

Nepal

FY2022 Ex-Post Evaluation of Grant Aid Project

Grant Aid “The Program for Rehabilitation and Recovery from Nepal Earthquake”

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## 0. Summary

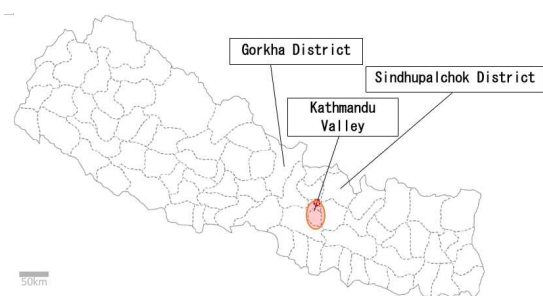
The project aimed to achieve "Build Back Better" by reconstructing the National Bir Hospital and the Paropakar Obstetrics and Gynecology Hospital in the Kathmandu Valley, reconstructing a water pipeline in Sindhupalchok District, which suffered the greatest earthquake damage, and constructing bridges in Gorkha District which was the epicenter of the earthquake, thereby contributing to the development of social infrastructure and institutions for sustainable and balanced economic growth. These were the prioritized facilities selected from among the ones that were demolished by the earthquake in Nepal for the grant aid program in Technical Cooperation for Development Planning "Nepal Earthquake Rehabilitation and Reconstruction Project". The project was consistent with the development policy and the development needs of earthquake recovery and reconstruction in Nepal and was also consistent internally with Japan's development cooperation policy and related technical cooperation projects. However, there are some issues regarding the relevancy of the water pipeline construction project in Chautara, as the project plan was not agreed upon by the local community in target area. Therefore, its relevance and coherence are moderately low. Although the project period exceeded the plan, the project cost was within the plan, thus efficiency of the project is high. The effectiveness and impact of the project are high because the expected outcomes and impacts were generally achieved through the reconstruction of the buildings of the two hospitals, the construction of the water pipeline in Chautara, and the construction of the bridges on the Barhakilo-Barpak road, and no negative social impacts were observed. Although there were some issues in the organization and structure, financial aspects, and the response to risks related to each subproject, improvements are expected and therefore, the sustainability of the effects achieved by the project is high.

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

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## 1. Project Description



Project Location Map



The Rangrung River Bridge  
Subject to Barhakilo-Barpak Road Bridge Project

(Source: external evaluator)

### 1.1 Background

On April 25, 2015, a magnitude 7.8 (U.S. Geological Survey) earthquake occurred, with its epicenter about 80 km northwest of the capital Kathmandu. The subsequent aftershocks caused extensive damage, with 8,702 people killed, 22,303 injured, approximately 500,000 houses completely destroyed and 260,000 half destroyed.<sup>2</sup>

According to estimates by the United Nations, the Nepalese government, and others, 20% of the total population lives in the 14 Districts designated as particularly hard-hit areas<sup>3</sup>, and more than 90% of all casualties and serious damage to both public facilities and private residences from the recent earthquake was concentrated in these 14 Districts.<sup>4</sup> In addition, many roads and bridges across the country were damaged by landslides and other disasters caused by the earthquake, which hampered the recovery and reconstruction of the affected areas, including these 14 Districts.

JICA implemented the "Nepal Earthquake Recovery and Rehabilitation Project" (2015-2019), a development planning survey type technical cooperation project, under the policy of seamless implementation from emergency and humanitarian assistance to development by the International Emergency Relief Team. In this technical cooperation, based on the complete list of damaged facilities, a long list of 66 facilities with significant damage and potential for grant assistance was prepared through interviews with government agencies. The list, excluding cases with other donor support, was reviewed based on 19 criteria, including the degree of damage, contribution to earthquake recovery, and beneficiary population. Grant aid target projects were then selected: reconstruction of two hospital buildings, reconstruction of the Chautara water transmission

<sup>2</sup> Source "Ex-ante Evaluation Sheet " (2015); original source "PDNA Survey Report".

<sup>3</sup> Dolakha, Sindhupalchok, Gorkha, Nuwakot, Rasuwa, Dhading, Karvreparanchowk, Ramechharp, Bhaktapur, Okhaldhunga, Sindhuri, Lalipur, Kathmandu and Makawanpur districts.

<sup>4</sup> Source " Ex-ante Evaluation Sheet " (2015); original source "Nepal Disaster Risk Reduction Portal" (as of December 18, 2015).

system and the construction of bridges on the Barhakilo-Barpak Road which were higher priority projects. A schematic design for these projects was conducted. This program was implemented as a program grant assistance for several projects planned under the technical cooperation project.

## 1.2 Project Outline

The objective of the program was to realize "Build Back Better (BBB)" by rebuilding the National Bir Hospital and the Paropakar Obstetrics and Gynecology Hospital in the Kathmandu Valley, reconstructing a water transmission system in Sindhupalchok District, which suffered the greatest damage, and building bridges in Gorkha District, the epicenter of the earthquake, thereby contributing to the development of social infrastructure and institutions for sustainable and balanced economic growth.

According to ex-ante evaluation sheet of the program, the goals for realizing BBB for each project were as follows:

- ① Hospital reconstruction (2 projects): The goal was to reconstruct a more earthquake-resistant building than the pre-disaster facility (which was completely destroyed by the earthquake), to make the hospital safer and thus able to function in the event of a disaster, and by doing so to increase the number of patients and surgeries, with or without a disaster.
- ② Construction of Chautara Water Transmission System: The goal was to restore and improve the water supply service by upgrading to a seismic resistant water pipeline.
- ③ Bridge construction: Construction of bridges to enable year-round traffic, including the rainy season, and to accelerate the rehabilitation and reconstruction of the northern Gorkha region through enhanced public service outreach.

Grant Limit/Actual Grant Amount	4,000 million /3,936 million yen
Exchange of Notes Date/Grant Agreement Date	December 2015/February 2016
Executing Agencies	Ministry of Finance, National Planning Commission. Organizations responsible for each project are listed below. ① Hospital Reconstruction (2 projects) Ministry of Health & Population*. ② Construction of Chautara Water Transmission System Department of Water Supply and Sewerage Management, Ministry of Water Supply (herein after referred to as "DWSSM") ③ Bridge Construction Department of Road, Ministry of Physical Infrastructure and Transport
Project Completion	May 2019
Target Area	Kathmandu City, Gorkha District, Sindhupalchok District

Contractors	Main Consultants	① Hospital reconstruction (2 projects): Oriental Consultants Global Co., Ltd., K.I.T.O Architects & Engineers Inc., and International Techno Center Co., Ltd. ② Construction of a water pipeline to Chautara: CTI Engineering International Co., Ltd. ③ Bridge construction: Oriental Consultants Global Co., Ltd.
	Contractor	Hazama Ando Corporation
Basic Design/Preparatory Survey**		July 2015 - February 2016
Related Projects		JICA Technical Cooperation Development Plan Study Type Technical Cooperation "Nepal Earthquake Rehabilitation and Reconstruction Project" (2015-2019)

\*At the time the program was initiated, Ministry of Health and the Department of Water and Sewerage under Ministry of Water Supply and Sanitation, respectively.

\*\*A schematic design study was conducted under Outcome 3 of the development planning survey type "Nepal Earthquake Rehabilitation and Reconstruction Project".

