Ex-Post Project Evaluation 2014
(Papua New Guinea, Solomon, China)

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The Independent State of Papua New Guinea

Ex-Post Evaluation of Japanese Grant Aid Project

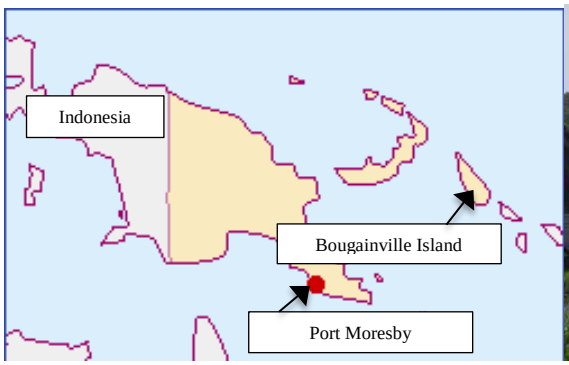
"The Project for Construction of Bridges on Bougainville Coastal Trunk Road"

External Evaluator: Keiichi Takaki, International Development Center of Japan

0. Summary

The objective of this project is to provide safe and stable transportation between Kokopau and Arawa by constructing fifteen bridges on Bougainville Coastal Trunk Road, thereby contributing to the stability of people's lives and socio-economic reconstruction. The relevance of this project was high since it is consistent with the development policies, sector policies and development needs of the recipient country and Japan's ODA policy. The efficiency of the project is high since the project was implemented within the schedule and budget. The effectiveness and impact of the project is also high. Although one bridge could not be used for a certain period of time, all the other bridges have been open throughout. The transportation time is reduced, the traffic volume has increased and transportation convenience is greatly improved. Operation and maintenance have been implemented appropriately, and the financial status is good. There are some organizational issues since only one official is engaged in the maintenance and there is also a minor technical problem. Therefore, sustainability of the project effects is fair. In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description



Project Location

Rawa 1 Bridge

1.1 Background

Bougainville Island experienced armed conflict at the time of the independence movement that started in 1988, and the main infrastructure including Bougainville Coastal Trunk Road was damaged. This trunk road stretches for approximately 190 km from Kokopau across from Buka to Arawa, the former capital. Not only is it the most important route for people and goods (agricultural products such as cocoa and kopra and daily necessities) but also for emergency vehicles such as ambulances. However, at 15 locations along the route, the bridges and causeway bridges[1] were damaged or there was no bridge, and people and vehicles had no choice but to cross the river shallows. Such conditions

[1] A bridge that connects the two sides of a river by shaping concrete into the form of a bank with holes in the sides for river water to pass through

impeded the flow of traffic. Against this background, this project constructed 15 bridges between Kokopau and Arawa in order to ensure safe and stable transportation.

Figure 1 Locations of the Bridges

1.2 Project Outline

The objective of this project is to provide safe and stable transportation between Kokopau and Arawa (approximately 190 km) by constructing fifteen bridges on Bougainville Coastal Trunk Road, thereby contributing to the stability of people's lives and socio-economic reconstruction.

Grant Limit / Actual Grant Amount	D/D[2]: 50 million yen /50 million yen Main: 3,154 million yen /3,058 million yen
Date of Exchange of Notes (/Date of Grant Agreement)	June 2009 / June 2009
Implementing Agency	Department of Works (DOW) Autonomous Bougainville Government (ABG)
Project Completion Date	March 2012

[2] Detailed Design

Main Contractor(s)	Kitano Construction Corp.
Main Consultant(s)	Chodai Co., Ltd.／Eight-Japan Engineering Consultants Inc. (JV)
Basic Design	October 2008
Detailed Design	September 2009
Related Projects	None

2. Outline of the Evaluation Study

2.1 External Evaluator

Keiichi Takaki, International Development Center of Japan

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 – June 2015

Duration of the Field Study: October 26 – November 8, 2014 and January 11 – January 17, 2015

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

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of Papua New Guinea

As stated below, this project is consistent with the development policies of Papua New Guinea and Autonomous Bougainville Government at the time of both planning and ex-post evaluation.

The Medium Term Development Plan 2005-2010, the current development plan at the time of project planning, aimed at strategic budget allocation for 7 expenditure priorities including reconstruction and maintenance of the transportation infrastructure as the first items. The Medium Term Development Plan 2011-2015, the current development plan at the time of the ex-post evaluation, had improvement of the roads as the essential main sector for socio-economic development and aimed at establishing a nationwide road network.

The National Transport Development Plan (NTDP) 2001-2010 was formulated as the highest plan in the transportation sector at the time of planning for the provision of safe and reliable transportation services in the nation. In 2006, it was revised to allocate a budget for repair and maintenance of the existing infrastructure as the priority and this was announced as the NTDP 2006-2010. This plan covers 15 priority trunk roads including Bougainville Coastal Trunk Road. NTDP 2006-2010 allocated a budget for improving 15 national highways in response to people's needs. At the time of the ex-post evaluation, the National Transport Strategy 2014-2018 was the successor to NTDP 2006-2010 and it

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

[4] ③: High, ② Fair, ① Low

had 16 national highways as priority roads including Bougainville Coastal Trunk Road.

At the time of planning, the Autonomous Bougainville Government formulated the Strategic Action Plan 2006-2010 including improvement of the transportation network for improved access to services as a strategic policy. This plan included the improvement of Bougainville Coast Trunk Road and bridges as an important project. At the time of the ex-post evaluation, the Autonomous Bougainville Government's priority for development 2011-2015 was the current development plan, and it had four pillars: "Peace and Security," "Economic Development," "Human Development," and "Good Governance." The first item "Peace and Security" emphasized the importance of basic infrastructure including roads as a means of contact between communities and individuals and assistance in maintaining strong community and family ties as this would contribute to preventing conflicts and crime.

3.1.2 Relevance to the Development Needs of Papua New Guinea

As stated below, this project is consistent with the development needs of Papua New Guinea at the time of both planning and ex-post evaluation.

At the time of planning, the main infrastructure including Bougainville Coastal Trunk Road was damaged because of the armed conflict at the time of the separatist movement that started in 1988. There were 15 locations on the trunk road where the bridge or causeway bridge was damaged or there was no bridge, and people and vehicles had to cross the shallows, and they could not cross the river when the water level was high[5]. At the time of planning, concrete examples of inconvenience were as described below and the development needs were high.

- When the level of the river rose, children often did not go to school. It was difficult to keep in touch with relatives and friends who lived in other villages[6].
- At the time of emergency transport by ambulance, sometimes the ambulance could not cross the river because of the high water level, and patients sometimes passed away[7].
- When police vehicles had to go to the scene of a crime or accident, their arrival was often delayed because of the high water level of the river[8].
- When cocoa exporters transported cocoa beans to the port, they often could not cross the river because of the high water level until the next day. Cocoa beans often got wet because of rain and their quality was degraded[9].

[5] Basic Design Study Report
[6] Based on interviews with local people
[7] Based on interviews at Arawa Health Center
[8] Based on interviews at Arawa Police Station
[9] Based on an interview with a cocoa bean exporter

Although at the time of the ex-post evaluation, there was no future projection of the traffic volume between Kokopau and Arawa where the bridges in this project are located, the island population has increased by 2.7%[10], and thus the number of people who use the bridges and roads is expected to increase at a similar rate. In addition, reliable and efficient transportation of goods is essential[11] for the economic growth of the island. Thus, the need for the bridges is expected to continue.

3.1.3 Relevance to Japan's ODA Policy

As described below, this project is consistent with Japan's ODA policy.

Japan's ODA Charter considers sustainable development as a major issue, and it mentions the intention to assist the socio-economic infrastructure for the purpose of promoting trade, investment and movement of people in developing countries and supporting sustainable development.

At the time of the Fourth Pacific Islands Leaders Meeting in May 2006, the Government of Japan announced five main areas of assistance for Papua New Guinea: 1. Economic Growth, 2. Sustainable Development, 3. Good Governance, 4. Security, and 5. People-to-People Communication and Exchange. In July 2006, the ODA task force and the Government of Papua New Guinea held a policy dialogue and agreed to implement economic cooperation for the subsequent 5 years primarily in three areas: 1. improvement of basic education by distance education, 2. improvement of the socio-economic infrastructure in the area of transportation including bridges and ports, and 3. promotion of farming and fishing villages such as small-scale self-sufficient agriculture[12].

This project is highly relevant to the country's development plan and development needs as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

The outputs were as planned (refer to Table 1). The names of bridges no. 3, no. 4, and no. 5 were changed from Pukarobi 1, Pukarobi 2 and Creepers in the plan to Tuve, Barurui and Ratavi respectively, since the names at the time of planning were the river names under colonial rule. During the project implementation, these names were changed so they were consistent with the traditional local names of the rivers[13].

[10] National Census 2011, National Statistical Office of Papua New Guinea
[11] Based on interviews at the Autonomous Bougainville Government (ABG)
[12] ODA Data by Country, 2008
[13] Based on interviews at ABG

Table 1 Planned and Actual Outputs

Planned						Actual					
No	Name	Structural Type	Length (m)	Width (m)	Foundation	No	Name	Structural Type	Length (m)	Width (m)	Foundation
1	Bakanovi	Bridge	75	5	Pile	1	Bakanovi	Bridge	75	5	Pile
2	Bove	Bridge	20	5	Pile	2	Bove	Bridge	20	5	Pile
3	Pukarobi 1	Bridge	25	5	Pile	3	Tuve	Bridge	25	5	Pile
4	Pukarobi 2	Bridge	50	5	Pile	4	Barurui	Bridge	50	5	Pile
5	Creepers	Bridge	20	5	Pile	5	Ratavi	Bridge	20	5	Pile
6	Ratavi	Bridge	50	5	Pile	6	Kasiava	Bridge	50	5	Pile
7	Iraka	Bridge	75	5	Pile	7	Iraka	Bridge	75	5	Pile
8	Korova	Bridge	20	5	Pile	8	Korova	Bridge	20	5	Pile
9	Malas	Bridge	20	5	Pile	9	Malas	Bridge	20	5	Pile
10	Ururva	Bridge	20	5	Pile	10	Ururva	Bridge	20	5	Pile
11	Kaskrus	Bridge	25	5	Spread	11	Kaskrus	Bridge	25	5	Spread
12	Rotaovei	Bridge	40	5	Spread	12	Rotaovei	Bridge	40	5	Spread
13	Warakapis	Bridge	25	5	Spread	13	Warakapis	Bridge	25	5	Spread
14	Irung	Bridge	40	5	Spread	14	Irung	Bridge	40	5	Spread
15	Rawa 1	Bridge	40	5	Spread	15	Rawa 1	Bridge	40	5	Spread

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual expenditure borne by the Japanese side was 3,058 million yen and the planned expenditure was 3,203 million yen. The actual expenditure was less than the planned expenditure by 96 million yen. The planned expenditure to be borne by the Papua New Guinea side was 5 million yen, but the actual expenditure is not known (refer to Table 4). Therefore, the evaluation was based on the expenditure by the Japanese side. The project budget was lower than planned (95% to the plan).

Table 2 Planned and Actual Project Budget

(Unit: million yen)

Item		Planned	Actual
Japanese side	D/D	50	50
	Main	3,154	3,058
Papua New Guinea side	Removal of existing bridges	5	Unknown
	Maintenance of existing structures		
	Expenditure for opening B/A[14], A/P[15]		

[14] Banking Arrangement
[15] Authorization to Pay

3.2.2.2 Project Period

The planned schedule was from June 25, 2009, the date of the Exchange of Notes, to June 2012 (37 months). The actual implementation period was from June 25, 2009 to March 20, 2012 (33 months). The actual period was shorter than planned by 4 months (89% to the plan).

The reasons why the project implementation period was shorter were that 1. the rainfall amount in the first year of the implementation was less than expected, 2. the bridges were located on the 190 km trunk road, subject to slightly different rainfall patterns which were recorded in the first year, and used for planning the efficient construction activities. In addition, ABG held monthly meetings to raise local people's awareness, and went on radio to explain about the project. Because of these, local people had better understanding of the project and were cooperative, which lead to less security problems than expected[16].

Both the project cost and project period were within the plan. Therefore, the efficiency of the project is high.

3.3 Effectiveness[17] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

As described below, the objectives included in the operation and effect indicators set at the time of planning are mostly achieved.

(1) Waiting days due to flooding

After project completion, a part of the Rotaovei Bridge (Bridge No. 12) and its approach road were washed away by increased river water on April 24, 2014, and the bridge was closed for 22 days until repairs were completed on May 15, 2014. All the other bridges have been open throughout, and the waiting days due to flooding were zero (refer to Table 3) [18].

For this project to have full effect, Bougainville Coastal Trunk Road has to be open throughout. This road has been maintained as necessary and has never been closed. Although the trunk road has 7 causeway bridges that are submerged by high water for 2-3 hours a few days a year, it is not a major problem for the transportation of local people[19]. From the above, the objectives of the project at the time of planning were mostly achieved.

(2) Travel time between Kokopau and Arawa

The bridges constructed in this project have reduced the travel time between Kokopau and Arawa

[16] Based on interviews at ABG
[17] Sub-rating for Effectiveness is determined with consideration for Impact.
[18] From interviews at ABG
[19] From interviews at ABG

from 5 or 6 hours to 3 hours, and the objective at the time of planning was achieved (Refer to Table 3) [20].

(3) Diversified Transportation Means

Table 5 shows that there were no motorcycles or bicycles and there are more small buses and middle-sized trucks than at the time of planning in 2008 as shown in Table 4. Cocoa exporters said that before the project, middle-sized and large trucks could not cross some of the rivers and they mostly used small trucks. Since project completion, they use more middle-sized trucks, and this is consistent with the traffic survey at the time of the ex-post evaluation. From the above, the objective at the time of planning was achieved.

(4) Increased Traffic Volume

In accordance with the traffic survey at the time of planning in 2008 (Table 4), the number of vehicles from Arawa to Buka was 72, and in the opposite direction the number was 86. In accordance with the traffic survey at the time of the ex-post evaluation (Table 5), the number of vehicles from Arawa to Buka was 123, and in the opposite direction, the number was 106. The traffic volume at the time of the ex-post evaluation had increased by 1.7 times and 1.2 times respectively. Thus, the objective was achieved.

Table 3 Target and Actual Effect Indicators

Effect indicator	Baseline	Target	Actual		
	2008	2012	2012	2013	2014
	Baseline year	Completion year	Completion year	1 year after completion	2 years after completion
1. Waiting days due to flooding	30 days	0 days	0 days	0 days	22 days[21]
2. Travel time between Kokopau and Arawa	5-6 hours	5-5.5 hours	3 hours	3 hours	3 hours [22]
3. Diversified transportation means	No description	Diversified transportation means	Diversified*		
4. Increased traffic volume	No description	Increased traffic volume	Increased*		

*These are based on interviews, not on quantitative data

[20] Same as above
[21] 22 days of waiting is at Rotaovei Bridge and the situation there are described in the section on the current status of operation and maintenance.
[22] Travel time from Kokopau to Arawa at the time of the ex-post evaluation was confirmed by the evaluator.

Table 4 Traffic Survey Results (Plan)
Survey Date and Time: March 20, 2008 6:00-18:00
Survey Location: Rawa 1

Vehicle Type	Arawa → Buka	Buka → Arawa
4WD	24	24
Small truck	48	62
Total number of vehicles	72	86
Total number of passengers	1,017	1,400
Total number of pedestrians	23	27

Source: Basic Design Study Report

Table 5 Traffic Survey Results (Ex-post evaluation)
Survey Date and Time: November 3, 2014 6:00-18:00
Survey Location: Rawa 1

Vehicle Type	Arawa → Buka	Buka → Arawa
4WD	110	91
Ambulance	1	2
Police Vehicle	2	1
Small bus	2	2
Small truck	9	10
Medium sized truck	0	2
Total number of vehicles	123	106
Total number of passengers	1,486	1,054
Students	9	10
Adults	7	10
Total number of pedestrians	16	20

Source: Traffic survey by the evaluator

3.3.2 Qualitative Effects

(1) Emergency vehicles can cross the bridges at all times

This project aimed to make it possible for emergency vehicles such as ambulances and police vehicles to cross the bridges at all times. At the time of the ex-post evaluation, Arawa Health Center, the only hospital in Arawa, had one doctor and twenty-five nurses. Before this hospital had a doctor, emergency transportation of patients was required 8-10 times a month. After they got the doctor, emergency transportation of patients was required 3-4 times a month. Before the bridges were constructed, transportation to Buka District Hospital took 4-5 hours. When there was heavy rain and the water level of the rivers rose, they often could not transport patients and patients sometimes passed away while waiting for the water level to subside. Since the bridges were constructed, transportation takes 2 hours, and emergency transportation of patients[23] can be provided at any time.

Arawa Police are responsible for a large area, and they have to dispatch their vehicles to the area around Uruva Bridge, about 90 km away, at least 3 times a month for traffic accidents and homicide cases. Before the bridges were constructed, the journey took two hours. At the time of the ex-post evaluation, it took one hour, greatly helping police investigations[24]. From the above, the ability of emergency vehicles to cross the bridges has been much improved.

3.4 Impacts

[23] From interviews at Arawa Health Center
[24] Based on interviews at Arawa Police Station

3.4.1 Intended Impacts

Table 6 Target and Actual Impact Indicators

Indicator	Baseline	Target	Actual		
	2008	2012	2012	2013	2014
	Baseline Year	Completion year	Completion year	1 year after completion	2 years after completion
1. Reduced transportation cost	The transportation fare from Kokopau to Arawa is 100 kina.	Due to diversified transportation means, the number and types of vehicles will increase and transportation costs will be reduced.	Improved	Improved	Improved
2. Stable transportation of goods	No description	Stable transportation of daily necessities	Improved	Improved	Improved
3. Increased agricultural production	Agricultural production in 2006: Cocoa (10.5t), Copra (12.4t)	Improvement expected due to improved transportation means	No judgment since no data		
4. Solution of river water pollution due to riverbed crossing	River water used for drinking and washing is polluted.	Water pollution solved	Improved	Improved	Improved
5. Stable river environment and stable use of land by local people near rivers	Dilapidated causeways lead to renewed collapse of riverbanks and environmental destruction	By improving the river areas, riverbank collapse will be controlled and the environment will be stabilized.	0 (solved)	0 (solved)	0 (solved)
6. Riverbed crossing solved	Riverbed crossing at 15 locations	Crossing of river by vehicles will be solved.	0 (solved)	0 (solved)	0 (solved)
7. River accidents solved	River accidents occur because of unsafe riverbed crossing by vehicles and pedestrians	River accidents solved	0 (solved)	0 (solved)	0 (solved)
8. Improved access to medical and educational facilities	No description	Access to medical and educational facilities will be improved.	Improved	Improved	Improved

(1) Reduced transportation fare

Table 7 shows that the transportation fare in each year fell from 150 kina in 2008 to 50 kina in 2012. The reason for the increased fare before the bridges were constructed was that vehicles had to cross the riverbed, which caused the engines and brakes to break down, and the vehicle owners added the repair and maintenance costs to the fare. After the bridge construction, they reduced the fare since they did not need to add the repair and maintenance costs to the fare and there was competition due to the increased number of vehicles[25]. Thus, the objective at the time of planning was achieved.

Table 7 Transportation between Kokopau - Arawa

(Unit: Kina)

Year	2008	2009	2010	2011	2012	2013	2014
Transportation fare	150	150	100	100	50	50	50

Source: ABG

In the ex-post evaluation a beneficiary survey was conducted to investigate the improved traffic convenience for local communities in addition to the reduced transportation fee[26]. Table 8 shows that the survey asked respondents to choose the applicable items, and 70-90% of the respondents agreed that transportation is cheaper, they have more transportation means, it is safer and faster, and transportation is reliable and they can plan transportation better than before. Thus, it can be said that the bridges greatly improved transportation convenience.

[25] Based on interviews at ABG

[26] For this ex-post evaluation, a beneficiary survey was conducted in the villages near the bridges. The survey was carried out at villages with a relatively large population for efficient information collection. The survey target was households and the respondents were either the household head or his/her spouse. Table 14 shows the total number of households and the number of actual respondents in all the villages. Tables 15 and 16 show the age and sex of the respondents, respectively.

Table 14 Beneficiary Survey Villages

Name of village	Total number of households	Number of respondent households	Response rate (%)
Bove	92	38	41.3
Coastal Veanana	26	16	61.5
Puskombu	48	34	70.8
Tarara	66	20	30.3
Teopasino Village	43	18	41.8
Veanana Highway	54	25	46.2
Vito	60	54	90.0
Total	389	205	52.6

Source: Beneficiary survey

Table 15 Age of Respondents

Age category	Number of persons	Percentage (%)
Under 20	27	13.2
21-30	63	30.6
31-40	44	21.7
41-50	33	16.1
51-60	21	10.5
Over 61	6	3
No response	11	5.4

Source: Beneficiary survey

Table 16 Sex of Respondents

Sex	Number of persons	Percentage(%)
Female	95	46.3
Male	110	53.7
Total	115	100

Source: Beneficiary survey

Table 8 Improved Transportation Convenience by the Bridges

Items	Number of respondents (%)
1. Transportation is cheaper.	138 (67.3%)
2. More transportation means are available.	185 (90.2%)
3. Transportation is safer.	197 (96.1%)
4. Transportation is faster.	202 (98.5%)
5. Transportation is reliable and you can plan transportation better than before.	188 (91.7%)

Source: Beneficiary survey

(2) Stable transportation of goods

Cocoa bean transporters said that before the bridges were constructed, they often could not cross some rivers to transport their cocoa beans to the storehouses at the port within the same day of shipping, and the cocoa beans got wet in the rain and the quality was compromised. After the bridge construction, transportation within the same day of shipping was possible, and it improved the quality of the cocoa beans[27]. As the cocoa transporters said that they can always transport their cocoa beans and the transportation of goods is more stable, it can be said that the object has been achieved.

The ex-post evaluation examined the cost of transporting goods. Table 9 shows that the transportation cost of 1 ton of goods was 1,000 kina in 2011 and 2,000 kina since 2012 because the provision of transportation means vis-à-vis demand is not sufficient. The bridge construction has not led to reduced cost of transporting goods[28].

Table 9 Transportation Cost for 1 ton of Goods between Kokopau and Arawa

(Unit: kina)

Year	2008	2009	2010	2011	2012	2013	2014
Transportation cost	n/a	n/a	n/a	1,000	2,000	2,000	2,000

Source: ABG

(3) Increased production of main agricultural products

Since the Autonomous Region of Bougainville does not have any data on agricultural production, production of agricultural produce cannot be compared before and after the bridge construction. It cannot be known whether the objective was achieved[29].

(4) Solution of river pollution

156 respondents (76.1%) in the beneficiary survey said that after the bridge construction they had not crossed the riverbed and this has solved river pollution. Thus, the objective was achieved.

