

# **JICA's Assistance for Nepal Earthquake Reconstruction ~Basic Infrastructure Support for Resilient Society~**

- I. Overview of JICA's Cooperation for Nepal**
- II. Quake Damage**
- III. Reconstruction Efforts for the Earthquake  
Disaster by JICA**

**Urban and Regional Planning Development Group,  
Infrastructure and Peacebuilding Dept.,  
The Japan International Cooperation Agency (JICA)**

# I. Overview of JICA's Cooperation for Nepal

# JICA's Cooperation Strategy for Nepal

## **Achievement of Equitable and Sustainable Growth**

### **1. Social infrastructure and institutional development for sustainable and equitable economic growth**

#### **(i) Social and economic infrastructure development**

Transport , Power, Urban environment (water supply and sanitation, waste management)

#### **(ii) Private sector development**

Improvement of business environment

### **2. Consolidation of peace and a steady transition to a democratic state/society**

#### **(i) Establishment of mechanism for democratic state/society**

Policy dialogue, peace building, election, laws, media, mediation

#### **(ii) Public administration improvement**

M&E, public procurement, local governance

### **3. Rural poverty reduction**

#### **(i) Rural living standards improvement**

Agriculture and rural development

#### **(ii) Education and health services improvement**

### **<Significance of JICA's cooperation for Nepal>**

- Poverty reduction achieving MDGs,
- Peace building
- Geographical importance between India and China
- Good relations with Japan (Annual Japanese visitors to Nepal is 20,000 to 30,000)

# Overview of JICA's Cooperation in Nepal: Infrastructure-related



**Electricity: construction of hydropower plants (assistance to one-third of the total power supply in Nepal)**

Kulekhani Hydroelectric Project (I) (II), Kali Gandaki A Hydroelectric Project (Loan) (completed)

- Total Loan amount: \33.07 billion
- Project Start: Kulekhani(I)1976 , Kulekhani(II)1982 , Kali Gandaki 1996
- Outline: Kulekhani (I):60MW, Kulekhani(II):32MW, Kali Gandaki :144MW)

Tanahu Hydropower Project (Loan) (under considerations) (co-financing with ADB etc.)

- Outline: 140MW



**Transport: construction of main trunk roads**

Sindhuli Road Construction Project (Grant) (on-going)

- Total Grant amount: \20.78 billion
- Project Start: 1995
- Outline: construction of alternative route between Kathmandu and Terai

Improvement of Kathmandu Baktapur Road (Grant) (completed)

- Total Grant amount: \2.69 billion
- Project Start : 2008 (completed in 2010)
- Outline: expansion of Kathmandu-Baktapur road from 2 to 4 lanes

Modernization of Tribhuvan International Airport (Grant) (completed)

- Total Grant amount: \4.72 billion
- Project Start : 1994 (completed in 2001)



**Water Supply: construction of 15 water treatment plants in Nepal**

Water Supply to Urban and Semi-Urban Centers (Grant) (completed)

- Total Grant amount: \4.33 billion
- Project Start: 1988

Improvement of Kathmandu Water Supply Facilities(Grant)(completed)

- Total Grant amount: \3.53 billion
- Project Start : 1993 (completed in 2003)
- Outline: water supply facilities in KV (covers 52% of treatment capacity in valley)

Melamchi Water Supply Project (Loan) (on-going) (co-financing with ADB etc.)

- Total Loan amount: \5.49 billion (JICA portion)
- Project Start : 2001 (on-going)

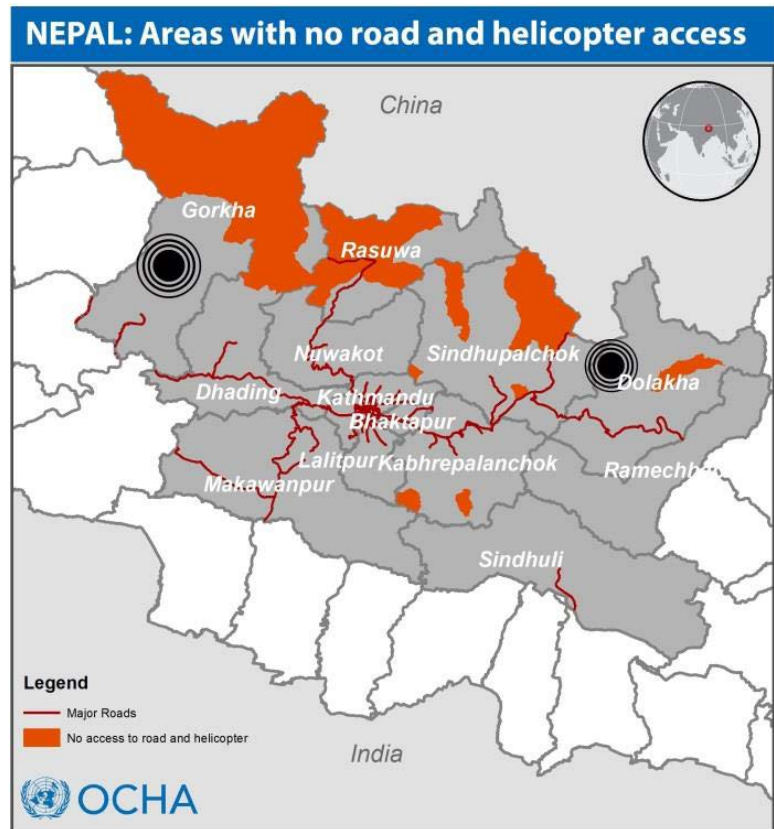
## Education

Non-formal education (2004 to 2009) (completed)

School Management Support (on-going)

Construction of more than 9,500 class rooms (Grant)

# II. Quake Damage



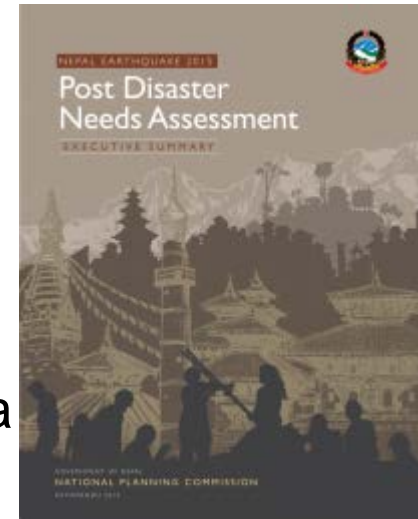
Map Sources: Nepal Survey Department, USGS, WFP  
 The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Map created on 15 May, 2015

Access data reported by the Nepal Food Security Monitoring Programme via WFP/Logistic Cluster prior to 25 April.

# Needs Assessment

## Post Disaster Needs Assessment (PDNA):

- ◆ Lead: Multi-Sectoral Needs Assessment facility led by NPC (GON)  
UN, WB, EU, ADB, JICA
- ◆ Coverage: 23 Sectors (Housing, Health, Education, Transport, Disaster Risk Reduction, etc.)
- ◆ Duration: Appx. 40 days for completion
- ◆ Key Findings:
  - Total Needs: 6,695 MUSD
  - Housing Account for 49% of total needs
  - Damage: 1/3 of GDP, 100% of GFCF
  - Worst Affected Areas: Poorest Areas (Dolakha Sindhupalchowk, Gorkha, Nuwakot, Dhading)
  - Appeal at the Donor Conference: 4.4 Billion USD Pledged



Courtesy of the Reliefweb

# JICA Effort to Fix Quake-Damaged Schools (1)

- **Outline:**
- ◆ JICA has been cooperating with primary school construction in Nepal since 1994, and as of 2014, 9,500 classrooms had been built through six projects. The walls of some of those classrooms collapsed but their steel frames, the main structural components, remained intact.
- ◆ Areas: Dhading, Gorkha, Nuwakot,
- ◆ Budget: 263 MJPY (App. 200 schools)
- ◆ Priority: Damaged school buildings constructed by the community with material support by GA in the past (Follow-up cooperation)
- ◆ Cause of damage
  - Non-engineered construction
  - Not complying with drawings
  - Site location (weak embankment foundation, etc)



# JICA Effort to Fix Quake-Damaged Schools (2)

## Short-term

- Improved Seismic Resistance by Introducing brick or concrete block with cement mortar masonry walls that have properly reinforced by RC bands and vertical reinforcement steel bars
- Construction by contractors with monitoring by community

## Mid-term

- Support formulating new guidelines for school construction with more rigorous earthquake resistance standards.



A temporary classroom built by residents.



Repairs progress at a rapid pace.



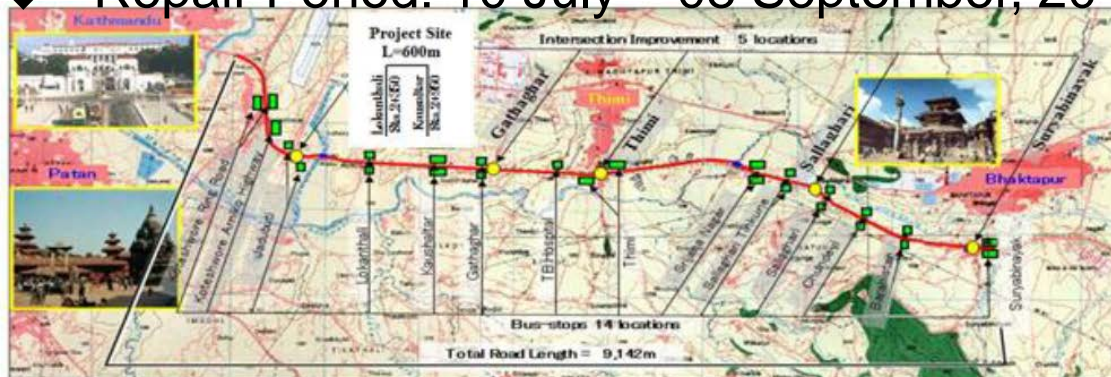
The finished school buildig.



