4th Earthquake Commemoration Seminar

Overview of Japanese Support for Earthquake Recovery in Nepal

26 April 2019

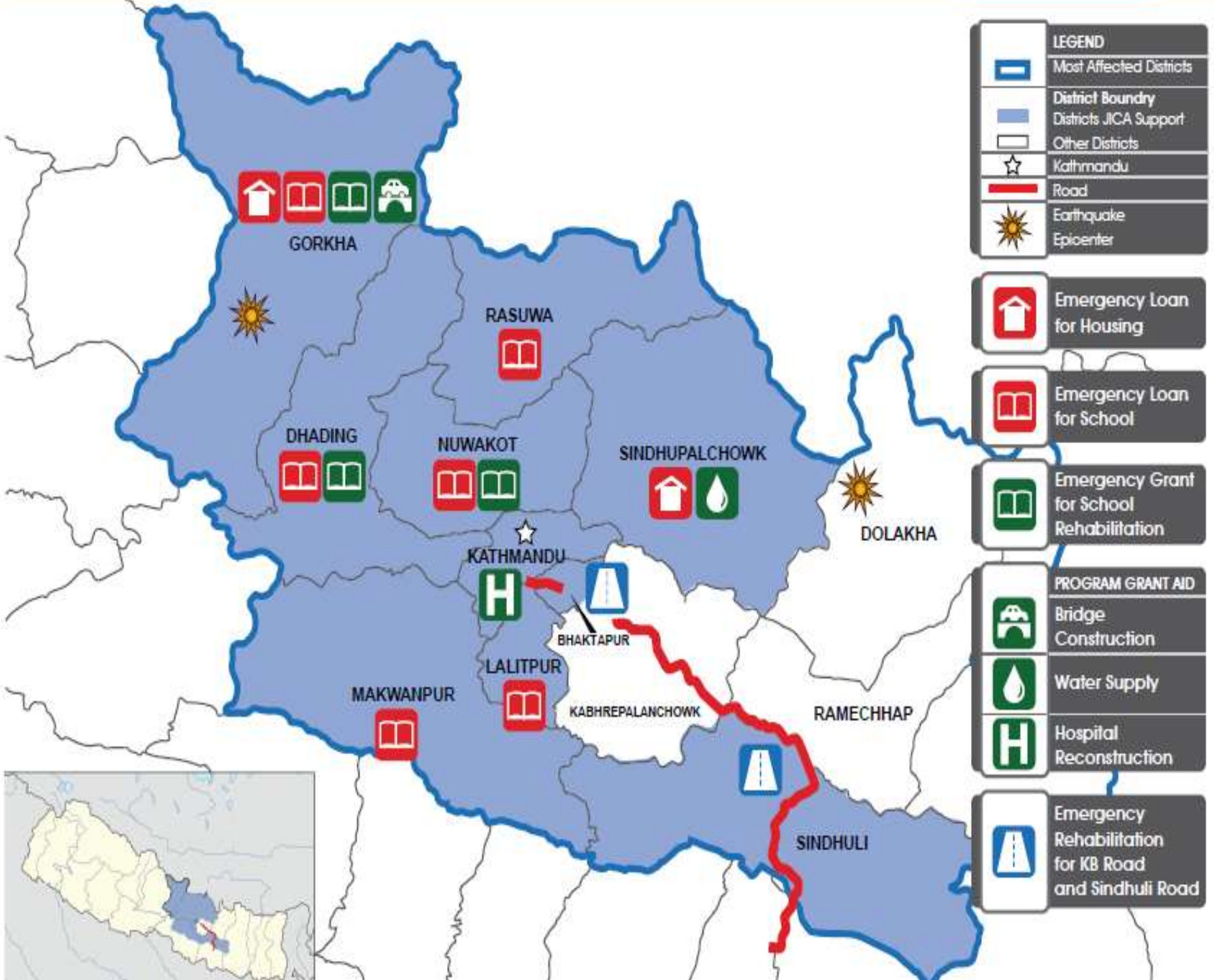
Dr. Kozo Nagami
JICA Nepal

国際協力機構

Our Support for EQ Recovery

Based on the ***Build Back Better (BBB)*** concept, a wide range of support has been provided since immediately after the earthquake in April 2015.

- Housing Reconstruction (EHRP)
- School Reconstruction (ESRP)
- Rebuilding Public Facilities & Infrastructure (RRNE, GA)
- Rehabilitation of Cultural Heritage (HER)
- Livelihood Recovery in the Affected Communities (RRNE)
- District-Level Recovery & Resilience Planning (RRNE, ERAKV)


LEGEND
Most Affected Districts
District Boundry
Districts JICA Support
Other Districts
Kathmandu
Road
Earthquake Epicenter
Emergency Loan for Housing
Emergency Loan for School
Emergency Grant for School Rehabilitation
PROGRAM GRANT AID
Bridge Construction
Water Supply
Hospital Reconstruction
Emergency Rehabilitation for KB Road and Sindhuli Road
GORKHA
RASUWA
DHADING
NUWAKOT
SINDHUPALCHOWK
DOLAKHA
KATHMANDU
BHAKTAPUR
LALITPUR
MAKWANPUR
KABHREPALANCHOWK
RAMECHHAP
SINDHULI

Principles for Achieving BBB

- **Official Definition** (https://www.unisdr.org/we/inform/terminology)

increase resilience and reduce disaster risk

- **Disaster Risk Reduction**

To reduce risk, we can only reduce vulnerability.