[27] Based on an interview with a cocoa bean exporter
[28] Based on interviews at ABG
[29] Same as above

(5) Stable land use

Before the project implementation, the rivers were not cleaned and the remains of dilapidated causeway bridges were left, and the water level rose at the time of heavy rain. This caused flooding of the neighboring villages and agricultural land. According to villagers near the Iraka Bridge, the remains of dilapidated causeway bridges blocked the river flow and this caused overflowing of the river at the time of heavy rain every year and flooding of their houses and land. At the time of bridge construction, these leftover bridges were removed and there is no flooding any more.

The beneficiary survey found that 119 respondents were engaged in agriculture near the bridges and 64 respondents (53.8%) responded "much improvement," and 33 respondents (27.7%) responded "improvement." Land use is improved and the objective is achieved.

(6) Frequency of riverbed crossing by vehicles

Before the bridge construction, 20-30 vehicles per day crossed the riverbeds. Since the bridge construction, the number is zero and the objective was achieved[30].

(7) River accidents involving pedestrians and vehicles

According to ABG, the number of river accidents was 3 in 2010 and 5 in 2011. Since the bridge construction, the number is zero and the objective at the time of planning has been achieved. (Refer to Table 10)

Table 10 Total Number of Accidents at Fifteen Bridges

Year	2008	2009	2010	2011	2012	2013	2014
Number of cases	0	0	3	5	0	0	0

Source: ABG

(8) Improved access to medical and educational facilities

Local people said that before the bridge construction, some people passed away due to illness and injury since they could not get to hospital in time because of the high water level at the time of heavy rain. The beneficiary survey asked, "How do you think the bridge changed the access to hospital for your household or your community?" 169 (82.4%) responded "much better" and 26 (12.7%) responded "better," indicating the bridges much improved access to medical facilities.

The beneficiary survey asked, "How do you think the bridge changed the access to school for your household or your community?" 155 (75.6%) responded "much better," and 33 (16.1%) responded "better," indicating the bridges much improved access to educational facilities. From the above, the objective to improve access to medical and educational facilities has been achieved.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

Since the bridge construction polluted the river water in 4 villages where about 600 people used

[30] By the interview at ABG

the water for their daily lives, ABG provided 15 water tanks with a capacity of 5,000 liters for each village (60 tanks in total). Since the water tanks were to be used after the bridge construction was completed, ABG did not purchase land for their instalment, and each community provided land. Vibration and noise during construction was minimal and was not a problem. In this regard, there were no problems at the time of the ex-post evaluation[31].

(2) Land Acquisition and Resettlement

During the bridge construction, farmland had to be used for detours and agricultural products had to be removed. The owners of the removed products were compensated in cash in accordance with the rules of the Government of Papua New Guinea. In this matter, the people concerned were consulted in advance and their agreement was obtained, hence there were no problems. After the bridge construction, the farmland was restored to the original state, and there were no problems at the time of the ex-post evaluation[32].

(3) Unintended Positive Impact

Local contractors and local people were involved as sub-contractors and workers under the Japanese contractor for the bridge construction and they received technical training. This made it possible for them to be engaged in maintenance and repair work. When part of the Rotaovei Bridge was washed away, the local contractors and local people repaired it[33].

The beneficiary survey found that 196 respondents (96.6%) knew that the bridges were constructed with the assistance of Japan. It further asked how much it had changed their impression of Japan. Of 196 respondents, 145 (73.9%) responded “much better” and 35 (24.1%) responded “better”, indicating that it had greatly improved their impression of Japan.

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

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The bridges constructed in the project are operated and maintained by ABG which was established in 2000. Only one official from the Technical Service Department of ABG is solely engaged in maintenance of the bridges. The management of the Technical Service Department of ABG is broadly structured, and the official engaged in maintenance of the bridges is given a high degree of

[31] Based on interviews at ABG
[32] Same as above
[33] Same as above

discretion. Thus, appropriate maintenance depends on his judgment and efforts[34]. Although the bridges are listed in ABG's bridge inventory, the condition of the bridges is not updated in the inventory. Without his presence, no other officials know the condition of the bridges. Therefore, the organization of maintenance operations is not adequate.

Cleaning and weeding at bridges and culverts are undertaken by the communities near each bridge. Local people are organized into twelve groups, and they undertake cleaning once every month for 1-2 days with a 200-kina wage per person per day. Repair and construction of the bridges are undertaken by contractors by open bidding[35].

ABG plans to expand its organization by recruiting 2-3 new staff in 2015, and to divide the trunk road between Kokopau and Arawa into three sections, and one official will be in charge of one or two sections. The current official in charge will transfer his responsibilities to the new staff[36].

3.5.2 Technical Aspects of Operation and Maintenance

As described later in the section on operation and maintenance, operation and maintenance are adequately carried out, and ABG has an adequate level of technical capability. On the other hand, since only one official is in charge of maintenance, no one is trained and no manuals are prepared, and this is an issue. New recruiting should be carried out, responsibility for maintenance should be transferred, and new personnel should be trained.

At the time of construction of the bridges, no local contractors had an adequate level of technical capability, and they received training from the Japanese contractor as they constructed the bridges. At the time of the ex-post evaluation, the local contractors had acquired the technical capability necessary for repairing the bridges.

3.5.3 Financial Aspect of Operation and Maintenance

Table 11 shows the planned and actual expenditure. Usually, budgets are allocated by the submission of project proposals and the approval of ABG and the central government.

Since the necessary budget is allocated as shown in Table 11 and maintenance works have been appropriately implemented with this budget as shown in Table 12, it can be said that the financial status is no problem.

[34] Based on interviews at ABG
[35] Same as above
[36] Same as above

Table 11 Budget for Maintaining the Bridges Constructed in the Project
(budget and actual expenditure)

(Unit: Kina)

		2012	2013	2014
Budget	Item	3,000,000	3,000,000	1,926,000
Expenditure	Overhead costs (personnel, operation and maintenance of vehicles)	544,950	311,865	546,565
	Maintenance of facilities (repair and cleaning of bridges and others)	1,152,727	380,012	359,762
	Construction (river training)	36,993	42,977	709,473
	Total	1,734,670	734,853	1,615,800
	Difference	1,265,330	2,265,147	310,200

Source: ABG

3.5.4 Current Status of Operation and Maintenance

The project planning foresaw the operation and maintenance works as listed in Table 12. These works have been appropriately carried out, and the bridges constructed in the project are used for the most part without any problems.

On the other hand, the Rawa 1 Bridge has a problem with the gabion baskets that protect the banks. Young villagers with behavioral problems steal the wires from the gabion baskets for fishing. To prevent this, ABG plans to cover them with concrete[37].

[37] Based on interviews at ABG

Table 12 Planned and Actual Maintenance Works for the Facilities

Work Item	Location	Content of Work	Frequency			
			Planned	Actual		
				2012	2013	2014
Road and bridge maintenance	Whole facility	Update ABG's bridge inventory	Continuously	1	0	0
		Maintenance work based on the RAMS or BMS DOW system	Continuously	0	0	0
Bridge maintenance	Expansion joints	Cleaning of expansion joints, and if damage is detected, take photos and record the date	Twice per annum	10	12	12
	Drains	Cleaning of drainage pipes, and if damage is detected, take photos and record the date		10	12	12
	Bearings	Cleaning around the bearings. Confirm the movement and deterioration of elastomeric bearings.		10	12	12
	Handrails Guard Rails	Confirm the degree of deterioration and if damage is detected, take photos and record the date		10	12	12
	Steel Girders	Confirm the paint condition and rust. If problems are detected, take photos and record the date		10	12	12
	Abutment, Pier	Confirm local scouring and subsidence of the structure	After flooding	10	12	12
Approach road	Pavement	Repair potholes	Twice per annum	10	12	12
	Shoulder	Weed and level the shoulder		10	12	12
	Slope	Repair slope erosion		10	12	12
	Drain	Removal of deposits		10	12	12
Bank protection	Concrete blocks	Confirm movement due to erosion. Repair protection if problems are detected	Twice per annum and after a flood	10	12	12
Periodical bridge repair	Steel members	Prepare budget and repair	Every 30 years	0	0	0

Source: Basic Design Study Report (The actual frequency of maintenance work is based on responses from ABG)

The Rotaovei Bridge was closed from April 24 to May 15, 2014 since the approach road connecting the Trunk Road and the bridge was washed away, and part of the bridge collapsed. The approach road was washed away since the increased river water directly flowed onto it, and the soil was washed away. Part of the bridge was built on the soil and once the soil was gone, this part of the bridge collapsed. The approach road did not have the structural strength to withstand the direct flow of a large volume of water, and ABG should have trained the river so that increased water would not

directly flow onto the approach road[38]. The bridge and the approach road were repaired by local contractors who were subcontracted when the bridge was constructed. The Rotaovei Bridge has been open since May 16 without any problems. To prevent the same problem at the Rotaovei Bridge from happening again, ABG had completed river training at the time of the ex-post evaluation[39].

Some minor problems have been observed in terms of the institutional and technical aspects of operation and maintenance. Therefore, the sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to provide safe and stable transportation between Kokopau and Arawa by constructing fifteen bridges on Bougainville Coastal Trunk Road, thereby contributing to the stability of people's lives and socio-economic reconstruction. The relevance of this project was high since it is consistent with the development policies, sector policies and development needs of the recipient country and Japan's ODA policy. The efficiency of the project is high since the project was implemented within the schedule and budget. The effectiveness and impact of the project is also high. Although one bridge could not be used for a certain period of time, all the other bridges have been open throughout. The transportation time is reduced, the traffic volume has increased and transportation convenience is greatly improved. Operation and maintenance have been implemented appropriately, and the financial status is good. There are some organizational issues since only one official is engaged in the maintenance and there is also a minor technical problem. Therefore, sustainability of the project effects is fair. In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Although the bridges constructed in the project have been appropriately operated and maintained by ABG, only one official is engaged in operation and maintenance with great discretion. Thus, appropriate operation and maintenance depends on his judgment and efforts, and the organization of ABG regarding management and support is not adequate. Since no other officials were engaged in operation and maintenance at the time of the ex-post evaluation, ABG has no system for training junior officials for the future. From the above, in order to ensure sustainability, ABG should construct a system for managing and supporting the official engaged in maintenance and operation, and for training staff by recruiting new staff.

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[38] The evaluation did not take points off because of river development not included in the plan. This is because only the Rotaovei Bridge was closed for 22 days thanks to the early response by ABG, and ABG has already completed the measurements for river development to prevent the same thing from happening again. Thus, it did not cause any major problems in realizing the effectiveness and ensuring the sustainability of the project.

[39] Based on interviews at ABG

4.2.2 Recommendations to JICA

Although the bridges constructed in the project had no problems with regard to maintenance at the time of the ex-post evaluation, in order to ensure sustainability, JICA should urge ABG's technical service department to strengthen its organization and monitor progress.

4.3 Lessons Learned

(1) Importance of technical transfer for local contractors and people in island countries

Although local contractors and the people of Bougainville Island did not have an adequate level of technical capability at the beginning of the bridge construction, they acquired the necessary civil engineering knowledge and skills as they were engaged in the construction of the bridges under the Japanese contractor. This enabled them to complete the necessary repair work after the bridge construction was completed. In particular, since Bougainville Island had limited transportation access from other islands and transportation was costly, it was difficult to bring in contractors and workers from outside the island. Therefore, they had to train local contractors and local people.

This experience indicates that when local contractors and local people do not have an adequate level of technical capability at the beginning of project implementation in island countries, they may have to be trained through the engagement in the construction, so that they can engage in maintenance and repair work after project completion. Even if the project involves contractors from outside the island, the necessary repair work may not be done after project completion because the contractors with adequate technical capability may not stay on the island. Considering such necessity and possibilities, it may be useful to consider hiring local contractors and providing the necessary training and include it in the plan as a note.

(2) Importance of monitoring when the implementing agency does not have adequate operation and maintenance capability

ABG was only established in 2000 and it does not have adequate organizational capability. Appropriate operation and maintenance of the project is carried out through the individual efforts of the official in charge. When the implementing agency does not have adequate organizational capability, JICA should monitor the maintenance condition in order to ensure adequate operation and maintenance after project completion. If operation and maintenance is not adequately carried out, JICA should point this out, and it is desirable to include it in the plan as a note.

(3) Importance of ensuring the strength of structures surrounding the bridges

In this project, increased river water at the time of heavy rain washed away the approach road of the Rotaovei Bridge, and the bridge was closed because the river was not trained. The plan should have considered not only the structural tolerance of the bridge but also that of the other structures, and foreseen potential situations for all the concerned structures. JICA should have urged the implementing agency to make adequate arrangements accordingly and should have engaged in

follow-up activities during project implementation. As a lesson, in order to avoid situations where different structures with different strengths face stress and breakdown, the responsible parties should be clarified and implement the necessary work, and this should be included in the plan as a note to ensure its implementation.

Solomon Islands

Ex-Post Evaluation of Japanese Grant Aid Project

"Project for the Reconstruction of Gizo Hospital"

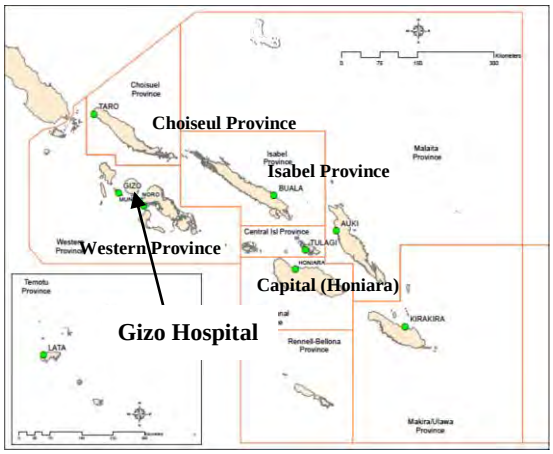
External Evaluator: Yukako Matsuura, International Development Center of Japan

0. Summary

The project aimed to improve the quality and quantity of medical referral services in the Western region of the country and secure a regional healthcare base in case of disasters, by constructing a new building for the deteriorated Gizo Hospital affected by the tsunami following the 2007 Solomon Islands earthquake as well as by providing necessary equipment. This objective has been consistent with development policies of the Government of Solomon Islands and needs of the country since the time of planning, as well as Japan's aid policies at the time of planning. The set target of beneficiaries was slightly ambitious because a part of the intended area has had no means of transportation to Gizo. The need to restore and improve the healthcare provided by Gizo Hospital was, however, extremely serious, and the project was considered highly relevant. The project cost borne by the Japanese side was kept within budget, whereas data for that on the Solomon side was not available. The construction period was extended, and the opening of the hospital was further delayed after the handover of the new building from Japan; accordingly the process efficiency was fair. Annual records of healthcare significantly vary year to year. A number of indicators of healthcare did not always meet the target criteria set as the ideal level of pre-tsunami caseloads, such as number of outpatients and inpatients, deliveries, and surgeries, whereas caseloads in dentistry, ophthalmology, and physiotherapy greatly increased. The physical conditions of the hospital environment were upgraded, and patients' satisfaction with the facilities and treatment was high. The project had a significant impact on people, especially those from remote islands who had received unsatisfactory healthcare but henceforth had access to qualified referral services. Presently, Gizo Hospital also functions as a disaster response hub. Moreover, visits by foreign medical teams to the hospital have increased; they provide more complicated surgeries. This outcome is counted as another impact of the project. Taking these facts into account, the project is assessed to have high effectiveness and impact. Maintenance management has also been greatly improved, and most of the provided medical equipment are used and well maintained. However, a number of issues in the water supply and ventilation systems remain unsolved. In addition, surgeons and obstetricians have not been assigned to the hospital; consequently, the sustainability of Gizo Hospital as a secondary referral hospital is rated as fair.

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

1. Project Description



Project Location

Old and New Gizo Hospital Buildings

1.1 Background

Solomon Islands is an island nation consisting of nearly 1,000 small and large islands located in the Pacific Ocean. The country is made up of nine provinces and a capital territory, Honiara City, encompassing an area of 28,900 km^2 with a population of 534,000 (2006). Its per-capita GNI was USD 680 (2006, World Bank). The health sector had suffered constantly from such problems as shortage of medical professionals, dilapidated facilities, and insufficient budget allocation. Rural areas were reported to have more serious demand for medical facilities due to the tribal conflicts from 1999 to 2003.

Gizo Hospital is the largest hospital in Western Province, the second largest province in the country with a population of approximately 72,000. Of the hospitals in Solomon Islands, Gizo Hospital ranked fourth for its bed capacity. It has been a referral hospital in the Western Province region, expected to cover the nearly 130,000 population in Western and Choiseul Provinces as well as a part of Isabel Province. Since its construction in 1959, the building has been extended and renovated in parts, eventually becoming a convoluted space whose layout hindered efficient movement in terms of providing medical services, even basic services. The shortage of space was also serious due to the increasing number of patients. Further extension of the old building was no longer realistic; therefore, in August 2006, the Government of Solomon Islands requested the Government of Japan for a grant aid to construct a new building adjacent to the old one for relocation.

On April 2, 2007, after the above request was submitted, a magnitude 8.1 earthquake hit the Western region of Solomon Islands and a subsequent tsunami caused serious damage to the facilities of Gizo Hospital. Houses of the hospital staff were destroyed, consequently disabling

the staff from providing hospital services. Inpatients and undamaged medical equipment were transferred to hospitals in Honiara and other places. As a result, the functions of Gizo Hospital were greatly restricted. The hospital restored its medical services gradually after the disaster; however, it definitely needed improvement to the dysfunctional layout of a maze of corridors, as well as expansion of the space itself for providing secondary referral services. Constructing a new building, and then relocating the hospital functions to it, was deemed necessary and urgent.

1.2 Project Outline

The project aimed to restore and improve the medical services of Gizo Hospital by constructing a new building for relocation and providing necessary equipment, thereby contributing to the improvement of the quality and quantity of medical referral services in Western region for the 130,000 residents in Western and Choiseul Provinces and a part of Isabel Province. Another expected impact was to secure a regional healthcare base during disasters.

Grant Limit / Actual Grant Amount	Detailed Design: JPY 72 million / JPY 72 million Construction and Equipment: JPY 1,900 million / JPY 1,691 million
Exchange of Notes Date (/Grant Agreement Date)	Detailed Design: February 2009 (/February 2009) Construction and Equipment: June 2009 (/June 2009)
Implementing Agency	Ministry of Health and Medical Services (MHMS)
Project Completion Date	March, 2012[1]
Main Contractor(s)	Construction: Kitano Construction Corp. Equipment: NBK Corporation (Nanyo Boeki Kaisha, Ltd.)
Main Consultant(s)	Nihon Sekkei Co., Ltd.
Basic Design	November 2008
Detailed Design	September 2009
Related Projects	[Technical Cooperation] Japanese Technical Cooperation Project for the Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (February 2011 to February 2016) [Grant Aid for Grassroots Human Security] Rehabilitation Plan for the Gizo Hospital Wharf and Jetty (Ministry of Infrastructure Development of Solomon Islands, JPY 9.9 million, 2007) [Japan Overseas Cooperation Volunteers (JOCV)] Nursing (two years from March 2011, two years from July 2013), Medical equipment (two years from October 2013)

[1] The opening of the new Gizo Hospital was delayed until March 2012; JICA handed over the new building and equipment to the hospital in August 2011. In light of the project objective, project duration is defined as the period up to the opening and operational commencement of the new hospital.

2. Outline of the Evaluation Study

2.1 External Evaluator

Yukako Matsuura, International Development Center of Japan, Inc.[2]

2.2 Duration of Evaluation Study

Duration of the Study: August 2014 to September 2015

Duration of the Field Study: October 13 to 24, 2014, and February 9 to 13, 2015

2.3 Constraints during the Evaluation Study

The health sector of Solomon Islands suffers from a widespread lack of records and statistical data.[3] Records of medical treatments are collected and kept manually at Gizo Hospital. Certain parts of operations and treatment ledgers were missing at this evaluation, and certain data were unreliable. Therefore, parts of this evaluation are based on data whose accuracy and credibility could not be fully confirmed.

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

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance to the Development Plan of Solomon Islands

At the time of project planning, the Government of Solomon Islands set forth the restoration of basic social services as its overarching goal, such as health and education, in "National Economic Recovery, Reform and Development Plan 2003–2006," and the subsequent "Medium-Term Development Strategy 2008–2010" also emphasized the significance of health, especially rural health facilities, rural water supply, and infectious diseases control, such as malaria. The "National Health Strategic Plan 2006–2010" aimed to reinforce primary healthcare service as an important agenda and laid out policies to set up a healthcare system that focused on preventive medicine and to expand secondary medical services.

The "National Development Strategy 2011–2020" in force at the ex-post evaluation prioritizes qualified healthcare, and its implementing plan "Medium-Term Development Plan 2014–2018" intends to provide qualified secondary medical services to the entire nation by 2018. The "National Health Strategy Plan 2011–2015" emphasizes health

[2] The evaluator is a consultant of International Development Solutions, Inc. and assisted International Development Center of Japan with this ex-post evaluation.

[3] "National Health Strategic Plan 2011–2015 (MHMS)" admits that health information in provinces as well as at the National Referral Hospital (NRH) are collected manually without being entered into a database, and counting and calculation are impossible for many health indicators without relying on estimates and compromising amid conflicting data from different sources.

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

[5] ③: High, ②: Fair, ①: Low

promotion and preventive services through provincial health programs to improve health services qualitatively and quantitatively. Based on the policy review, the objective of this project is assessed as being in line with the development strategies and plans of Solomon Islands from the planning to the ex-post evaluation.

3.1.2 Relevance to the Development Needs of Solomon Islands

The provision of qualified healthcare to the entire nation of scattering islands has been an important agenda in Solomon Islands, to be achieved by strengthening rural health facilities. The shortage of physicians has been serious[6], and many primary health facilities lack sufficient water and power supplies; accordingly, referrals to secondary health facilities are high. This project thus needed to focus on a secondary medical facility that would serve a sizable number of beneficiaries.[7]

To ensure nationwide secondary and tertiary health services, the Ministry of Health and Medical Services (MHMS) has divided six main islands and a thousand of the surrounding small islands into four blocks to establish a system: the central part would be covered by the National Referral Hospital (NRH), the only tertiary hospital in the country, the northeastern part by Kiluifi Hospital, the eastern part by Kirakira Hospital, and the western part by Gizo Hospital.[8] Under these circumstances, Gizo Hospital was the appropriate choice for this project because its facility was the most decaying and affected by the 2007 tsunami disaster when the project was requested and designed.