# JICA Effort to Fix Quake-Damaged Infrastructure: Kathmandu-Bhaktapur (KB) Road (1)

- **Outline:**

- ◆ Significance: One of the Busiest Trunk Roads in Nepal constructed with GA support
- ◆ Area: Lokanthali – Kausaltar (app. 900m)
- ◆ Damage: Damage on surface, embankment
- ◆ Possible cause of damage
  - Liquefaction-related ground depression
  - (Source: JSCE Landslide survey group [http://committees.jsce.or.jp/eec205/system/files/JSCE-landslides-report6\\_0.pdf](http://committees.jsce.or.jp/eec205/system/files/JSCE-landslides-report6_0.pdf) )
- ◆ Budget: 72 MNPR
- ◆ Repair Period: 10 July – 08 September, 2015



Location Map

# JICA Effort to Fix Quake-Damaged Infrastructure: Kathmandu-Bhaktapur (KB) Road (2)

- Rehabilitation Works and Comparison between “Before and After”



Eastbound Lane Back-filling and Compaction for an Open Crack  
July 20, 2015



Eastbound Lane Base Coarse Laying July 20, 2015

Kathmandu-Bhaktapur Road, East/Westbound lane nearby Lokanthali Junction



BEFORE April 28, 2015



AFTER September 6, 2015

Kathmandu-Bhaktapur Road, Eastbound lane nearby Kaushaltar Bus-stop



BEFORE April 28, 2015



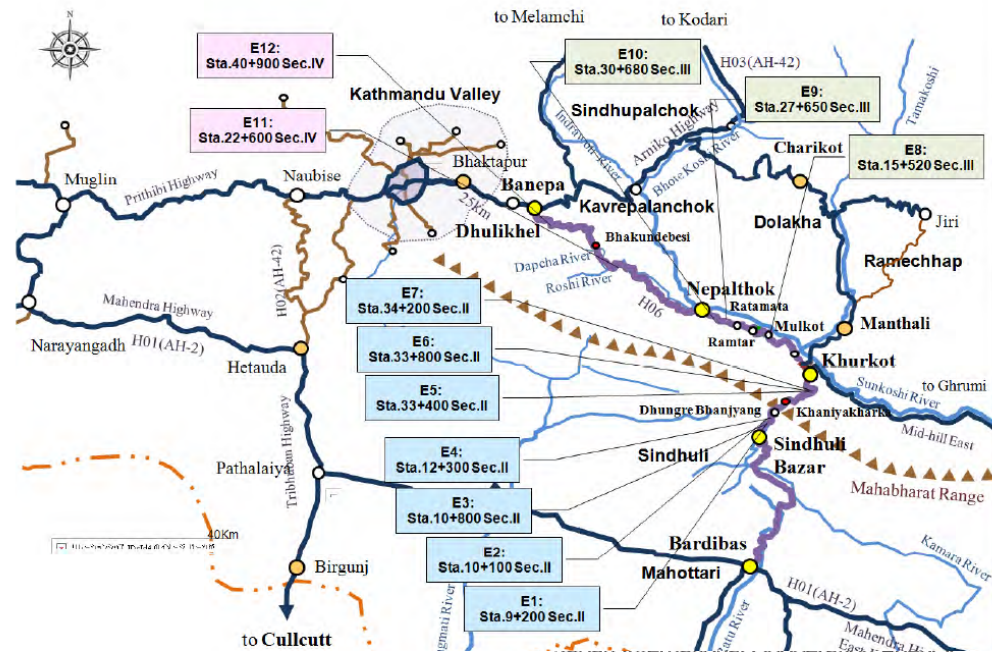
AFTER September 6, 2015

# JICA Effort to Fix Quake-Damaged Infrastructure: Sindhuli Road Road (1)

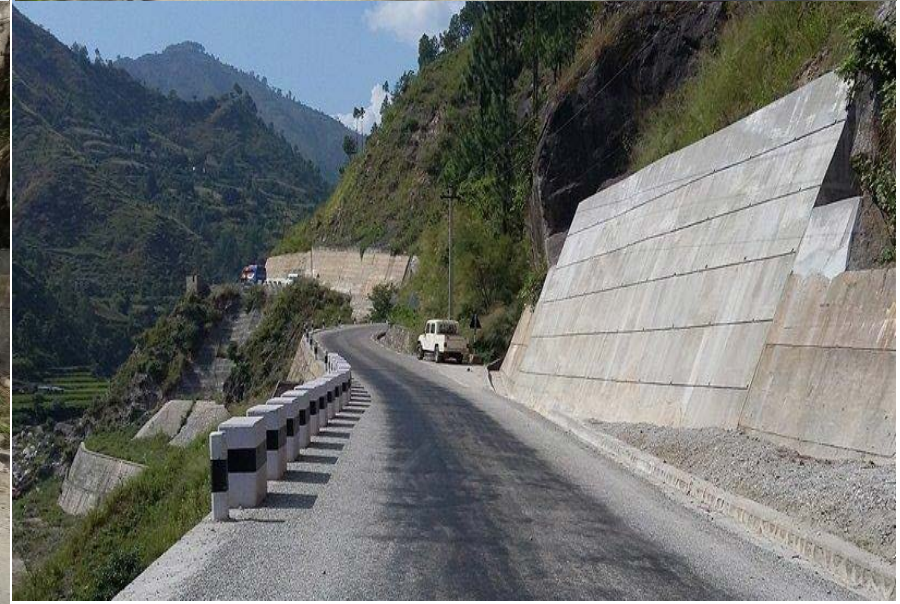
- **Outline:**

- ◆ Significance: One of the Busiest Trunk Roads and Symbolic Project of Japan's ODA in Nepal
- ◆ Area: Dhulikhel – Sindhuli Bazar
- ◆ Damage: Damage on surface, embankment
- ◆ Possible cause of damage:
  - Ground depression, slope failure, deformation of gabion, etc

- ◆ Component:
  - Road Rehab.
  - Construction Machinery (Backhoe, Road Roller, etc.)
- ◆ Construction Period: 21 June - November



# JICA Effort to Fix Quake-Damaged Infrastructure: Sindhuli Road Road (2)



# Roads / Bridges in Kathmandu : Simplified Vulnerability Study



## Vulnerability Ranking on Possibility of Serious Damage

Rank A: High Possibility  
Rank B: Medium Possibility  
Rank C: Low Possibility  
(Tentative, Need Detailed Evaluation)

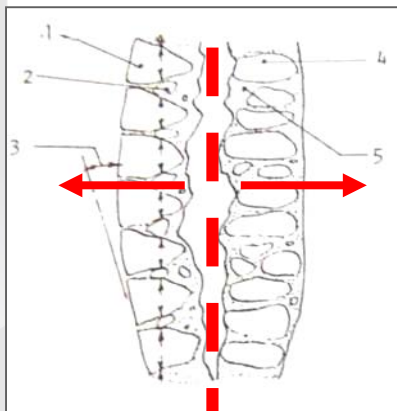
- Weak and Non-ductile Stopper
- Poor Construction Quality (cold joint, thin concrete cover, etc)
- Capacity Bottlenecks (for transport, river flow)

(Source: Dr. Shigeki UNJOH,

[http://www.jica.go.jp/nepal/english/office/topics/c8h0vm00009n66lq-att/150710\\_06.pdf](http://www.jica.go.jp/nepal/english/office/topics/c8h0vm00009n66lq-att/150710_06.pdf)

# Typical Damaged House (1)

De-lamination



Corner damage



**Mud mortar house with no damage in Gorkha**

- **Dressed Stones**
- **Interlocking at corner**

# Typical Damaged House (2): Out-of plane failure



Houses with seismic band has less failure

# Considerations for reconstruction direction

---

- ◆ Seismic Standard and Design
- ◆ Implementation / Enforcement of Regulation
- ◆ Capacity Development / Training
- ◆ Improvement of Lifeline to connect Villages to Cities
- ◆ Public Service Outreach
- ◆ Livelihood
- ◆ Disadvantaged / Vulnerable People
- ◆ Raising Awareness for Future Risks



# III. Reconstruction Efforts for the Earthquake Disaster by JICA

# JICA's Reconstruction Strategy

## Pursue “Build Back Better” as an Overarching Principle for Realizing Resilient Society

- ◆ One of the most significant lessons learned from disasters is that **rebuilding of affected communities to pre-disaster standards will recreate the vulnerabilities** that existed earlier.
- ◆ Recovery is defined as the restoration and improvement of **not only infrastructure and facilities**, but also **livelihoods, economy and living conditions** of disaster affected communities.
- ◆ Reconstruction from disaster is **an opportunity** to “build back better”.
- ◆ The concept of “build back better” approach was accepted in **the Third UN World Conference in 2015** as one of the priority areas in disaster risk reduction.



# JICA's Response to the Nepal Earthquake

Emergency Response

Reconstruction

April 25	<b>The Nepal Earthquake</b>
April 27	<b>Japan Disaster Relief Team</b>
May 1	<b>Contact Mission</b> <ul style="list-style-type: none"> <li>◆ Vision: “Build Back Better”</li> <li>◆ Needs for (1) Enhanced Resilience in Kathmandu Valley, (2) Reconstruction in Rural Districts, (3) Resilient Housing Model</li> </ul>
May 20	<b>Dispatch of 3 Experts (Mr. Kaneko, Mr. Shingai, Dr. Unjoh)</b> from Ministry of Land, Infrastructure, Transport and Tourism
May 25	<b>“BUILD BACK BETTER RECONSTRUCTION SEMINAR FOR NEPAL”</b>
June	<b>Finalization of Project Framework</b> <ul style="list-style-type: none"> <li>◆ Emergency Rehabilitations of Vital Infrastructure “Sindhuri Road”, “Kathmandu-Bakhtapur Road”</li> <li>◆ Urgent Development Study (T/C) “The Project on Rehabilitation and Recovery from Nepal Earthquake”</li> <li>◆ Preparation for Financial Support (Loan) “Emergency Housing Reconstruction Project” “Emergency School Reconstruction Project”</li> <li>◆ Preparation for Rehabilitation of Schools (F/U for Grant)</li> </ul>
June 25	<b>Donor Conference (Total of 4.4 billion USD pledge by DPs)</b>
July 5	<b>Commencement of “The Project on Rehabilitation and Recovery from Nepal Earthquake”</b>
Nov~	<b>Loan Aid on Houses and School Buildings Reconstruction</b>

# Location Map of JICA Projects

ERAKV

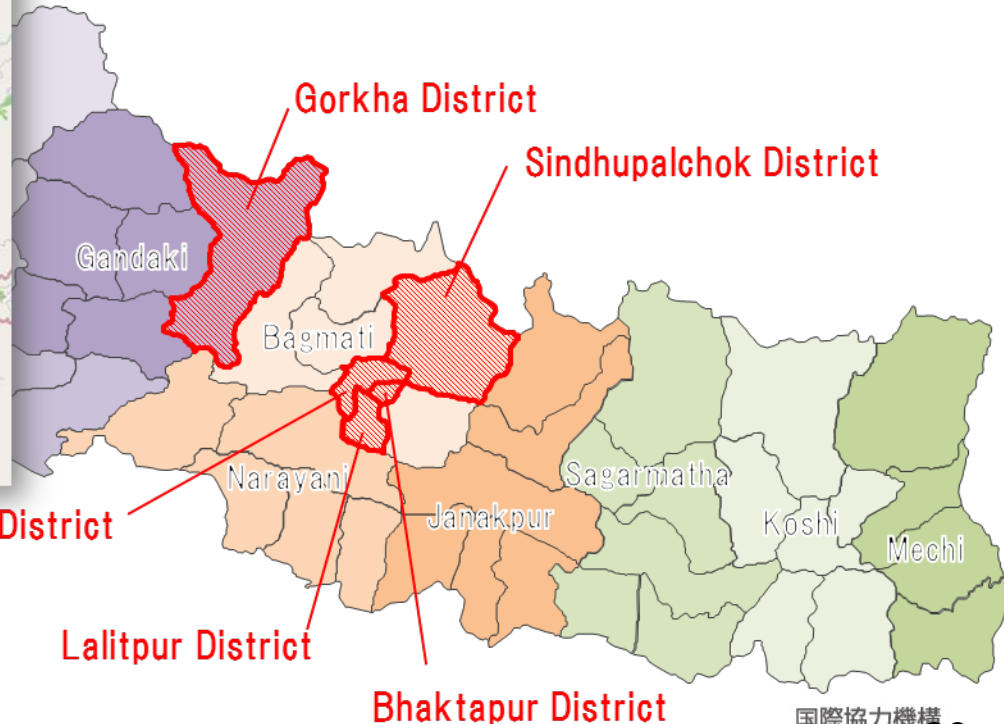
The Project for Assessment of Earthquake Disaster Risk for the Kathmandu Valley