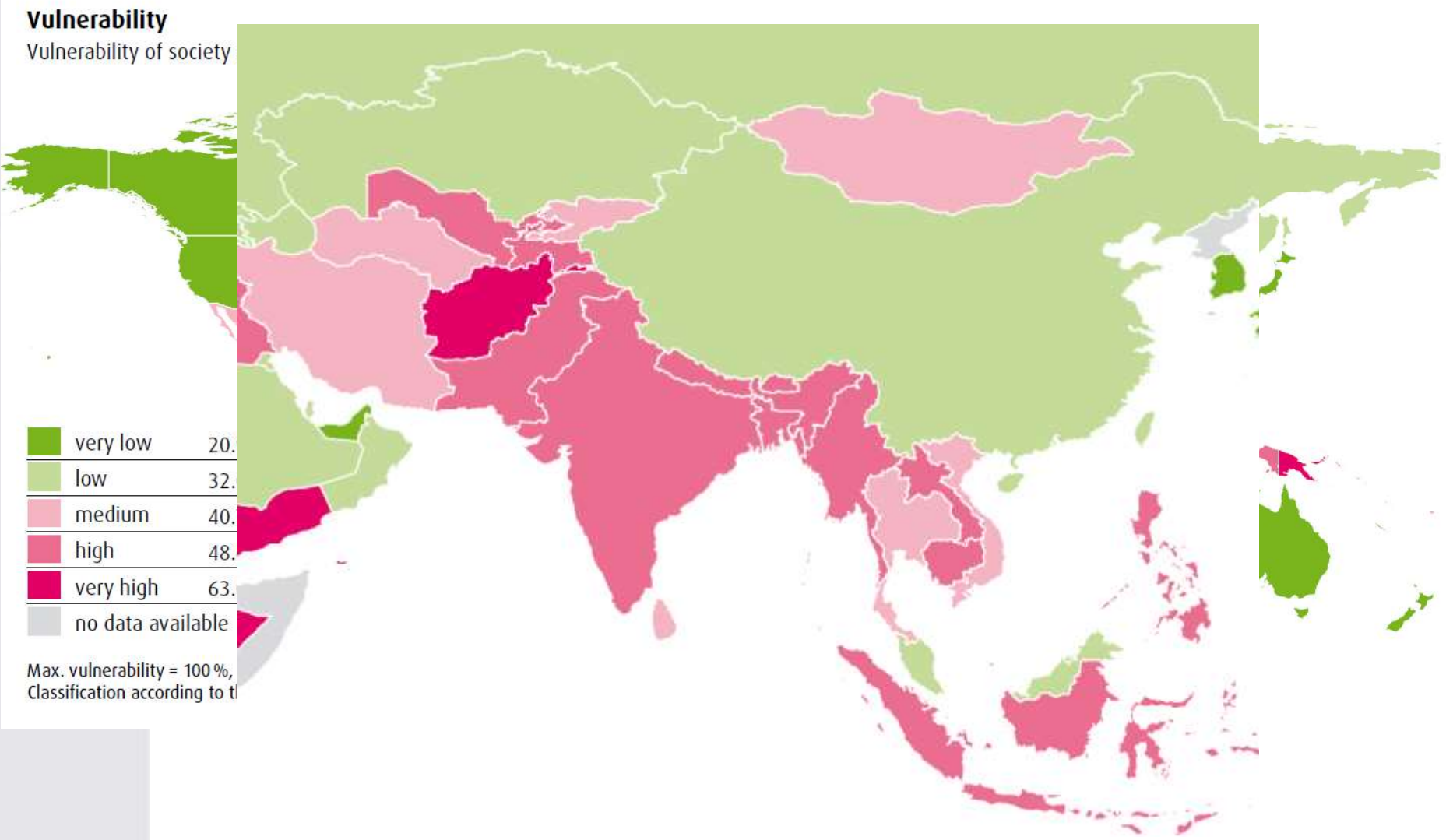
World Risk Index 2018

	World Risk Index 2018	Exposure (Hazard)	Vulnerability	
	7.475711047	15.77668605	46.23186047	←World Average
Nepal	5.44	9.53	57.1	←Score (bigger worse)
	104	137	50	←Rank among 172 (bigger better)
India	6.83	12.47	54.78	
	75	93	55	
Bangaladesh	17.38	29.95	58.03	
	9	16	47	
Afghanistan	10.45	15.48	67.53	
	35	57	18	
Bhutan	7.56	15.48	48.82	
	62	57	68	
Pakistan	6.11	10.7	57.11	
	89	118	49	
Sri Lanka	7.65	16.01	47.81	
	61	50	71	
Japan	11.08	46.55	23.81	
	29	5	165	