The target setting of 130,000 beneficiaries is assessed as slightly ambitious. According to the JICA Project Formulation Survey for Earthquake and Tsunami Rehabilitation and Reconstruction in Solomon Islands conducted from April to May in 2007, before the disaster, Gizo Hospital provided services to approximately 100,000 persons consisting of 75,800 residents in Western Province, 24,200 residents in Choiseul Province, and others from a part of Isabel Province.[9] One year after the survey, the project was designed to set a population of 130,000 as expected beneficiaries.[10] Practically, access to Gizo Hospital depends on sea lane. However, there has been no traffic between Gizo Island and Isabel Island since the project designing stage, and is no prospect of launching such a lane even

[6] The total number of physicians in the country in 2009 was 118 according to the WPRO Country Health Information Profile 2011 (http://www.wpro.who.int/countries/slb/31SOLtab2011_finaldraft.pdf?ua=1).
[7] The construction of a primary healthcare facility requires securing water source and installing water and electricity supply systems; thus, the cost per beneficiary tends to be higher. Therefore, targeting a secondary facility was appropriate in light of cost-benefit performance in this project.
[8] Interview with MHMS Permanent Secretary in February 2015
[9] Report of JICA Project Formulation Survey for Earthquake and Tsunami Rehabilitation and Reconstruction in Solomon Islands, August 2008
[10] Basic Design Study Report on the Project for the Reconstruction of Gizo Hospital in Solomon Islands did not refer to any information on transportation to Gizo Hospital from outside of Gizo Island nor to actual visit records. A justification for the 130,000 population target was not provided as well.

at the ex-post evaluation. Residents of Isabel Island currently receive secondary medical services in Honiara City, the capital, and only a few patients residing in islands close to Gizo would come to Gizo Hospital by their own boat or canoe. According to a 2009 population census, the most recent census available at this evaluation, the realistic number of beneficiaries is roughly 100,000 persons.[11] The capacity of the hospital building and facility was designed based on records of treatment from 2004 to 2006; as a result, the overestimation of beneficiaries did not affect the scale and capacity of the hospital. In the end, Gizo Hospital was designed to serve, and has been serving, the needs of 100,000 people throughout the project, whereas it was impractical to include patients from Isabel Island.

3.1.3 Relevance to Japan's ODA Policies

From the project planning stage to the ex-post evaluation, the Government of Japan consistently supported the development of the Pacific Islands, including Solomon Islands, as a partner and active member of the Pacific Islands Leaders Meetings. The Fourth Japan–Pacific Islands Forum Summit Meeting sets forth primary healthcare as an important agenda, and the fifth and the following Forum Summit Meeting promote "Overcoming Vulnerabilities and Promoting Human Security," with particular emphasis on supporting healthcare facilities. As regards the health sector of Solomon Islands, the Government of Japan and JICA have joined in aid coordination network since 2009, based on the partnership arrangement[12] between the Government of Solomon Islands and health development partners. From these aspects, the project was assessed as being in line with Japan's ODA policy.

In short, this project has been highly relevant to the country's development plan and Japan's ODA Policy. Although the target of the project was set slightly ambitiously in terms of the number of beneficiaries, the project was consistent with the urgent development needs to recover from the disaster and strengthen the secondary healthcare foundation of the country. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

[11] According to the most recent 2009 population census, the population of Western Province was 76,649, and that of Choiseul Province was 26,372, for a total of 103,021 for both. Isabel Province had a population of 26,158 (http://www.spc.int/prism/solomons/).

[12] "The Partnership Agreement between the Solomon Islands Government (MHMS) and Health Development Partners." The partners included Government of Australia, World Health Organization, International Development Association (World Bank), United Nations Children's Fund, United Nations Population Fund and Government of Japan.

The project aimed to restore and improve the medical services of Gizo Hospital by constructing a new building for relocation and providing necessary equipment. The project also included soft component to transfer skills for maintenance of the hospital. Outputs were mostly achieved as planned.

Table 1: Outputs (Departments and Facilities)[13]

	Original Plan	Actual Outputs / Changes
First Floor		
Outpatient Department (OPD)	General, emergency, special clinics (internal medicine, surgery, obstetrics and gynecology, ophthalmology, dental clinic, physiotherapy, and traveling clinic)	As planned (After the handover, the hospital placed 20 additional beds in the OPD for outpatients staying overnight.)
Medical imaging	X-ray, Ultrasonic	As planned
Medical tests	Biochemical, bacterial and TB laboratories, blood test, and blood bank	Extra toilets added; others were as planned
Administration	Pharmacy, office, duty	Most of the administration functions, except for the reception, remained in the old building, including the director's office.[14]
Service	Radio room	A radio system was installed in the reception.
Second Floor		
Operating theater	Theater (1 major and 1 minor)	Location of outdoor unit of air conditioner was adjusted; others were as planned
Central sterilizing and supply	Washing room, sterilization room	As planned
Delivery	Labor, delivery (2), nursery	As planned
Wards	Male, female, pediatrics, maternity, HDU, isolation (62 beds in total)	70 beds installed at this evaluation (male, 14; female, 20; pediatrics, 12; maternity, 14; HDU, 6, isolation, 4)
Services	Electric room	As planned
Others		
Sewage treatment plant and control room		The shape of the sewage tank was modified.
Generator		As planned
Water reservoir tank		The arrangement of the water reservoir tank and machines was adjusted.

[13] The total site area was 9,000 m^2, and the total floor area was 3,903.85 m^2, including the hospital building (3,783.26 m^2), pumping room (9.35 m^2), and sewage treatment plant (111.24 m^2), laid out as planned.

[14] The administration department has been in charge of provincial health administration. The decision was therefore made to leave the department in the old hospital building in light of its mandate and to maximize the limited space (interview with the hospital management).

Others	The shape of the roof and lighting window was changed; the entrance's sloping direction was shifted; the range of glass blocks was adjusted.

Source: Basic Design Study Report and Documents provided by JICA

Table 2: Outputs (Equipment)

Original Plan		Actual Outputs / Changes
OPD	Examination lights, slit lamps, dental chairs, nebulizers, etc.	The specs of the dental compressor were changed.
Emergency	Examination couches, nebulizers, emergency medical kits, etc.	As planned
Physiothera-py	Hot pack heater, examination couches	As planned
X-ray	Mobile X-ray machine, ultrasound machine, X-ray viewer, dental X-ray machine, etc.	As planned
Laboratory	Spectrometer, automatic water distillation machine, autoclave, electric balance, etc.	As planned
Pharmacy	Automatic water distillation machine, electric balance, refrigerator, etc.	As planned
Operating theater	Operating light and table, anesthesia machine with ventilator, bedside monitor, defibrillator, autoclave, electrosurgical unit, etc.	The specs for the anesthesia machine were modified.
Central sterilizing and supply	Autoclave	As planned
Obstetrics	Delivery tables and beds, incubator, phototherapy unit, infant warmer, etc.	As planned
HDU	Suction unit, bag resuscitator with adult and pedia masks, stretchers, Gatch beds, etc.	As planned
Maintenance	Maintenance set	As planned

Source: Basic Design Study Report and Documents provided by JICA

Changes and adjustments to the specifications of certain facilities, as well as placement, were made according to the hospital's requests. These adjustments were all minor and necessary for better use and maintenance of facilities, and thus regarded appropriate, causing no major changes to the project duration and budget. Changes in equipment were also limited, and most items were installed and then used as planned.

Trainings for the operation and maintenance were conducted by Japanese consultants as planned, as a soft component of the project. The deliverables submitted by the consultants

were the following: proposals for the maintenance structure, budget plan, and total management system, which were drafted based on analyses of the old hospital's maintenance conditions. They also prepared manuals, ledgers, repair request sheets, maintenance flowcharts, and other documents useful for the maintenance of facilities and equipment as well as for waste management; these were presented to concerned personnel in Gizo Hospital and NRH in July 2010 and May and August 2011.[15] Most of the training participants have remained in service at Gizo Hospital. Thus, appropriate personnel were selected for the training.

The pre-construction undertakings of the Government of Solomon Islands were mostly implemented as planned, such as repair of the hospital jetty, construction site preparation and demolition of existing facilities, improvement of drainage, and staff housing construction. Undertakings during the construction, such as the implementation of the public power and water supply projects; installation of a sewer pump for the public septic tank; preparation of access street and drainage facilities in front of the site; and preparation of the electricity wiring, telephone line, and water supply piping connection to the project site, were also implemented by the Solomon Islands side as planned. However, significant delays occurred in the post-construction undertakings of Solomon Islands, such as the purchase of furniture and supplies, relocation of existing furniture and equipment (including X-ray equipment), transfer of patients to new wards, and construction of walls and fences surrounding the new hospital site (See also 3.2.2.2 Project Period).

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project was implemented within the planned budget. According to the plan, the project budget from the Japanese side was JPY 1,972 million; the actual cost was JPY 1,691 million, or 86% of the original budget. The project budget from Solomon side was initially estimated to be JPY 79 million; the actual budget used was unavailable at both Gizo Hospital and MHMS. As such, the total project cost was therefore impossible to evaluate by comparing the original budget and actual cost.

3.2.2.2 Project Period

The project was estimated to take 25 months from February 2009: 4 months for detail designing, 3 months for tendering, and 18 months for construction work. The construction period was prolonged for five months; the completion and handover were pushed to August 2011. To be specific, tendering was delayed for a month awaiting confirmation

[15] Documents provided by JICA.

from the Government of Solomon Islands as regards assurance of the necessary electricity supply. Another extension of four months was needed for construction work owing to a delay in the visa issuance to construction workers from a third country as well as a delay of the cement supply due to a machine breakdown at a domestic cement factory. Gizo Hospital initially planned to open the new hospital with a ceremonial event upon completion of the undertakings of Solomon Island, such as installation of new furniture, walls, and fences, and a new kitchen and laundry area which were later added with Australian support.[16] However, these undertakings were significantly hampered and postponed. The hospital therefore compromised to start services after furniture was placed and patients were transferred in March 2012, foregoing a formal opening. It took seven months from the handover of the new building to the commencement of services, but there were few negative impacts on patients because healthcare was still available at the old hospital. In light of the core mission of the project, which was to improve the medical services of Gizo Hospital, the launch of medical services at the new hospital, and not the handover, should mark the project's completion. Hence, the project period is assessed to be extended by 12 months or a 148% delay from the original plan.

In sum, the project cost was within the original plan, but the project period exceeded the plan considerably. Therefore, the efficiency of the project is fair.

3.3 Effectiveness[17] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

In this project, the operational indicators were the number of outpatients, inpatients, deliveries, and surgical operations accommodated at the hospital. The expected outcome was to restore these medical services to their pre-disaster level, or 2006 level. In addition to these operation and effect indicators (shown in Table 3 and Figure 1), other services provided only at a secondary facility, such as dentistry, ophthalmology, physiotherapy, X-ray and ultrasound examinations, and bloods testing, were also reviewed in this ex-post evaluation for measuring effectiveness (as shown in Figures 2 and 3).

The number of outpatients steadily rose in 2012 and 2013, but the record in 2014, which was reported as a preliminary figure for this evaluation, revealed a sharp drop to below half the number of the previous year. The hospital staff expressed their doubt of the

[16] The construction of a kitchen and laundry area in the new hospital was launched with financial support from the Australian Government. However, construction ceased midway because of corruption issues on the constructors' side. The new kitchen and laundry area were listed in the original request of this project; therefore, their necessity was assessed at the Basic Design Study phase. Ultimately, they were excluded from the project after the Japan and Solomon Islands sides agreed that both facilities in the old compound could be used.

[17] Sub-rating for Effectiveness is to be considered with that of Impact.

record and considered it unreliable, although they acknowledged a decrease in the number of outpatients to a certain degree after doctors and nurses of the hospital launched medical tours to remote islands in 2014 and primary health facilities began providing basic treatments.[18] Assuming that the 2014 record is probably miscounted at the information section,[19] the indicator of number of outpatients was evaluated based on the increase in 2012 and 2013. In terms of this indicator, the project has achieved a certain level of effectiveness. Meanwhile, the admission of inpatients has not been recovered to the 2006 level. A plausible reason for this phenomenon could not be identified, although sources mentioned that the number of patients who are treated sufficiently at OPD had been increasing.[20] The number of treated deliveries changed year to year, but the records in 2012 and in the target year 2014 significantly exceeded the level of 2006; thus, the function of delivery service was confirmed as having being restored sufficiently. The number of surgical operations has not yet been recovered to the 2006 level because a surgical doctor left the hospital after the tsunami. However, visits of foreign medical teams from Australia and other countries have increased after improvement of operating theatre through this project,[21] which has widened a range of operable cases and increased the caseload of major surgeries, as shown in Figure 1 and Table 4. Many patients and staff indeed replied in the beneficiary survey for this evaluation that through the project, surgical operation has been the most improved among all the medical services. Therefore, this evaluation concluded that the project had an impact on surgical operations, focusing more on types and ranges of surgeries[22] rather than the caseload alone.

Table 3: Quantitative Effects (Operation and Effect indicators)

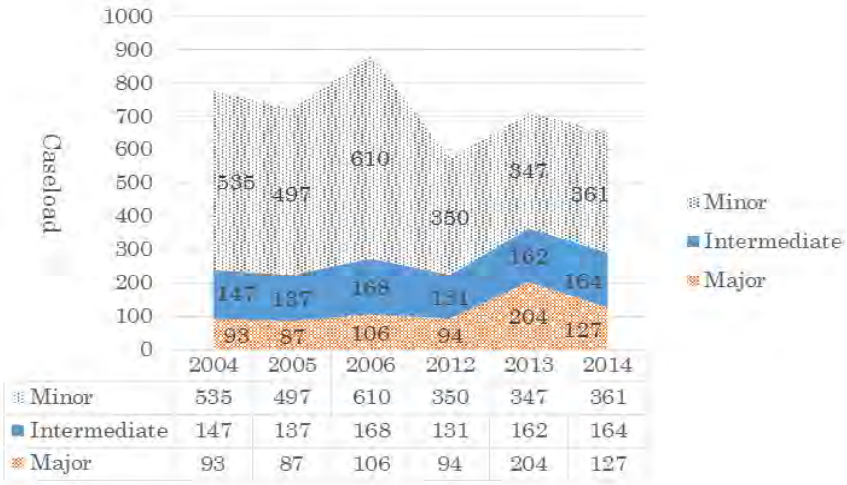
	Baseline	Target	Actual		
	2006	2013	2012	2013	2014
	Baseline year	Two years after completion	Completion year	One year after completion	Two years after completion
Outpatients (person/year)	27,740	Restore/ Increase	29,886	36,112	16,434 (*1)
Inpatients	1,812	Restore/	1,584	1,390	1,422

[18] The medical touring team of Gizo Hospital visits four clinics every week and goes around almost all of the major clinics in the province for over two months. (Interview with Gizo Hospital management)
[19] A ledger for 2014, a main source of the database, was not available at the nursing department at the time of the field visit for this evaluation. No other record was provided by the hospital director and nursing department.
[20] The average annual admission from 2004 to 2006 was 1,844; the record for inpatients in 2006 was not unusual.
[21] Foreign doctors and nurses voluntarily set up a medical team and visit Gizo Hospital for about two weeks to conduct surgical operations. Teams with various specialties have supported the hospital. (Interview with Gizo Hospital management)
[22] Surgical treatment is categorized into three levels at Gizo Hospital as follows. Major operations: salpingo-oophorectomy, Caesarean section, cataract extraction, laparotomy, etc. Intermediate operations: appendectomy, hernia repair, varicose veins operation, tubal ligation, split-thickness skin graft, etc. Minor operations: abscess incision, gastroscopy, excision/biopsy of lesion, toe amputation, debridement, etc.

(person/year)		Increase			
Deliveries (case/year)	589	Restore/ Increase	641	305	765
Operations (case/year)	884	Restore/ Increase	575	713 (*2)	652

Source: Basic Design Study Report and Documents provided by JICA
*1: Preliminary data, February 2015
*2: Record for 11 months in 2012 with the missing records from August 2012 excluded.

Figure 1: Record of Surgical Operations



	2004	2005	2006	2012	2013	2014
Minor	535	497	610	350	347	361
Intermediate	147	137	168	131	162	164
Major	93	87	106	94	204	127

Source: Basic Design Study Report and Documents provided by Gizo Hospital
Note: Caseload of 2012 was for 11 months with the missing records from August excluded.

Table 4: Surgical operations provided at the new Gizo Hospital

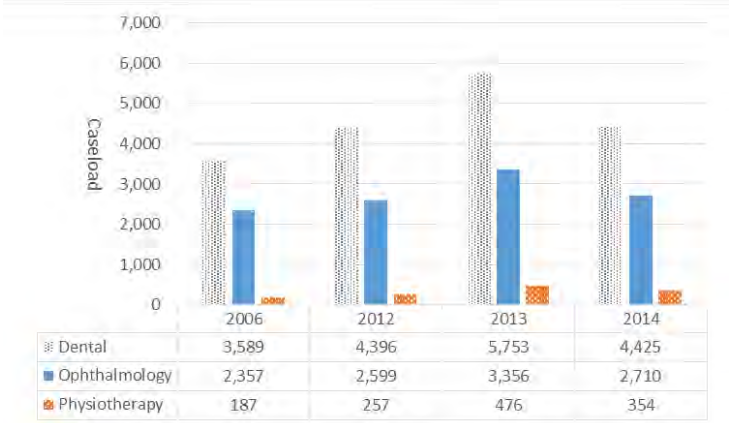
Routine surgeries	Surgeries provided with the support of foreign medical teams
Diabetes-related amputation, incision of abscess, Caesarean section, tubal ligation, fracture, suturation, appendectomy, abortion, removal of foreign body	Cataract extraction, plastic surgery, laparotomy, cholecystectomy, hernia repair, hysterectomy, scrotectomy, arthroscopy, thyroidectomy, split-thickness skin graft

Source: Interview with Gizo Hospital

Caseloads for dental treatment, ophthalmologic treatment, and physiotherapy exceeded the target figures of 2006, as shown in Figure 2[23]. Patients with obesity, diabetes, diabetes-related ophthalmologic diseases, peripheral neuropathy, and quadruple amputation caused by peripheral hypo-perfusion are increasing. Accordingly, Gizo Hospital has been strengthening preventive medical checkups as well as physiotherapy for amputees. The number of a series of examinations, except biochemical examination and X-ray, is also increasing (Figure 3).

[23] A reason for the sudden decrease in 2014 after the steady increase until 2013 was not identified.

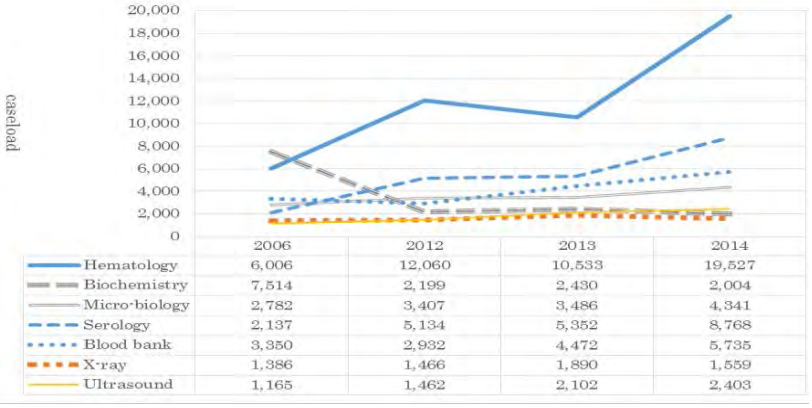
Figure 2: Records of Dental Treatment, Ophthalmologic Treatment, and Physiotherapy



	2006	2012	2013	2014
Dental	3,589	4,396	5,753	4,425
Ophthalmology	2,357	2,599	3,356	2,710
Physiotherapy	187	257	476	354

Source: Basic Design Study Report and Documents provided by Gizo Hospital

Figure 3: Other Examinations



	2006	2012	2013	2014
Hematology	6,006	12,060	10,533	19,527
Biochemistry	7,514	2,199	2,430	2,004
Micro-biology	2,782	3,407	3,486	4,341
Serology	2,137	5,134	5,352	8,768
Blood bank	3,350	2,932	4,472	5,735
X-ray	1,386	1,466	1,890	1,559
Ultrasound	1,165	1,462	2,102	2,403

Source: Basic Design Study Report and Documents provided by Gizo Hospital

3.3.2 Qualitative Effects

Indicators for qualitative effects were not set at the project planning stage. In the ex-post evaluation, a beneficiary survey was conducted to measure the satisfaction of patients and hospital staff as regards the safety, efficiency, amenities, and improvement in medical services of the new hospital by comparing the satisfaction levels for the old and new hospitals. In addition, the qualitative effects of operations and maintenance training were also analyzed through interview and observation.

<Patient Satisfaction>

Out of a total of 165 respondents, 95 respondents who had used the old hospital rated both the old and new hospital buildings.[24] Their satisfaction with the new hospital was

[24] Five enumerators (three males and two females) interviewed patients to fill out a questionnaire for a week, except Sunday. A total of 165 patients responded: 85 males and 80 females. The 20s and 30s age groups comprised half of the total respondents, followed by the 40s age group. In terms of area, 90% of the respondents (149) were from Western Province and 7% (12) from Choiseul Province. In terms of ethnicity, 88% (145) were Melanesian and 11%

high overall and especially, their satisfaction with the cleanliness and amenities of the new building was remarkably high, changing significantly between the before and after the project (Figure 4). Satisfaction with the overall quality of services also increased as well as with other aspects with which the project did not intervene, such as staff politeness/kindness, clarity of instructions, drug availability, and opening hours. The survey revealed that the project contributed to the higher satisfaction of patients as regards overall hospital facility and healthcare services, especially with the amenities and hospital environment, which was clean and comfortable and with enough waiting space surrounding a bright courtyard. Patients and staff greatly appreciated the clean environment; the high awareness toward cleanliness and sanitation in the hospital was deemed deserving of being called a first-class hospital in the country.

Figure 4: Comparison of Patients' Satisfaction with the Old and New Hospital Buildings

<Hospital Staff Satisfaction>

In the beneficiary survey of hospital staff[25], 34 out of the 36 respondents (94%) gave a high rating for the cleanliness of the new hospital, whereas 31 (86%) appreciated the amenities, followed by the layout improvement for patients and staff (Figure 5). As to equipment, 22 members of the staff (61%) were satisfied with easy use of equipment, although few (11 members, 30%) agreed with the item on easy maintenance. The results suggest that staff gradually undertook "maintenance" of equipment; many broken machines and facilities had been derelict in the old hospital. In comparison with the old hospital, the new one has better environment and amenity, which is pointed out by 75% of the respondents as the most significant change (Figure 6). Among the medical

(18) Micronesian. Degree of satisfaction was graded on a scale from one to five: 5-excellent, 4-satisfactory, 3-moderate, 2-poor, and 1-very poor.

[25] A questionnaire was filled out by 36 hospital staff members: 2 doctors, 12 nurses, 9 lab technicians, 6 maintenance staff members, 1admnistration staff member, 2 pharmacists, 3 health promotion staff members, 1 physiotherapist; 22 males and 14 females. As for years of experience, the survey indicated the following: less than a year, 1 staff member;1 to 5 years, 11; 6 to 10 years, 6; 11 to 20 years, 8; and more than 20 years, 10.

services, surgical operations and the general outpatient practice were chosen as the most improved (Figure 7).