RRNE

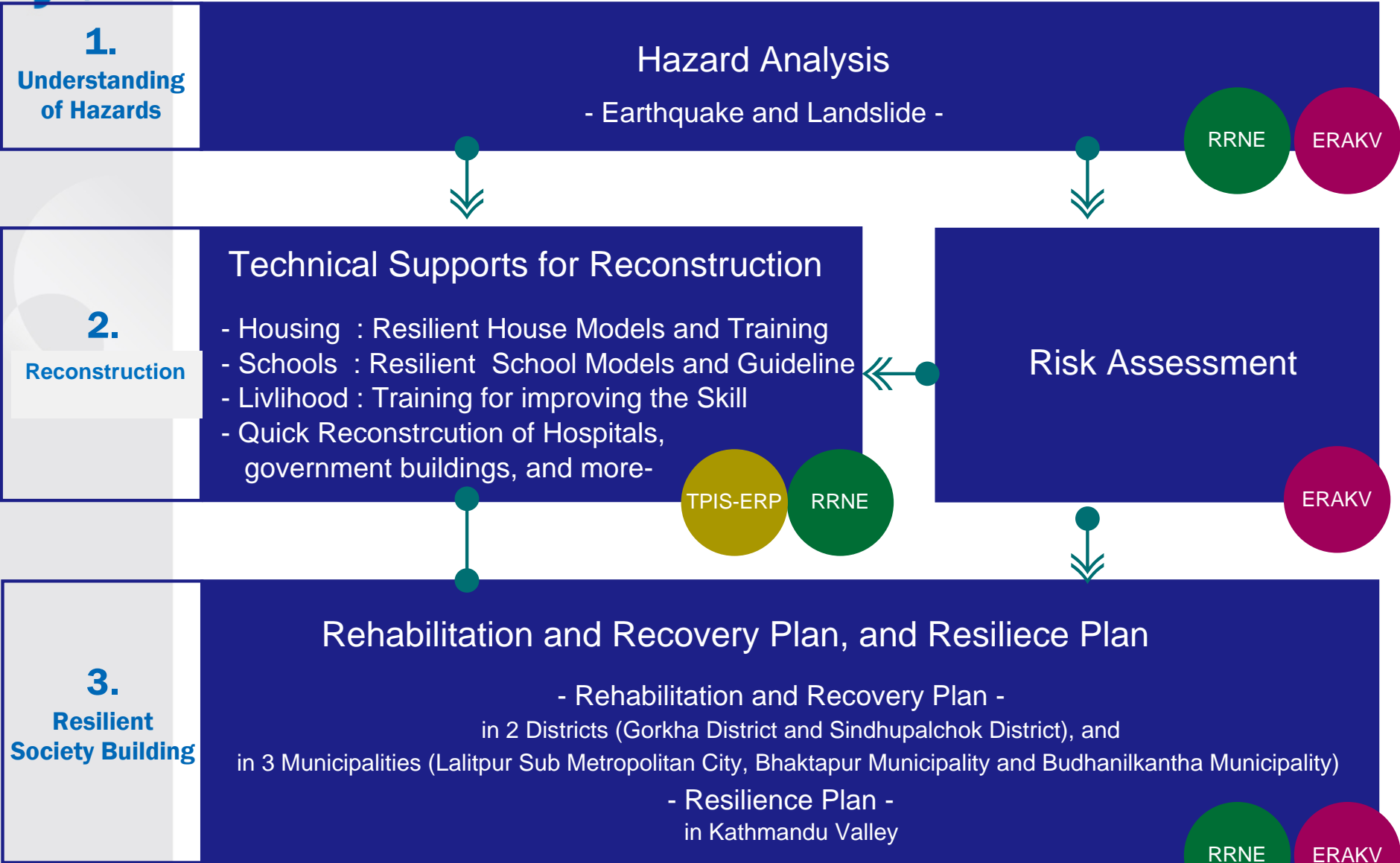
The Project on Rehabilitation and Recovery from Nepal Earthquake

TPIS-ERP

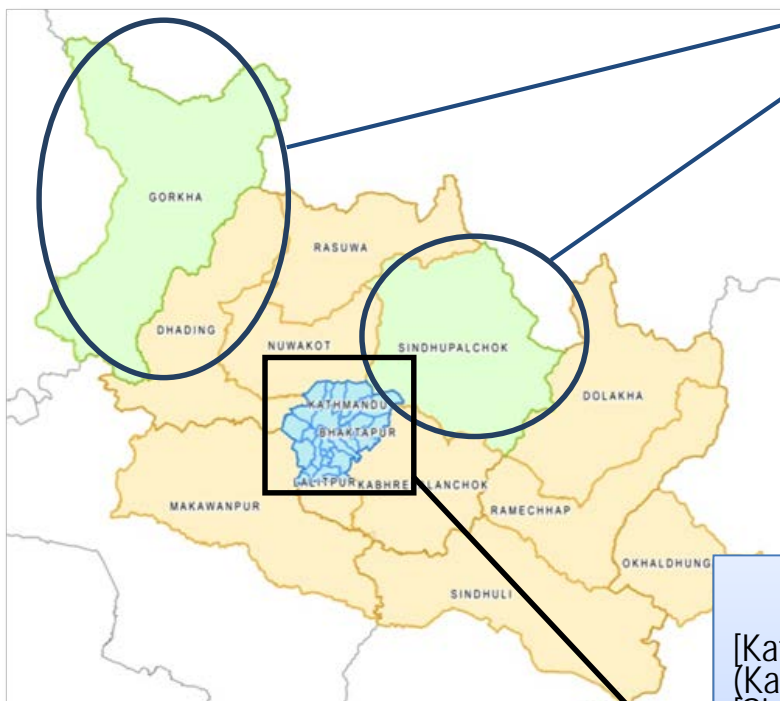
The Transitional Project Implementation Support for Emergency Reconstruction Projects



# Approach Towards BBB



# 1. Digital Maps Hazard Analysis: Collected Geo-information



## [Gorkha, Sindhupalchowk]

- Existing Topographic map data
- Satellite Imagery (After Earthquake/SPOT/1.5mResolution)
  - > Updating Roads/River/Buildings
  - > Landslide Identification
- Satellite Imagery (Before Earthquake/SPOT/1.5mResolution)
  - > Landslide Identification
- Digital Elevation Model (DEM)
  - > Contour line Creation
  - > Grasping Disaster damage on 3D view

## [Other Districts]

- Existing Topographic map data
- Satellite Imagery (After Earthquake/SPOT/1.5mResolution)
  - > Updating Roads/RiveNPR/Buildings
  - > Landslide Identification

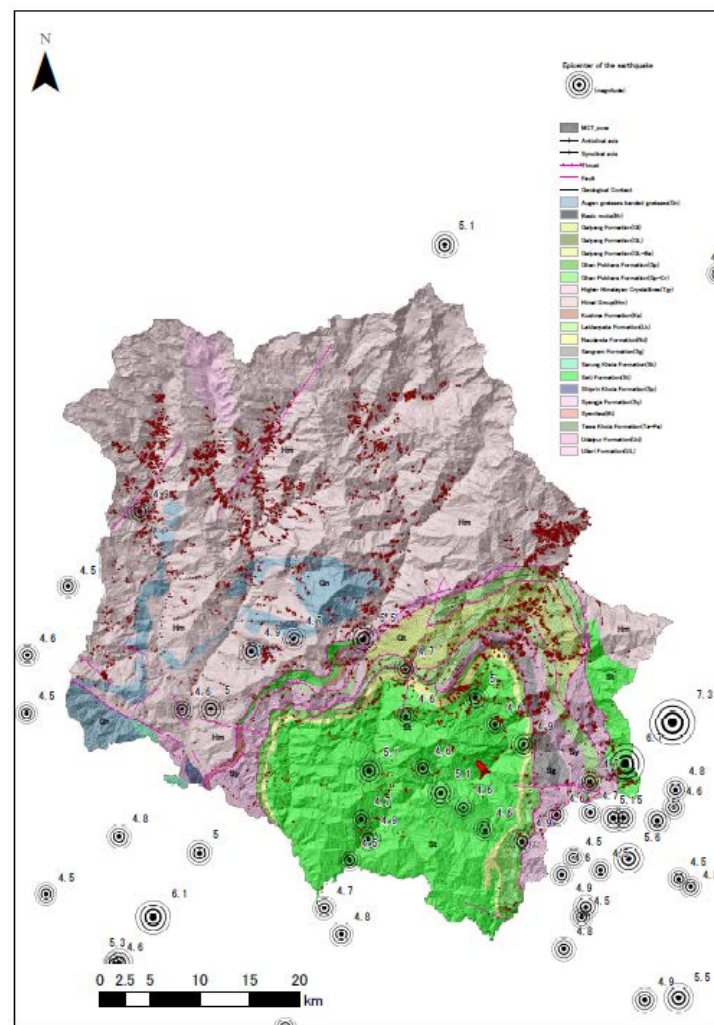
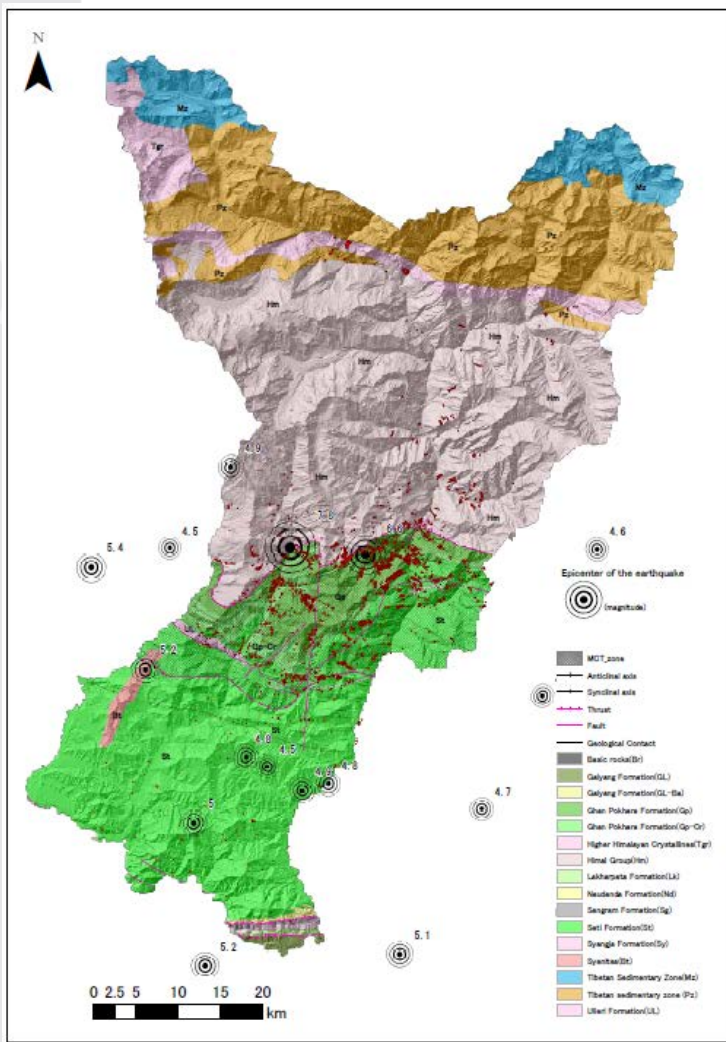
## [Kathmandu Valley]