uncontrollable

reducible

World Risk Index 2018

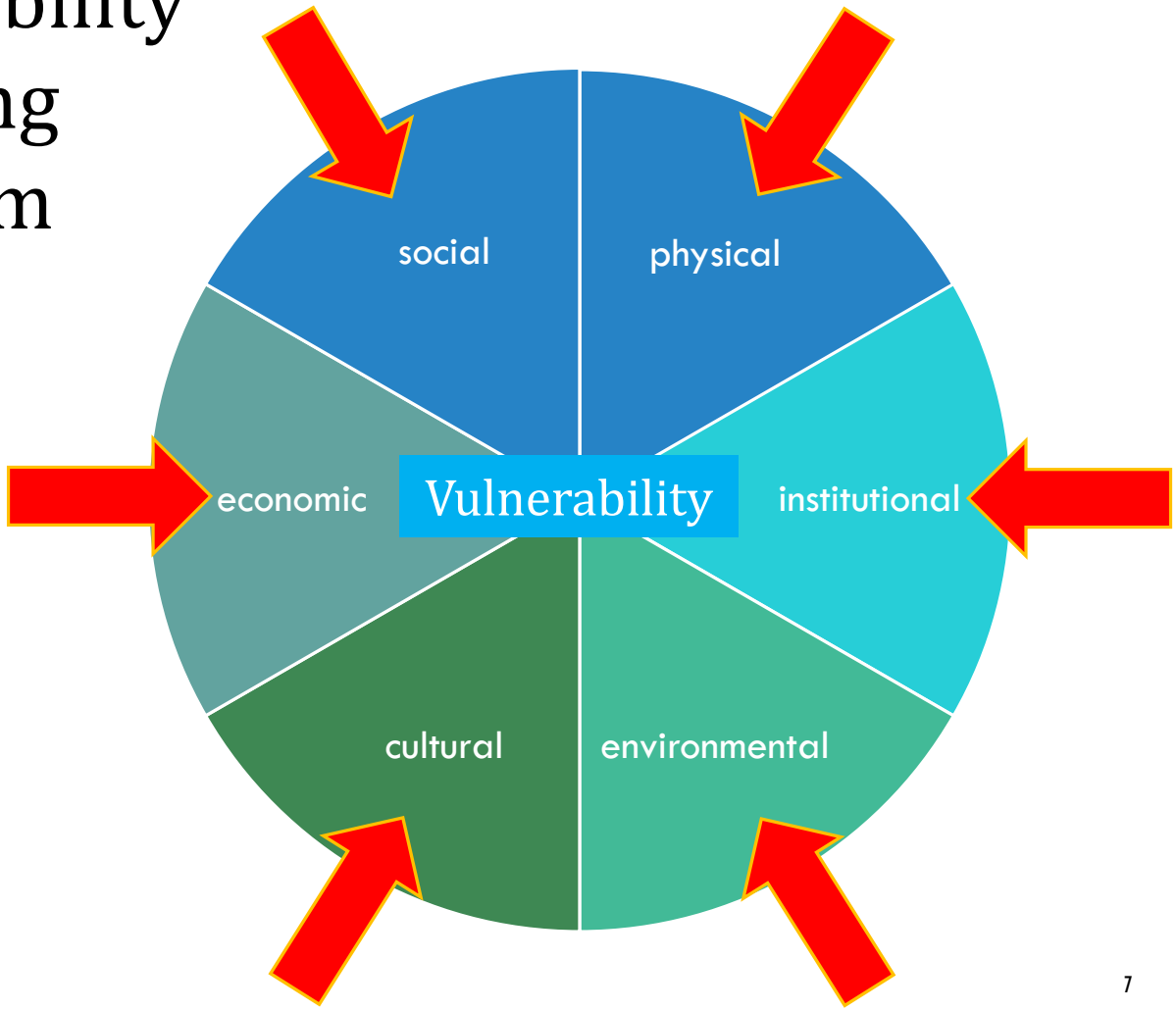


World Risk Report 2018
https://weltrisikobericht.de/download/1060/

国際協力機構

Sectoral Breakdown of Vulnerability

JICA reduces the existing vulnerability with approaching dynamically from diverse sectors.



Concept from Birkmann et al. (2013)

HOUSING RECONSTRUCTION

Project Outline

Emergency Housing Reconstruction Project (EHRP)

Project purpose:
To restore and improve the living condition of the victims of the Nepal earthquake by reconstructing the destroyed and damaged houses with an adequate seismic standard in the districts severely affected by the Nepal earthquake.