Figure 5: Staff Satisfaction with the New Hospital

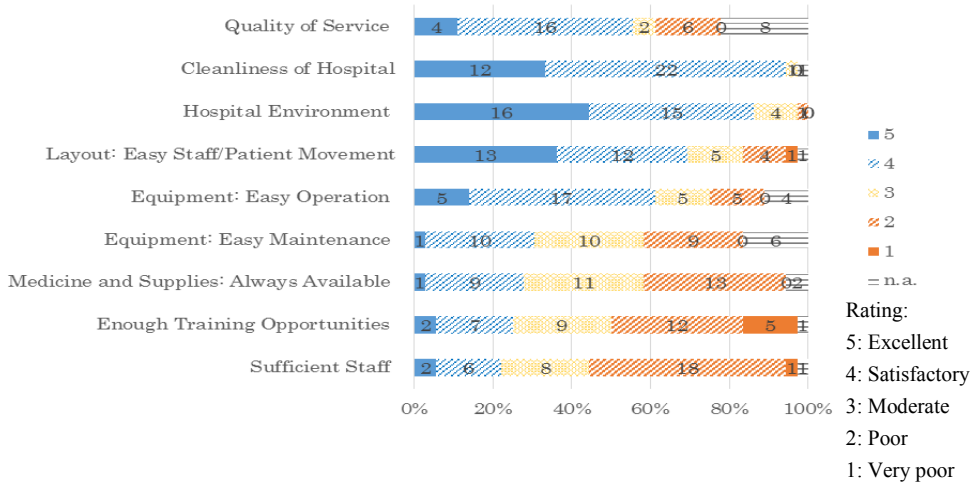


Figure 6: Most Improved Aspect from the Old Hospital

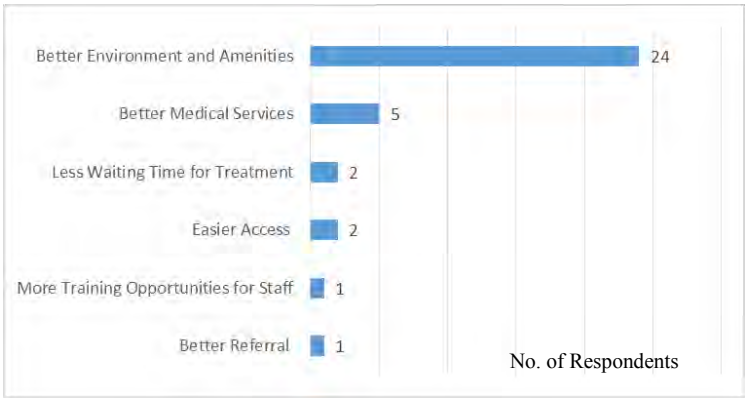
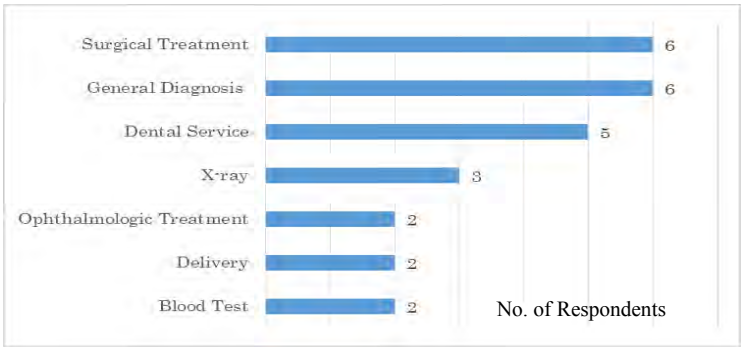


Figure 7: Most Improved Medical Service from the Old Hospital



The staff also responded to the most frequently heard complaints from patients. A total of 66% of the staff chose "time for waiting" as the most frequent, followed by "attitude of hospital staff," marked by 25 % of the responded staff. These complaints had been heard in the old hospital, and the hospital management is eager to tackle them, especially the work management of the staff, after the hospital got on the proper track toward proper management of operations and maintenance of the hardware installed by the project[26]. Further, a significant number of staff members and patients expressed their concern on the distance from OPD to the nearest toilets; there were reports of cases of diarrhea patients who failed to reach the toilet and ended up spreading diarrhea stool along the corridor. Thus, careful consideration was expected to decide the allocation of toilets near the OPD at the project planning phase.

Maintenance improvement was also confirmed from an interview with the maintenance department and observation of its workshop. The staff has come to understand the significance of maintenance. They have set up a managing system, made maintenance a part of their daily routine, such as regular check-up of equipment and facilities, introduced maintenance log and budgeted the maintenance cost. These progresses are considered as fruits of the operation and maintenance training conducted as a soft component of project. Meanwhile, a comment of the maintenance staff on the timing of the training is worth mentioning: the training was conducted ahead of the construction completion and relocation, without equipment and facilities to be maintained, and thus, it was challenging for the participants to capture the practical skills for maintenance and repair.

In sum, the project had effectiveness, with outpatients and delivery caseloads reaching the expected goal based on the changes over the recent years, although the number of inpatients has not been recovered to the 2006 level. Effectiveness was also confirmed in the expanded surgical operation capacity based on the fact that operable types of cases increased, although the annual operations caseload has not been recovered to its level in 2006. Moreover, the dental, ophthalmologic, and physiotherapy clinics are better equipped to treat more patients compared with the case in 2006. The hospital's examination capacity also demonstrated an upward trend, such as blood-related tests and ultrasound test, with exceptions of microbiology tests and X-ray imaging. Quantitative effectiveness is confirmed to have reached the expected goal as a whole. Qualitative effectiveness is also upheld with the high satisfaction of patients and staff as regards the facilities and medical services at the new hospital, particularly for amenities. Advancement in maintaining

[26] Interview with Gizo Hospital Director. Staff capacity building was out of the scope of the project; therefore, the attitude of the hospital staff was not counted in assessing "effectiveness" in this evaluation. However, the result of the beneficiary survey was shared with Gizo Hospital as a reference for reforming hospital management.

equipment and facilities has been also observed. Consequently, the effectiveness of the project is high.

3.4 Impact

3.4.1 Intended Impact

3.4.1.1 Healthcare Reaching 130,000 Residents in Western Region through Referral Service

Approximately 100,000 residents in Western and Choiseul Provinces have been evidently covered by the referral services of Gizo Hospital, out of the targeted 130,000 beneficiaries that boldly included Isabel residents who have no access to Gizo, as described earlier in 3.1.2 "Relevance to the Development Needs." Healthcare, including delivery services, is largely provided in a challenging environment: water and electricity supply are not sufficient even at comparatively well-organized Area Health Centers (AHCs), which are primary healthcare facilities. Rural Health Clinics (RHCs) and Nurse Aid (NA) under AHCs have further difficult conditions, including shortage of medical personnel and drugs. Under such circumstances, more patients are reportedly coming to Gizo Hospital, bypassing the referral flow of NA to RHC to AHC to Gizo Hospital.[27] Qualified free referral services, including safe delivery, available in the improved environment of Gizo Hospital have evidently given a positive impact on people's life. Referral cases from Gizo Hospital to NRH, the only tertiary medical facility in the country, are reportedly decreasing owing to the broadened capacity of medical services at Gizo Hospital.

However, it was difficult to back up the above notion and to analyze pre-post traits with statistical data comparatively, because the credibility of the 2006 baseline data was not confirmed. Moreover, the counting method for referrals has been inconsistent. Therefore, it was impossible to compare the pre- and post-renovation changes of the hospital and then quantify the impact from available data (Table 5). According to the hospital director, the figure 1,200 referral cases from Gizo to NRH in 2006, or equivalent to 23 cases per week, was unrealistic financially and physically. Further, the 2014 record was divided into emergency and non-emergency cases; however, such categorization was not available in 2006, 2012, and 2013.

[27] In referral case, the travel cost is borne by the hospital in case of emergency recognized by the hospital; otherwise, the cost is borne by the patient or his/her family. In recent years, the number of self-paying patients is rapidly increasing according to hospital management.

Table 5: Referral Record

	2006	2012	2013	2014
Referral cases from first medical facility (case/year)	589	444	N/A	Total: 2,309 Emergency: 583 Non-emergency: 1,726
Referral cases to NRH (case/year)	1,200	129	119	Total: 25 Emergency: 18 Non-emergency: 7

Source: Basic Design Study Report, Documents provided by and interview with Gizo Hospital

3.4.1.2 Tackling the Healthcare Gap between the Main Island and Isolated Islands

Gizo Hospital has launched outreach tours by medical doctors and nurses to surrounding clinics in Western Provinces since 2014. With this effort, clinics in isolated islands now receive healthcare provided by doctors bimonthly.[28] Moreover, sterilization of medical appliances used in surrounding clinics is performed by Gizo Hospital.[29] In this manner, Gizo Hospital contributes to reducing the healthcare gap between Gizo and the isolated islands.

3.4.1.3 Improving the Health Indicators of Solomon Islands

Western Province was ahead in terms of such national health indicators of infant mortality rate and maternal mortality rate, both at the planning phase and ex-post evaluation (Table 6). However, causal relations could not be identified between the changes in the data and project intervention. The credibility of the provided data could not be examined owing to limited information. Health data from Isabel and Choiseul Provinces were unavailable; thus, for the statistics for Western region, the target area was not calculated.

Table 6: Change in Health Indicators (National average and Western Province)

	At the planning phase (2006)	At the ex-post evaluation (2014)
Population	National Total: 478,000 Western Province: 75,800	National Total: 515,870 (2009) Western Province: 76,649 (2009)
Infant Mortality Rate (per 1,000 live births)	National Average: 20.7 Western Province: 10	National Average: 26.0 (2009) Western Province: 4 (2009) 10 (2013)
Maternal Mortality Rate (per 100,000 live births)	National Average: 130 Western Province: 88	National Average: 103 (2007) Western Province: 1 (2009), 6 (2013)

[28] Interview with the Director of Gizo Hospital and nurses.
[29] Interview with a Japanese volunteer nurse dispatched to Gizo Hospital (Japan Overseas Cooperation Volunteers).

Source: Basic Design Study Report, Documents provided by and Interview with Gizo Hospital
Note: Years in parentheses indicate the year of the most recent data available. All data at the planning were from 2005.

3.4.1.4 Strengthening the Function of Base for Disaster Response in Western Province

A base for disaster response is defined as an operational center equipped to provide medical services at the time of disaster and to function as hub for gathering disaster-related information by using radio and other communication means.[30] In light of this definition, Gizo Hospital is assessed to have already performed such function; the Red Cross conducted damage assessments by using the hospital's radios in disasters, such as cyclones.[31] The Red Cross in Gizo has a desire to develop an emergency response plan in collaboration with Gizo Hospital, and if this plan is put into practice, the function of Gizo Hospital as a base for disaster response would be further strengthened.

3.4.2 Other Impacts

3.4.2.1. Impacts on the Natural Environment

At the effluent treatment facility of Gizo Hospital, wastewater is clarified with depurative material according to treatment standards. Effluent treatment has been greatly improved at the new hospital; in previous days at the old hospital, non-treated wastewater was discharged and allowed to flow directly into the ocean. In medical waste management, waste collection has been better managed, with sorted waste collected routinely. Meanwhile, the incineration process needs further improvement; the incinerator operator needs better protection from secondary infection and unexpected accidents, such as by wearing the appropriate protective outfit. Moreover, a surrounding wall of the medical waste incinerator is partially damaged, and boxes of collected waste are left lying around until the incinerator is turned on. Better storage of collected waste and recordkeeping of the incinerator operation are necessary. In the current waste management, negative environmental impacts have not been observed, including hazardous smoke and smell, which may hinder project objective and effectiveness. As for the management of biological and pathological waste, such as placenta, human tissue, and body parts, MHMS does not have any standardized procedures and sees no problem in using a landfill for these types of waste. Incineration is desirable for these waste types; nonetheless, it is concluded that the current medical waste management is not causing any serious negative impact at the ex-post evaluation, based on the fact that Gizo Hospital takes the best option

[30] The definition of "a base for disaster response" was not clear at the time of planning of the project. For the ex-post evaluation, an original expectation for "a base for disaster response" was identified through interviews with concerned officials and consultants and set as baseline for evaluation.
[31] Interview with a representative of Red Cross in Gizo.

available in the current condition by dumping the waste into mountain sites isolated from residential areas; so far, no environmental risks are reported.

3.4.2.2 Land Acquisition and Resettlement

Several interviews with concerned officials revealed that a few houses were resettled for the new hospital construction. The resettled households were provided with land to move to by Western Province under the Ministry of Provincial Government and Institutional Strengthening, which is in charge of land registration; these families also received proper compensation from MHMS without any troubles.[32] The Ministry of Provincial Government and Institutional Strengthening does not have any regulations for resettlement and generally handles resettlements on a case to case basis through its provincial office. As no problems have been reported from the construction to this evaluation, it is presumed that resettlements were undertaken appropriately.[33]

3.4.2.3 Unintended Positive/Negative Impacts

The new Gizo Hospital, with its upgraded healthcare facilities, has become a destination for foreign medical professionals to provide technical cooperation and volunteer programs. Since the opening of the new hospital, visits of foreign medical teams composed of doctors and nurses from Australia, New Zealand, and the United States, among others, are increasing (Table 7). Foreign medical teams usually stay at the hospital for two weeks to conduct surgical operations and treatments, which enable the hospital to expand its operable cases. Australia, the biggest donor to Solomon Islands's health sector, also dispatches Australian doctors and nurses who stay for a longer term, from a few months to a year, and contributes to upgrading the healthcare provided by the hospital. Doctors with various specialties rotated every three months when the field survey of this evaluation was conducted. The increase in foreign support is considered as a positive impact of the project.

To summarize, this project has largely achieved its objectives. Therefore, the effectiveness and impact of the project are high.

[32] There was no documentation on the resettlement; no further information was available in the Western Province Administration and Gizo Hospital.

[33] The Report of JICA Project Formulation Survey for Earthquake and Tsunami Rehabilitation and Reconstruction in Solomon Islands, August 2008 (p. 40) pointed out the necessity for agreements on resettlement with houses built on construction sites. However, the succeeding Basic Design Study Report did not refer to this issue; hence, the detailed process of the resettlement is uncertain. It is assumed that the Provincial Administration and MHMS took proper measures to develop the land, according to an approval of the land to be developed for the hospital issued by Western Province, which was attached to the Basic Design Study Report.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

Gizo Hospital has been managed under the Western Province Health Service from the planning stage to this ex-post evaluation. The director of the Health Service serves as the director of Gizo Hospital as well. The staff at the hospital has expanded 1.8 times, including contractual staff. The maintenance department is particularly improved with the appointment of a senior engineer. Further, the maintenance system for the facilities and equipment is reinforced. At the time of planning, NRH engineers were expected to provide maintenance support to Gizo Hospital; however, most facilities and equipment are currently under the control of Gizo Hospital, with a few exceptions listed in section 3.5.2 "Technical Aspects of Operation and Maintenance." Periodic checkup is conducted routinely;[34] malfunctioning machines are fixed, and a maintenance log is maintained.

In medical services, appointments of specialist physicians are delayed whereas a sufficient number of nurses are assigned. Before the 2006 tsunami disaster, there were six general physicians and four specialists: surgeon, anesthesiologist, obstetrics and gynecology specialist, and pediatrician.[35] At the time of ex-post evaluation, there were only five general physicians and one additional general physician expected to be placed. Solomon Islands does not have any educational institutes to train doctors; thus, MHMS has to send medical students to Cuba, Fiji, Papua New Guinea, and other countries for training doctors. Several medical students who were supposed to be assigned to Gizo Hospital canceled their return to Solomon Islands in favor of remaining at their place of training; as a result, there is no prospect to have a specialist physician in Gizo currently.[36] Consequently, Gizo Hospital has relied on foreign medical teams and local medical teams dispatched from NRH for complex surgeries. Although visits of foreign and local medical teams increased rapidly in 2013 after the opening of the new hospital, this trend did not continue in 2014, in which fewer visits from local teams were recorded (Table 7). Local teams reportedly intend to prioritize more remote areas than Gizo.[37]

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[34] The wards, OPD, operating theater, delivery department, and dental clinic are inspected weekly. The malaria laboratory, tuberculosis laboratory, central sterilization supply department, general laboratories, X-ray section, ophthalmologic clinic, diabetes clinic, physiotherapy section, and pharmacy are inspected monthly.

[35] The Report of JICA Project Formulation Survey for Earthquake and Tsunami Rehabilitation and Reconstruction in Solomon Islands, August 2008 (p. 36).

[36] Interview with MHMS management.

[37] Interview with Gizo Hospital management. The old hospital had approximately five visits from local teams per year. The hospital director coordinates with foreign and local medical teams for scheduling. The scheduling depends on the preference of these teams rather than that of Gizo Hospital.

Table 7: Visits of Foreign and NRH Medical Teams to Gizo Hospital

No. of Teams	2012	2013	2014	2015 (Plan)
Foreign Medical Teams	2	10	6	3(Plan)
NRH Local Medical Teams	1	6	0	N/A
Total	3	16	6	3

Source: Interview with Gizo Hospital

MHMS is responsible for appointing doctors, allocating budget, and administering procurement and other processes necessary for hospital management. However, coordination within MHMS between departments responsible for these functions appears inadequate; consequently, the managerial issues of Gizo Hospital that require MHMS's attention remain unaddressed.[38]

In short, institutional backup from MHMS needs to be strengthened for better operation and maintenance of Gizo Hospital, especially in the appointment of specialist physicians. Otherwise, the hospital cannot recover its pre-tsunami level healthcare capacity.

3.5.2 Technical Aspects of Operation and Maintenance

The technical level of doctors, nurses, laboratory technicians, and other medical staff appears satisfactory.[39] Providing training opportunities for upgrading medical skills is not easy because of the limited training institutions in the country as well as limited budget. However, Gizo Hospital has undertaken efforts to provide opportunities to its staff, such as in-house clinical training and nursing training at other hospitals and the Solomon Islands National University.

Equipment maintenance has improved significantly. At the old hospital, medical equipment received maintenance rarely, and broken or malfunctioning equipment tended to be abandoned because of shortage in spare parts and lack of repairing skills.[40] Such problems have not been observed in the new hospital as regards the operation and maintenance of most of the installed medical equipment. The technical skill of the staff is upgraded through on-the-job training. However, as regards facilities, there are concerns over troubleshooting: malfunction of the chemical sterilizer in the town water treatment

[38] For instance, the construction of a new kitchen and laundry area, which was added as Solomon Islands's input to complement this project, has been ceased for months owing to fraud issues on the contractors' side. A strong initiative from the MHMS is required to break such a stalemate.

[39] According to a JOCV nurse assigned to the operational theater, the knowledge and skills of the theatre staff are as high as those in Japan. With this project, operational capacity has expanded in terms of operable cases and time. Emergency operations, such as appendicitis and Caesarean section cases, are regularly conducted for 24 hours at the new hospital.

[40] This notion is according to a report of technical cooperation for operation and maintenance (soft component) conducted in May 2011, prior to the completion of the new hospital.

plant,[41] water leakage from/around air-conditioning ducts,[42] and breakdown of ventilators possibly caused by humidity. The water leakage from/around air-conditioning ducts is a recurrence of the problem at the defect inspection. The maintenance staff is unable to identify causes to these problems and has requested for technical assistance in upgrading their maintenance skills for facilities, especially broken facilities, and for testing water quality properly.

To summarize, there is no significant problem in sustaining the medical technique/skill as well as maintaining medical equipment. However, facilities require the further improvement of the maintenance techniques/skills of the staff responsible.

3.5.3 Financial Aspects of Operation and Maintenance

The operational cost of Gizo Hospital is budgeted within the Western Province Healthcare Service Budget. It was impossible to extract the operational budget and actual cost of Gizo Hospital out of the total provincial health budget/cost at the planning phase as well as at this evaluation; therefore, financial sustainability is evaluated based on the provincial health budget/cost.[43] The Western Province Healthcare Service Budget is funded by the Government of Solomon Islands as well as the Government of Australia and Global Fund, along with other organizations. The health budget in 2013 was 1.2 times higher than that in 2012, with quintupled Australian financial support that has yielded around half of the total budget since 2013 (Figure 8). The Government of Australia and MHMS has exchanged a direct funding agreement valid until 2016, as the health sector support program of Australia that prioritizes healthcare in Solomon Islands and is committed to support it for the long term.[44] Australian assistance to Gizo Hospital has been steady, and doctors and nurses from Australia have been stationed at the hospital. With the ongoing and prospective Australian support, financial sustainability is confirmed.

Table 8: Fiscal Revenue and Expenditure of Western Province Healthcare Service

(Unit: SBD[45])

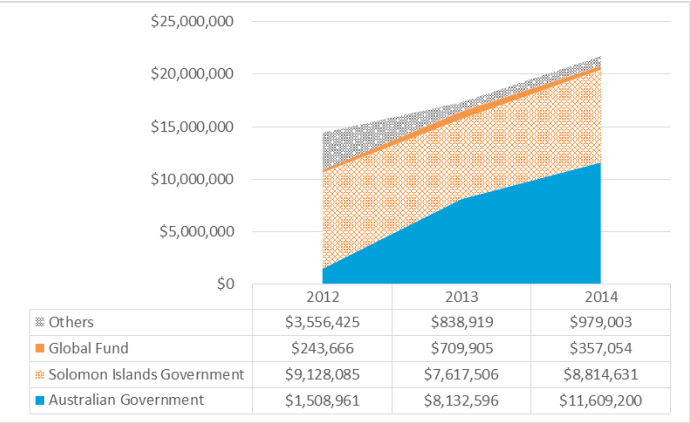
	Revenue	Expenditure	Balance
2012	14,437,137	15,203,239	-766,102
2013	17,298,926	16,315,467	983,459

[41] Any cause could not be identified in the ex-post evaluation.
[42] At the defect inspection conducted in August 2012, the reason for the water leakage was specified as the gap between heat insulation materials and/or heat insulation materials tightened too firmly. Consultants of the inspection team fixed the problem by filling the gap and adjusting the material for better insulation performance according to a document provided by JICA.
[43] The operational budget of Gizo Hospital was assumed to account for 60% of the total provincial health budget at the planning stage; the current share was not available at the ex-post evaluation.
[44] Direct Funding Agreement between the Government of Australia and MHMS.
[45] SBD: Solomon Islands Dollar. JICA rate at the second field survey of this evaluation was 1 SBD=15.507 JPY.

2014	21,759,888	16,689,066	5,070,822

Source: Documents provided by MHMS

Figure 8: Revenue Breakdown of Western Province Healthcare (SBD)



	2012	2013	2014
Others	$3,556,425	$838,919	$979,003
Global Fund	$243,666	$709,905	$357,054
Solomon Islands Government	$9,128,085	$7,617,506	$8,814,631
Australian Government	$1,508,961	$8,132,596	$11,609,200

Source: Documents provided by MHMS

In the expenditure of the Western Province Healthcare Service, staff cost, including wages and housing, increased 1.7 times in 2013 and 1.4 times in 2014 compared with the baseline data of 2012. Regarding maintenance cost, the actual cost of the hospital was not available; the cost estimation revised in 2011 by the project consultant was double that in the original plan. The overall repair and maintenance expenses of the provincial healthcare services increased 1.5 times in 2013 and 2.5 times in 2014 compared with 2012 data.[46] Moreover, these increases are considered far ahead of the inflation rate. Gizo Hospital has taken possible countermeasures against expanding maintenance cost, such as installing light-emitting diode (LED) bulbs, which enabled a monthly savings of SBD 50,000 (approximately JPY 700,000) in electric bills.[47] To summarize, the budget of Gizo Hospital has expanded far beyond the original estimation at the planning stage in 2008. Nonetheless, financial sustainability is deemed high, with the expected long-term support from Australia, which has been the top donor and provided financial and policy support to Solomon Islands.