(Kathmandu, Bhaktapur, Part of Lalitpur)

## [Sindhupalchowk]

- Existing Topographic map data
- Satellite Imagery (After Earthquake/SPOT/1.5mResolution)
  - > Updating Roads/River
- Satellite Imagery (After Earthquake/Pleiades /0.5mResolution)
  - > 1/10,000, 1/5,000 Reconstruction Support Map

# Geological Map

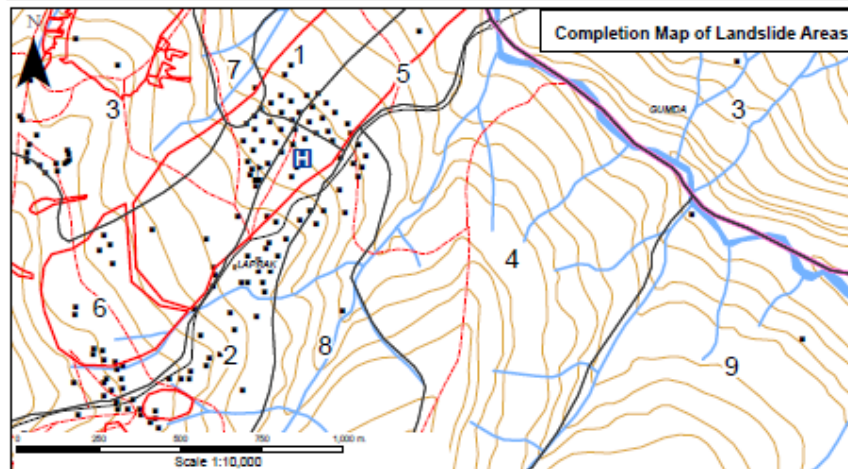
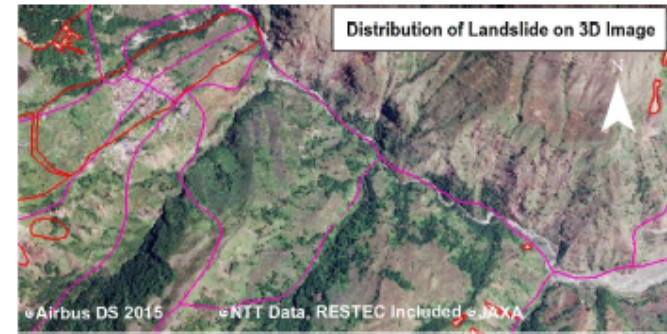
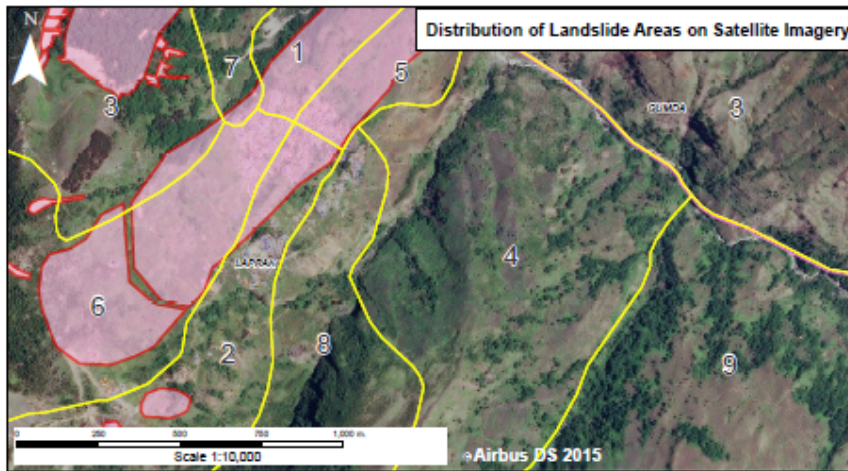


Source: 1:1,000,000 Geological map of Nepal 2004  
 ©NTT DATA, RESTEC Included ©JAXA

# Example of 1:10,000 Hazard Map

## LANDSLIDE AREA MAP

BI19



**MAP INFORMATION:**  
Map shows information of the District of Gorkha in three types: satellite imagery, topographic map & 3D view.

**DATA SOURCE:**  
Administrative boundaries are from the Survey Department of Nepal. Landslides, roads, water bodies, contours & buildings were extracted from the SPOT satellite imagery.  
3D view of the Area was generated from the combination of SPOT Satellite Imagery and Digital Surface Model (DSM).

**COORDINATE SYSTEM:**  
WGS 84 / UTM Zone 45 N

- LEGEND:**
- School
  - Public Office
  - Health Post, Hospital
  - Religious
  - Residential
  - River/Stream
  - Highway
  - Feeder/District/Other road
  - Cart track
  - Trails
  - Foot path
  - Index Contour
  - Intermediate Contour
  - Ward Boundary
  - Village Development Committee
  - District Boundary
  - Adjacent Districts

- Landslide Types:** Before EQ After EQ
- Shallow Landslide
  - Rock Fall
  - Deep Landslide
  - Debris Flow

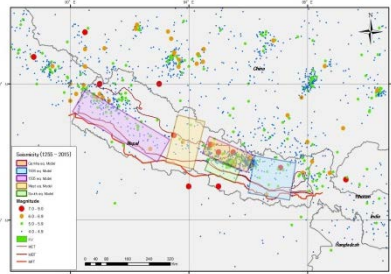
**Index:**

BI15	BI19	BI20
BI15	BI19	BI20
BI15	BI19	BI20

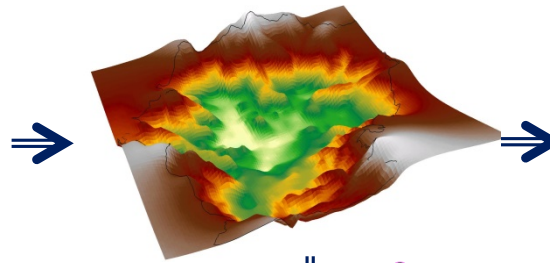
Federal Democratic Republic of Nepal  
&  
Japan International Cooperation Agency  
**Earthquake Restoration and Reconstruction Project in Nepal**