Finance (Untied loan to GoN)

- JPY 12,000 Million (approx. 108 Million USD)
- Annual interest rate:0.01%
- Repayment period: 40 years including 10 year grace period

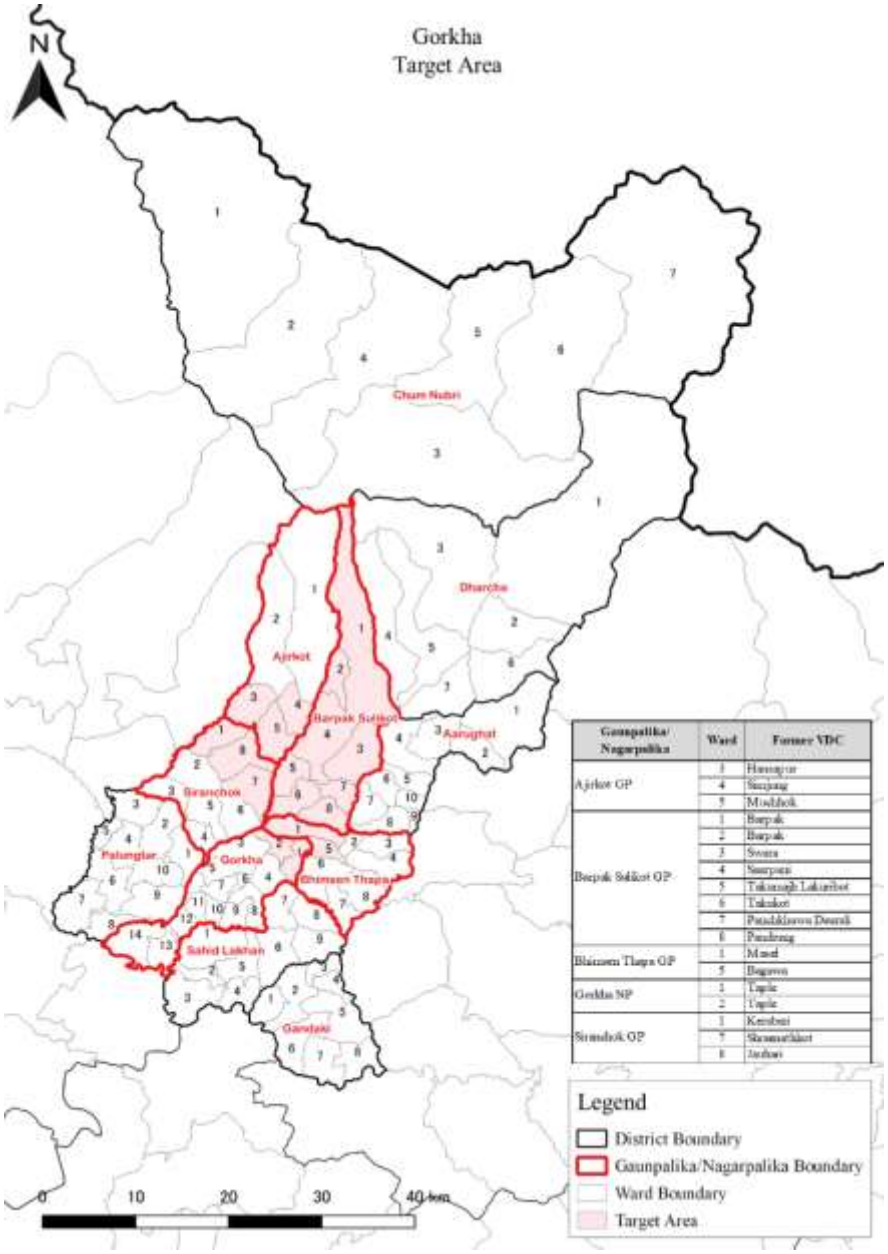
Scope of Loan:

- Housing Reconstruction
- Consulting Service

Modality:

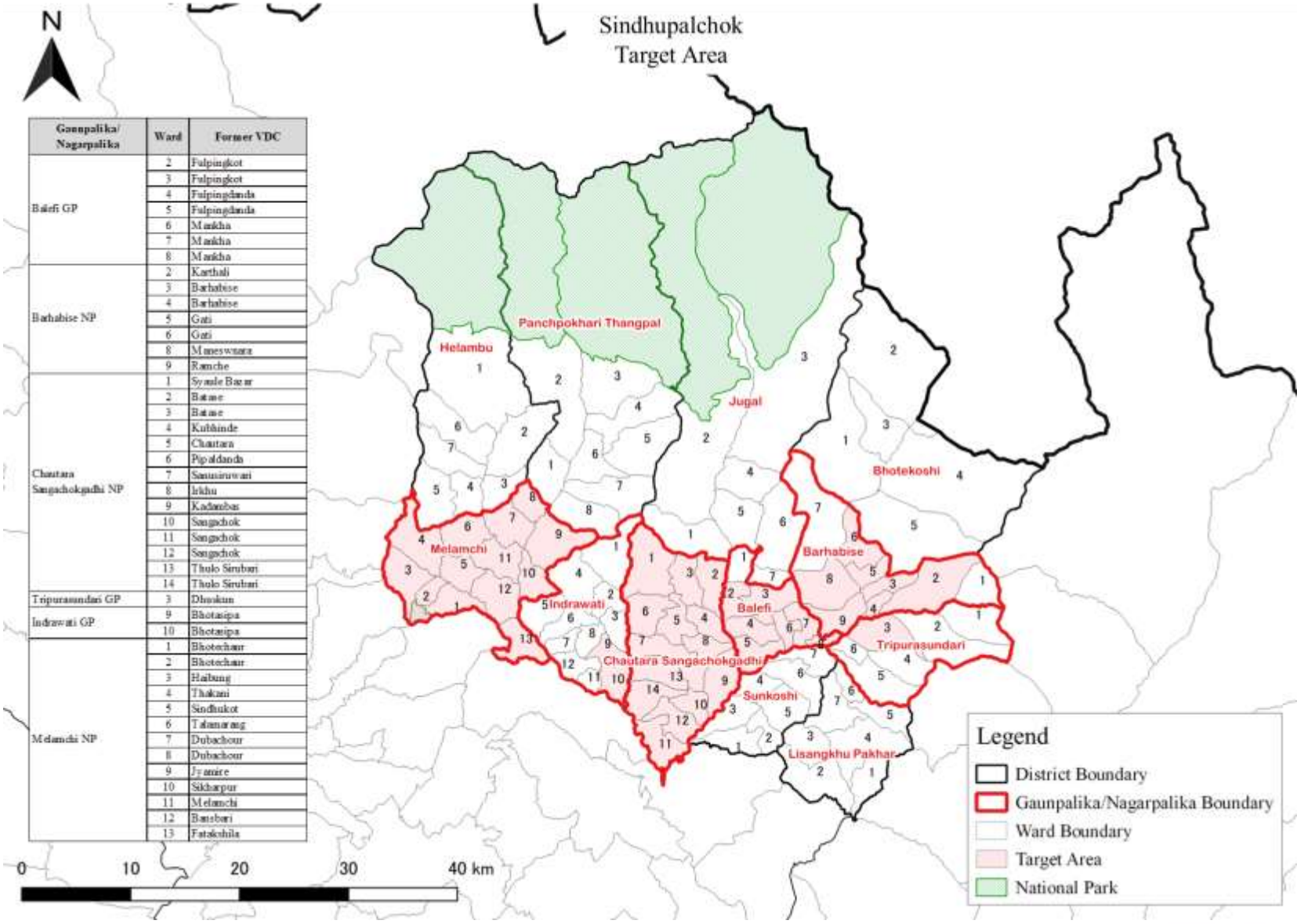
- Design & Supervision Consultant by Oriental Consultant Global

Target Area in Gorkha



Gaunpalika/ Nagarpalika	Ward	Former VDC
Ajirkot GP	3	Hansapur
	4	Sirajung
	5	Mushthok
Barpak Sulikot GP	1	Barpak
	2	Barpak
	3	Swara
	4	Saurpani
	5	Tokarough Lakurbot
	6	Tukukot
	7	Pandkhayon Deurali
	8	Pandurung
Bhimsen Thapa GP	1	Murtel
	5	Bagarpu
Gorkha NP	1	Taple
	2	Taple
Siranchok GP	1	Kerabari
	7	Sharmarkhet
	8	Jarubari

Target Area in Sindhupalchok



Gaunpalika/ Nagarpalika	Ward	Former VDC
Balefi GP	2	Fulpingkot
	3	Fulpingkot
	4	Fulpingdanda
	5	Fulpingdanda
	6	Mankha
	7	Mankha
	8	Mankha
Barhabise NP	2	Karthali
	3	Barhabise
	4	Barhabise
	5	Gati
	6	Gati
	8	Maneswara
	9	Ramche
Chautara Sangachokgadhi NP	1	Syaule Bazar
	2	Batase
	3	Batase
	4	Kuthlinde
	5	Chautara
	6	Pipaldanda
	7	Sanusiruwari
	8	Ikhu
	9	Kadambas
	10	Sangachok
	11	Sangachok
	12	Sangachok
	13	Thulo Sirubari
	14	Thulo Sirubari
Tripurasundari GP	3	Dhunkun
Indrawati GP	9	Bhotasipa
	10	Bhotasipa
Melamchi NP	1	Bhotechaur
	2	Bhotechaur
	3	Haibung
	4	Thakani
	5	Sindhukot
	6	Talamarang
	7	Dubachour
	8	Dubachour
	9	Jyamire
	10	Sikharpur
	11	Melamchi
	12	Bansbari
	13	Fatakshila

国際協力機構

Minimum Requirements

Source: DUDBC

Minimum Requirements for building construction with Stone Masonry in Cement Mortar for Residential Building