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Mitsue Mishima, Ryo Matsumaru (OPMAC Corporation)

### 2.2 Duration of Evaluation Study

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

Survey period: October 2022 –February 2024

Field Studies: March 19 - April 9, 2023 and July 22 - 28, 2023

### 2.3 Constraints during the Evaluation Study

The details of the situation in each ministry in Nepal at the time of implementation could not be confirmed directly because it was not possible to contact the person in charge at the time of implementation in each ministry. As for the documents related to the environmental and social considerations of the water transmission system construction project, the documents such as those regarding monitoring at the time of implementation could not be obtained from JICA and the implementing agency and could not be finally confirmed in a written form. Thus, the evaluation was based on other existing documents and the results of interviews with the relevant persons. Since the details of the financial statements of the two hospitals could not be obtained, the analysis was mainly based on the results of observation on site visits, information from interviews with hospital officials, and the evaluation of the financial management of each hospital by the Ministry of Health and Population.

## 2.4 Scope of evaluation of the Project

QIP-24 “Majuwa No. 1 and No. 2 Water Supply Headrace Improvement Project” (hereinafter referred to as “QIP-24 Majuwa Headrace Improvement”), one of the Quick Impact Projects (QIP) of the Development Planning Study Type Technical Assistance “Nepal Earthquake Recovery and Rehabilitation Project” (2015-2019), was considered for the implementation of this program at the design stage of the grant assistance outline. Since the total project cost was capped at 4 billion yen to be implemented as grant assistance, this headrace component was implemented as QIP separate from this program. This was also the case with one part of the bridge construction project. QIP-24 Majuwa Headrace Improvement consisted of one section of the Majuwa Water Transmission System (connecting from the water source in Majuwa to the Municipality of Chautara) designed as part of this program. This directly affected the relevancy, effectiveness/impact, and sustainability of the project under this program. Therefore, QIP-24 Majuwa Headrace improvement is included in this report in the analysis of (1) appropriateness of the project plan, approach, etc., for plan change and consensus building under “Relevance,” (2) effect in water supply to the Chautara municipality under “Effectiveness and Impact,” and (3) organizational structure, etc., under “Sustainability”. The analysis of “Efficiency” and “Sustainability” of the QIP-24 Majuwa Headrace Improvement as a project alone is included in the scope of the ex-post evaluation of the Development Planning Study Type Technical Assistance “Nepal Earthquake Recovery and Rehabilitation Project”.

Since this program was for rehabilitation and reconstruction, the focus of evaluation of “Effectiveness/Impact” and “Sustainability” of the target projects of hospitals, water transmission system, and bridges was particularly on the evaluation of the effectiveness and sustainability in terms of realizing BBB. The two hospitals are reconstructions of damaged hospital buildings, thus the evaluation focuses on whether the buildings are more resilient to earthquakes and other disasters than they were before the disaster, and whether the recovery of medical services is ensured as it was before the disaster.

## 3. Results of the Evaluation (Overall Rating: B<sup>5</sup>)

### 3.1 Relevance and Coherence(Rating: ②<sup>6</sup>)

#### 3.1.1 Relevance (Rating ②)

##### 3.1.1.1 Consistency with the Development Plan of Nepal

At the time of project planning, *13th Development Plan (2013/14-2015/16)* of Nepal stated that mainstreaming disaster management in development was indispensable to reduce the damage caused by disasters, and that the development of legal and administrative systems, information and communication systems, and capacity building for disaster preparedness and response were

<sup>5</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>6</sup> ④:Very high, ③: High, ②: Fair, ①: Low

essential to achieve this. This program supported the improvement of disaster response capacities. The *National Disaster Risk Management Strategy (2009)* was also to mainstream disaster mitigation in the development process, in line with sectoral development plans and poverty reduction plans. The project plans in this program included consideration of future disaster mitigation in the design as well as the rehabilitation of individual infrastructures.

As for subsequent efforts regarding disaster response capacity up to the completion of the project are as follows, The *14th Development Plan (2016/17-2018/19)*, which aimed at early recovery and reconstruction from disasters, called for strengthening the capacity of government agencies and mainstreaming disaster risk reduction in all aspects of development. The current *15th Development Plan (2019/20-2023/24)* also prioritizes resilience to natural disasters and climate change. Furthermore, the *Disaster Risk Reduction Policy (2018)* states that the country will work to promote the concept of better recovery (BBB) through the construction of disaster resilient infrastructure.

Based on the above, the project is judged to have been in line with the development policy of Nepal from the time of the project planning to the time of the ex-post evaluation.

#### 3.1.1.2 Consistency with development needs

In recovery and reconstruction assistance from disasters, it is necessary to respond quickly and flexibly to the ever-changing and diverse needs of the affected areas. This program grant aid supported the response to the needs of various sectors in the form of the flexible implementation of multiple projects under a single grant aid program.

The target areas were those where the damage was relatively severe: a hospital in the Kathmandu Basin of the metropolitan area, the reconstruction of a water transmission system in Sindhupalchok District, which suffered the greatest damage, and bridge construction on roads in Gorkha District leading to the epicenter of the earthquake in Balpak. The beneficiaries of all these projects were a wide range of local residents. The hospital was a facility that needed immediate reconstruction, Chautara water transmission system construction was to meet immediate water supply needs to an existing pipeline, and the three bridges were important for access to the affected areas.

As grant aid program eligible projects, the priority of the target projects was considered to be high and consistent with the needs in the earthquake response.

#### 3.1.1.3 Appropriateness of the Project Plan and Approach

Among the lessons learned from the grant aid program “The Program for Rehabilitation and Recovery from Typhoon Yolanda” in the Philippines and others, the establishment and regular meetings of a progress management committee consisting of relevant agencies in the recipient country, centered on the National Reconstruction Agency (NRA), is an indispensable step to

plan and work on progress management. It is essential to plan and work on such progress management through regular coordination with each relevant agency led by the National Reconstruction Agency (NRA), and this has been done. In addition, it was also stated as a lesson learned that, in order to realize the BBB for "reconstruction assistance considering disaster risk" reconstruction assistance that takes into account disaster risks other than earthquakes should be implemented. As a countermeasure to disaster risks, the detailed design of each facility and infrastructure in the program included high earthquake resistance and measures against landslides.

However, it was observed that the plan should have reflected residents' opinions on the construction of the Chautara Water Transmission System. The intention of the project was to lay the water pipeline in a route with low disaster risk, rather than in the original one, replacing it with a new water pipeline using ductile iron pipes with high resistance to earthquake and landslide impact. However, the old pipeline route continued to be used thereafter. That is, the water transmission system was essentially expanded since the pipeline route was not replaced. In addition, the Water Users Committee (formally known as the Jugal Thalkhola Drinking Water User and Sanitation Committee, hereinafter referred to as "WUC") also changed the route of the Majuwa system water pipeline after project completion. The reason for this was that the WUC in the target area had not agreed on the new route of the project. When this was confirmed with the WUC at the time of the ex-post evaluation, the WUC stated the following reasons for not agreeing: (1) the WUC hoped to continue to use old pipeline, and (2) for the Majuwa pipeline, the new pipeline route for the project was not deemed sufficient to ensure the volume of water delivered. Regarding the Majuwa water pipe route constructed by the project, it was found that the WUC re-routed it two years after project completion (the details of the changes to the water pipe route and their impact are described in section "3.3.1 Effectiveness").