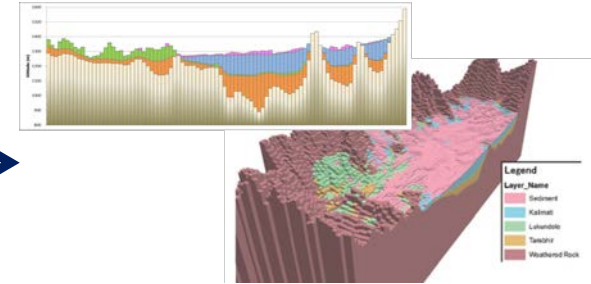
# Outputs of Seismic Hazard Assessment



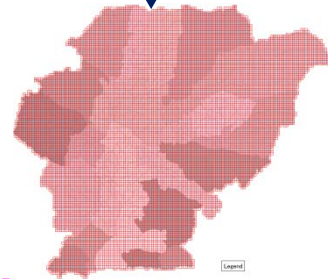
New Scenario EQ



Base Layer Surface

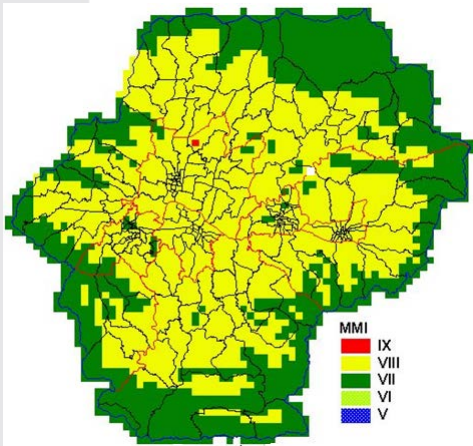


Ground Model

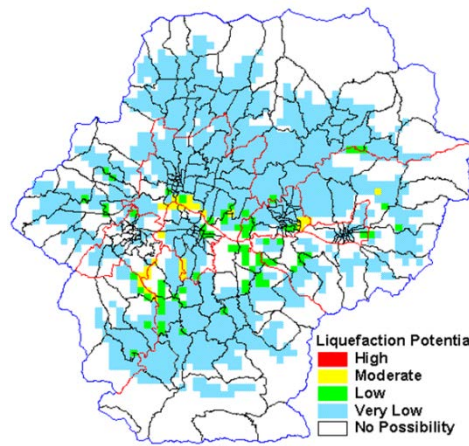


Calculation Unit  
250m\*250m

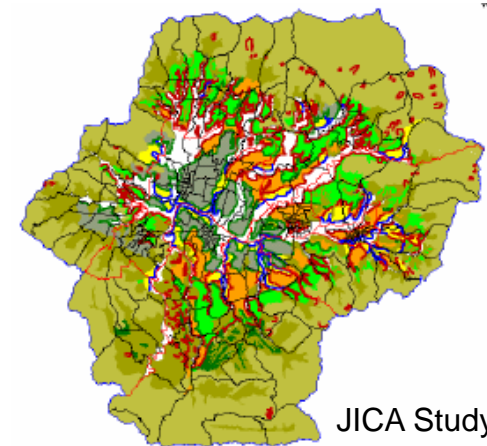
## Hazard Map



Intensity Map



Liquefaction Hazard Map



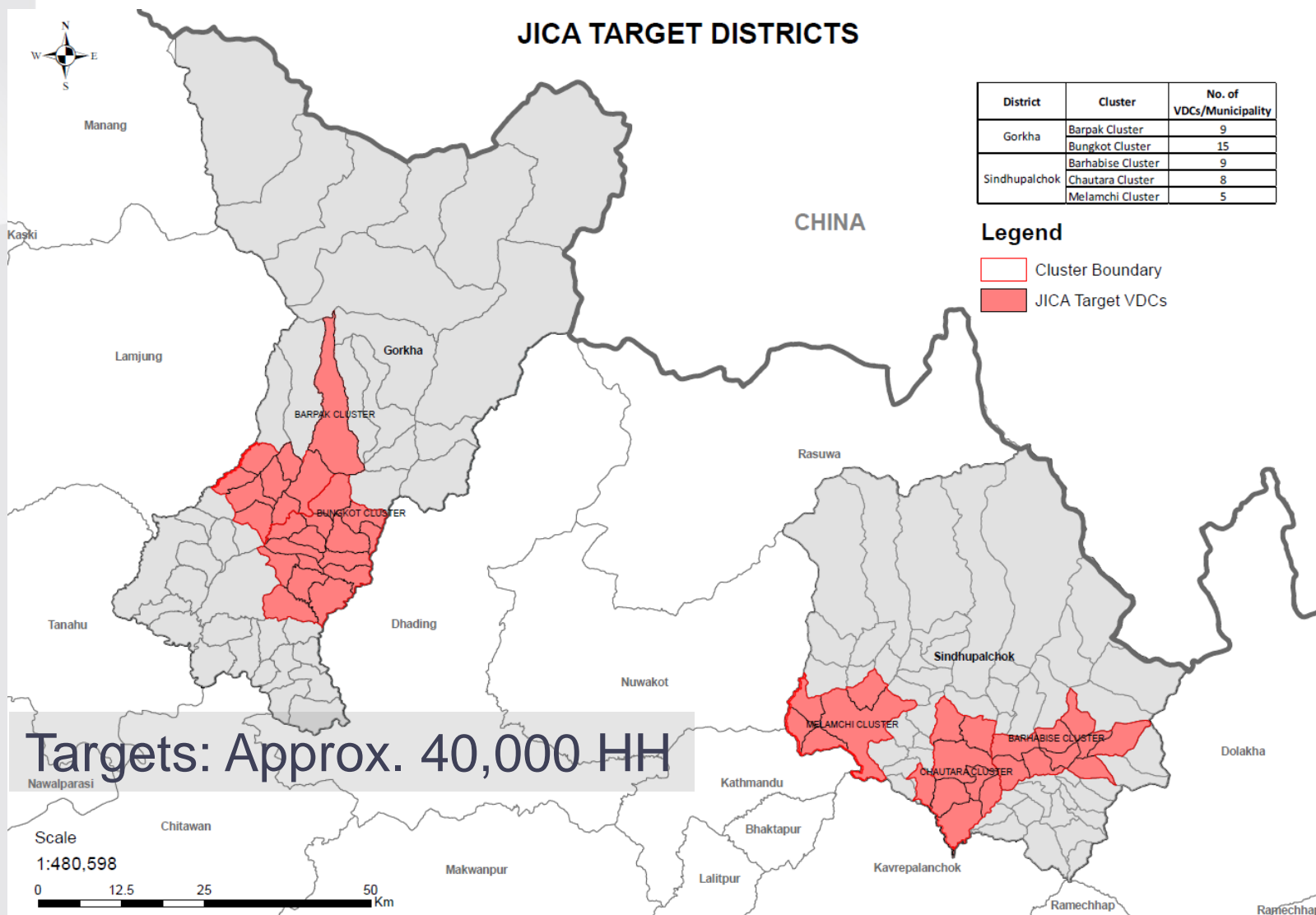
Landslide Hazard Map

## 2. Housing and School Reconstruction:

### (1) Emergency Housing Reconstruction Project

- Project Name: Emergency Housing Reconstruction Project (EHRP)
- Objective: Reconstruct the collapsed housing through housing grant
- Location: 14 affected districts
- Priority Districts: Sindhupalchowk and Gorkha districts
- Cost: 12,000 million JPY (JICA's eligible portion)  
(Equivalent to 10,000 million NPR)
- Executing Agencies: NRA
- Implementing Agencies: MOFALD and MOUD
- Loan Agreement signed on December 21<sup>st</sup>, 2015
- Schedule: August 2015 – December 2020

# Target Area: Gorkha and Sindhupalchowk



**Targets: Approx. 40,000 HH**

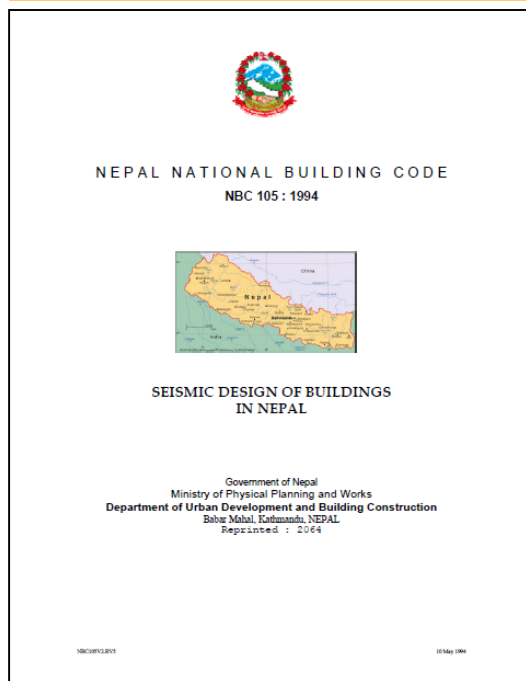
# NBC105 as Seismic Design

- In Nepal, MRT (Mandatory Rules of Thumb) in NBC was not based on structural calculation, guidelines were based on the experiences from past earthquakes.
- Therefore, a structural analysis of prototypes by NBC105 as seismic design was conducted.

The design for earthquake actions shall be in accordance with either:

- The working stress method (elastic method), or
- The limit state method

Two methods which are static structural calculation and structural analysis using FEM. were conducted.



## 1 Scope

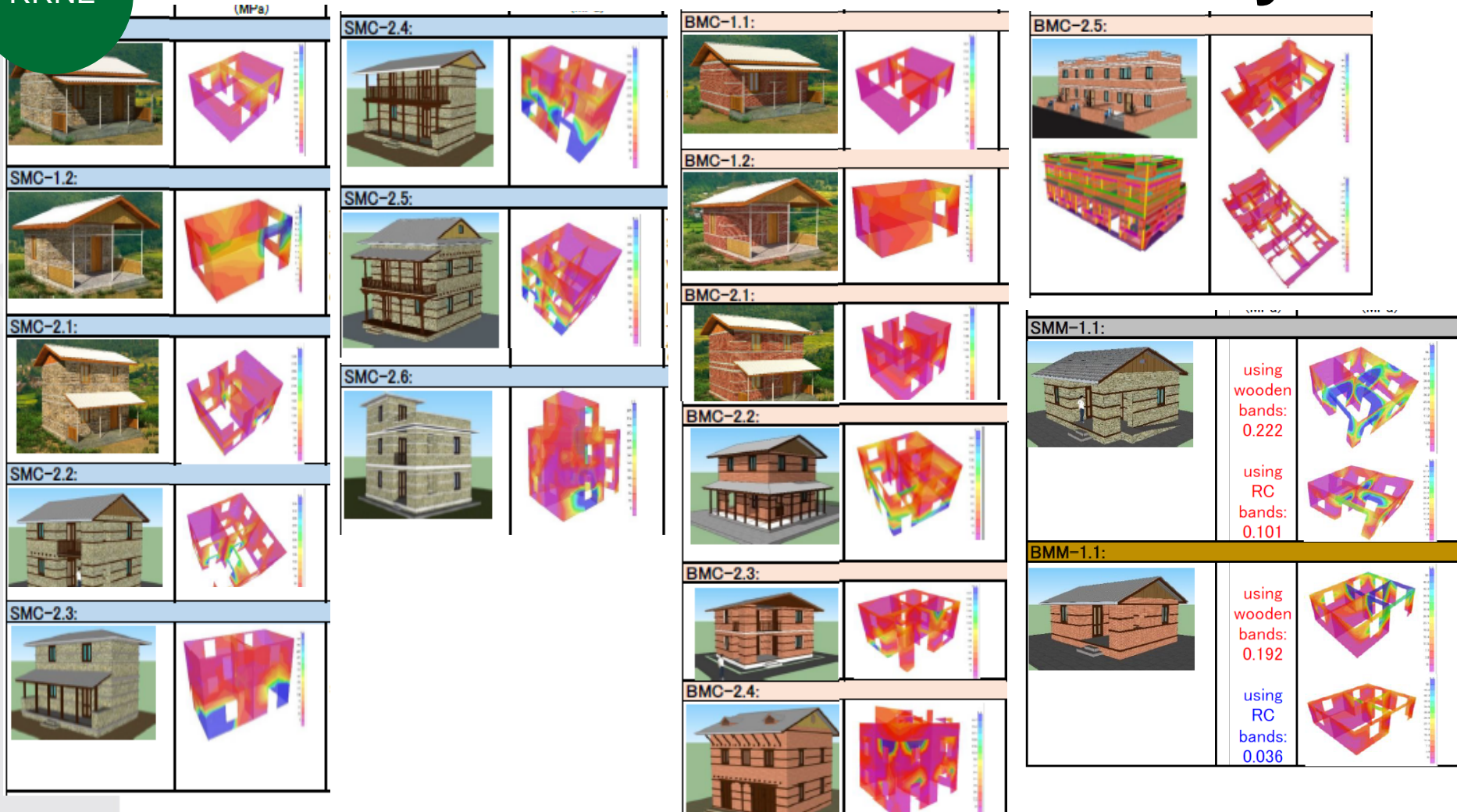
This standard sets down requirements for the general structural design and seismic design loadings for structures within any of the following categories :

- All buildings having a floor area greater than 20 square metres.
- Any building with a height greater than five metres.
- All masonry or concrete walls greater than 1.5 metres in height.
- Elevated tanks of up to 200 cubic metres capacity. Larger tanks than this should be the subject of a special study.
- All buildings to which the general public have access.

The requirements are not intended to apply to :

- Unusual buildings or structures (eg, those with unusual configurations or risk - such as nuclear power stations, etc).
- Civil engineering works (eg, bridges, dams, earth structures, etc).
- Buildings or structures greater than 90 m in height.

# Structural Calculation and Analysis



According to structural calculations, Cement mortar models satisfy the NBC105 seismic requirement. The tensile stress and shear stress were below the limit. On the other hand, Mud mortar should be limited to one storey with attic at maximum, considering the possibility of out-of-plane failure during earthquake.

NRA organized the TSC (Technical Standardization Committee) in the end of February. In this committee, it was discussed that NBC105 should be applied to residential buildings in the reconstruction programme as the seismic requirement.

Then, the minimum requirements for residential building in reconstruction programme were developed. JICA Study Team

# Design Catalogue

The designs provided in the catalogue cover four broad categories of building materials and typology:

- SMC: Stone masonry in cement mortar
- BMC: Brick masonry in cement mortar
- SMM: Stone masonry in mud mortar
- BMM: Brick masonry in mud mortar

} JICA Model

## DESIGN CATALOGUE FOR RECONSTRUCTION OF EARTHQUAKE RESISTANT HOUSES

### Volume I



October, 2015 (Aswin, 2072)



Nepal Housing  
Reconstruction Programme

Government of Nepal  
Ministry of Urban Development  
Department of Urban Development and Building Construction  
Babarmahal, Kathmandu

Department of Urban Development and Building Construction  
Babarmahal, Kathmandu

Structural Type	No. of Floor	Model No.	Designed by
Stone masonry in cement mortar, P5- <b>SMC</b>	1	SMC-1.1	JICA
	1	SMC-1.2	JICA
	2	SMC-2.1	JICA
	2	SMC-2.2	DUDBC
	2	SMC-2.3	DUDBC
	2	SMC-2.4	DUDBC
	2+ATTIC	SMC-2.5	DUDBC
	2+TERRACE	SMC-2.6	DUDBC
		Technical details	
		Flexible design	
Brick masonry in cement mortar P71- <b>BMC</b>	1	BMC-1.1	JICA
	1	BMC-1.2	JICA
	2	BMC-2.1	JICA
	2	BMC-2.2	DUDBC
	2	BMC-2.3	DUDBC
	2	BMC-2.4	DUDBC
	2+ATTIC	BMC-2.5	DUDBC
2+TERRACE	BMC-2.5	DUDBC	
		Technical details	
		Flexible design	
Stone masonry in mud mortar, P129- <b>SMM</b>	1	SMM-1.1	DUDBC
		Technical details	
		Flexible design	
Brick masonry in mud mortar, P147- <b>BMM</b>	1	BMM-1.1	DUDBC
		Technical details	
		Flexible design	

The JICA Study Team supported the preparation of the catalogue in DUDBC, then it was published in November, 2015 by DUDBC.