[46] According to the Basic Design Study Report in 2008, the project consultant estimated the maintenance cost of the second year after opening to be SBD 516,750. With the unpredicted increase in electricity cost and inflation, the consultant in 2011 revised the cost estimation for 2013 to SBD 1,241,361. Inflation rates were 17.3% in 2008, 7.1% in 2009, 1.1% in 2010, 7.3% in 2011, 5.9% in 2012, and 5.4% in 2013 according to the World Bank.

[47] Interview with Gizo Hospital.

Table 9: Maintenance cost of Gizo Hospital (Estimation and Actual Cost)

(Unit: SBD)

	Estimated Cost (original plan in 2008) (Gizo Hospital only)	Estimated Cost (revision in 2011) (Gizo Hospital only)	Actual Cost (Western Province Health Sector)[48]
2012		1,128,510	1,691,967
2013 (second year of the new hospital)	516,750	1,241,361	2,499,107
2014 (third year of the new hospital)	550,617	1,365,497	2,121,253

Source: Basic Design Study Report and documents provided by JICA and MHMS

3.5.4 Current Status of Operation and Maintenance

Most of the equipment installed by the project was used and maintained without problems, except the following items: one autoclave in the laboratory has not been used at all because it is not connected with a drainage pipe yet, which should have been secured by the Solomon Islands's side as its undertaking. The autoclave would be utilized once the pluming is done with the support of NRH. A spectrometer has not been used either because of the unavailability of appropriate reagents at medical stores in the capital. The maintenance department is currently identifying suitable reagents and exploring possible suppliers. Regarding facilities, water leakage from the air conditioning duct is an ongoing problem and needs sooner troubleshooting. As for the ventilation system, 10 to 12 fans have not been functioning since 2013. The chemical sterilizer in the water supply system stopped functioning in November 2014. The problem has not been resolved because the maintenance department has faced difficulty in identifying its cause; consequently, water bypasses the sterilizer and is supplied through filtering. Urgent action is needed to resolve this problem.

Moreover, Gizo Hospital has installed two additional 5,000-liter water tanks and a 25-meter well with an electric pump to mitigate the shortage of water supply during the dry season. One of undertakings of Solomon Islands "City Water Supply Project" was implemented as planned; however, the water source was found to hold an insufficient amount of water, which would translate to serious water shortage during the dry season in future. Several patients and staff members pointed out the necessity to install more water tanks in the beneficiary survey. Measures to secure enough water and to save and use water efficiently in the hospital are necessary.

[48] This refers to the total maintenance expenditure of the provincial health sector, including repairs for buildings and equipment as well as utilities cost.

To conclude, the sustainability of the project is evaluated as fair, with consideration for the following minor problems. Specialist physicians have not been appointed; therefore, institutional arrangement needs to be strengthened at this point. As for technical aspects, a significant progress has been observed in the regular inspection and maintenance, on the one hand. On the other hand, a number of facilities have technical malfunctions that remain unresolved. Further, concerns over water shortage in the dry season and water quality remain.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project aimed to improve the quality and quantity of medical referral services in the Western region of the country and secure a regional healthcare base in case of disasters, by constructing a new building for the deteriorated Gizo Hospital affected by the tsunami following the 2007 Solomon Islands earthquake as well as by providing necessary equipment. This objective has been consistent with development policies of the Government of Solomon Islands and needs of the country, as well as Japan's aid policies at the time of planning. The set target of beneficiaries was slightly ambitious because a part of the intended area has had no means of transportation to Gizo. The need to restore and improve the healthcare provided by Gizo Hospital was, however, extremely serious, and the project was considered highly relevant. The project cost borne by the Japanese side was kept within budget, whereas data for that on the Solomon side was not available. The construction period was extended, and the opening of the hospital was further delayed after the handover of the new building from Japan; accordingly the process efficiency was fair. Annual records of healthcare significantly vary year to year. A number of indicators of healthcare did not always meet the target criteria set as the ideal level of pre-tsunami caseloads, such as number of outpatients and inpatients, deliveries, and surgeries, whereas caseloads in dentistry, ophthalmology, and physiotherapy greatly increased. The physical conditions of the hospital environment were upgraded, and patients' satisfaction with the facilities and treatment was high. The project had a significant impact on people, especially those from remote islands who had received unsatisfactory healthcare but henceforth had access to qualified referral services. Presently, Gizo Hospital also functions as a disaster response hub. Moreover, visits by foreign medical teams to the hospital have increased; they provide more complicated surgeries. This outcome is counted as another impact of the project. Taking these facts into account, the project is assessed to have high effectiveness and impact. Maintenance management has also been greatly improved, and most of the provided medical equipment are used and well maintained. However, a number of issues in the water supply and ventilation systems remain unsolved. In addition, surgeons and obstetricians have not been assigned to the

hospital; consequently, the sustainability of Gizo Hospital as a secondary referral hospital is rated as fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

4.2.1.1 Recommendations to Gizo Hospital

1） The autoclave at the laboratory, which has not been used at all, needs to be connected with the drainage duct as soon as possible and with assistance by NRH so that the laboratory could start using the device.

2） Extra toilets may be installed near the OPD as requested by a significant number of patients and the staff. Prompt installation is advisable to meet the needs of elderly and persons with disabilities and in preparation for the occasional diarrhea outbreaks.

3） Incineration is preferable for biological and pathological waste management, such as placenta and human tissue, considering the possible risk of contamination of infectious materials into soil and groundwater, although disposal by landfill is regarded as fitting to local custom and practice; MHMS finds no problem with landfill disposal. Currently, the Pacific Hazardous Waste Management (PacWaste) Program is ongoing under the initiative of the Secretariat of the Pacific Regional Environment Programme (SPREP), which has been charged by the governments and administrations of the Pacific region with the protection and sustainable development of the region's environment. As part of its efforts to improve hazardous waste management in the region, PacWaste is planning and preparing to install a medical incinerator at Gizo Hospital and then conduct training on its operation and maintenance as well as on infection control measures at hospital facilities.[49] In this regard, Gizo Hospital is recommended to consult with SPREP as regards establishing an appropriate medical waste management.

4.2.1.2 Recommendations to MHMS

1） MHMS has made an effort to appoint specialist physicians, such as surgeons and obstetrics and gynecology specialists, to Gizo Hospital but is recommended to take further action to realize the appointment at the earliest stage possible to maximize the benefit of installed facility and equipment and to expand healthcare services. With the assignment of a surgeon, Gizo Hospital could also serve as a teaching hospital to provide practical training for medical students graduated from foreign institutes.[50]

49 Details of the PacWaste Programme are available at http://www.sprep.org/pacwaste/healthcare-waste.

50 The MHMS management expressed an intention to use Gizo Hospital as a teaching hospital for capacity building of medical professionals once a surgeon is assigned.

2） The construction of the kitchen and laundry area, added as undertakings by Solomon Islands's side, should be completed as soon as possible to ensure the hygienic distribution of meals and laundry of operating gowns and other cloth items. The MHMS is requested to take a strong initiative to restart the suspended construction.

4.2.2. Recommendations to JICA

1） The daily operations and maintenance system are already established through soft component under the project. However, the transfer of troubleshooting skills seems insufficient. Urgent action is deemed necessary to improve the malfunctioning ventilation and air conditioning facilities, which were also observed at the defect inspection, and to solve the problem with the chemical sterilizer for the water supply. JICA is suggested to conduct follow-up maintenance trainings, especially focusing on facilities, by dispatching engineers for a few weeks.

4.3 Lessons Learned

4.3.1 Designing Hospitals

1） Hospital layout design with consideration for sanitary facilities and patient movement: There were cases of diarrhea patients failing to make it to a toilet in time and spreading diarrhea stool because of distant location of toilets from the OPD. Although this incident alone does not negate the relevance or validity of the project design and approach, locating toilets close to the OPD and waiting room should be considered when designing a hospital, especially in a region where diarrhea is prevalent and elderly and patients with disabilities are expected.

2） Hospital design to save power in areas with limited electricity: This project adopted a design for a two-story building with a ramped emergency entrance and another ramped access to the second floor, without elevators. The building also has lighting windows to maximize natural lighting and an airy layout to reduce electricity consumption. Measures to save power and ensure a comfortable environment for users are integrated into the design appropriately. Such a design could be a reference for other hospitals to be built in areas with power shortage.

4.3.2 Realistic Scope Setting for Referral Services

The target beneficiaries of this project turned out to be slightly overestimated because of the insufficient needs survey on accessibility to Gizo from Isabel Island. The hospital building and facilities were designed based on the population of Western Province with access to Gizo as well as on actual operation records of the old hospital from 2004 to 2006.

Thus, the hospital capacity is not excessive. However, over-capacity facilities and equipment could have been installed if the architectural design had been calculated based on the ambitious number of beneficiaries of 130,000 including Isabel residents. In the construction of a referral hospital, the assessment of the transportation means and cost to a referral hospital as well as of the actual number of incoming patients is crucial to set a realistic target of beneficiaries and to design practicable hospital buildings, facilities, and personnel allocation.

4.3.3 Effective Timing and Method of Training for Operation and Maintenance (Soft Component)

A soft component of the project, namely, technical cooperation for operations and maintenance, was implemented three times before the completion of the construction and handover. The training had a certain impact on staff who participated and understood the concept of "maintenance." However, classroom lectures without the actual materials and facilities to maintain have limited effectiveness in terms of ensuring the comprehension and acquisition of practical techniques to handle the materials among the participants. In hospital construction and medical equipment provision, a soft component for operations and maintenance is better conducted upon installation of the facilities and equipment, that is, upon the time that the materials are operational for training. If this scenario is impossible, it is recommended for project consultants to make the best effort to conduct practical training and guidance, for instance by bringing in the same/similar devices for demonstrating proper practical handling.

Box: Synergy between the Project and Activities of JOCV Volunteers

Japanese volunteers specialized in nursing and medical mechanics have played an active role in Gizo Hospital. When a previous nurse volunteer was assigned to the old hospital, she was shocked to see used needles scattered about and slides with blood wiped and repeatedly used for different patients. There was no awareness of cleanliness nor infection prevention. She started to talk about the "5S principle: sort, set in order, shine, standardize, and sustain"[51] to her colleagues, placed trash bins in strategic areas around the hospital, and went around to train cleaners. In this way, hygiene and cleanliness in the hospital were significantly improved. She also launched hygiene education for the hospital staff and advocated the prevention of secondary infection. Hygiene education and health promotion

[51] The 5S principle was developed in Japan to improve profitability, efficiency, service, and safety. The 5S stands for the Japanese words *seiri* (sort; tidiness), *seiton* (set; orderliness), *seiso* (shine; cleanliness), *seiketsu* (standardize; standardization), and *shitsuke* (sustain; discipline).

programs for patients awaiting treatment were also introduced in collaboration with the hospital staff. Even after she left the hospital, these activities to promote awareness on sanitation and healthy lifestyle have been continued and carried on by her successors and colleagues.

The number of cleaners has increased in the new hospital. The hospital is kept thoroughly clean by cleaners going around regularly. Patients, their family, and visitors voluntarily take off their shoes and enter the hospital after washing their feet. By now, the patients and staff are concerned about the hospital environment. The beautiful and comfortable hospital is now spoken of as a symbol of Gizo and a pride of its residents.

Another volunteer, a medical mechanical technician, has been assigned to the maintenance department. She has assisted in the regular inspection and repair of medical equipment, working with other mechanical and electric technicians under the supervision of a senior engineer. She is also developing a database for equipment management. A number of laboratory devices need reagents procured from overseas, including Japan. She has helped in these transactions as a liaison.

The activities of these Japanese volunteers (JOCV) specialized in nursing, health education, and maintenance of medical equipment have greatly contributed to improving the quality of healthcare at Gizo Hospital, complementing the upgraded hard components provided by this project, namely, the building, facilities, and equipment.

People's Republic of China

Ex-Post Evaluation of Technical Cooperation Project
"Project for Surveillance and Control of Vaccine-Preventable Diseases"

External Evaluator: Toshihiro Nishino, International Development Center of Japan Inc.

0. Summary

The Project aimed at improving the immunization rate through improvement of the infectious disease control service, thereby contributing to the reduction of the incidence of infectious diseases and improving the health of children in five provinces/autonomous regions in the central and western parts of China.

The improvement of infectious disease control through the strict enforcement of immunization conforms to the importance and needs of the relevant policies of China as well as Japan's ODA policy, indicating the high level of relevance of the Project. There is no doubt that infectious disease control has generally improved in every target province/autonomous region as illustrated by increased immunization rate. However, there are some unachieved issues in some provinces and the incidence of measles has not yet reached the target. Moreover, details of the situation of hepatitis B and Japanese encephalitis are unavailable for some provinces. It is apparent that the activities in the first half of the project period made a certain contribution towards the realization of the project purpose. Meanwhile, checking of immunization records and supplemental immunization conducted in the second half of the project period made a major contribution in Jiangxi and Gansu Provinces but their contribution in the remaining Sichuan Province and Xinjiang and Ningxia Autonomous Regions could not be clearly determined. Accordingly, the general effectiveness/impacts of the Project are judged to be fair. The project period was within the planned period but the project cost exceeded the planned cost, making the efficiency of the Project fair. The sustainability of the project effects is high as there appear to be no problems regarding sustainability in relation to the policy, organization, and technical and financial requirements.

In light of the above, the Project is evaluated as satisfactory.

1. Project Description

Project Locations

Immunization Inspection Records by child (At a primary school in Gansu Province)

1.1 Background

The Government of the People's Republic of China (hereinafter referred to as "China") began the implementation of the Expanded Program on Immunization (EPI) in 1978 and the EPI has played a major role in the control of vaccine-preventable infectious diseases. In subsequent years, however, there has been a growing economic gap between urban areas and rural areas in

China, in turn leading to an increased potential risk of the spread of infectious diseases in rural areas because of the insufficient surveillance capacity as well as inadequate EPI implementation system in rural areas. At the Ministerial Conference of the WHO Western Pacific Region (WPRO) held in 2005, it was agreed to sustain polio-free status while seeking the elimination of measles and control of hepatitis B by 2012. To achieve these public health goals, the Government of China found it particularly necessary to improve the immunization service in rural areas.

Against this background, JICA decided to provide Japanese ODA to improve the level of surveillance and quality of the immunization service targeting four vaccine-preventable diseases, i.e. polio, measles, hepatitis B and Japanese encephalitis, in five provinces/autonomous regions (Jiangxi Province, Sichuan Province, Gansu Province, Ningxia Hui Autonomous Region and Xinjiang Uygur Autonomous Region) in the central and western parts of China. A technical cooperation project (the Project) which is the subject of the present ex-post evaluation study began in December, 2006.

Because of the trend of persisting incidence of measles in the period after the commencement of the Project, it was decided to focus on the selection of and concentration on suitable activities, especially those related to the elimination of measles, in the second half of the project period. To be more precise, the Project focused on checking the immunization status of pupils at the time of their entry to kindergarten or primary school among pupils enrolling at kindergarten or primary school using their immunization records and conducting supplemental immunization when necessary (hereinafter referred to as “checking of immunization records and supplemental immunization”) for the purpose of improving the immunization rate through the elimination of non-immunized pupils.

1.2 Project Outline

Overall Goal		The health for children is improved in the five target provinces and autonomous regions through the control of diseases associated to the Project.
Project Purpose		The level of surveillance and the quality of immunization service are improved in the five target provinces and autonomous regions in the Project.
Outputs	Output 1	Field surveillance, including regular monitoring, monitoring and supervision, and reporting system, is strengthened.
	Output 2	Network for polio laboratories is strengthened, diagnostic level of measles laboratories at each administrative level is improved, and cooperation to Japanese encephalitis laboratories is maintained.
	Output 3	The system for linkage and communication with other organizations related to EPI is established.
	Output 4	The immunization service is improved.
	Output 5	The activities for education and advocacy related to immunization are enhanced.
Total cost (Japanese Side)		594 million yen
Period of Cooperation		December, 2006 to December, 2011 (Follow-up cooperation: January, 2012 to March, 2012 and March, 2013)
Implementing Agency		• Ministry of Public Health* • Chinese Center for Disease Control and Prevention (CCDC) • Public Health Bureau and Center for Disease Control and

	Prevention (CDC) of the target provinces and autonomous regions *The Ministry of Public Health was reorganized as the National Health and Family Planning Commission (NHFPC) in 2013 following the reorganization of Chinese government ministries.
Other Relevant Agencies/Organizations	CDC and Bureau of Education in the pilot counties (Nanfeng County and Shanggao County in Jiangxi Province; Lu County and Lezhi County in Sichuan Province; Anding District and Qingcheng County in Gansu Province; Longde County and Haiyuan County if the Ningxia Hui Autonomous Region; Jimisar (Jimusaer) County and Toqsu (Xinhe) County in the Xinjiang Uygur Autonomous Region)
Supporting Agency/Organization in Japan	• National Institute of Infectious Diseases (NIID) • National Center for Global Health and Medicine (NCGM)
Related Projects	(Technical Cooperation) • Polio Control Project: 1991 – 1999 • Expanded Program on Immunization Strengthening Project: 2000 – 2005 (Loan) • Public Health Infrastructure Facility Improvement Project: L/A signed in 2004 (Grant Aid) • Project for the Eradication of Poliomyelitis (three phases: 1993, 1994 and 1995) • Project for Improvement of Equipment forImmunization System: 1996 • Project for Virus Examination Equipment Supply: 1997 • Immunization Expansion Program: 1999 • Project for Promotion of the Prevention of Infectious Diseases in Seven Western Provinces: 2002 (Other International Organizations and Aid Organizations, etc.) • World Health Organization (WHO): poliomyelitis eradication, measles elimination and hepatitis B control • United Nations Children's Fund (UNICEF): policy dialogue at the government level, improvement of the routine immunization regime and immunization of children • US Center for Disease Control (USCDC): enhanced measles immunization campaign • Global Alliance for Vaccines and Immunization (GAVI): supply of hepatitis B vaccine and policy support, etc. • Program for Appropriate Technology in Health (PATH): cooperation regarding hepatitis B and Japanese encephalitis • World Bank: support for the surveillance and control of vaccine-preventable diseases • KfW Bankengruppe: health Program in eight western provinces (support for equipment supply to CDCs and hospitals)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Time of the Terminal Evaluation

The terminal evaluation report concluded that "the prospect of achieving the project purpose was high because ① the reported immunization rate was high for polio, measles and hepatitis B and the surveillance of polio and measles had been properly conducted and ② the implementation of the checking of immunization records and supplemental immunization had increased the immunization rate for polio, measles, Japanese encephalitis and hepatitis B among incompletely immunized children.

1.3.2 Achievement Status of Overall Goal at the time of the Terminal Evaluation

The terminal evaluation report concluded that EPI-related infectious diseases in the target provinces were effectively controlled and that it was expected that the standard of health of children would improve in view of the fact that the target diseases were adequately controlled (polio, hepatitis B and Japanese encephalitis) or reduced to the lowest level in history (measles).

1.3.3 Recommendations at the Time of the Terminal Evaluation

The terminal evaluation report put forward the following three recommendations.

(1) Enhancement of the effectiveness of the checking of immunization records and supplemental immunization of incompletely immunized children: ① clarification of where the responsibility lies at each stage of the work to smoothen the implementation process, ② strengthening of educational and advocacy (publicity) activities and ③ establishment and implementation of a method to monitor and evaluate the progress of the checking of immunization records and supplemental immunization

(2) Dissemination of the project outputs: ① facilitation of the dissemination of the model for the checking of immunization records and supplemental immunization to areas outside the pilot counties, ② examination of the prospect of disseminating the approaches and methods adopted to produce the project outputs to the rest of China and ③ securing of the necessary budget for the envisaged dissemination by local governments at all levels

(3) Utilization of the platform through collaboration between departments: promotion of inter-departmental collaboration and establishment of a relevant platform through the introduction of participatory workshops, project cycle management training and other attempts made under the Project.

2. Outline of the Evaluation Study

2.1 External Evaluator

Toshihiro Nishino, International Development Center of Japan Inc.

2.2 Duration of the Evaluation Study

Duration of the Study : August, 2014 – September, 2015

Duration of the Field Study: October to 28, 2014 –November 4, 2014 and
March 15 – March 25, 2015

2.3 Constraints during the Evaluation Study

This ex-post evaluation study experienced several constraints listed in the table below during the field surveys because of the ongoing process of administrative reform which affected the implementing agencies in China (inauguration of the National Health and Family Planning Commission through the merger of the Ministry of Public Health and the National Population and Family Planning Commission and organizational reform at the local government level). Consequently, the evaluator was unable to obtain detailed information on the present state of

immunization, etc. in Sichuan Province, Ningxia Hui Autonomous Region and Xinjiang Uygur Autonomous Region not visited during the field survey.

Component	Constraints
Field Survey	It was planned for the evaluator to visit the five target provinces/autonomous regions (including five pilot counties) during the first field survey period along with an on-site visit to the remaining five pilot counties by a local consultant. However, only Jiangxi Province and Gansu Province (including two pilot counties) were actually visited. Moreover, the planned interviews with those involved in the Project at the central government level (NHFPC) did not materialize.
Questionnaire Survey and Beneficiaries Survey	The evaluator originally planned to conduct a questionnaire survey with the implementing agencies and people concerned and a beneficiaries survey with people in the participating townships/villages (lower end administrative bodies of county-class cities with multiple administrative villages below them) during the Project. However, neither survey was conducted (only some data for quantitative indicators was obtained).

As the indicator for the PDM and project purpose, the surveyed immunization rate estimated on the basis of the actual interview results is used for this report instead of the reported immunization rate because of the doubtful accuracy of the latter despite it being an official figure. For this ex-post evaluation, the surveyed immunization rate by disease provided by individual provinces/autonomous regions is used to determine the progress of immunization, etc. However, the warning of a Japanese expert involved in the Project that the surveyed immunization rate may not be very accurate in some areas because of the possibility of the exclusion of fluid population in the target population for the immunization rate survey and also because of the possibility of regional differences in the reliability of random sampling must be noted.

3. Results of the Evaluation (Overall Rating: B[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance to the Development Plan of China

In its 11th Five Year Guideline for Economic and Social Development (2006 – 2010) which was China's national development plan at the time of the ex-ante evaluation of the Project, the Government of China called for immunization rate of 90% or higher through EPI for children, control of epidemics of serious infectious diseases and the development of rural health services, including the improvement of township and village clinics offering routine health care for local residents, as part of its efforts to improve the situation in rural areas. Meanwhile, the China National Program for Child Development (2001 – 2010) adopted such targets as the achievement of immunization rate of 90% at the township/village level and the inclusion of hepatitis B on the list of target diseases for regular immunization among the policies designed to strengthen the immunization regime and control of vaccine-preventable diseases.