In this regard, the project plan should have been officially agreed with local residents before finalization as part of the process of social consideration at the time of project planning. Furthermore, documents should have been exchanged on the results of this process. At that time, the process of environmental and social considerations was simplified more than usual on the Japanese and Nepalese sides because the project was an urgent reconstruction and rehabilitation work. The planning of the project outline was conducted under the technical cooperation for development planning "Nepal Earthquake Reconstruction and Rehabilitation Project" and because of the urgent situation of this technical cooperation, the procedures in Section 3.4.1 (Review Stage of Proposed Projects) and Section 3.4.2 (Detailed Plan Preparatory Study Stage) of the JICA Guidelines for Environmental and Social Considerations were skipped<sup>7</sup>. The JICA

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<sup>7</sup> JICA Advisory Committee on Environmental and Social Considerations, 60th Plenary Meeting, p.2 (URL address: [https://www.jica.go.jp/Resource/environment/advice/ku57pq00000ngjcu-att/advice60\\_data.pdf](https://www.jica.go.jp/Resource/environment/advice/ku57pq00000ngjcu-att/advice60_data.pdf), accessed December 14, 2023)

side was to monitor environmental and social considerations at the scoping stage after the commencement of the project. According to interviews with a party involved<sup>8</sup> on the Japanese side, at the scoping phase, it was confirmed that there was the agreement with DWSSM. According to DWSSM, the normal procedure on the Nepalese side is for DWSSM to confirm the agreement of local stakeholders on the project design. However, in this case, there was no written confirmation as to whether or not agreement had been reached.

### 3.1.2 Coherence(Rating: ③)

#### 3.1.2.1 Consistency with Japan's ODA Policy

In the Country Assistance Policy for Nepal, "development of social infrastructure and institutions for sustainable and balanced economic growth" was stated as one of the priority areas, and this project was in line with the "sustainable development that takes into consideration the natural environment and disaster prevention" as a development issue in this priority area.

The project was also consistent in its contribution to the priority actions of the *Sendai Framework for Disaster Reduction 2015-2030 (April 2015)* adopted at the Third United Nations World Conference on Disaster Reduction: "Investing in Disaster Reduction for Resilience" and "Understanding Disaster Risk". With a view to contributing to the Japanese government's policy "*Sendai Disaster Reduction Cooperation Initiative*" (March 2015), this program was consistent with Japan's development cooperation policy, aiming at strengthening the national resilience of Nepal under the concept of "Build Back Better".

#### 3.1.2.2 Internal Coherence

This project was selected and designed based on Output 3 of the Development Planning Study Type Technical Cooperation "Nepal Earthquake Rehabilitation and Reconstruction Project" prior to this program, promoting rapid implementation. Furthermore, the road bridge project and water transmission system projects under the technical cooperation were to be implemented simultaneously with this program to have high impact on the target areas. The selection and schematic design of the project for grant assistance under the technical cooperation were conducted, and this was recognized as an achievement that led to the speedy implementation of the project.

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<sup>8</sup> Based on the response to our inquiry to the consultant in charge of project implementation. Attempts were also made to contact the consultant in charge of environmental and social considerations, however the person in charge had already resigned and could not be contacted, and thus could not be confirmed.



### 3.1.2.3 External Coherence

Duplication of other donors' projects was avoided since one of the selection criteria was not to repeat other donor projects. However, there were no specific achievements, such as efforts to increase effectiveness in collaboration with other donors.

Based on the above, the relevance and coherence are moderately low due to some issues on "Appropriateness of the Project Plan and Approach" with relevancy.

## 3.2 Efficiency (Rating: ③)

### 3.2.1 Project Outputs

The planned and actual outputs of the project are shown in Table 1 (outputs are shown in Photos 1-6). As for the actual results at the time of completion of each project, although the number of chambered sections had increased compared to the plan for the Chautara water pipeline project, according to JICA data, this was due to changes in the pipeline route and to facilitate maintenance and management. The addition of water collection chambers and flow meters was also considered to be necessary. The outputs of each project were generally as planned.

Table 1: Planned and Actual Outputs

(Data) Item	Plan (February 2016)	Actual (as of completion)
1. Reconstruction of the National Bir Hospital (refer to Photo 1)	<ul style="list-style-type: none"> <li>● Building: Reconstruction of one building in the third ward</li> <li>● Equipment procurement: Patient central monitoring system, ventilator, blood gas analysis, video endoscope, dialysis machine. etc.</li> </ul>	As planned
2. Reconstruction of Paropakar Obstetrics and Gynecology Hospital (refer to Photo 2)	<ul style="list-style-type: none"> <li>● Building: reconstruction of one building in main ward</li> <li>● Equipment procurement: ultrasound equipment, patient monitors, delivery tables, operating tables, incubators, sterilizers, ventilators, etc.</li> </ul>	As planned
3. Reconstruction of the Chautara water pipeline (refer to photos 3 and 4)	<ul style="list-style-type: none"> <li>● Water pipeline construction: Shaure confluence to Chautara water treatment plant (C1 line), Holche intake chamber to Shaure confluence (C2 line point), Chitre pressure breaking chamber to Shaure confluence (C3 line), Phusre pressure breaking chamber to Chitre pressure breaking chamber (C4 line)</li> </ul>	As planned

(Data) Item	Plan (February 2016)	Actual (as of completion)
	<ul style="list-style-type: none"> <li>● Chamber construction: <ul style="list-style-type: none"> <li>• C2 line 3 pressure breaking chambers</li> <li>• C3 line 4 pressure breaking chambers</li> <li>• C4 route One pressure breaking chamber</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Chamber construction: as follows. <ul style="list-style-type: none"> <li>• C2 route 4 pressure breaking chambers /collecting chambers</li> <li>• C3 route 5 pressure breaking chambers</li> <li>• C4 route 3 pressure breaking chambers /collecting chambers</li> <li>• 1 repair of a water collection chamber in Thalkharka</li> <li>• 1 flow meter chamber</li> </ul> </li> </ul>
4. Barhakilo -Barpak Road and bridge construction (refer to photos 5 and 6)	<ul style="list-style-type: none"> <li>● Gatte Khola Bridge, Rangrung Khola Bridge, Daraudi Khola Bridge and attached road extension to each bridge, revetment, riverbank/ riverbed field protection works, etc.</li> </ul>	As planned

Source: "Outline of Grant Aid for Nepal Earthquake Recovery and Rehabilitation Project, Nepal" (February 2016) for the time of planning. Actual results are from materials provided by JICA.



Photo 1: National Bir Hospital (left: building at the time of the 2015 disaster, right: at the time of the 2023 post-evaluation)  
(Source: left provided by implementing consultant; right by external evaluator)



Photo 2: Paropakar Obstetrics and Gynecology Hospital (left: building at the time of the 2015 disaster; right: as of the 2023 post-evaluation)  
(Source: left provided by implementing consultant; right by external evaluator)



Photo 3: Chitre pressure breaking chamber  
(At the time of the post-evaluation,  
source: external evaluator)



Photo 4: Holche system water pipeline  
(At the time of the post-evaluation,  
source: external evaluator)



Photo 5: Daraudi Khola Bridge  
(At the time of the post-evaluation,  
source: external evaluator)



Photo 6: Gatte Khola Bridge  
(At the time of the post-evaluation,  
source: external evaluator)

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

Since the actual project cost on the Nepalese side could not be confirmed, only the comparison of the planned and actual JICA project cost was analyzed. The actual amount was 3,936 million yen compared to the planned 4,000 million yen, which was 99% of the planned amount and within the plan.

#### 3.2.2.2 Project Period

The project period was verified to be from the signing of the grant agreement (G/A) to the delivery of all facilities and equipment; planned for February 2016 to July 2018 (30 months). Actual results exceeded the plan (133% of plan) with a 10-month delay from February 2016 to May 2019 (40 months).