# Minimum Requirements

## ढुङ्गाको गारोमा सिमेन्ट मसलाको जोडाई-न्यूनतम मापदण्ड

नेपालको राष्ट्रिय भवन संहिता (NBC 202) मा आधारित



नेपाल सरकार

राष्ट्रिय पुनर्निर्माण प्राधिकरण

**१. स्थानको चयन**

**२. ढुङ्गाको चयन**

**३. आधारभूत**

**४. भित्ति**

**५. छत**

**६. फर्क**

**७. ढुङ्गाको चयन (नि)**

**८. ढुङ्गाको चयन (नि)**

**९. ढुङ्गाको चयन (नि)**

**१०. ढुङ्गाको चयन (नि)**



Minimum Requirements

## ढुङ्गाको गारोमा सिमेन्ट मसलाको जोडाई निर्माण प्रक्रिया

राष्ट्रिय भवन संहिता (NBC 202) मा आधारित



नेपाल सरकार  
राष्ट्रिय पुनर्निर्माण प्राधिकरण

**१. आधारभूत**

**२. भित्ति**

**३. छत**

**४. फर्क**

**५. ढुङ्गाको चयन (नि)**

**६. ढुङ्गाको चयन (नि)**

**७. ढुङ्गाको चयन (नि)**

**८. ढुङ्गाको चयन (नि)**

**९. ढुङ्गाको चयन (नि)**

**१०. ढुङ्गाको चयन (नि)**



Construction Sequence

国際協力機構

# Achievement (As of 24<sup>th</sup> April 2016)

- **Mason Trainings**

- 497 masons were trained, further target is 2,310
- Special attentions are paid to minimum requirements and practical skills

- **Awareness Raising to the House owners**

- 1,156 house owners participated, further target is 6,160
- Theatrical performance is extended with the “Earthquake-Resistant Performing Character”

- **Commencement of the Enrolment Camp**

- Hansapur VDC , Gorkha (Apr. 10-19): 764 Participation Agreement (81%) were signed out of 944 eligible house owners
- Barpak VDC, Gorkha (Apr. 24-)
- Chautara Municipality, Sindhupalchok (Apr. 24-)

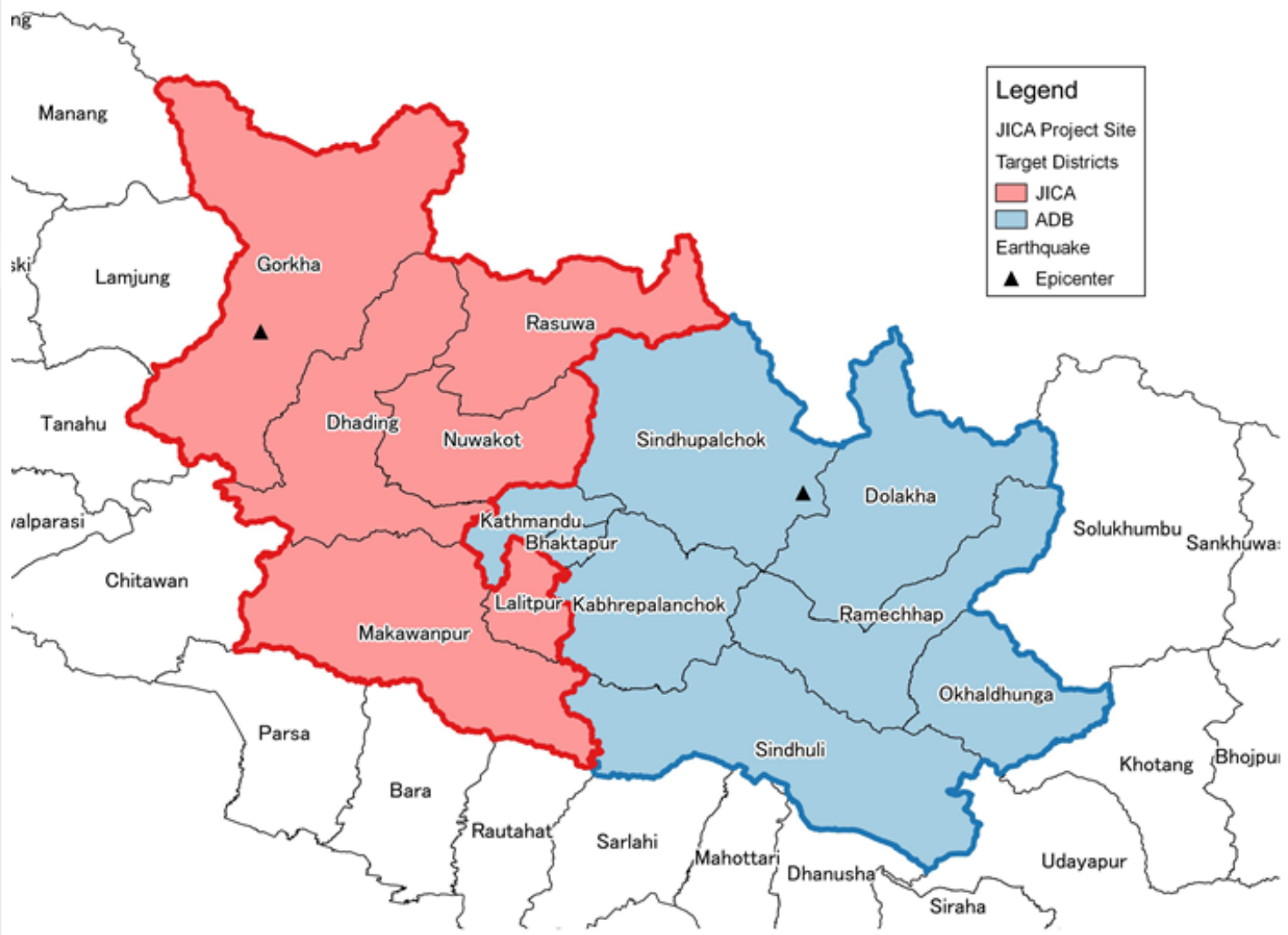




## (2) Emergency School Reconstruction Project

- Project Name: Emergency School Reconstruction Project (ESRP)
- Objective: rebuild and retrofit schools in the districts affected by the earthquake
- Location: Gorkha, Dhading, Nuwakot, Rasuwa, Makwanpur and Lalitpur districts
- Cost: (JICA) 14,000 million JPY, (GON) 2,522mil JPY
- Co-Financer: ADB (200mil USD for rebuilding and restoring schools, roads, and public buildings)
- Executing Agencies: Nepal Reconstruction Authority
- Implementing Agencies: DOE (Department of Education)
- Scope: i) civil works, ii) consulting services
- Loan Agreement signed on December 21<sup>st</sup>, 2015
- Schedule: August 2015 – August 2019

# Target Area



# Seismic Resistant Building Guidelines & Design of School

The project for the reconstruction of schools is being carried out by JICA and ADB together

The guideline consists of two volumes.

1. GUIDELINES FOR DEVELOPING TYPE DESIGNS FOR SCHOOL BUILDINGS IN NEPAL
2. INTERIM STRUCTURAL DESIGN CRITERIA FOR TYPE DESIGN OF SCHOOL BUILDINGS

## SCHOOL DISASTER RISK REDUCTION GUIDELINES FOR DEVELOPING TYPE DESIGNS FOR SCHOOL BUILDINGS IN NEPAL

This document presents the recommended procedures to be used for the development of Type Designs for new school buildings for Post-Earthquake Reconstruction of education facilities.



February 2016



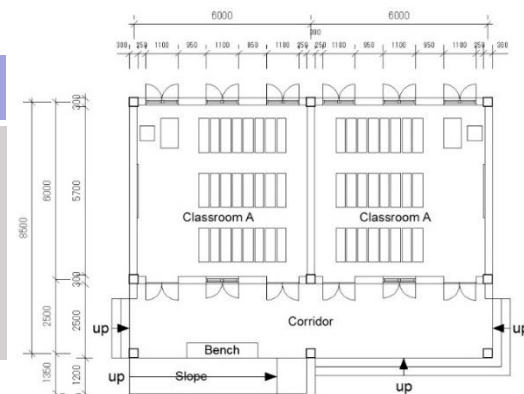
Volume 1 focuses on architectural, mechanical and electrical criteria

Volume 2 mentions structural criteria

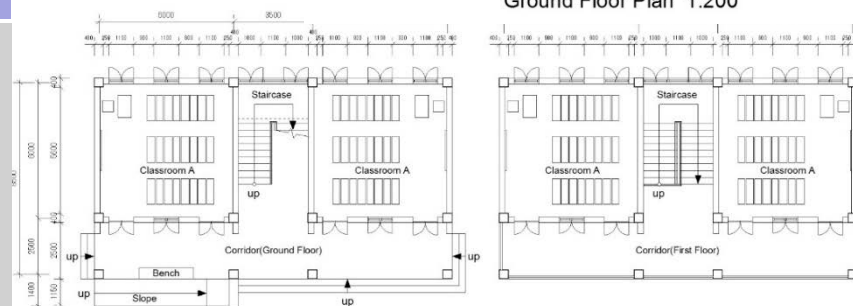
## Single story



## Two stories



Ground Floor Plan 1:200



Ground Floor Plan 1:200

First Floor Plan 1:200

## 3. DESIGN OF NEW SCHOOL PROTOTYPES

Some new prototypes were designed at the beginning and after that the number was included based on the demands.

A total of 37 new prototypes were designed in order to cover kindergartens, primary schools, lower secondary schools, secondary schools, and higher secondary schools.

# Emergency School Reconstruction Project (Type design)



Academic Block,3-6C(S)



Academic Block,2-6C(S)



Toilet Combine Block



Practical Block,2-  
LALIEM



Multipurpose Hall

## Build Back Better

- New School Guideline
- Environment friendly multi-hazard resilient structures
- Child , Gender and Disable (CGD) friendly

# Emergency School Reconstruction Project

**SHREE KALIDEVI HIGHER SECONDARY SCHOOL: PYUTAR, LALITPUR**  
**EXISTING CONDITION** **PLAN**



**HIMALAYAN HIGHER SECONDARY SCHOOL: ARPAK, GORKHA**  
**EXISTING CONDITION** **PLAN**



# 3. Formulation of Plans

- **Kathmandu Valley Resilience Plan(KVRP)**
  - **Kathmandu Valley**
- **Rehabilitation and Reconstruction Plan(RRP)**
  - **Gorkha and Sindhupalchowk Districts**
  - **Lalitpur Sub-metropolitan City**
  - **Bhaktapur Municipality**
  - **Budhanilkantha Municipality**