The 12th Five Year Guideline for Economic and Social Development (2011 – 2015) which was in progress at the time of project completion clearly stated such targets as "the development of professional public health care networks to prevent and control serious diseases", "strengthening of the capacity to prevent serious infections and endemic diseases and to deal with outbreaks" and "the establishment of emergency rural medical care networks and a shift

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[2] ③: High, ② Fair, ① Low

towards universal access to health education" in Chapter 34: Improvement of Basic Health Care System.

The 12th Five Year Plan for Health Sector Development (2011 – 2015), which is the detailed development plan for the health sector in China, called for conscious efforts to regain and maintain polio-free status, to achieve measles elimination and to strengthen hepatitis B immunization among the priority population. Furthermore, the China National Program for Child Development (2011 – 2020) lists "the control of common childhood diseases and serious infectious diseases, including HIV/AIDS, syphilis, tuberculosis and hepatitis B" and "the increase of the immunization rate to above 95% at the township level as part of the national immunization plan" among the major objectives of the strategy for children and health. Provinces, including the five target provinces/autonomous regions of the Project, formulate their own programs basically in line with the above-mentioned national programs/guidelines.

3.1.2 Relevance to the Development Needs of China

At the time of the ex-ante evaluation of the Project, the incidence of measles and hepatitis B patients in China accounted for approximately half of the incidence in the Western Pacific Region and some 30% of the global patients respectively. There was a major potential risk of the spread of infection in rural areas in China because of the insufficient capacity for the swift as well as accurate diagnosis of incidents involving infectious diseases and of the planning and implementation of countermeasures based on the accurate assessment of the situation of the spread of such diseases. To make matters worse, the central and western provinces in China lacked both a strong financial base and sufficient manpower to effectively deal with outbreaks of infectious diseases. Under these circumstances, these provinces faced such critical issues as (i) a high level of incidence of various diseases above the national average or a high position in the provincial incidence ranking and (ii) a high risk of the incursion of wild polio strains from neighboring countries (India, Pakistan, etc.) where polio was endemic. These provinces were, therefore, urgently required to implement a focused approach to improve the situation.

Even at the time of this ex-post evaluation, while a report for the China National Program for Child Development (2011 – 2020) puts the immunization rate for the four target diseases at 90% or high, it identifies gaps in terms of the service level between urban and rural areas and between different provinces. Therefore, the elimination of these gaps is an urgent task. Particularly urgent is improvement of the immunization rate in the central and western provinces, rural areas and areas of minority ethnic groups and among the fluid population. As such, there is still a strong need for improvement of the immunization rate. There was an incident of imported polio from Pakistan to the Xinjiang Uygur Autonomous Region (two people died out of 20 confirmed cases, including those in Beijing), exposing the risk faced by China of the importation of polio from neighboring non polio-free countries. Under these circumstances, Japanese encephalitis was newly added to the list of subject diseases for immunization in the National Immunization Plan of China in 2010, resulting in all four target infectious diseases of the Project being on this list. This addition illustrates the continuing importance of implementing vaccine-preventable disease control measures in China, especially the four target infectious diseases of the Project.

The background for the prioritization of the checking of immunization records and supplemental immunization in the second half of the project period was the urgent need to establish a concrete method to implement these activities as the Regulations on Administration of Vaccine Circulation and Immunization promulgated by the State Council of China in 2005 failed to stipulate detailed rules, methods, etc. despite its obvious call for the implementation of the activities in question. The prioritization of these activities reflected the need to achieve the project purpose, especially the improvement of measles control, and this emphasis was clearly in line with the development needs of China.

3.1.3 Relevance to Japan's ODA Policy

The Economic Cooperation Program for China (2001) which spelled out Japan's basic ODA principles for China at the time of the ex-ante evaluation of the Project listed cooperation for infectious disease control as part of the cooperation designed to resolve global issues. Meanwhile, the Country Assistance Program for China prepared by the Ministry of Foreign Affairs (MoFA) in 2001 referred to "cooperation to deal with global issues, such as environmental issues" as one of the economic cooperation policies by priority and theme because of the potential direct impact on such issues faced by China on Japan. One example of such issues was infectious disease control. The MoFA's ODA Country Databook (2006) included infectious disease control as one of the priority issues for China. Based on the MoFA's Country Assistance Program for China, JICA endorsed cooperation to deal with global issues, such as environmental issues, as one of its three priority areas for assistance for China and infectious disease control was given as a concrete example.

At the WPRO Ministerial Conference in 2005 in which Japan participated, agreement was reached on the maintenance of the polio-free status, elimination of measles and control of hepatitis B by 2012.

This project was highly relevant to country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Effectiveness and Impact[3] (Rating: ②)

3.2.1 Effectiveness

3.2.1.1 Project Output

Here, the state of achievement of the five planned outputs at the time of project completion (2011) and ex-post evaluation (2014) is analyzed.

Output 1: Field surveillance, including regular monitoring, monitoring and supervision and the reporting system, is strengthened.

In Jiangxi and Gansu Provinces where the field survey was conducted, the development of human resources in the county, township and village-level health sectors under the Project, etc. led to improved awareness and knowledge. Apart from the official field surveillance by the provincial, municipal and county governments and CDCs, other achievements included ① proper understanding of the situation using various opportunities, including the occasion of vaccine supply and acquisition, ② strengthening of the understanding of the situation at the village level by village doctors and ③ strict implementation of the periodic surveillance of hospitals above a certain size. As the reporting level has been improved, it can be concluded that field surveillance has been strengthened in general.

Although the detailed situation of the another province and two autonomous regions which were not visited is unclear, an incident of imported polio in 2011 in the Xinjiang Uygur Autonomous Region where the development of the field surveillance system is believed to lag behind that of the other target provinces was swiftly discovered and dealt with and was successfully contained. This fact suggests that the field surveillance had been strengthened to a certain level in all of the five target provinces by the time of project completion.

Output 2: The network for polio laboratories is strengthened, the diagnostic level of measles laboratories at each administrative level is improved and cooperation for Japanese encephalitis laboratories is maintained.

The capability of laboratory technicians can be determined based on the results of ① the WHO proficiency test and ② WHO inspection. Apart from one item of the WHO inspection results for polio laboratories (the annual NPEV isolation rate for Gansu, Ningxia and Xinjiang),

[3] Sub-rating for Effectiveness is to be put with consideration of Impact.

all laboratories in the five target provinces passed the relevant criteria at the time of both project completion (2011) and ex-post evaluation (2014). Because of the installation of equipment by the Government of China along with the intense learning and actual application of concrete techniques, know-how, etc. including the IgM ELISA testing method (measles virus antibody testing method), transferred under the Project, it is now possible to diagnose measles at county (city) level laboratories. In the case of Japanese encephalitis laboratories, testing and inspection results against domestic criteria are used as important data to judge the capability of laboratory technicians in Jiangxi Province where testing and inspection by the WHO has not been conducted and it has been confirmed that the said criteria are met.

Interviews with former Japanese experts and CCDC officials found that when an incident of imported polio was discovered in Xinjiang in 2011, a regional laboratory which was one of the targets for assistance under the Project first discovered the virus. The same laboratory efficiently conducted the testing of patient samples as well as samples from the neighboring area and monitoring of the local environment, thereby contributing to preventing the spread of polio.

The transmission of local data to CCDC for integration and sharing has strengthened the laboratory network and the system to discover and deal with local abnormal incidents has been improved.

Output 3: A system for linkage and communication with domestic and overseas organizations related to EPI is established.

The increased awareness of the importance of field surveillance among the people concerned has led to increased awareness of the need to strengthen the coordination between the people concerned as well as stakeholder organizations, resulting in a much strengthened inter-sectoral coordination system in Jiangxi and Gansu Provinces. Many provincial and county CDC officials have expressed the shared opinion that the sharing of experience between different provinces and also between cities and counties in each province through the Project has greatly improved the analysis of the current state of EPI and related activities. Further attempts to strengthen the coordination system with the relevant domestic and overseas organizations have also been made through participation in “conferences with international organizations” and “WHO reviews of polio laboratories”.

For the proper implementation of the checking of immunization records and supplemental immunization, it is essential for a coordination system to be established between the health sector and education sector. While there was a government policy to promote such work, no concrete division of work or the work flow was clearly stated. Because of this, efforts were made in the course of the Project to examine and establish a trial coordination system between these two sectors. Given the fact that the directly targeted areas of the Project were 10 pilot counties in five provinces, the establishment of the said coordination system at the time of project completion was restricted to these pilot counties. In Jiangxi and Gansu Provinces, the outcomes of the Project in the pilot counties were disseminated throughout the province in the post-project period in an attempt to establish a province-wide coordination system between the health sector and education sector.

Output 4: The immunization service is improved.

Following an official notice called “the implementation policy for the checking of immunization records at the time of enrollment in kindergartens and primary schools” which was issued through the Project in 2009 and which indicated the mission, procedures and responsibilities of the individual organizations involved, the work in question was promoted throughout the five provinces. At the time of project completion, although the application of the outcomes (regarding how to proceed with inter-sectoral coordination between the health sector and education sector, how to educate/train the people concerned and others) in the pilot counties was limited, the completed checking of immunization records exceeded 95% for both schools and pupils in all five provinces.

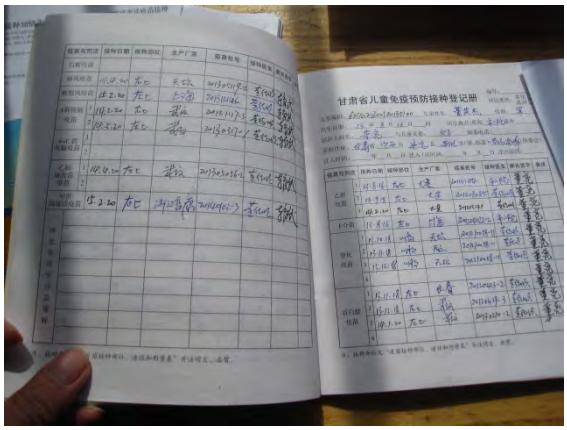
Table 1 Checking of Immunization Records by School and by Pupil in Each Target Province (%)

	Jiangxi		Sichuan		Gansu		Ningxia		Xinjiang	
	School Check Ratio	Pupil Check Ratio	School Check Ratio	Pupil Check Ratio	School Check Ratio	Pupil Check Ratio	School Check Ratio	Pupil Check Ratio	School Check Ratio	Pupil Check Ratio
2008	94.6	93.3	92.0	91.1	92.2	90.3	99.8	99.3	97.9	95.1
2011	99.0	97.7	-	-	95.1	97.9	100.0	99.7	-	-
2012	99.4	98.9	99.2	99.0	99.6	98.9	100.0	99.9	99.8	98.7
2013	99.3	98.9	99.9	99.3	99.9	99.4	100.0	100.0	99.7	99.9
2014	100.0	99.0	-	-	99.9	99.5	100.0	100.0	99.9	99.0

Source: Provincial CDCs

In 2011 when the Project was completed, a notice on the checking of immunization records and supplemental immunization at the time of enrolment in kindergartens and primary schools was issued to illustrate the more concrete method and management format for the work in Jiangxi and Gansu Provinces with a view to disseminating the outcomes in the pilot counties to the entire province. In Gansu Province, the practice of checking spread to almost all schools in the province, and the checking ratio of school records was increased from 95.1% in 2011 to 99.6% in 2012. It is clear that this notice led to an improved checking ratio at the provincial level (more than 99% at the time of the ex-post evaluation in 2014). The improvement of the checking ratio was also evident in other three provinces. In all five target provinces, the checking ratio by school or pupil was around 99% or more at the time of the ex-post evaluation.

In Gansu Province (pilot counties), the evaluator confirmed that the checking of immunization records and supplemental immunization have been thoroughly conducted at kindergartens, primary schools, village clinics, etc. in accordance with the said notice and that records of the immunization history of individual pupils and other relevant matters have been properly compiled and kept.



Immunization history of individual pupils (kept at a village clinic in Gansu Province)

Township hospital where immunization is conducted (Nanfeng County, Jiangxi Province)

Other activities designed to improve the immunization service under the Project included "the strengthening of vaccine control" and "the improvement of measures to control adverse events following immunization (AEFI)". In the case of the former, storage, transportation, etc. were properly implemented in accordance with the type of vaccine by the time of the completion of the Project. In Gansu Province (pilot counties), a refrigerator for vaccine storage which had previously been used at only township hospitals or higher level hospitals was installed at village clinics and further improvement was witnessed at the time of the ex-post evaluation. In regard to the improvement of measures to control AEFI, the positive outcomes of

the training in Japan were somewhat limited because of its timing immediately before project completion. Nevertheless, the relevant measures have been implemented in the post-project period to exploit the positive outcomes of the training and the capacity to deal with AEFI has been improved, particularly in rural areas.

Output 5: The activities for education and advocacy related to immunization are enhanced.

In the course of the Project, publicity posters and pamphlets and educational VCD[4] were printed/created and distributed with due consideration given to the cultural and social background of each target province when their contents were determined. Such media as TV commercials and short message services were also used. The education and enlightenment activities targeting teachers have also been strengthened.

In both Jiangxi and Gansu Provinces, strengthened and continuing educational and enlightenment activities on immunization were observed at the time of the ex-post evaluation. An increased budget for infectious disease control means expanded educational and enlightenment activities at the township/village level. New approaches have been made, including training on infectious diseases for students of teacher training colleges. The social awareness of infectious disease control and immunization has markedly improved, partly because of ① the increasing interest in child health among parents as a result of China's economic development and ② the strong social impact of such infectious diseases as SARS and avian flu in China.

Notice board publicizing infectious disease control measures (at a village clinic in Gansu Province)

Educational pamphlets on infectious disease control measures (at a village clinic in Gansu Province)

3.2.1.2 Achievement of Project Purpose

The indicators (by disease) related to the project purpose and the actual performance regarding each indicator are shown in Table 2. The achievement level of each indicator by province is shown in Table 3.

[4] A VCD (video compact disc) is a video recording medium popularly used in China.

Table 2 Achievement of the Project Purpose

Project Purpose	Indicator	Actual Performance
The level of surveillance and the quality of the immunization service is improved in the five target provinces and autonomous regions of the Project.	(Polio) 1-1: The surveyed immunization rate among children in rural areas of the target provinces/autonomous regions has achieved and maintained a target figure of 90% or higher.	• The surveyed immunization rate for polio in 2011 (at the time of project completion) exceeds the 90% level except in Gansu Province where the figure was 87%. • Immunization performance data for rural areas is only available for Jiangxi, Ningxia and Xinjiang. The 2011 performance level exceeds 90% in all of these provinces (98% or higher in 2013 onwards; see Table 4).
	(Polio) 1-2: The surveillance of AFP (acute flaccid paralysis) is maintained.	• The performance data for 2011 indicate a generally high level of performance for all of the relevant indicators, including the rate of timely investigation within 48 hours of initial reporting. In Xinjiang, the performance values have not sufficiently improved for "the rate of collecting two stool samples within 14 days" and "the rate of collecting acceptable stool samples". • The performance data for 2012 onwards show that the values for the relevant indicators have been lower in the Ningxia and Xinjiang compared to the other target provinces (Table 5).
	(Measles) 2-1: The immunization of children in the target provinces/autonomous regions has achieved and maintained the surveyed immunization rate of 95% or higher.	• The surveyed immunization rate for measles in 2011 is below 95% in Sichuan (measles vaccine 2), Ningxia (measles vaccine 1) and Xinjiang (measles vaccine 1 and 2). • The performance data for 2012 onwards is less than 95% in the case of measles immunization No. 1 in 2012 and measles immunization No. 2 in 2013 and 2014 in Sichuan.
	(Measles) 2-2: Non-immunization cases are traced and supplemental immunization is conducted.	• The 2011 performance data put the rate of uncompleted supplemental immunization at less than 5% in all of the target provinces except Jiangxi (10.5%). • The performance in 2012 onwards has generally maintained a level of 5% or less in Jiangxi, Gansu and Sichuan but shows much fluctuation from one year to another in Ningxia and Xinjiang. The actual figures for 2013 for Ningxia and for 2014 for Xinjiang are above 10% (Table 7).
	(Hepatitis B) 3-1: The surveyed thrice immunization rate for newly born babies in the target provinces/autonomous regions has achieved and maintained the target rate of approximately 90%.	• The 2011 performance for the surveyed thrice immunization rate for newly born babies exceeds 90% except in Ningxia where the figure is 87.4%. • In 2012 onwards, the actual performance has exceeded 96% in all provinces (Table 8).
	(Hepatitis B)	• The 2011 performance exceeds 90% except in

	3-2: The initial immunization rate for newly born babies within 24 hours of birth in hospital is 90% or higher in the target provinces/autonomous regions.	Xinjiang where the figure is 65.1%. • In 2012 onwards, the surveyed immunization rate has exceeded 93% in all provinces (Table 8).
	(Japanese encephalitis) 4-1: The skills and knowledge associated with laboratory diagnosis is improved at all CDCs in the target provinces (Sichuan and Jiangxi).	• The skills and knowledge for laboratory diagnosis met the criteria at the time of both project completion (2011) and ex-post evaluation (2014), indicating their satisfactory level (Jiangxi). The situation in Sichuan is unknown.

Table 3 Achievement Level of the Project Purpose by Province and Indicator
(At the Time of Project Completion and Ex-Post Evaluation)

Disease	Indicator		Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang	Overall (by Indicator)	Overall (by Disease)
Polio	1-1：Surveyed immunization rate of 90% or higher for rural children	Comple-tion	○	○	△	○	○	○	○ (△)
		Ex-post	○	○	○	○	○	○	
	1-2：Maintenance of AFP surveillance	Comple-tion	○	○	○	○	×	○	
		Ex-post	○	○	○	×	×	△	
Measles	2-1：Surveyed immunization rate for children is 95% or higher	Comple-tion	○	△	○	△	×	△	△ (△)
		Ex-post	○	△	○	○	○	○	
	2-2：Tracing of non-immunization cases and implementation of supplemental immunization	Comple-tion	△	○	○	○	○	○	
		Ex-post	○	○	○	×	×	△	
Hepatitis B	3-1：Surveyed thrice immunization rate for newly born babies is approximately 90%	Comple-tion	○	○	○	△	○	○	○ (○)
		Ex-post	○	○	○	○	○	○	
	3-2：Initial immunization rate for newly born babies within 24 hours of birth is 90% or higher	Comple-tion	○	○	○	○	×	○	
		Ex-post	○	○	○	○	○	○	
Japanese encephalitis	4-1：Improvement of laboratory diagnosis skills and knowledge	Comple-tion	○	?	-	-	-	△?	△? (△?)
		Ex-post	○	?	-	-	-	△?	

Notes
1) ○ Achieved; △ Mostly Achieved, × Unachieved
2) "Ex-post" means at the time of the ex-post evaluation.
3) The symbols in parentheses in the "Overall (by disease)" column indicate the achievement level at the time of the ex-post evaluation.
Source: Prepared by the evaluator using materials supplied by provincial CDCs and the field survey findings.

The state of achievement of the project purpose at the time of project completion (2011) and ex-post evaluation (2014) is analyzed next.

(1) Polio

The surveyed immunization rate in the target provinces is shown in Table 4.

Table 4 Historical Changes of the Surveyed Immunization Rate for Polio in the Target Provinces/Autonomous Regions

Target	Year	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang
Overall	2011	99.3%	97.2%	87.3%	100.0%	93.7%
	2012	99.7%	98.6%	99.0%	-	-
	2013	99.6%	97.3%	97.7%	100.0%	99.9%
	2014	98.9%	97.2%	-	-	-
Rural	2011	99.7%	-	-	100.0%	93.7%
	2012	99.7%	-	-	-	-
	2013	99.4%	-	-	100.0%	99.9%
	2014	98.9%	-	-	-	-

Source: Provincial CDCs

As the promotion of infectious disease control and EPI through the Project as well as other efforts strengthened such related services as surveillance and laboratory diagnosis, the surveyed overall immunization rate for the target provinces in 2011 (when the Project was completed) exceeded the target 90% except in Gansu (87.3%), generally achieving the target for this indicator. In Jiangxi, Sichuan and Ningxia, the figure was as high as more than 97%. The relevant performance in 2012 onwards has shown further improvement as the rate has been above 97% in all provinces, including Gansu where the target was not met in 2011. As far as the polio immunization performance in rural areas is concerned, data is available for only three provinces, i.e. Jiangxi, Ningxia and Xinjiang. As in the case of the overall performance figures, the 2011 performance exceeded 90% (the target figure) in each of these provinces. From 2013 onwards, a very high rate of 98% or above has been maintained.

The implementation situation of AFP surveillance in the target provinces is shown in Table 5.

Table 5 Historical Changes of the AFP Surveillance Situation in the Target Provinces and Autonomous Regions

Province or Autonomous Regions	Year	Number of Reported AFP Incidents	Reported AFP Incidence (1/100,000)	Rate of Timely Investigation within 48 Hours of Reporting	Rate of Collecting Two Stool Samples within 14 Days	Rate of Collecting Acceptable Stool Samples	Rate of Timely Sending of Samples within 7 Days
Jiangxi	2011	186	1.91	98.9%	90.9%	90.9%	95.2%
	2012	185	1.87	100.0%	94.6%	94.6%	98.9%
	2013	192	1.95	100.0%	95.3%	94.8%	98.4%
	2014	186	1.91	100.0%	93.6%	91.9%	97.3%
Sichuan	2011	383	2.56	98.7%	95.6%	95.3%	99.5%
	2012	403	3.04	99.0%	94.0%	94.0%	93.2%
	2013	361	2.73	99.7%	96.1%	95.3%	96.6%
	2014	-	-	-	-	-	-
Gansu	2011	110	2.44	99.0%	89.0%	89.0%	99.0%
	2012	119	2.62	99.0%	93.0%	93.0%	98.0%
	2013	113	2.53	100.0%	88.0%	88.0%	100.0%
	2014	127	2.94	100.0%	92.0%	92.0%	94.0%

Ningxia	2011	35	2.49	100.0%	94.3%	94.3%	100.0%
	2012	23	1.71	100.0%	91.3%	91.3%	91.3%
	2013	20	1.49	100.0%	83.3%	83.3%	83.3%
	2014	35	2.63	100.0%	82.9%	82.9%	97.1%
Xinjiang	2011	165	3.66	100.0%	74.0%	74.0%	92.0%
	2012	145	3.22	97.7%	85.5%	85.5%	90.9%
	2013	87	1.92	98.8%	90.1%	89.6%	83.7%
	2014	101	2.23	98.9%	84.0%	78.2%	87.1%

Source: Provincial CDCs

The level of AFP surveillance is believed to be determined using such indicators as ① the rate of timely investigation within 48 hours of initial reporting, ② the rate of collecting two stool samples within 14 days, ③ the rate of collecting acceptable stool samples and ④ the rate of timely sending samples within 7 days as shown in Table 5. The 2011 performance data for these indicators were generally high although the figures for indicators ② and ③ in Xinjiang were more than 15% lower than the corresponding performance levels in other provinces, suggesting the insufficient state of achievement in this particular autonomous region. However, when an incident of imported polio occurred in Xinjiang in 2011, the surveillance as well as laboratory diagnosis systems functioned well and the spread of polio was prevented. This fact indicates that a certain level of AFP surveillance in Xinjiang has beenmaintained. Since 2012, the performance level of these four indictors have been continuously almost 90% or higher in Jiangxi, Sichuan and Gansu Provinces but figures below 90% have been recorded in the Ningxia and Xinjiang Autonomous Regions, particularly for indicators ② (rate of collecting two stool samples within 14 days) and ③ (rate of collecting acceptable stool samples), suggesting the slow progress of the improvement of AFP surveillance. The reasons behind such slow progress of improvement in these two autonomous regions are unclear as the field survey for this ex-post evaluation could not take place in these autonomous regions.