The main reason for the delay was that it took time to construct the hospital buildings. According to the JICA document, time was required to complete the items to be borne by the Nepalese side due to the delay in the building permit procedure within the Nepalese government. Extra time was also needed to complete the tasks for which the project executing agency was responsible due to the discovery of underground buried objects (high-voltage cables, drainage pipes, etc.) that could not have been anticipated at the time of bidding. The consultant in charge

of implementation also pointed out the delay in starting the bidding process and the fact that the Bir hospital had to dig a well and secure a new water source before starting construction because the well was broken and the water supply was no longer available.

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

### **3.3 Effectiveness and Impact<sup>9</sup> (Rating:③)**

#### **3.3.1 Effectiveness**

For each of the projects of this program, the actual result against the target values were analyzed and evaluated separately. The operation and effect indicators for the two hospitals at the time of the ex-ante evaluation of this program were the reconstruction of wards that were damaged and no longer available, respectively. Since these operational effectiveness indicators overlap with the output indicators, the effectiveness of this project was evaluated based on whether the BBB had been achieved through the reconstructed facilities, as well as by confirming the operational status of the facilities and referring to data related to operation and effect collected through the field survey. Regarding the operation and effect indicators for the water transmission system in Chautara, the water supply figures provided at the time of the original schematic design were used as target values and compared with the actual results. Regarding the water supply volume, at the time of the schematic design, a water supply of 20 L/sec to the Chautara municipality was planned in the scenario as a result of the implementation of the water pipe with Majuwa as the water source, the water pipe with Thalkharka as the water source, and part of the water conduit with Holche as the water source in the entire water conduit system to Chautara as a JICA project (refer to Attached Diagram in the Appendix). The effect of these water transmission system projects as a whole is the planned figure for water supply, and the effect of the Majuwa system pipeline is also included in the actual results.

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

As shown in Table 2, generally, the post-project completion figures assumed at the time of the ex-ante evaluation are considered to have been achieved.

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<sup>9</sup> Sub-rating for Effectiveness is to be put with Consideration of Impacts.

Table 2: Operational Status of Equipment

Indicators	Standard value (April 2015 post-earthquake situation)	Target value (After completion of the project) <sup>2</sup>	Actual results (as of March 2023)
1. Rebuild National Bir Hospital	Building Ward 3 was damaged and had ceased operation.	Reconstruction of one building	Reconstruction of one building was achieved. On-site survey confirmed that the building was fully operational.
2. Reconstruction of Paropakar Obstetrics and Gynecology Hospital	Main building wards damaged, and operations suspended	Reconstruction of one building	Reconstruction of one building was achieved. On-site survey confirmed that the building was fully operational.
3. Reconstruction of water pipeline: Amount of water transmission to the municipality of Chautara	10 L/sec (assumed value based on hearing) <sup>1</sup>	20 L/sec <sup>3</sup>	Purpose of reconstruction of water pipeline was achieved. Based on the results of interviews with the various parties involved, it appears that the amount of water piped to the Chautara municipality increased after the completion of this project, achieving at least 70%, and this project is considered to have contributed to the increase in the amount of water supplied.
4. Bridge Construction: Period of vehicle disruption on the Barhakilo-Balpak road	4 months (June - September) <sup>4</sup>	0 months	Vehicles can pass along the road all year round, and the indicator was achieved.

Note:

1. At the time of the preliminary evaluation, it was noted that afterwards the flow rate would be measured during the rainy season and the values updated, however, since the updated values could not be confirmed afterwards, this value is used as a reference.
2. Each indicator could be checked at any point after the completion of each project, and no specific year is indicated.
3. 20 L/sec water supply plan to the municipality of Chautara, as described in the Grant Assistance Summary (February 2016), p. 86. In the ex-ante evaluation sheet, "10% increase over the standard value," is reported. However, in this project, the project contents were changed as the plan for updating the water pipeline became actually an expansion project. Therefore, the 20 L/sec. given as the water transmission scenario for the water supply needs was referred to as a comparative figure.
4. Situation before the disaster.

Source: JICA Documents, Questionnaire answers from executing agencies

The following points are details used to confirm the achievement of the purpose of each project.

① Hospital Reconstruction (2 cases)

The following points were evaluated to determine that both hospitals are fully operational.

**【National Bir Hospital Reconstruction】**

As of the time of the ex-post evaluation, total number of the beds of the hospital is 960. The building which was constructed by this project was planned to have 94 beds, whereas, according to interviews with the hospital, the actual number of beds was 95. The plan has therefore been achieved. The hospital has important functions such as intensive care (ICU), and is home to the departments of cardiology, nephrology, and gastroenterology. As a top national referral hospital, however, it has a large number of patients from all over the country, and thus its capacity remains

insufficient. The hospital has also been very crowded due to the large number of people accompanying patients.

#### **【Paropakar Obstetrics and Gynecology Hospital Reconstruction】**

The total number of beds before the earthquake was 415. This number had increased to 489 as of the post-event assessment. According to the hospital, although 70 to 80 patients were expected to be attended per day, in reality, this is more than 90 to 100 patients, which is more than the capacity of the hospital. As in the case of the National Bir Hospital, this hospital is a top national reference hospital, and during each site visit there were many patients visiting from all over the country, making the main ward building extremely crowded. The hospital is also an education hospital for obstetricians, gynecologists, and nurses, and at the time of the ex-post evaluation, training was being conducted by the National Health Center of the Ministry of Health. It was confirmed that the third floor was being used for such training purposes as planned. Among the equipment procured, the sterilizer was out of order and not in use. However, the rest of the equipment was generally in use. Regarding the design of the hospital facilities, a hospital official commented that it would have been better to plan a slope rather than stairs to transport patients, since elevators were not always available due to frequent power outages at the time of the project planning. It has been recorded that the construction of the slope was planned to be undertaken by the Nepalese side. More care should be taken in the design of hospital facilities in the future, taking into consideration the conditions in the target countries and the conditions of the hospital users within possible scope from the beginning.

#### **② Construction of water transmission system in Chautara**

Based on the results of interviews with officials from WUC and the Chautara municipality, it was evaluated that the amount of water supplied has increased since the completion of this project. Although there was no data recorded over time, based on a comprehensive analysis of the interview information from both parties, the water supply was considered to be about 14 L/sec during the dry season and at least about 22 L/sec during the rainy season, which is more than 70% of the planned 20 L/sec water supply. Thus, the objective of restoring and improving water supply services was deemed to have been achieved. Interviews with officials from the Chautara municipality and the Provincial Water Supply Department revealed that water supply security in the target area is very important, and that the project has improved the water supply situation. The project is also supplying water to several small communities along the water pipeline, which is benefiting not only the Chautara municipality but also the residents of these communities.

However, as previously mentioned in section " 3.1.1.3 Appropriateness of the Project Plan and Approach ", WUC had not agreed to the replacement plan and the route of the Majuwa

pipeline after project planning. The current status at the time of the ex-post evaluation, which also takes into account the history of the project, is illustrated in Attached Diagram in the Appendix. There are three water pipelines to the municipality of Chautara, one from Majuwa, one from Thalkharka, and one from Holche. Currently, WUC continues to use the pipeline from Majuwa, which was in use before the disaster, while the Majuwa pipeline, which was constructed under the QIP of the Nepal Earthquake Recovery and Rehabilitation Project, a development planning study type technical cooperation project, was excavated and rerouted, and replaced with a Chitre pressure breaking chamber (hereinafter referred to as "PBC) instead of a Phusre one. According to WUC, that Majuwa pipeline had been operating as is since its completion in July 2018, however a replacement was made two years later, in July 2020, using the budget of WUC. At the time of the post-evaluation, the Phusre PBC constructed under this project and water pipeline from there to the Chitre PBC were not in use. However, according to WUC, there is a plan to construct a water supply facility to supply water to the community near the Phusre PBC in response to a request from the community. After the completion of this facility construction, the currently unused the Phusre PBC and water pipeline from thereto the Chitre PBC is scheduled to have water flow.