No.	Category	
1	Site selection	It shall be done to m A building shall not b ☐Geological fault o ☐Landslide suscept ☐Rock-fall Area ☐Filled Area
2	Shape/Size of building	No. of storey: No Clear span of room: No Size of room: No Height of wall: Flo In 1.8 Proportion: Sin Th Av
3	Materials	Stone: Av sto no Mortar: Ce by Concrete: It s (1 Rebar: Hig Timber: We Tin pre
4	Foundation	General: It s thi * if exp Depth of found. below GL: It s

Minimum Requirements for building construction with Stone Masonry in Mud Mortar for Residential Building

No.	Category		
1	Site selection	It shall be done to minimize risk A building shall not be construct ☐Geological fault or Ruptured A ☐Landslide susceptible Area ☐Rock-fall Area ☐Filled Area *If it is	
2	Shape/Size of building	No. of storey	RC band Timber band *If additional
		Clear span of wall	Not more than
		Size of room	Not more than
		Height of wall	Floor height sh In case of attic 1.8m and maxi
		Proportion	Simple and reg The length of h Avoid setbacks
3	Materials	Stone	Avoid use of r stones in its na Size of stone sh length or breac
		Mortar	Mud mortar Cement mortar
		Concrete	It shall not be l (1 part cement
		Rebar	High strength c

Minimum Requirements for building construction with Brick Masonry in Cement Mortar for Residential Building

No.	Category	
1	Site selection	It shal A build ☐Geo ☐Lan ☐Roc ☐Fille
2	Shape/Size of building	No. of Clear of roo Size o Heigh Propo
3	Materials	Brick Morta Concr Rebar Timbe

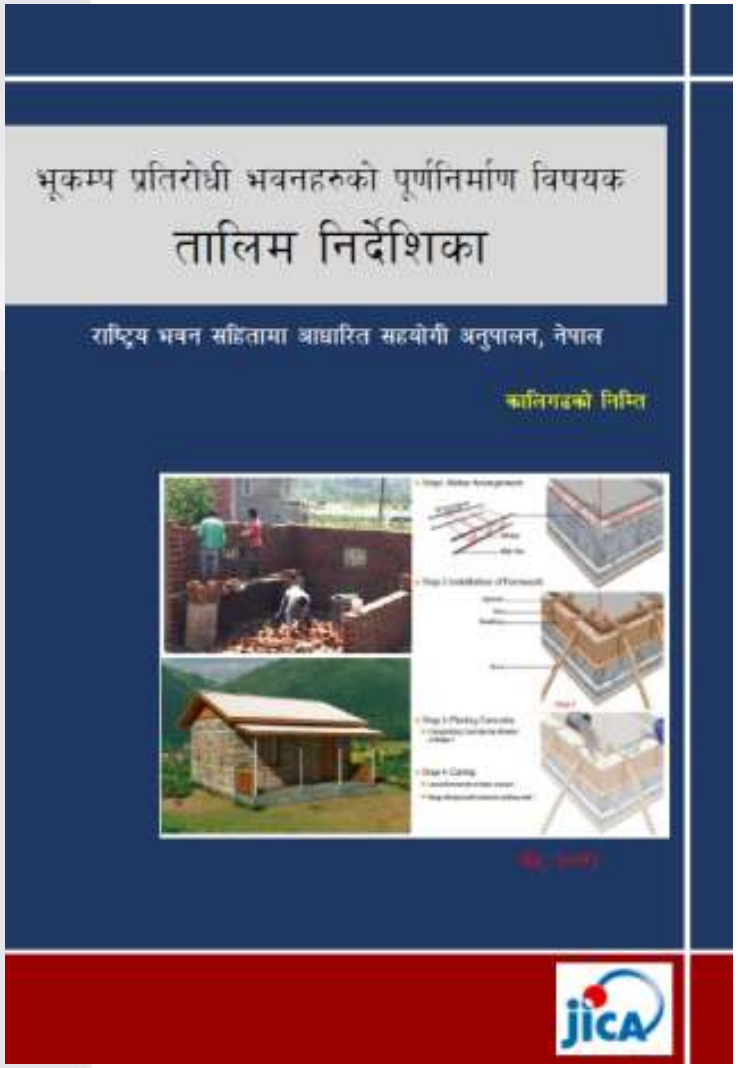
Minimum Requirements for building construction with Brick Masonry in Mud Mortar for Residential Building

No.	Category		
1	Site selection	It shall be done to minimize risk against natural hazards. A building shall not be constructed if any of the following conditions exist.	
		☐Geological fault or Ruptured Area	☐Steep Slope > 20° (1:3, Vertical : Horizontal)
		☐Landslide susceptible Area	☐River bank and Water logged Area
		☐Rock-fall Area	☐Liquefaction susceptible Area
		☐Filled Area	
		If it is in these areas, consult with expert.	
2	Shape/Size of building	No. of storey	RC band: Not more than one plus habitable attic. Timber band: Not more than one storey. *If additional storey required, consult with expert to adopt extra measures.*
		Clear span of wall	Not more than 12 times thickness of wall and not more than 4.5m.
		Size of room	Not more than 13.5sq.m.
		Height of wall	Floor height shall not be more than 3.0m. In case of attic floor,maximum height from flor level to ridge level shall be 1.8m and maximun height from floor level to eave level shall be 1.0m.
		Proportion	Simple and regular shaped as square and rectangular. The length of house shall not be more than 3 times of its width. Avoid setbacks.
3	Materials	Brick	Overburnt, underburnt and deformed bricks shall not be used. Shall have minimum crushing strength of 3.5 Mpa for construction.