Based on the above, the immunization rate and level of AFP surveillance for polio were found to have generally reached an adequate level. Therefore, the project purpose for polio was generally achieved. However, at the time of the ex-post evaluation, the level of AFP surveillance is found to be below the target level, failing to secure an adequate level to an extent in some provinces (Ningxia and Xinjiang Autonomous Regions).

(2) Measles

The surveyed measles immunization rate in the target provinces is shown in Table 6.

Table 6 Historical Changes of the Surveyed Immunization Rate for Measles in the Target Provinces/Autonomous Regions (%)

Year	Jiangxi		Sichuan		Gansu		Ningxia		Xinjiang	
	MV1	MV 2	MV 1	MV 2	MV 1	MV 2	MV 1	MV 2	MV 1	MV 2
2011	99.9	99.4	95.6	94.6	95.7	-	92.7	99.0	93.3	78.0
2012	96.8	96.9	94.5	95.8	97.5	-	-	-	-	-
2013	99.6	98.8	95.1	93.8	97.7	96.9	100.0	98.6	99.7	98.9
2014	98.7	97.2	95.9	93.7	-	-	-	-	-	-

Note: MV1 means the first measles vaccination (immunization) and MV2 means the second measles vaccination (immunization).

Source: Provincial CDCs

The surveyed immunization rate for measles in 2011 (at the time of project completion) fell short of the target rate of 95% in the case of either MV1 or MV2 or both in Sichuan Province and the Ningxia and Xinjiang Autonomous Regions. The situation of the second measles immunization in Gansu Province is unknown because of the lack of relevant data. The second measles immunization rate in Xinjiang of 78.0% was particularly low. Since 2012, the surveyed

immunization rate for measles has generally improved to 97% or more which is above the target rate of 95% in Jiangxi, Gansu, Ningxia and Xinjiang. In Sichuan Province, even though the surveyed rate has been around 95%, the overall improvement has been below that of other provinces. The rates of the first immunization in 2012 and the second immunization in 2013 and 2014 are all less than 95%. In the case of Gansu Province for example, the checking ratio of school records greatly improved from 95.1% in 2011 to 99.6% in 2012 as a result of dissemination of the work to check immunization records and supplementary immunization. As this example shows, the evaluator has been able to verify through the field survey that the province-wide dissemination of the said work has contributed to an improved immunization rate in Jiangxi and Gansu Provinces. The factors behind the data for the other provinces are unclear as the field survey was not conducted in these provinces.

Table 7 shows the state of the supplemental immunization of non-immunized children in the target provinces as this data is important for improvement of the immunization rate.

Table 7 State of Supplemental Immunization in the Non-Immunization Cases (Rate of Uncompleted Doses for Supplemental Immunization)

	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang
2011	10.5%	0.9%(2010)	2.5%	4.6%	3.1%
2012	4.1%	5.2%	1.2%	1.8%	1.2%
2013	2.6%	3.4%	1.5%	15.4%	2.3%
2014	2.5%	-	3.6%	4.2%	16.1%

Source: Provincial CDCs

The actual 2011 figure for the number of uncompleted doses [5] for supplemental immunization divided by the number of required doses for supplemental immunization (rate of uncompleted doses for supplemental immunization) in the case of the measles vaccine was good at less than 5% for all of the target provinces except Jiangxi Province where the figure was 10.5% (the figure for Sichuan Province was for 2010). Even in Jiangxi Province, the more recent figure was low at below 3% in 2009 and 2010. The performance level in 2012 onwards appears to vary depending on the year and province. The figure has generally been 5% or lower in Jiangxi, Gansu and Sichuan Provinces while greatly fluctuating in the Ningxia and Xinjiang Autonomous Regions from one year to another. A very high figure exceeding 15% was recorded for Ningxia in 2013 and for Xinjiang in 2014.

In Jiangxi and Gansu Provinces, the evaluator verified the situation where supplementary immunization is conducted not only for measles but also for a wide range of vaccine-preventable diseases as a result of appropriate follow-up for non-immunized children identified through the checking of immunization records and also for their parents. One such follow-up activity is that when immunization is difficult to conduct at hospitals, it is done by village doctors visiting the homes of children. Meanwhile, the exact situation and reasons for low supplementary immunization rate in Ningxia and Xinjiang Autonomous Regions are unclear.

The summary conclusion regarding the achievement of the project purpose in connection with measles is that the target immunization rate was not achieved in some provinces (Sichuan, Ningxia and Xinjiang) by the time of project completion. However, the subsequent improvement of the measles immunization rate has achieved the target immunization rate in all of the provinces by the time of the ex-post evaluation. Meanwhile, the rate of uncompleted does for supplemental immunization in Ningxia and Xinjiang was unsatisfactory in some years, posing a challenge. In short, it is fair to say that the project purpose has not been achieved in some aspects for measles.

[5] The number of doses means the number of immunizations.

(3) Hepatitis B

The performance indicators for hepatitis B immunization in the target provinces are ① the rate of first immunization within 24 hours of birth and ② the immunization process (three injections) completion rate. The actual figures by province are shown in Table 8.

Table 8 Historical Changes of the Surveyed Immunization Rate for Hepatitis B in the Target Provinces/Autonomous Regions (%)

Year	Rate of First Immunization within 24 Hours of Birth					Immunization Process (Three Injections) Completion Rate				
	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang
2011	98.8	92.8	92.6	91.0	65.1	99.8	95.6	98.1	87.4	91.2
2012	96.0	94.6	94.4	-	-	100.0	97.2	99.3	-	-
2013	99.6	94.9	94.5	93.8	95.2	99.8	96.4	98.9	99.4	99.6
2014	93.4	94.9	-	-	-	98.0	96.3	-	-	-

Source: Provincial CDCs

The 2011 performance for these two indicators exceeded the target rate of 90% in all of the provinces except the rate of first immunization within 24 hours of birth in Xinjiang and the immunization process completion rate for Ningxia. In Xinjiang, the first immunization rate of 65.1% was some 25 points below the target rate of 90%, failing to achieve the required level. However, improvements were made in 2012 onwards and the target rate was achieved in all provinces.

The interviews conducted at the Gansu CDC found the opinion that although the situation of identifying and vaccinating babies born at home was not ideal before the Project, the strengthened surveillance through the Project made it possible to adequately identify newly born babies, resulting in a substantial improvement of the immunization rate for hepatitis B. As the identification of pregnant women is a key factor for an improved immunization rate for hepatitis B, it is inferred that strengthening of the surveillance in the target provinces, including the Ningxia and Xinjiang Autonomous Regions, greatly contributed to improving the said immunization rate.

In short, although the target immunization for hepatitis B was not achieved in some provinces (Ningxia and Xinjiang) by the time of the completion of the Project, the target rate was achieved in all provinces by the time of the ex-post evaluation.

(4) Japanese Encephalitis

The scope of the cooperation under the Project to combat Japanese encephalitis was limited, only featuring the strengthening of laboratories (Output 2) and the establishment of linkage and communication (coordination system) between organizations (Output 3) in Jiangxi and Sichuan. As a result, the relevant indicator was “the skills and knowledge for laboratory diagnosis at the provincial CDCs in the target provinces (Jiangxi and Sichuan) are improved” instead of “the immunization rate and others” which are related to the outcomes of the infectious disease control service and are adopted for other infectious diseases.

The results of interviews at the Jiangxi Provincial CDC suggest that the skills and knowledge for laboratory diagnosis in Jiangxi pass the relevant laboratory criteria in China at the time of both project completion (2011) and ex-post evaluation (2014) due to their strengthening under the Project as well as related projects of the Government of China. As such, the level of knowledge among laboratory technicians and the laboratory diagnosis skills in Jiangxi are satisfactory.

Based on the above, it is fair to say that the project purpose for Japanese encephalitis has been achieved in Jiangxi Province while the situation in Sichuan Province is unclear.

3.2.1.3 Contribution of the Project towards the Achievement of the Project purpose

The state of achievement of the project purpose is described in 3.2.1.2 above. Here, the contribution made by the Project is clarified.

In the first half of the project period, support activities were conducted in the five target provinces to improve five different types of services featuring four infectious diseases. In the second half, however, the target disease was narrowed down to measles in 10 pilot counties identified for the prioritized checking of immunization records and supplemental immunization. Because of this, the project contribution in the first half and second half is discussed separately here.

In connection with the contribution of the project-related activities in the first half of the project period, it is essential to note that a number of cooperation projects of other donors and international aid organizations and also relevant projects of the Government of China were implemented in this period in relation to the project purpose of "improving the level of surveillance and quality of the immunization service in the target provinces (the relevant indicator is an improved immunization rate for the target infectious diseases). The activities related to these projects were particularly strengthened in the implementation period of the Project based on the 11th Five Year Guideline for Economic and Social Development (2006 – 2010). One typical example is the strengthening of EPI based on the 2006 – 2012 National Action Plan for Measles Elimination and the National Plan for Hepatitis B Control and Treatment in 2006 to 2010. Another example is the budgetary expansion for the control of infectious diseases at such lower administrative levels as township and village based on the Subject Matters for a Fairer Basic Public Health Service, a document issued in line with the national policy of strengthening the public health service in local and rural areas.

Although the budget size of the Government of China for infectious disease control, etc., especially the budget allocated to controlling four infectious diseases in the target provinces of the Project, is unclear, a former Japanese expert involved in the Project put such budget at more than 1,000 times the budget for the Project. The activities in the first half of the project period achieved ① the strengthening of surveillance through human resources development, ② improvement of the technical level of diagnosis due to the improved skills of laboratory technicians and ③ realization of safe injections and improvement of the cold chain[6] due to improvement of the immunization service. These facts indicate that the activities in the first half of the project period made a certain contribution to the realization of the project purpose (of which the indicator is an improved immunization rate). However, it is fair to say that the overall improvement described here was the combined outcome of activities under the Project as well as other similar projects (especially those independently conducted by the Government of China).

In regard to the work of checking immunization records and supplementary immunization in the second half of the project period, the activities were prioritized with a view to adopting and promoting a single model featuring ① the establishment of a work implementation system, ② promotion of the linkage and communication between the health sector and the education sector, ③ training and human resources development to support various activities, ④ the introduction of the TCM (training cycle management) technique for human resources development and ⑤ the development and introduction of a maternal and child health handbook integrating the pregnancy health record, child health handbook and immunization record (in Nanfeng county in Jiangxi Province only).

There has been a conscious attempt to disseminate the positive outcomes of this work to all provinces in the post-project period. The situation of the province-wide dissemination (at the time of the ex-post evaluation) of such outcomes in Jiangxi and Gansu Provinces where the field survey for the ex-post evaluation was conducted is summarized in Table 9.

[6] A cold chain means the mode of (and equipment used for) physical distribution to keep pharmaceutical products consistently in a low temperature environment through the production, transportation and consumption processes.

Table 9 Main Components of the Checking of Immunization Records and Supplemental Immunization Work and Situation of Province-Wide Dissemination (Jiangxi and Gansu Provinces)

Main Components	Situation of Province-Wide Dissemination
(1) Establishment of the work implementation system (preparation of the work flow, clarification of the respective responsibilities of the health sector and the education sector, etc.)	○
(2) Promotion of the linkage and communication between the health sector and the education sector	○
(3) Training and human resources development to support various activities (human resources development at various levels in the health sector and the education sector)	○
(4) Development and utilization of teaching materials relating to training and human resources development (development of a manual for immunization records)	△
(5) Introduction of the TCM technique for human resources development (management cycle and participatory model)	×
(6) Development and introduction of a maternal and child health handbook integrating the pregnancy health record, child health handbook and immunization record	×

Note: ○: disseminated; △: partially disseminated; ×: not disseminated

Source: Prepared by the evaluator using reference materials provided by provincial CDCs and the field survey findings.

In regard to Components (1) and (2) in Table 9, the relevant matters were included in the "notice on the checking of immunization records and supplemental immunization at the time of enrolment in kindergarten and primary school" which was issued by provincial bureaus of health and education based on the experience of the pilot counties, prompting the provincial-wide dissemination of the positive results of the work. Similarly, Component (3) has been actively promoted at the provincial level. Interviewed officials of the Public Health Bureaus and CDCs, etc. of the two visited provinces positively evaluated the Project, saying that the utilization of the outputs of the Project had made it possible to uniformly as well as efficiently implement immunization-related work at the provincial level, facilitating ① the improvement of the system for linkage and communication between the health sector and the education sector (Output 3), ② strict enforcement of the checking of schools and children (Output 4), ③ strengthening of the field surveillance (Output 1) and ④ enhancement of the awareness of infectious disease control among parents and other people concerned (Output 5). As a result, checking of immunization records of individual pupils at schools and the supplementary immunization of non-immunized pupils are now conducted at a rate of almost 100%. Meanwhile, the progress of the introduction of teaching materials and techniques in relation to human resources development was modest. Under the Project, a teachers' manual for the checking of immunization records and supplemental immunization was prepared. Even though the underlying idea of this manual was understood throughout the province, the actual use of the manual was limited to the pilot counties due to difficulty of paying for its printing cost. There was an active attempt under the Project to introduce the training cycle management (TCM) method which emphasizes the ideas of a management cycle[7] and participatory approach and trainers were trained in the pilot counties from the viewpoint of disseminating this TCM method.

[7] A management cycle means a series of stages or flow to ensure the efficient management of a project or work. Well-known cycles are ① Plan → Do → See and ② Plan → Do → Check → Action.

However, there has been no universal acceptance of the method because ① the method targeting a small number of people is not appropriate for China where the subject number of people for human resources development is huge and ② the training of trainers is inefficient as it requires much time and expense. In regard to the development and introduction of an integrated maternal and child health handbook, 12,150 handbooks have been distributed in Nanfeng County in the post-project period. There is a fundamental problem that the integration of immunization records and maternal and child health records is currently difficult as they are operated by separate administrative organizations along separate command lines partly due to the absence of a central government policy concerning the introduction of the integrated maternal and child health handbook. As of March, 2015, there is no plan for the additional printing of this handbook because of ① the outdated contents of the handbook as they do not reflect institutional changes in the health sector, ② lack of proper awareness among medical institutions of the importance of the handbook, resulting in the sporadic distribution of the handbook and ③ difficulty of efficiently using the handbook as it lacks sufficient space to fill in the necessary volume of information.

The contribution of the work regarding the checking of immunization records and supplemental immunization to the achievement of the project purpose is considered to be substantial (especially regarding measles) in Jiangxi and Gansu Provinces. However, since the full-scale provincial-wide dissemination of concrete project outcomes only took place after the completion of the Project, the planned emergence of the project effects on a province-wide basis to meet the project purpose primarily occurred in the post-project period. The current situation is that the components which are considered to be greatly effective in China appear to be selected and applied at the provincial level instead of the originally planned implementation of the model as a single package. In the case of the remaining provinces (Sichuan, Ningxia and Xinjiang), the details of the achievement situation of the project purpose (meaning the details of the contribution of the Project) at the provincial level are unclear due to the lack of a field survey.

In short, as far as the project purpose is concerned, the target immunization rate was achieved in most of the target provinces along with an improved level of surveillance and service quality by the time of project completion even though some of the more specific targets were not completely achieved in some provinces. At the time of the ex-post evaluation, some indicators, including the supplemental immunization rate for measles, are not achieved in the Ningxia and Xinjiang Autonomous Regions. No exact information is available on the situation of Japanese encephalitis laboratories in Sichuan Province. It is apparent that the activities in the first half of the project period had a certain degree of contribution to the achievement of the project purpose. In contrast, the degree of the contribution of the checking of immunization records and supplemental immunization conducted in the second half is assessed as substantial in Jiangxi and Gansu Provinces but is unclear in the case of the remaining target provinces (Sichuan, Ningxia and Xinjiang). Based on this, the project achieved at a limited level its project purpose.

3.2.2 Impacts

3.2.2.1 Achievement of the Overall Goal

As far as the state of achievement of the indicators for the overall goal is concerned, those indicators for which a target achievement time was not set are analyzed by disease in reference to their situation at the time of the ex-post evaluation. These indicators for the overall goal of the Project and the state of their achievement are outlined in Table 10. The state of achievement by indicator in each province is assessed in Table 11.

Table 10 Achievement of the Overall Goal

Objective	Indicator	Performance
Overall Goal: The health of children is improved in the five target provinces and autonomous regions through the control of diseases associated with the Project.	(Polio) 1. Maintenance of the polio-free status	The polio-free status is still maintained at the time of the ex-post evaluation.
	(Measles) 2. Lowering of the target indicator (measles incidence) value adopted by the Measles Elimination Program of China (1 in one million or less by 2012)	• The performance in the target year of 2012 showed achievement of the target in Jiangxi, Gansu and Ningxia but not in Sichuan and Xinjiang. • Since 2013, the target has not been achieved in every province (Table 12).
	(Hepatitis B) 3. The hepatitis B surface antigen prevalence rate for children under five years old is less than 1% by 2010.	• The hepatitis B surface antigen prevalence rate among children under five years old in 2010 was less than 1% although this figure was for entire China. No data for 2011 and thereafter was obtained. • The interviews with CDC officials in Jiangxi and Gansu found that the 2010 level has been maintained up to the present day, achieving the target (Table 13).
	(Japanese encephalitis) 4. Incidents of Japanese encephalitis are accurately diagnosed and suitable control measures are implemented.	• The interviews with CDC officials in Jiangxi Province found that the diagnosis of Japanese encephalitis and the implementation of control measures are sufficiently conducted. The situation in Sichuan Province is unclear.

Table 11 State of Achievement of the Overall Goal by Indicator in Each Province

Disease/ Indicator	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang	Combined
Polio: Maintenance of the polio-free status	○	○	○	○	○	○
Measles: Lowering of the target indicator (measles incidence) value adopted by the Measles Elimination Program of China (1 in million or less by 2012)	○ (×)	× (×)	○ (×)	○ (×)	× (×)	× (×)
Hepatitis B: The hepatitis B surface antigen prevalence rate for children under 5 years old is less than 1% by 2010	? (○)	? (?)	? (○)	? (?)	? (?)	? (?)
Japanese encephalitis: Incidents of Japanese encephalitis are accurately diagnosed and suitable control measures are implemented	○	?	-	-	-	△

Note: ○ = Achieved; △ = mostly achieved; ×=unachieved. The timing of the assessment is at the time of the ex-post evaluation for polio and Japanese encephalitis. For measles and hepatitis B, the state of achievement in the target year is evaluated. The assessment result in parentheses relates to the state of achievement at the time of the ex-post evaluation.

Source: Prepared by the evaluator using materials supplied by provincial CDCs and the field survey findings.

(1) Polio

According to those working for institutions specializing in infectious diseases in China and Japan, the polio-free status of China is maintained nationwide at the time of the ex-post evaluation.[8] An outbreak of polio is contained through a high immunization rate. As described earlier, an incident of imported polio in Xinjiang in 2011 was quickly contained due to the early detection of infected patients and the swift introduction of control measures. Here, two factors played a significant role in preventing the spread of polio: ① a fully functional regional laboratory to play its role and ② functioning of a system involving satisfactory surveillance and laboratory response. This successful containment of imported polio in Xinjiang was achieved due to the aggressive input of infectious disease control personnel from all over China into the region. It is also true to say, however, that the satisfactory level of infectious disease control in Xinjiang was also a vital component for the successful outcome.

Based on the above, it is fair to say that the overall goal for polio was achieved.

(2) Measles

The performance in the target year (2012) showed that the target incidence of one in one million or less was achieved in Jiangxi, Gansu and Ningxia but not in Sichuan and Xinjiang. While the minimum target level of incidence was somehow achieved in Sichuan, the incidence in Xinjiang of 27 in million was much higher than in other provinces, indicating insufficient improvement in this autonomous region.

Table 12 Measles Incidence in the Target Provinces and Autonomous Regions

(Unit: 1 in one million)

	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang
2006	36.8	99.5	55.7	6.9	14.9
2011	0.7	15.1	31.3	11.1	86.8
2012	0.9	3.1	0.7	0.9	27.0
2013	3.0	3.2	9.2	10.9	41.2
2014	1.4	-	10.4	10.1	55.6
Principal Age Group (Ratio)（2014）	< 1 year old（37.1%）	0 to 4 years old（58.0%）	0 to 1year old（35.1%）	≤20 years old（54.5%）	0 to 2years old（77.0%）

Source: Provincial CDCs.

Since 2013, the target incidence of 1 in million or less has not been achieved in any of the target provinces. The incidence exceeding 1 in 100,000 in Gansu, Ningxia and Xinjiang in 2014 was 10 times the target incidence. Xinjiang in particular recorded a very high incidence level of 55.6 in million in 2014. When looking at the most recent five year period, a trend of an improved incidence of measles can be observed in four target provinces as a result of the increased immunization rate, etc. except in Xinjiang but the target level has not been reached in general. The principal age group is young people, especially infants, in all provinces. Interviews with CDC officials in Jiangxi and Gansu found that the main reasons for the failure to achieve the target incidence are ① incidents of measles involving infants prior to immunization and ② persistent level of incidence among non-immunized adults. The suggested reasons for the much higher level of incidence in Xinjiang compared to the other provinces are ① insufficient supplemental immunization of non-immunized children because of the huge geographical area of this region together with a high level of fluid population and ② a high proportion of non-immunized adults. However, the details of these are unclear because of the absence of a field survey for this ex-post evaluation.

[8] The incident of imported polio in 2011 had a foreign source and was controlled within six months, making it legitimate to judge that the polio-free status of China was maintained despite this incident.

Based on the above, the short conclusion is that the overall goal for measles was achieved in some provinces in the target year but is not achieved in any province at the time of the ex-post evaluation.

(3) Hepatitis B

No new data on the hepatitis B antigen prevalence rate was obtained in the ex-post evaluation. The actual 2010 figure was obtained at the time of the terminal evaluation and this figure indicates that the target level (less than 1%) was achieved. However, this figure was for entire China and no concrete figures for the individual target provinces of the Project are available.