### ③ Bridge Construction

The locations of the roads and bridges between Barhakilo-Barpak targeted in this project are shown in Attached Map in the Appendix. According to information gathered in field visits together with interviews with the Department of Road, Ministry of Physical Infrastructure and Transport (hereinafter referred to as "DOR") and local government officials in the target area, it was determined that the road and bridges were now passable in all weather conditions, and there were no longer any periods of vehicle disruption. Traffic volumes also appear to have increased after implementation of this project.

#### 3.3.1.2 Qualitative Effects (Other Effects)

The contribution to the BBB of the project objective of this program is considered to have been achieved.

The reconstruction of the hospitals (2 cases), the construction of the water transmission system to Chautara municipaliy, and the construction of the bridges have resulted in buildings and facilities with disaster-resistant structures. Each facility was checked during the field survey at the time of the ex-post evaluation, and interviews with the persons in charge of each facility and item of infrastructure indicated that the structures have become more disaster resistant.

As for the hospital, hospital officials commented that the building structure was technically appropriate and strong against earthquakes, and that they felt the foundation had been strengthened compared to other buildings. Regarding water transmission, the water pipeline was

constructed with earthquake-resistant ductile iron pipes as planned to minimize the risk of damage posed by landslides caused by future earthquakes and other natural disasters. The WUC's opinion was that the project water pipes were excellent. Regarding bridge construction, the DOR pointed out that the structural aspects of the bridge improvement project and the revetment work had improved safety.

### 3.3.2 Impacts

#### 3.3.2.1 Intended Impacts

It is considered that the project has achieved its overall goal of "contributing to the development of social infrastructures and institutions for sustainable and balanced economic growth." The status of achievement for each part of the project is as follows.

##### ① Hospital reconstruction (2 cases)

In < the National Bir Hospital >, interviews with hospital officials showed that the nephrology department performs dialysis on 50 patients per day (35 beds), gastrointestinal endoscopies on an average of 120 patients per week, and colonoscopies on an average of 40-45 patients per week, and biopsies are conducted in about one week<sup>10</sup>. In addition, during the period of widespread COVID-19 infection, the building hospital became the designated hospital to handle infected patients, using the building built through this project. The Project therefore contributed in the above situation as well as to the development of the infrastructure of each hospital.

For < Paropakar Obstetrics and Gynecology Hospital >, according to interviews with hospital staff, while the number of deliveries had been approximately 20,000 per year before the disaster, it is now at 24,000. As reference indicator of impact on operation in the building constructed in this project, there are now 70-80 deliveries per day, with cesarean sections accounting for 37.5% of these. Before the disaster, there were approximately 50 deliveries per day, and cesarean sections accounted for approximately 25% of all deliveries. This indicates an increase compared to the pre-disaster period.

##### ② Construction of water pipeline in Chautara

According to WUC, there were 1,089 residential connections to water supplied from the same conduit, which, assuming an average family size of approximately 4 persons per house, is 4,356 persons. There were 190 water supplies to government and public institutions and organizations. The project is considered to have contributed to securing the water supply for these beneficiaries. In terms of water quality, a representative of the Provincial Water Supply Department pointed out that the water source of the Majuwa system is located in the vicinity of a national park which is rich in nature, and the water is from melting snow, so the project has had an impact in

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<sup>10</sup> These data were not available in written form, and the figures were stated through interviews at the time of the ex-post evaluation.



increasing the supply of good quality water. Based on the above, it is recognized that the project has promoted sustainable social infrastructure development for the residents of the target area.

### ③ Bridge Construction

According to all the interviews with local government officials in the vicinity of the target road, the bridges are now open to traffic all year round, which is considered to have increased traffic volume and led to the promotion of logistics and economic development around the road between Barhakilo and Barpak. The opening of the last bridge on the road to Barpak, the Rangrung Khola Bridge, which was very difficult to access during the rainy season, has been particularly effective in making the road passable all year round. Bridge improvement was reported to have facilitated the operation of ambulances, increased the number of long-distance buses from Kathmandu to Barpak, and increased the number of tourists and accommodation facilities such as hotels compared to before the project was implemented. The project is considered to have contributed to the rehabilitation and reconstruction of Barpak, the northern region of Gorkha.

#### 3.3.2.2 Other Positive and Negative Impacts

##### 1) Impact on the Environment

The project does not fall under the categories of large-scale bridges, the water supply sector, etc., listed in the "JICA Guidelines for Environmental and Social Considerations" (promulgated in April 2010), the undesirable effects on the environment were judged to be insignificant. In addition, the project does not fall under the sensitive characteristics and areas listed in the Guidelines, therefore, it is considered as Category B. At the time of the ex-post evaluation, whether or not there had been environmental impacts after project implementation was confirmed for each project, as follows.

##### ① Hospital reconstruction (2 cases)

The results of the field survey interviews did not reveal any problems that had a serious impact on the environment or complaints from the local residents.

##### ② Construction of water pipeline in Chautara

According to the WUC, there were no specific negative environmental impacts or complaints from the local residents.

##### ③ Bridge Construction

The Initial Environment Examination (IEE) was available for the bridges except for the Jale Khola Bridge, and a review of its contents indicated that no particularly serious problems were anticipated. According to the interview with the director in charge of roads in the target area, there have been no serious impacts on the natural and social environment or complaints from the local residents during the construction period or up to the present.

## 2) Resettlement and site acquisition

According to the data provided by JICA, during the construction of the "Barhakilo -Barpak Road Bridge Construction," it was found that there was private land within the construction site. According to the document provided after the completion of the project, the land acquisition procedures had generally been resolved by the completion of the project. At the time of defect inspection in July 2019, however, it was pointed out by consultant in charge of project implementation that there were still several sites for the Daraudi Khola Bridge construction where the formal procedures for land transfer to DOR had not been completed. After viewing the site during the ex-post evaluation site visit and interviewing the representative of the Roads Bureau in charge of the subject area, it was confirmed that the owner agreed that they would donate the necessary portion as the site for this project.

## 3) Gender, people inhibited from equitable social participation, social systems and norms, people's well-being, human rights

There is nothing to note about the facilities under the program, as confirmed by the existing documents and the ex-post evaluation survey.

As mentioned above, this project has mostly achieved its objectives. Therefore, effectiveness and impacts of the project are high.

### **3.4 Sustainability (Rating:③)**

#### 3.4.1 Policy and System

The implementation of BBB in disaster recovery, restoration, and reconstruction is one of the priority areas in the *National Disaster Risk Reduction Action Plan (2018-2033)*. The plan also states that the strategy of the mid-term goal is to follow the principles of green development and BBB in recovery, and that the structure of facilities recovering from the disaster should be more resilient and environmentally friendly in each of the relevant ministries and agencies. Thus, policy and institutional sustainability is ensured.

#### 3.4.2 Institutional/Organization Aspect

Regarding the organization and system for operation and maintenance of the facilities of the two hospitals, the water pipeline in Chautara, and the bridges constructed, the system for maintenance and management of the facilities of the water pipeline in Chautara is in place, and it is expected that the ownership of the project facilities will be transferred to WUC in the future. Although there are some improvements to be made in the current staffing for the bridges and the

two hospitals, the sustainability of the organization and system is assessed as having been secured for the day-to-day operation and maintenance of facilities to the same level as before the disaster. The analysis for each project is as follows.