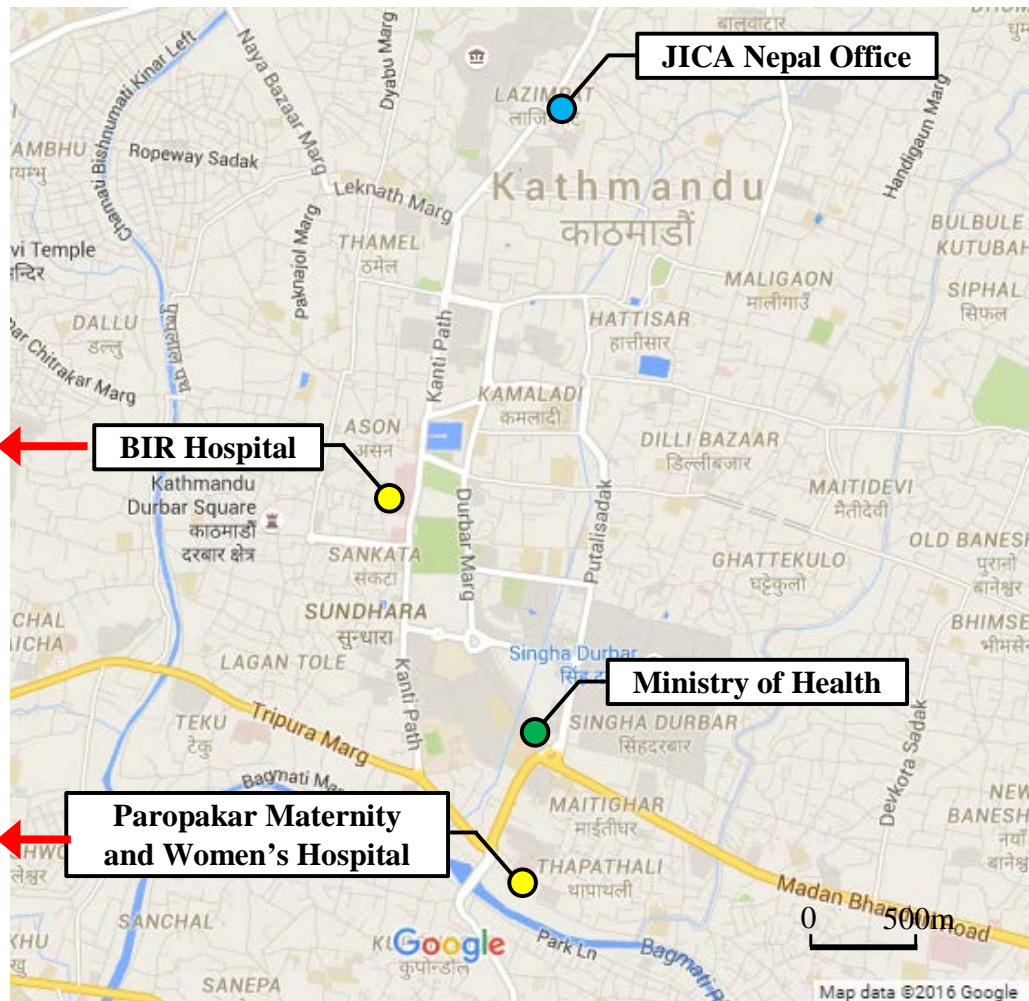
# 4. Reconstruction Projects

## (1) List of Grant Aid Projects

- **Date of E/N : December 21, 2015**
- **Date of G/A : February 17, 2016**

Name of the Projects	Specification	Contract Date
<b>Reconstruction of Paropakar Maternity and Women's Hospital with related Equipment</b>	RC Structure 3 stories / 5,322m <sup>2</sup>	April 5, 2016
<b>Reconstruction of Bir Hospital with related Equipment</b>	RC Structure 3 stories / 2,700m <sup>2</sup>	April 5, 2016
<b>Rehabilitation of Water Transmission System in Chautara</b>	Ductile Pipe app. 20km length Chamber 8 number	April 12, 2016
<b>Construction of Bridges along Barahkilo – Barpak Road</b>	5 Bridges length from 30m~150m. PC Hollow / PC I-Girder	April 6, 2016

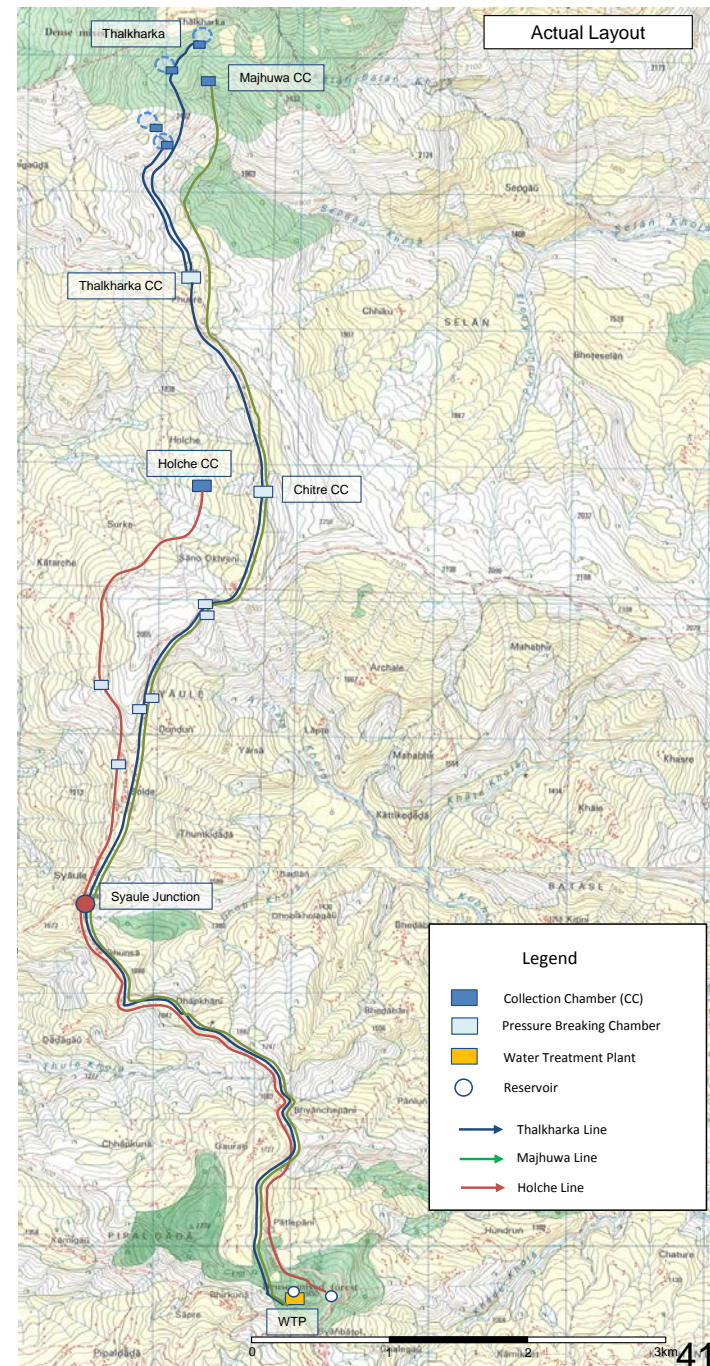
# Reconstruction of Hospitals in Kathmandu







# Rehabilitation of Water Transmission System in Chautara



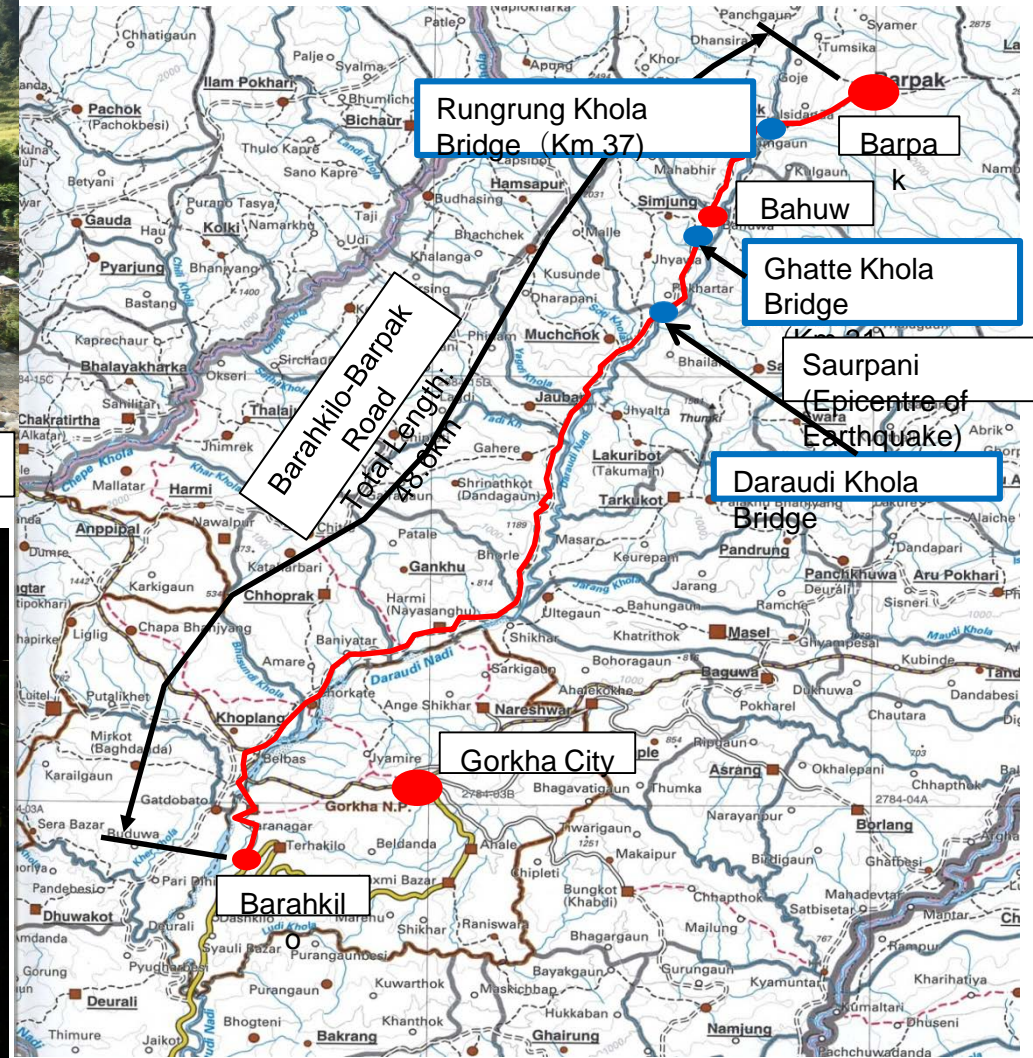
# Bridge Construction along Barhakilo-Barpak Road in Gorkha



Location of Ghatte Khola Bridge



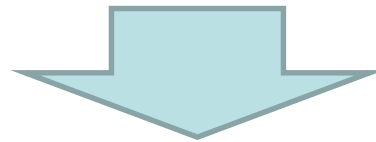
Location of Rungrung Khola Bridge



## (2) QIPs: Quick Impact Projects

Small-scale projects contributing to local recovery and reconstruction through:

- ✓ Linking Japanese Experience and Technology with Recovery and Reconstruction
- ✓ Contribution to the Recovery of the Vulnerable
- ✓ Contribute to strengthening Government Capacity for Disaster Risk Reduction in Public Facilities



**Aiming at “Build Back Better”**

# Planned QIPs

**26 projects planned for implementation**  
 (■ 15 public buildings, ■ 2 water supply,  
 ■ 1 road / 2 bridges, ■ 6 livelihood projects)