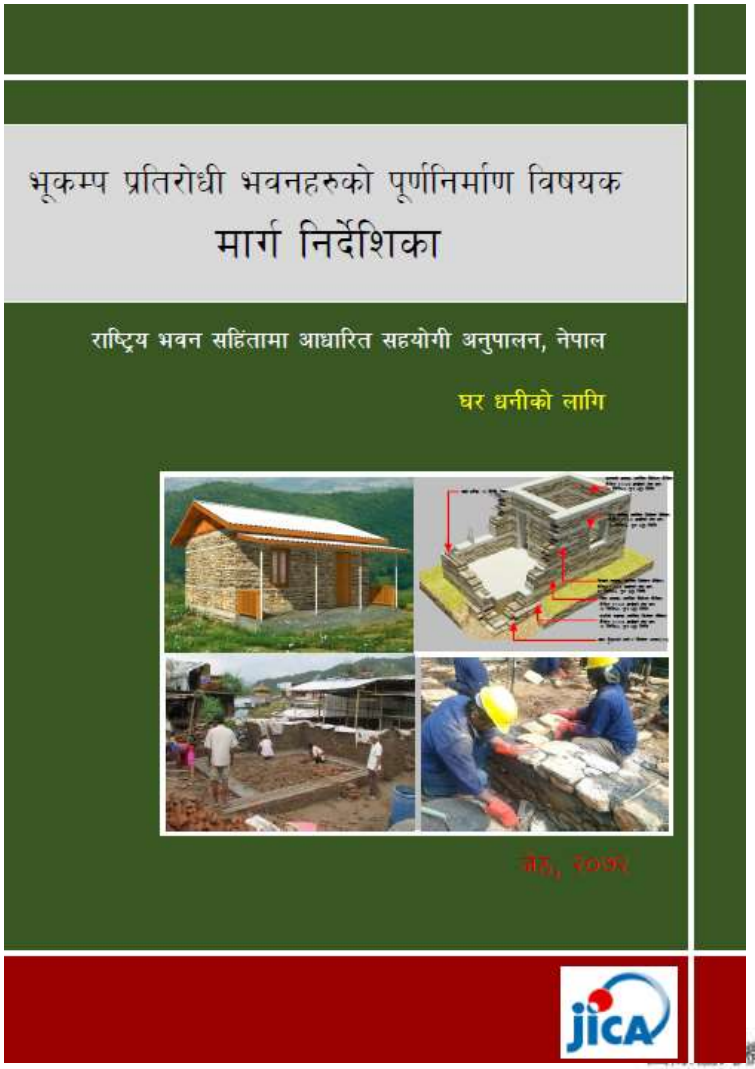
NRA organized the TSC (Technical Standardization Committee) in Feb 2016. In this committee, it was discussed whether NBC105 should be applied to residential buildings in the reconstruction programme as the seismic requirement. Then the minimum requirements for residential buildings were developed, and brochures were distributed.

Technical Materials for Housing Reconstruction

Technical handbook for masons



Guidebook for house owners



Source: JICA Project Team

Design Catalogue

For Reconstruction of Earthquake Resistant Houses

Source: DUDBC


SMC-1.1


SMC-1.2


SMC-2.1


BMC-1.1


BMC-1.2


BMC-2.1

JICA supported preparation of the catalogue, and proposed 6 prototypes among the 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

Community Mobilization Program (CMP)

1) Contents of 1st Phase CMP (from May 2017 up to March 2018)

Orientation

for Community Based Reconstruction Committee（CBRC）

+

Community Meeting

for all the house owners

+

Technical Assistance by Mobile Mason

selected at the each community to house owners and unskilled labors

国際協力機構

Community Mobilization Program (CMP)

2) Contents of 2nd Phase CMP (From April 2018 up to January 2019)