① Hospital reconstruction (2 cases)

In the case of the two hospitals, where two ward buildings which had stopped operations due to the disaster, it was confirmed through interviews that personnel to perform basic services had been secured and that an organization and system had been restored and operated as it did before the disaster. Both hospitals have personnel assigned to building maintenance. In addition, as far as equipment is concerned, both hospitals have one Biomedical Engineer, a technician with expertise in medical equipment, who coordinates repair procedures within the hospital and with manufacturers and distributors in the event of equipment malfunctions and problems. In the Bir hospital, it was pointed out that Biomedical Engineers who can handle the new equipment installed by this project were necessary, and that both hospitals have a shortage of medical personnel, especially nurses, to handle the number of patients. However, the organizations are at least capable of operating the same medical services as before the disaster.

② Construction of Water Transmission System to Chautara

As for Water Transmission System to Chautara, as WUC is in charge of the operation and maintenance of the water supply facility from water source to users, they conduct operation and maintenance of the facilities constructed by the project. According to the interview with WUC, the organizational structure is divided into a Board of Directors, which is a decision-making body consisting of members elected by the residents, and an Executive Team, which is actually in charge of operations. 23 personnel belong to the Executive Team, 4 of whom are technicians<sup>11</sup> in charge of operation and maintenance.

Although the project facilities had been turned over to DWSSM<sup>12</sup>, the formal handover of the facilities of this project from DWSSM to WUC had not yet occurred. According to explanation of WUC, WUC had rejected an official handing over of the facilities from DWSSM from the completion of this project to the time of the ex-post evaluation survey, because the water pipeline plan of this project had been different from WUC's intention, as described above. However, WUC has operated and maintained the facilities since the completion of this project, and has rerouted the Majuwa pipeline with its own funds. In addition, there is a plan to resume the use

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<sup>11</sup> Generally, a technician is defined as a person with less than a college degree, while an engineer is defined as a person with a college degree or higher.

<sup>12</sup> The Department of Water and Sewerage, Ministry of Water Supply and Sanitation at the time of project implementation is currently the Department of Water Supply and Sewerage Management, Ministry of Water Supply (DWSSM). There are separate organizations such as the Federal Water Supply and Sewerage Management Project Office, which is responsible for the federal project planning and the Provincial Water Supply Department, which is in charge of supporting water supply projects in the province with relatively smaller budgets than those of the federal government.

of the water pipeline between the Phusre and Chitre PBC, which was not in use at the time of the ex-post evaluation survey, once improvement of the water supply system in the area surrounding the Phusre PBC was completed. WUC therefore plans to complete the handover procedures in the near future.

### ③ Bridge Construction

At the time of the ex-post evaluation, the operation and maintenance of the bridges was being handled by the Maintenance Unit of the road project (11kilo Chhepetar Bhaluswara Barpak Road Project), whose project office is located near the center of Gorkha District. This road project is included in the Barhakilo-Barpak road. The Maintenance Unit is staffed with 4 engineers and 2 sub-engineers. Of these, one engineer and one sub-engineer are also in charge of the construction of new roads in the target area. When the director of the project office was interviewed by the evaluation team to confirm any issues with the organizational structure, he stated that although the number of sub-engineers is not sufficient, it is not at a level that would cause significant problems with basic maintenance and management.

After completion of the road project, the Damauli Division Office of the Federal Road Supervision and Monitoring Office (FRSMO) in Pokhara, DOR will take over operation and maintenance of the bridges. The Division Office has 30 to 40 employees, including management staff, who are responsible for the operation and maintenance of the roads under their jurisdiction.

### 3.4.3 Technical Aspect

No technical problems were identified in any of the projects that would significantly interfere with basic operations, and no serious technical issues affecting sustainability were identified. In the case of the two hospitals, the problems with building maintenance have already been addressed, and there are no problems with the basic operation of the majority of the equipment provided. For the water transmission system in Chautara and bridges, there are no technical problems that affect the sustainability of the project effects, and the technical sustainability of the project is considered as satisfactory. The status of each project is as follows.

#### ① Hospital reconstruction (2 cases)

In both hospitals, some of the equipment (e.g., sterilizers) installed in this project had malfunctions due to improper operation of the equipment or lack of knowledge on how to deal with malfunctions. However, most of the other equipment was in continual use and there were few technical problems. Although both hospitals had a problem with the water treatment part of their water supply system, which was no longer usable, they were able to construct a separate water supply system. Based on the above circumstances, it was evaluated that the hospitals' services were not significantly in a worse state compared to before the disaster, and that there

were no serious technical issues that could affect overall operations.

### ② Construction of Water Transmission System to Chautara

The self-assessment of WUC was that the technical level of operation and maintenance of the water pipe was adequate. Based on the status of repair and maintenance work related to this project to date, it was determined during the site visit that WUC's technicians are at a level that allows them to perform basic operation and maintenance of the facilities subject to this project. When repairs requiring more advanced technology or substantial civil works are required, WUC consults with the DWSSM, a central government agency, or the Provincial Water Supply Department for technical assistance. With regard to the water pipe, there is almost no possibility of water supply disruptions due to lack of operation and maintenance technology.

### ③ Bridge Construction

According to interviews with the DOR regional branch managers in charge of target bridges, DOR has a manual for bridge inspection and maintenance, and no problems affecting the sustainability of bridges and roads have been identified to date, especially not due to the technical level of the staff at Maintenance Unit.

#### 3.4.4 Financial Aspect<sup>13</sup>

The budget necessary to perform the minimum daily operation and maintenance requirements for the facilities and infrastructure of each project has been allocated. Although the two hospitals do not appear to have an adequate operation and maintenance budget for the hospitals as a whole, we assess that there is no serious impact in terms of the safety improvements achieved in the reconstruction of the hospitals and their maintenance.

### ① Hospital reconstruction (2 cases)

Bir Hospital and Paropakar Obstetrics and Gynecology Hospital have relatively high scores of 82% and 70%, respectively on the Ministry of Health and Population's assessment of each hospital's financial management (FY2022), and are thus considered to have sound financial management.<sup>14</sup> According to interviews with both hospitals, approximately Rs. 10 million (approximately 10 million yen) was earmarked for maintenance and management expenses in fiscal year 2022 for Bir Hospital and in fiscal year 2023 for Paropakar Obstetrics and Gynecology Hospital. According to interviews with both hospitals, the budget is not sufficient for maintenance

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<sup>13</sup> Since financial data documents could not be obtained from Bir Hospital and Paropakar Obstetrics and Gynecology Hospital, financial evaluation was conducted through a hearing with the Director General of Bir hospital and administration representatives of Paropakar Obstetrics and Gynecology Hospital.

<sup>14</sup> Results of the assessment of Minimum Service Standards (MSS) by the Quality Standards and Regulation Division of the Ministry of Health and Population. Financial management is indicated by the percentage of items that meet the standards out of 17 checkpoints.

of facilities and equipment, and therefore it is not always possible to promptly address problems with facilities. However, once the budget becomes available, urgent issues were handled. In the Paropakar Obstetrics and Gynecology Hospital, maintenance contracts (e.g., for elevators) that were not concluded after the completion of this project due to lack of budget have subsequently been concluded. Therefore, there are no financial problems that would seriously affect the sustainability of the goal of BBB for this project, which is to make the hospital safer and more capable of functioning even in the event of a disaster.