No.	Major Project Contents
QIP-01	Construction of Models for Disaster Resilient Construction Technology
QIP-02	Construction of WCO facility in Chautara Municipality
QIP-03	Reconstruction of Ampipal Hospital in Palungtar Municipality
QIP-04	Reconstruction of Palungtar Area Police Office buildings
QIP-05	Reconstruction of Thokarpa VDC office building
QIP-06	Reconstruction of DADO building in Chautara Municipality
QIP-07	Reconstruction of Agriculture Collection Center in Bhotechaur VDC
QIP-08	Construction of Water supply system in Tipeni area
QIP-09	Improvement of Road facilities in Bhotechaur / Melamchi
QIP-10	Reconstruction of Health Post building in Barbarise VDC

# Planned QIPs

No.	Project Name
QIP-11	Reconstruction of Barbarise Area Police Office buildings
QIP-12	Reconstruction of Barpak VDC office building
QIP-13	Reconstruction of Barpak Women Community Centre
QIP-14	Reconstruction of Health Post in Barpak VDC
QIP-15	Reconstruction of Police Post in Barpak VDC
QIP-16	Reconstruction of Sarupani VDC office building
QIP-17	Reconstruction of Maneshwra VDC office building
QIP-18	Establishment /enhancement of Women's Cooperative in Barpak
QIP-19	Goat farming for women's groups in Barpak
QIP-20	Improvement of vegetable farming practices for women's groups
QIP-21	Improvement of maize farming practices for poor famers
QIP-22	Improvement of the production of quality seed
QIP-23	Promotion of Safety measures for Housing Workers
QIP-24	Improvement of Majhuwa Water Supply Headrace
QIP-25	Construction of Khahare Khola Bridge
QIP-26	Construction of Jhyalla Khola Bridge

# Location of Planned QIPs

## Gorkha

### QIP'S

1.04 3 4 12

**BUILDING**

16

25 26

**BRIDGE**

18 19 20 21

**LIVELIHOOD PROJECTS**

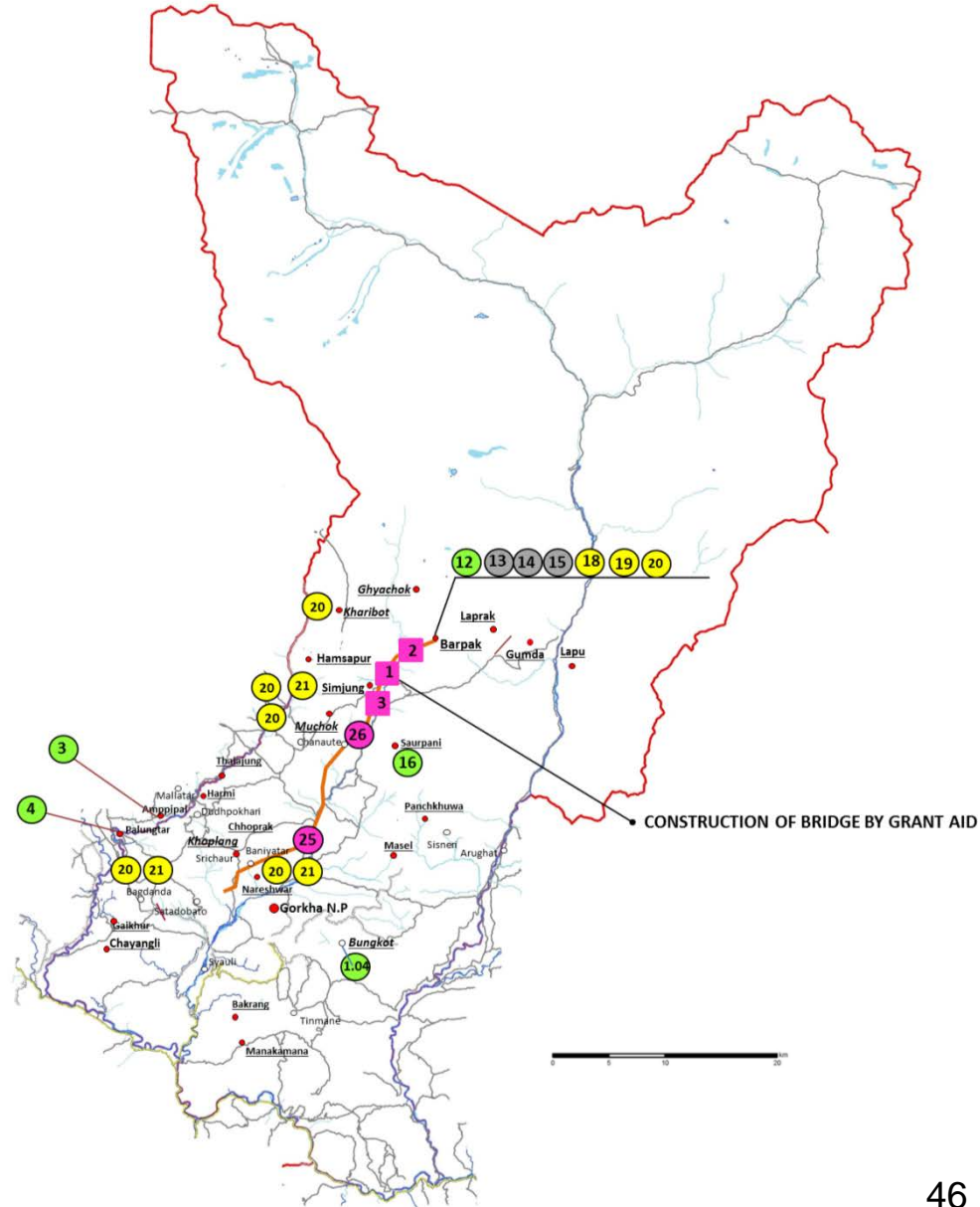
13 14 15

**BUILDING (SITE UNDECIDED)**

### GRANT AID

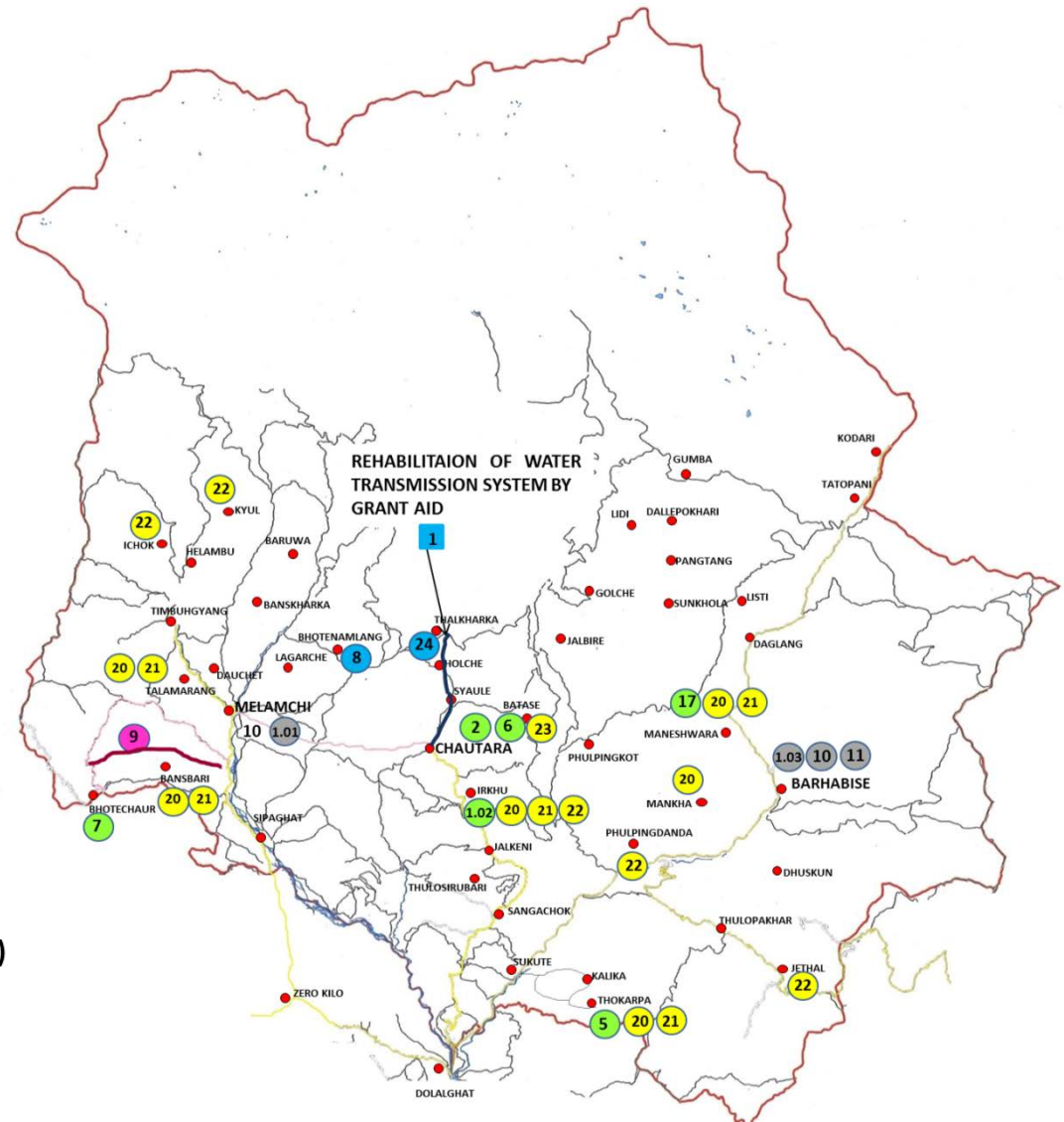
1 2 3

**BRIDGE**



# Location of Planned QIPs

## Sindhupalchok



### QIP's

1.02 2 5 6

7 17

8 24

9

20 21 22 23

1.01 1.03 10 11

BUILDING

WATER SUPPLY

ROADS AND IRRIGATION

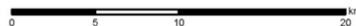
LIVELIHOOD PROJECTS

BUILDING (SITE UNDECIDED)

### GRANT AID

1

WATER SUPPLY



# Public Facilities

- Implementaton started for: 3 projects for reconstruction of public facilities and 3 projects for livelihood



## WOMEN TRAINING CENTER

Location: Chautara,  
Sindhupalchok

Specification: 2 Story Office,  
139sqm

Period of Construction: Mar -  
Dec 2016

## THOKARPA VDC OFFICE

Location: Thokarpa,  
Sindhupalchok

Specification: 1 Story,  
123sqm

Period of Construction: Apr -  
Oct 2016



## Promotion of Safety measures for Housing Workers





# Livelihood

## IMPROVEMENT OF VEGETABLE FARMING

Locations: 11 VDCs of Sindhupalchok and Gorkha

Major Contents: Input and training to local women's groups to improve productivity in home gardens

Period : Apr 2016 – Mar 2017



## FARMING

Locations: 8 VDCs of Sindhupalchowk and Gorkha

Major Contents: Input and training to marginal farmers to improve productivity of major grain crop

Period: Apr – Oct 2016



## IMPROVEMENT OF QUALITY SEED PRODUCTION

Location: 5 VDCs of Sindhupalchowk

Major Contents: Input and training for improvement of certified seed production

Period: Apr 2016 – Mar 2017



**Thank you very much for attention.**

**For queries, please contact:  
Murooka.Naomichi@jica.go.jp**