Table 13 Hepatitis B Surface Antigen Prevalence Rate among Children Under 5 Years Old (Entire China: 2010)

	Number of Children Tested	Number of Those Positive	Ratio of Positive Samples (%)	Hepatitis B Surface Antigen Prevalence Rate (%)
Boys	8,740	106	1.21	1.10
Girls	7,636	71	0.93	0.79
Total	16,376	177	1.08	0.96

Source: Terminal Evaluation Report

While a concrete antigen prevalence rate was not obtained for Jiangxi or Gansu during the field survey, the interviewed provincial CDC officials confirmed that the target was met in 2010 in their provinces and that the same level has been maintained from 2011 to the time of the ex-post evaluation. According to these officials, the improved immunization rate of women delivering babies at home as a result of the strengthened field surveillance and supplemental immunization system have made a considerable contribution to the successful control of hepatitis B.

Based on the above, while the overall goal for hepatitis B has been achieved in Jiangxi and Gansu Provinces at the time of the ex-post evaluation according to the CDCs, the real picture is unclear, partly because of the absence of new data on the antigen prevalence rate for these provinces as well as the other three provinces.

(4) Japanese Encephalitis

The interviewed Jiangxi Provincial CDC officials told the evaluator that the improved skills and knowledge concerning laboratory diagnosis had led to the sufficient levels of Japanese encephalitis diagnosis and implementation of control measures. As the incidence of Japanese encephalitis has been low in Jiangxi Province, these officials perceive that diagnosis and subsequent treatment are conducted in a satisfactory manner in this province. The situation in Sichuan Province, another target province, is unclear.

As far as the achievement of the overall goal for Japanese encephalitis is concerned, it is achieved in Jiangxi Province at the time of the ex-post evaluation but the situation in Sichuan Province is unclear.

The overall short conclusion is that the polio-free status has been maintained in all of the target provinces. In contrast, despite the trend of a declining incidence due to an improved immunization rate among children in most provinces, the target level of measles incidence has not been achieved in all of the target provinces. Moreover, the fact that the principal age group affected by measles is young children, especially infants, suggests that the health of children has not necessarily improved as planned. In the case of hepatitis B and Japanese encephalitis, the achievement of the respective targets was confirmed in the two provinces visited but the

situation in other provinces is unclear. In the light of the above, the project has achieved at a limited level its overall goal.

3.2.2.2 Other Impacts

Advancement of Countermeasures against Infectious Diseases Other Than Those Targeted by the Project

The Project targeted four different infectious diseases and the checking of immunization records and supplemental immunization in the second half of the project period principally targeted measles. The active implementation of the Project consolidated the necessary conditions for the effective control of infectious diseases, including improved linkage and communication between the people as well as organizations concerned, increased awareness of parents of infectious diseases and strengthening of the surveillance. As a result, the immunization rate was increased along with the early detection of patients and the quick implementation of control measures for not only the four targeted diseases but also for a wide range of infectious diseases.

Utilization of the TCM Method for Activities of the Health Office and CDC of Gansu Province

As described earlier, the TCM method stressing the management cycle and a participatory approach has not been utilized much to spread the concept and practice of the checking of immunization records and supplemental immunization throughout the target provinces primarily because of the high implementation cost, including the cost of trainer training (see 3.2.1.3 Contribution of the Project Towards the Achievement of the Project Purpose e). Nevertheless, the idea and effectiveness of the TCM method are highly evaluated based on the results in the pilot counties. At the provincial Health Office and CDC in Gansu, this method is actively utilized for training and management activities involving a small number of provincial officials and is becoming the standard practice.

Since this project has to some extent achieved the project purpose and overall goal, effectiveness and impact of the project are fair. For the project purpose, the target immunization rate was achieved in most provinces by the time of project completion while the improvement of the level of surveillance and quality of the immunization service was underway. In some provinces, however, part of the project purpose was not achieved for some diseases. It is apparent that the activities in the first half of the project period made a certain contribution to realizing the project purpose but the degree of contribution of the checking of immunization records and supplemental immunization conducted in the second half of the project period is unclear in Sichuan, Ningxia and Xinjiang. In regard to the overall goal, while the polio-free status has been maintained in all of the target provinces, the target incidence for measles has not been achieved or maintained in all of the target provinces. In the case of hepatitis B and Japanese encephalitis, while the achievement of the respective targets is confirmed in the provinces visited by the evaluator, the situation in other provinces is unclear.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

The inputs for the Project are classified in the following table.

Inputs	Plan	Actual (at the Time of Terminal Evaluation)
(1) Experts	Long-term: 4 persons (16 person-year) Short-term: 50 persons (50 person-month)	Long-term: 6 persons (11.2 person-year) Short-term: 43 persons
(2) Trainees received	25 persons	45 persons
(3) Equipment	Cold chain and laboratory equipment, etc.	Laboratory equipment, OA equipment, vehicles, training/information system

		equipment and cold chain Total: 133 million JPY
(4) Others	Local activities: preparation of reference materials and textbooks Local training: seminars, etc.	Cost of local activities: 135 million JPY Cost of carrying equipment: 5.8 million JPY
Japanese side Total Project Cost	580 million JPY	594 million JPY
Chinese side Operational Expenses	Administrative and executing staff for the Project, work-related facilities and project operation cost	2,610 million JPY

Note: The actual figures are those at the time of the terminal evaluation except for the total contribution by the Japanese side (at the time of project completion).
Source: Terminal Evaluation Report (JICA for the total contribution by the Japanese side (at the time of project completion))

3.3.1.1 Elements of Inputs

(1) Japanese Inputs

[Dispatch of Experts]

In regard to the dispatch of Japanese experts, the actual total person-year figure for long-term experts was 4.8 person-year lower than planned (some 11.2 person-year compared to the planned 16 person-year) and the actual total person-month figure for short-term experts was 7 person-month lower than planned (43 persons compared to the planned 50 persons). The reason for the lower figure for long-term experts is that the third generation team leader in the second half of the project period was reclassified as a short-term expert. The main reason for the lower figure for short-term experts is adverse external impacts caused by the Great Sichuan Earthquake, etc.

[Training of Counterparts]

A total of 45 Chinese persons related to the project implementing agencies in China underwent training in Japan, far exceeding the planned 25 persons. This increase was based on the recognition that in view of the wide-ranging target diseases and provinces, it would be necessary for as many Chinese personnel as possible to undergo training in Japan to improve the laboratory diagnosis capability in regard to the target diseases and also to facilitate a proper understanding of the requirements associated with immunization management and epidemiological administration. As such, the increase is believed to be within reasonable scope in view of the nature of the Project.

[Equipment]

As far as the provision of equipment is concerned, Japan provided ① laboratory equipment, ② vehicles, ③ training and information system equipment and ④ cold chain to the CCDC and provincial CDCs as shown in Table 14.

Table 14 Breakdown of Provided Equipment by Recipient

	CCDC	Jiangxi	Sichuan	Gansu	Ningxia	Xinjiang
Laboratory Equipment		○	○	○	○	○
Vehicles	○	○	○	○	○	○
Training and Information System Equipment	○	○	○	○	○	○
Cold Chain			○	○		

Note: Those marked ○ are included in the scope of equipment to be provided under the Project.
Source: Prepared by the evaluator based on the Terminal Evaluation Report.

[Other]
The Japanese side disbursed 135 million JPY to cover the cost of local activities and 5.8 million JPY to cover the cost of carrying equipment.

(2) Chinese Inputs
[Assignment of Counterparts of the Implementing Agency, etc.]
The Chinese side assigned 144 persons as counterparts for the Project. These were mainly senior officials of the Immunization Management Office, Department of Disease Control, Ministry of Health and Immunization Planning Center as well as laboratories of the CCDC at the national level and the disease control office of the provincial bureau of health and immunization planning as well as the laboratories of provincial CDCs at the local level. For the implementation of the checking of immunization records and supplemental immunization in the second half of the project period, the heads of two pilot counties in each target province were assigned as counterparts.

[Provision of Land and Facility]
A CCDC office in Beijing was provided to act as the project office.

[Financial Contribution by Chinese Side]
The Chinese side disbursed some 180 million CNY (approximately 2,610 million JPY) for the five provinces by the time of the terminal evaluation to meet the local administrative expenses. As Japan's technical cooperation project to assist infectious disease control had been continuing for some time, it was agreed that the share of China's financial contribution to the Project would gradually increase to reflect the economic development and increased funding capability of China. The Chinese proportion for the Project was high as it exceeded 80% of the total project cost.

3.3.1.2 Project Cost
The project cost of Japan was 594 million JPY which is higher than the originally planned contribution of 580 million JPY (102% of the original cost).

3.3.1.3 Period of Cooperation
The actual cooperation period was 60 months (five years) as planned.

Although the project period was as planned, the project cost slightly exceeded the plan. Therefore, the efficiency of the project is fair.

3.4 Sustainability (Rating: ③)
The subject matter in this section is checking of the necessary items for the promotion and maintenance of a drive designed to reduce the incidence of infectious diseases through improvement of the immunization rate which was the objective of the Project. Because details of the current situation have not been grasped in the three provinces where the field survey for ex-post evaluation could not be conducted, the evaluation scope of the sustainability is quite restricted. However, it has been decided to make an overall judgement on the sustainability based on ① the situation in Jiangxi and Gansu Provinces in which the field survey was conducted, ② results of interviews with officials of NHFPC and CCDC and former Japanese experts involved in the Project and ③ the situation in the five target provinces at the time of project completion and subsequent general trend in China.

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects
China's development plan and policy at the time of this ex-post evaluation indicate an active commitment to promoting infectious disease control and immunization management as in the

case of such commitment at the time of project planning as well as project completion. This commitment was and still is apparent in the 12th Five Year Guideline for Economic and Social Development (2011 – 2015), China National Program for Child Development (2011 – 2020) and Draft Plan to Strictly Enforce the Guidelines for Chinese Women Development (2011 – 2020). At the provincial level, including the five target provinces, a plan has been formulated to copy the national plan, indicating an unchanged commitment at the provincial level to prioritizing infectious disease control.

In regard to the checking of immunization records and supplemental immunization, the implementation policy for the checking of immunization records has been formulated under the Project in all of the five target provinces based on the Regulations on the Administration of Vaccine Circulation and Immunization. In Jiangxi and Gansu Provinces, the evaluator has confirmed that the work in question has been implemented throughout these provinces as a uniform provincial system following the issue of an official notice explaining how to implement the work in a concrete manner.[9] According to some NHFPC and CCDC officials interviewed by the evaluator, provincial governments have been actively promoting the checking of immunization records and supplemental immunization while follow-up research has been conducted by the CCDC to further improve this work.

It is, therefore, concluded that the sustainability of the Project in terms of policy and institutional aspects is basically secured.

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

As described earlier, the National Health and Family Planning Commission was launched in 2013. This means that organizational reform at the central government level has been completed and similar reform at the local government level is in progress at the time of the ex-post evaluation. Following the said organizational reform, while major staff reassignment appears to have taken place at the central government level, no significant staff reassignment has taken place in Jiangxi and Gansu Provinces where project-related activities are being smoothly implemented. In regard to CDCs which are the implementing agencies, no major changes have taken place relating to the system, roles and their relationship with superior or subordinate organizations and there are no visible problems.

In regard to the situation of the linkage and communication between the health sector and the education sector which have major implications for the smooth implementation of the checking of immunization records and supplemental immunization, one relevant development is the formulation of the implementation policy for the checking of immunization records which indicates the basic direction for linkage and communication between the two sectors, in all five target provinces. While the details for the three provinces not visited for the ex-post evaluation are unclear, it has been confirmed that the relevant work has been smoothly implemented in Jiangxi and Gansu Provinces based on the concrete division of work between the two sectors as indicated by the official notice. As such, no problems are observed.

Other types of work related to infectious disease control, including laboratory work and surveillance work, have been routinely conducted. In Jiangxi and Gansu Provinces visited by the evaluator, no organizational problems are observed down to the township/village level. The improvement of village clinics is gradually taking place. According to a former Japanese expert, the infectious disease control system in China has been continually improved in every target province of the Project. The swift response to the imported case of polio in the Xinjiang

[9] In the case of the work to distribute the maternal and child health handbook, however, it will be necessary in the future to deal with a situation where there is no immediate prospect of sustaining this work let alone its further development as it was suspended in 2014 due to the absence of a central government policy regarding the introduction of the maternal and child health handbook system even in Nanfeng County which had been the pilot county for this work (see 3.2.1.3 Contribution of the Project Towards the Achievement of the Project Purpose).

Autonomous Region is appraised as evidence of the infectious disease control system in the five target provinces having reached a certain standard.

It is, therefore, concluded that the sustainability of project effects in terms of the organizational aspects of the implementing agency is basically secured.

3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

Various skills and know-how to achieve the five planned outputs were widely disseminated under the Project by means of the provision of training, etc. for officials of the former Ministry of Health and the CCDC, those of organizations related to infectious disease control at the provincial, municipal, county, township and village levels and people concerned in the education sector. The number of training sessions and participants in the post-project period have declined from the level in the project period (Attached Tables 1 and 2). According to the interviewed officials of the Jiangxi and Gansu Provincial CDCs, this decline reflects the Chinese government policy of implementing training more efficiently and reducing the number of training sessions. Meanwhile, the necessary training has been continually provided. In regard to the technical level of the laboratories dealing with specific diseases, the WHO proficiency test results indicate that they have maintained a satisfactory level in all of the five target provinces (see Output 2 in 3.2.1.1 Project Outputs). While the details of the three provinces not visited for the ex-post evaluation are unclear, the terminal evaluation report concluded that various types of work related to infectious disease control were smoothly conducted as routine. For this ex-post evaluation, the evaluator has confirmed that there are no technical problems in either Jiangxi Province or Gansu Province.

One promotional factor to secure the necessary technical standard concerning infectious disease control is to secure a certain level of human resources which possess expert knowledge of health in general and infectious disease control in particular. In the case of the Jiangxi and Gansu Provincial CDCs, new recruitment focuses on post-graduates. There has been an increase of the number of young doctors with certain expert knowledge working at village clinics, partly because of an improved pay package. Meanwhile, the Government of China has been pursuing wide-ranging human resources development policies, including a system of dispatching student interns to township/village hospitals or clinics for five years. There appears to be a virtuous cycle of enhanced professionalism among training participants equipped with better knowledge and expertise leading to faster understanding and mastering of the training contents, in turn leading to further improvement of the technical standard.

It is, therefore, concluded that the technical sustainability of the Project effects is basically secured.

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effects

In this ex-post evaluation, no concrete figures have been obtained for the budget size for infectious disease control and the financial situation of the CDC in each target province. However, the results of interviews with officials of NHFPC, CCDC and Jiangxi and Gansu Provincial CDCs indicate that there are no problems in regard to securing the necessary budget for their work because of the emphasis of the Government of China on infectious disease control. Fiscal spending in China (central government spending plus local government spending) has recorded a high annual growth rate of some 20% on average since 2000 against the background of steady economic development, and the growth rate of spending in the health and sanitation sector has been higher than those of other sectors (an actual annual increase of 27% in 2013). This situation suggests that the target provinces of the Project are unlikely to experience budgetary problems.

At the lower administrative levels of township and village which were thought to be more likely to experience budgetary problems, active assistance has been provided by the central government based on the Subject Matters for a Fairer Basic Public Health Service. The

budgetary disbursement for infectious disease control targeting the lower administrative levels has been continually increased to the point where 40 CNY is to be disbursed per villager in 2015 (compared to the actual figure of 15 CNY in 2009) in order to further improve the local budget situation to achieve an acceptable level to a certain extent. The growth of the relevant budget has increased the financial reward for village doctors engaged in the immunization service. Other favorable impacts of the increased budget are more publicity to make people aware of infectious disease control and the strengthening of training activities featuring various persons concerned.
It is, therefore, concluded that the financial sustainability of the Project effects is basically secured.

No major problems have been observed regarding the policy background and the organizational, technical, financial aspects of the implementing agency. Therefore, sustainability of the project effects is high.

4 Conclusions, Lessons Learned and Recommendations

4.1 Conclusions

The Project aimed at improving the immunization rate through improvement of the infectious disease control service, thereby contributing to the reduction of the incidence of infectious diseases and improving the health of children in five provinces/autonomous regions in the central and western parts of China.

The improvement of infectious disease control through the strict enforcement of immunization conforms to the importance and needs of the relevant policies of China as well as Japan's ODA policy, indicating the high level of relevance of the Project. There is no doubt that infectious disease control has generally improved in every target province/autonomous region as illustrated by increased immunization rate. However, there are some unachieved issues in some provinces and the incidence of measles has not yet reached the target. Moreover, details of the situation of hepatitis B and Japanese encephalitis are unavailable for some provinces. It is apparent that the activities in the first half of the project period made a certain contribution towards the realization of the project purpose. Meanwhile, checking of immunization records and supplemental immunization conducted in the second half of the project period made a major contribution in Jiangxi and Gansu Provinces but their contribution in the remaining Sichuan Province and Xinjiang and Ningxia Autonomous Regions could not be clearly determined. Accordingly, the general effectiveness/impacts of the Project are judged to be fair. The project period was within the planned period but the project cost exceeded the planned cost, making the efficiency of the Project fair. The sustainability of the project effects is high as there appear to be no problems regarding sustainability in relation to the policy, organization, and technical and financial requirements.

In light of the above, the Project is evaluated as satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency.

<u>Active promotion of the dissemination of the outputs of the checking of immunization records and supplemental immunization</u>

In Jiangxi and Gansu Provinces in which the field survey was conducted, it is clear that the effective dissemination and utilization of the outputs of the checking of immunization records and supplemental immunization have led to improvement of the immunization rate. Meanwhile, the situation in Sichuan, Ningxia and Xinjiang is unclear. Both NHFPC and CCDC are required to clarify the detailed dissemination and utilization situation of the checking of immunization records and supplemental immunization in these three provinces and should make active dissemination efforts if the situation of utilization is found to be insufficient. Particularly in Xinjiang Autonomous Region where there is a problem with supplemental immunization, it is essential for the project outputs to be effectively utilized. It is highly desirable for the outputs of

and lessons learned from the Project to be sorted and evaluated in an appropriate manner with a view to their active utilization in provinces not targeted by the Project.

4.2.2 Recommendations to JICA

Consultations with the Chinese side on the utilization of the outputs of the maternity and child health handbook-related work

The expected outputs did not materialize for the work to disseminate and utilize a maternal and child handbook. However, the Government of China is said to be considering the introduction of this handbook from the viewpoint of achieving the relevant Millennium Development Goals. The start of NHFPC has raised the possibility of eliminating the biggest obstacle to the introduction of the handbook in those different administrative organizations and separate command lines are involved not only in immunization but also in maternal and child health.

Future Japanese cooperation for China for this work is, however, worthy of consideration in view of its high appraisal in terms of ① the much improved understanding and awareness on the part of mothers of the necessary arrangements as well as responses to ensure the health of their children and ② the contribution to the raised level of health care in general for mothers and children through the provision of an integrated service. It is advisable for JICA to jointly assess the results of the work with NHFPC and to fully discuss the future development of the work, utilization of the relevant outputs of the Project and further potential for Japan-China cooperation.

4.3 Lessons Learned

Importance of implementing a project based on a clear policy of the central government

As mentioned earlier, there is no clear prospect for the future continuation of the work related to the maternal and child health handbook even in Nanfeng County which has been the pilot county for this work. The reasons for the slow dissemination of this work are ① lack of a central government policy regarding the introduction of a maternal and child health handbook system; ② insufficient linkage between the immunization work and the maternal and child health work because of reason ①; ③ lack of proper preparations to accommodate institutional changes and user needs (outdated contents of the handbook and lack of sufficient space to fill in vital information, etc.); and ④ insufficient awareness of the need for this type of handbook (due to insufficient education and publicity). These indicate a sharp contrast with the checking of immunization records and supplemental immunization for which the then Ministry of Health and Ministry of Education issued a clear policy for promotion of the work in 2005.

In the case of a project involving multiple ministries and agencies, one important precondition for the successful implementation of the project and dissemination of the project outputs is the existence of a clear central government policy, followed by the active involvement of stakeholder organizations in the project based on such a policy. It is, therefore, essential to fully examine and confirm ① the conformity of the planned project for promotion and dissemination with the relevant government policy and ② the likelihood of the active involvement of related organizations.

Effects of linkage and communication between diverse stakeholders and importance of external assistance to promote such linkage and communication

The establishment of a coordination system between the health sector and the education sector was emphasized in the Project, especially for the checking of immunization records and supplemental immunization. The reality of the Project is that it involved many organizations and people, such as health and education bureaus, primary schools, kindergartens, medical institutions and doctors in the pilot counties in addition to provincial health offices and CDCs. The implementation of the Project through activities involving wide-ranging project-related stakeholders and parties at various levels contributed to the promotion of effective cooperation between various organizations and the smooth implementation and embedding of the Project. It

appears likely that this type of approach involving the participation of wide-ranging parties can be implemented more smoothly if external assistance (by the JICA, etc.) is available instead of a recipient country going it alone.

Meanwhile, it is true that the implementation of a project with the participation of wide-ranging parties demands a high level of coordination capability on the part of the implementing agency (agencies) and people concerned in the recipient country. In the case of the present Project, there were no problems in regard to the coordination capability because of the high level of management capability of the Chinese organizations involved. In general, the selection of this approach should be based on the actual situation of the recipient country and the judgement results on the likely merits and demerits of the approach.

Attached Tables

Attached Table 1 Performance of Field Surveillance-Related Training

Year	Jiangxi		Sichuan		Gansu		Ningxia		Xinjiang	
	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants
2009	3	720	-	-	7	817	2	1218	3	404
2010	3	692	-	-	2	260	2	1253	4	402
2011	1	30	-	-	2	350	-	-	1	9
2012	1	30	-	-	5	647	-	-	2	160
2013	1	240	-	-	3	405	-	-	-	-
2014	1	30	-	-	-	-	-	-	1	60
Ratio of Participants to the Total Number of Relevant Persons (2014)	100%		－ %		100%		100%		100%	
Retention Rate among the Participants (2014)	100%		－ %		100%		90%		100%	

Notes

1) In the first half of the project period, training on field surveillance, etc. was carried out for a total of some 2,800 participants (Mid-Term Evaluation Report).
2) "-" denotes that the figure in question has not been obtained.

Source: Provincial CDCs

Attached Table 2 Performance of Training of Laboratory Technicians (Excluding Training in Japan)

Year	Jiangxi		Sichuan		Gansu		Ningxia		Xinjiang	
	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants	Number of Sessions	Number of Participants
2009	3	4	-	-	1	2	2	1	1	14
2010	4	5	-	-	1	2	2	1	2	400
2011	4	7	-	-	1	2	2	1	-	-
2012	5	8	-	-	1	2	3	1	1	150
2013	4	7	-	-	1	2	3	1	-	-
2014	7	10	-	-	1	2	4	1	2	66
Ratio of Participants to the Total Number of Relevant Persons (2014)	100%		－ %		－ %		－ %		100%	
Retention Rate among the Participants (2014)	100%		－ %		－ %		－ %		100%	

Notes

1) Some 620 persons participated in the training sessions led by Japanese experts in the first half of the project period (Mid-Term Evaluation Report).
2) "-" denotes that the figure in question has not been obtained.

Source: Provincial CDCs