#### ② Construction of Water Transmission System to Chautara

According to WUC, there is no fixed amount of maintenance budget each year, and the daily maintenance budget is almost entirely covered by water charge revenues. No problems with the collection of water charges have been pointed out to date. In some cases, maintenance work, such as those involving civil works, are also carried out with financial contributions from agencies such as the federal government DWSSM and provincial water departments. According to the responses to the questionnaire with WUC, for example, maintenance expenditure was 3.8 million rupees last year, and a subsidy of 1.8 million rupees was received from the federal government for the construction of a water tank.

#### ③ Bridge Construction

Verifying the data on the actual maintenance budgets of DOR, the budgets for the maintenance of the bridges in this project were requested as needed each year, at approximately 900,000 rupees in FY 2020, approximately 19.93 million rupees in FY 2021, and approximately 8.94 million rupees in FY 2022. It was confirmed that the maintenance and management of the bridges on the target road has been carried out and is considered to be financially sound. Since the maintenance and management details vary from year to year, there are large fluctuations in the maintenance and management costs. For example, in 2021, maintenance costs increased significantly because levee protection works were also implemented on several bridges, and in 2022, maintenance of the entire target road and the painting of bridges was conducted.

#### 3.4.5 Environmental and Social Aspect

No environmental or social considerations that could affect sustainability in the future were found in the review of available data or in the field survey at the time of the ex-post evaluation.

#### 3.4.6 Preventive Measures to Risks

During the field survey at the time of the post-evaluation, it was found that the approach road and part of the retaining wall for the Rangrung Khola Bridge had collapsed (see Photo 7) because of a heavy rainfall in June 2022 that had exceeded the designed water level of the river. At the time of the post-evaluation, there were no problems with vehicle traffic. However, cracks can be seen in the areas where the road collapsed, and there is a high risk of further road collapse if another flood event of the level that caused the collapse were to occur.



Photo 7: Location of collapsed approach road and a portion of the retaining wall at the Rangrung Khola Bridge. (Source: external evaluator)

#### 3.4.7 Status of Operation and Maintenance

##### ① Hospital reconstruction (2 cases)

There were no major maintenance issues with the buildings of either hospitals, and no concerns about the continuation of current medical services.

##### ② Construction of Water Transmission System to Chautara

The field survey at the time of the post-evaluation did not reveal any particular areas in need of immediate repair, except for the water pipe of the Holche system, which is already being repaired by WUC.

##### ③ Bridge Construction

As mentioned in section "3.4.6 Preventive Measures to Risks", the levee of Rangrung Khola Bridge needs to be repaired as soon as possible, and a budget request has been made for FY2023 for the cost of the work.

For the two hospitals in the project, there are some issues with the organizational structure, system, and financial situation related to the operation and maintenance of the buildings and equipment, however, there is no serious impact on the sustainability of the effects of the project. For the water transmission system and the bridges, there are no issues affecting sustainability in terms of the organizational structure, technology, and finances for operation and maintenance management. As of the time of the ex-post evaluation, it was planned that the unused portion of the water pipe would be used in the future. Regarding the bridges, the DOR project office requested the necessary budget for the parts which require repair to respond to risks in the future. Thus there is a high possibility that improvements will be made and issues resolved. Considering

the above, slight issues have been observed in the institutional/organizational and financial aspects and in preventative measures against risks. However, there are good prospects for improvement/resolution. Therefore, sustainability of the project effects is high.

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

### **4.1 Conclusion**

The project aimed to achieve "Build Back Better" by reconstructing the National Bir Hospital and Paropakar Obstetrics and Gynecology Hospital in the Kathmandu Valley, reconstructing a water transmission system in Sindhupalchok District which suffered the greatest damage, and constructing bridges in Gorkha District which was the epicenter of the earthquake. This targeted prioritized facilities that were selected from buildings and facilities that were demolished by the earthquake in Nepal and designated as a grant aid program in Development Planning Survey Type Technical Cooperation "Nepal Earthquake Rehabilitation and Reconstruction Project", thereby contributing to the development of social infrastructure and institutions for sustainable and balanced economic growth. The project was consistent with the development policy and the development needs of earthquake recovery and reconstruction in Nepal and was consistent internally with Japan's development cooperation policy and related technical cooperation projects. However, there are some issues regarding the relevancy of the water transmission system construction to Chautara, as the project plan was not agreed upon by the local community in the target area. Therefore, its relevance and coherence are moderately low. Although the project period exceeded the plan, the project cost was within the plan, thus efficiency of the project is high. The effectiveness and impact of the project are high because the expected outcomes and impacts were generally achieved through the reconstruction of the buildings of the two hospitals, the construction of the water transmission system to Chautara, and the construction of the bridges on the Barhakilo-Barpak road. No negative social impacts were observed. Although there are some issues related to each project in the organization and structure, financial aspects, and response to risk, those are expected to be improved and therefore the sustainability of the effects achieved by the project is high.

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

### **4.2 Recommendations**

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

##### Immediate response to damage on part of the road and levee at the Rangrung Khola Bridge.

In June 2022, there was heavy rainfall that exceeded the designed water level, causing and the approach road and retaining wall of the Rangrung Khola Bridge to partially collapse. This had not been repaired at the time of the post-evaluation. There is a high risk that similar heavy rainfall in the future could cause further road collapse in this area. Therefore, it is recommended that



repairs are conducted as soon as possible. As planned at the time of the ex-post evaluation (August 2023), a budget should be secured during the 2023 fiscal year to ensure that the measures are implemented.

#### 4.2.2 Recommendations to JICA

None

### 4.3 Lessons Learned

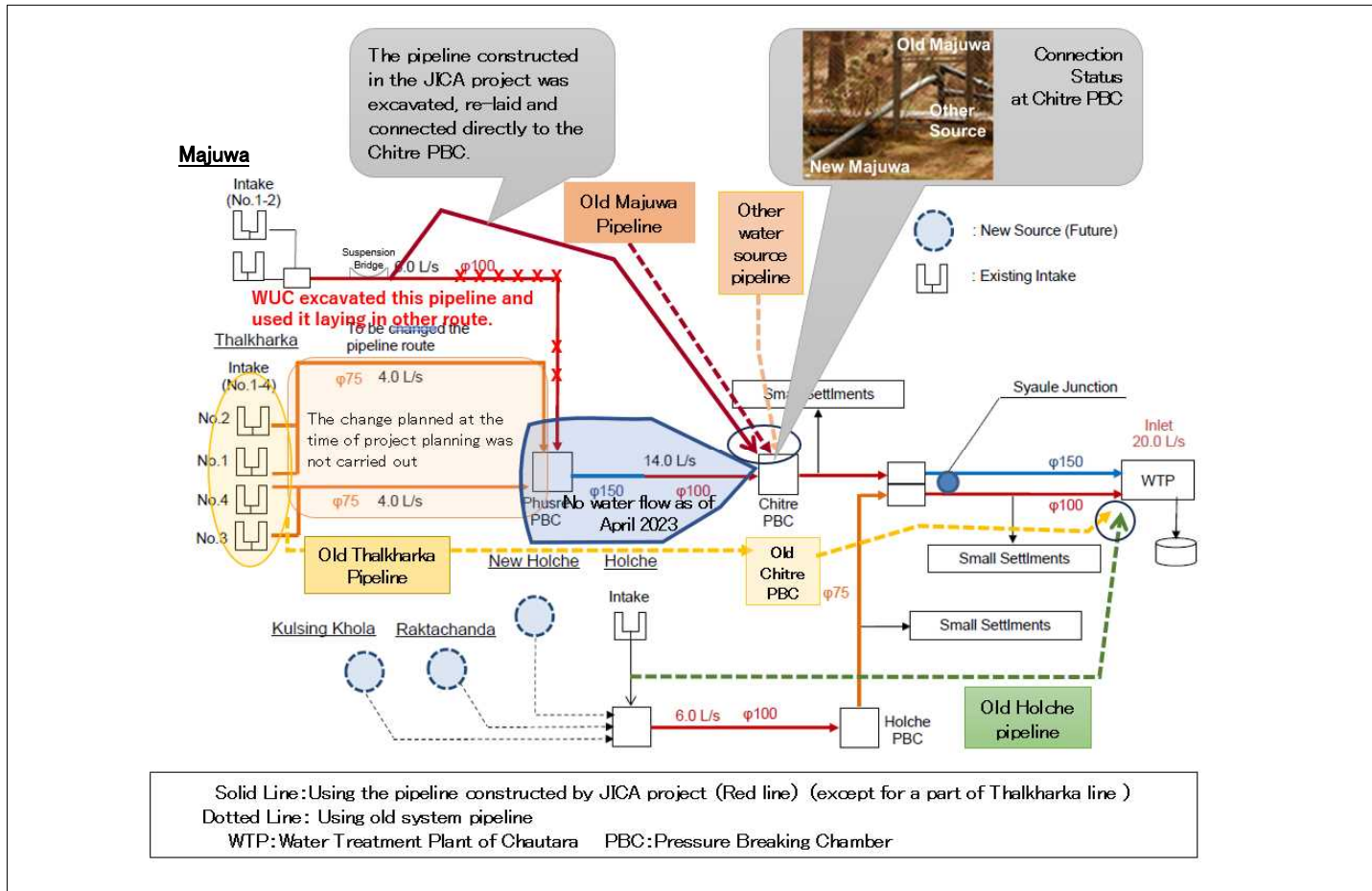
#### Incorporation of local residents' opinions on the design of the water transmission system

