a contact list of manufacturers and local agencies of the procured equipment was handed over to the target facility along with the operation manuals at the installation of the equipment. However, it is found in the ex-post evaluation that the contact list was not kept by the target facilities. Therefore, they are looking for an agent every time the equipment becomes malfunction, and in case it is difficult, the equipment is used without the parts or not repaired.

Moreover, many agents listed in the contact list are located in Yangon, however, the target facilities are looking for agents in Mandalay, the nearest city from the facility. According to the person-in-charge of the target facilities, it is not realistic to bring down parts from, or hand-over equipment for repair with agents in Yangon, which is far from the facilities.

It is desirable to hand-over the contact list to the target facilities, that includes information on local agencies of the manufacturer located in the nearest cities, wherever possible, to which the target facilities able to inquire and bring-down equipment without much difficulties, so that they can maintain the equipment properly. It is also desirable to securely hand-over the contact list to the target facilities, together with other hand-over documents, and advise them to carefully keep and utilize it.

End