The construction of the water transmission system to Chautara was undertaken with the goal of restoring and improving water supply services by upgrading the water pipe to a seismic resistant one. The consultant proposed the replacement of the old water pipe in Majuwa, by laying a new water pipe along a route with lower disaster risk than the route of the old water pipe. However, WUC did not agree to the proposal and was continuing to use the old water pipe at the time of the ex-post evaluation, with no plans to discontinue its use in the future.

For the Majuwa water pipe constructed under the project, WUC had re-laid the water pipe route in July 2020, two years after completion in July 2018, changing the connection point from the Phusre PBC to the Chitre PBC. In addition, it was found that the water pipe between Phusre and Chitre was not being used at the time of the post-evaluation.

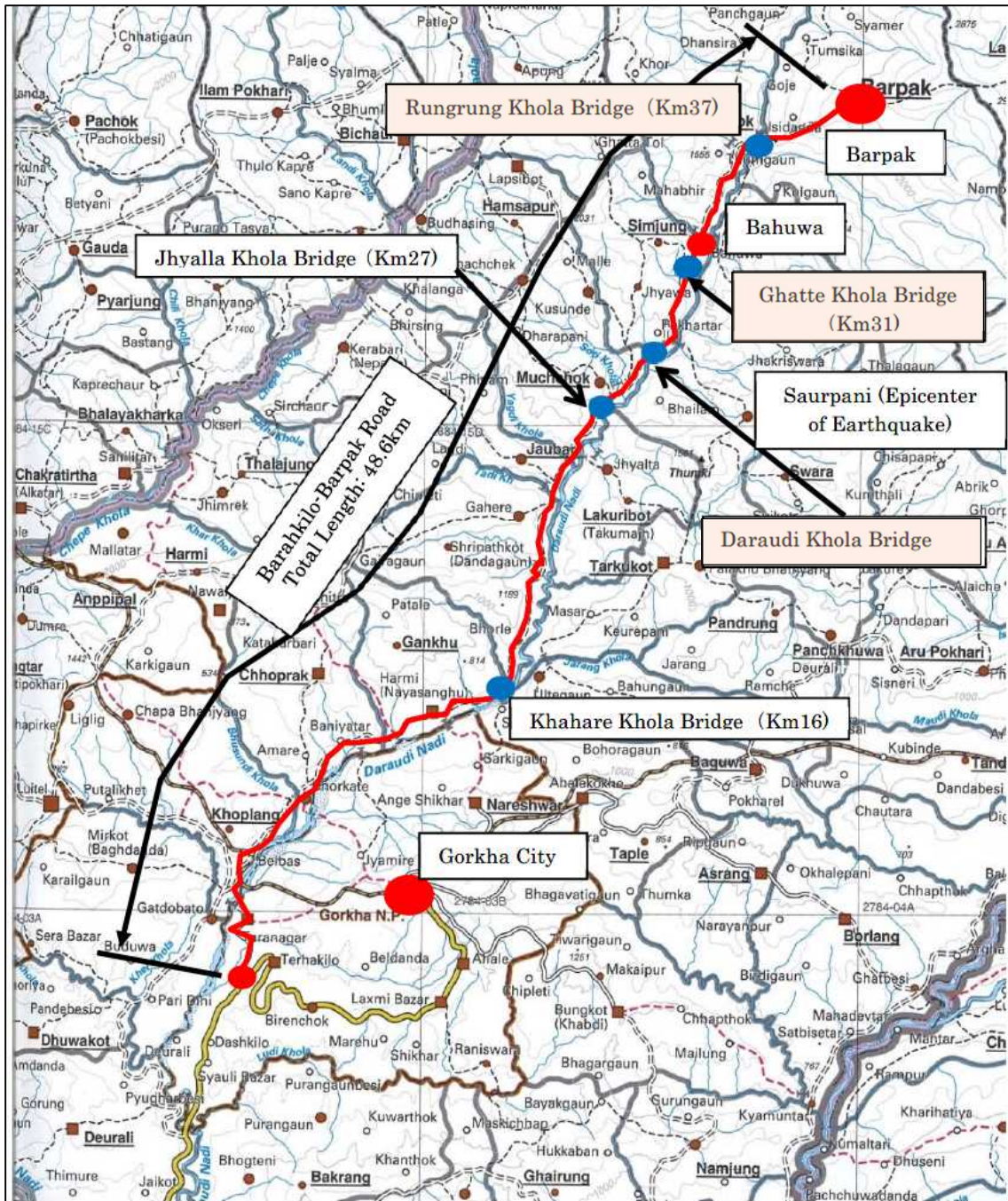
The above factors stem from the fact that no agreement was obtained from the local WUC at the time of project planning. It is thought that one of the reasons why the project plan was carried out without obtaining agreement was because the procedures for environmental and social considerations were simplified due to the project being a rehabilitation/reconstruction project. In general, water supply-related projects can cause disputes among beneficiaries regarding the allocation of water supply, etc. Therefore, it should have been important to confirm the intentions of local residents to the extent possible and to obtain their official consent for the design, even for restoration/reconstruction projects where immediate actions are desirable.

End



Source: Prepared by external evaluator from JICA, "Nepal Earthquake Recovery and Rehabilitation Project, Nepal: Grant Aid Outline Document" (February 2016), p. 86, Figure 4-3 Planned Water Transmission Scenario.

Attached Diagram: Chautara Water Transmission System (as of April 2023)



Source: JICA, "Nepal Earthquake Rehabilitation and Reconstruction Project, Nepal: Grant Aid Outline Document" (February 2016), p. 63, Figure 3-37 Location map of target bridges

Bridges covered by the project

Attached Map: Bridges on the Barhakilo-Bapak Road