Ward Level Coordination meeting

with Ward members and DLPIU Engineers

+

Issue Specific Community Meeting

For Beneficiaries who has specific issue

+

Technical Assistance by Mobile Mason

selected at the each community to house owners and unskilled labors

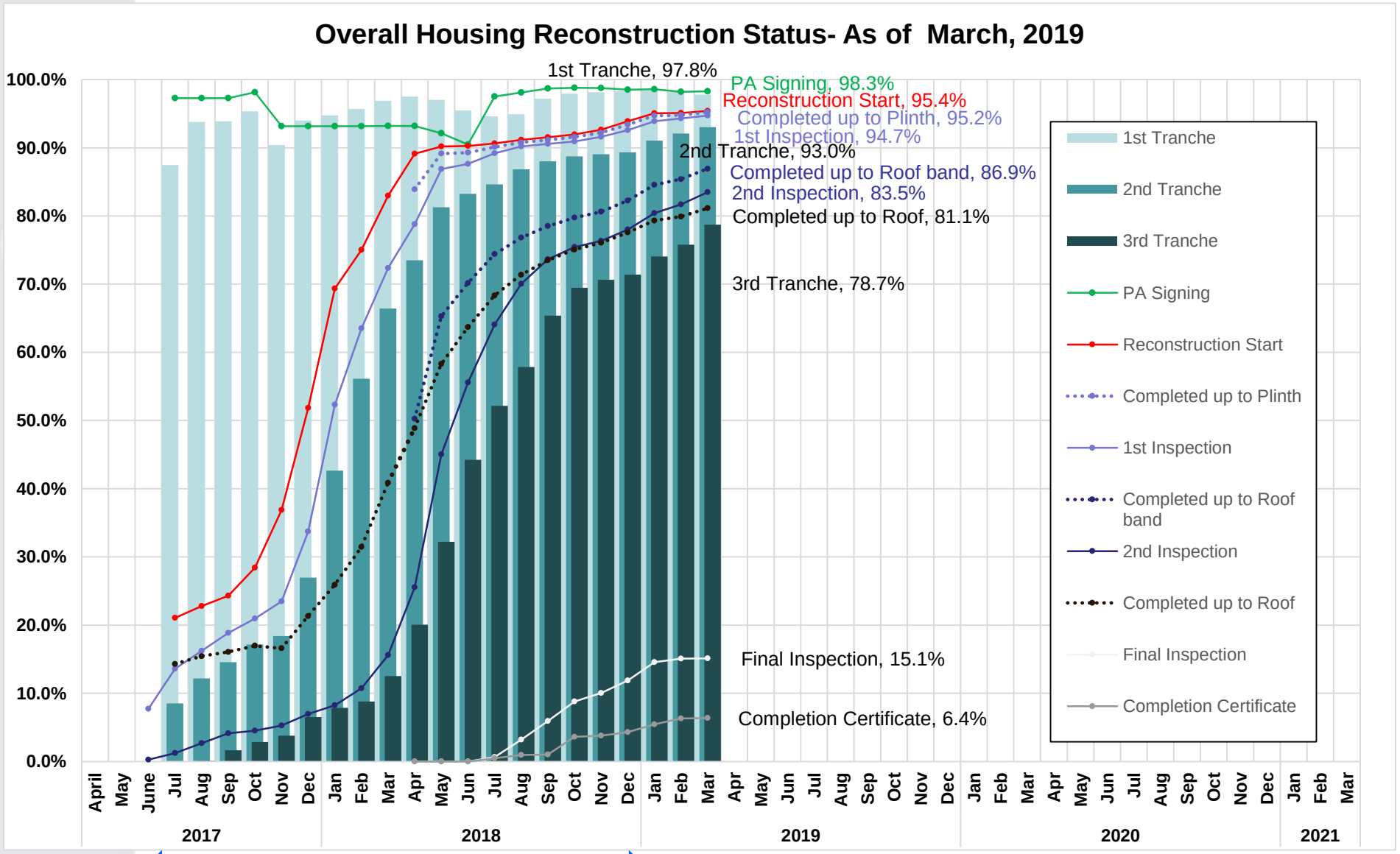
+

Correction

For non-compliant houses

国際協力機構

Reconstruction Progress



CMP

国際協力機構

Reconstruction Progress (as of March 2019)

	Gorkha	Sindhupalchowk	Total
Identified Beneficiaries	15,216	41,490	**56,706**
PA signing	14,860 (97.7%)	40,862 (98.5%)	55,722 (98.3%)
Construction Started	14,440 (94.9%)	39,660 (95.6%)	54,100 (95.4%)
1st Tranche Received	14,773 (97.1%)	40,686 (98.1%)	55,459 (97.8%)
2nd Tranche Received	14,217 (93.4%)	38,524 (92.9%)	52,741 (93.0%)
3rd Tranche Received	12,929 (85.0%)	31,706 (76.4%)	44,635 (78.7%)
Completion of Reconstruction	13,154 (86.4%)	32,850 (79.2%)	46,004 (81.1%)

Completed Houses

Completed Houses

Completed Houses

SCHOOL RECONSTRUCTION

Project Outline

Emergency School Reconstruction Project (ESRP)

Project purpose
To rebuild and retrofit schools in the districts severely affected by the Gorkha EQ

Finance (Untied loan to GoN)

- JPY 14,000 Million (approx. 126 Million USD)
- Annual interest rate: 0.01%
- Repayment period: 40 years including 10 year grace period

Scope of Loan

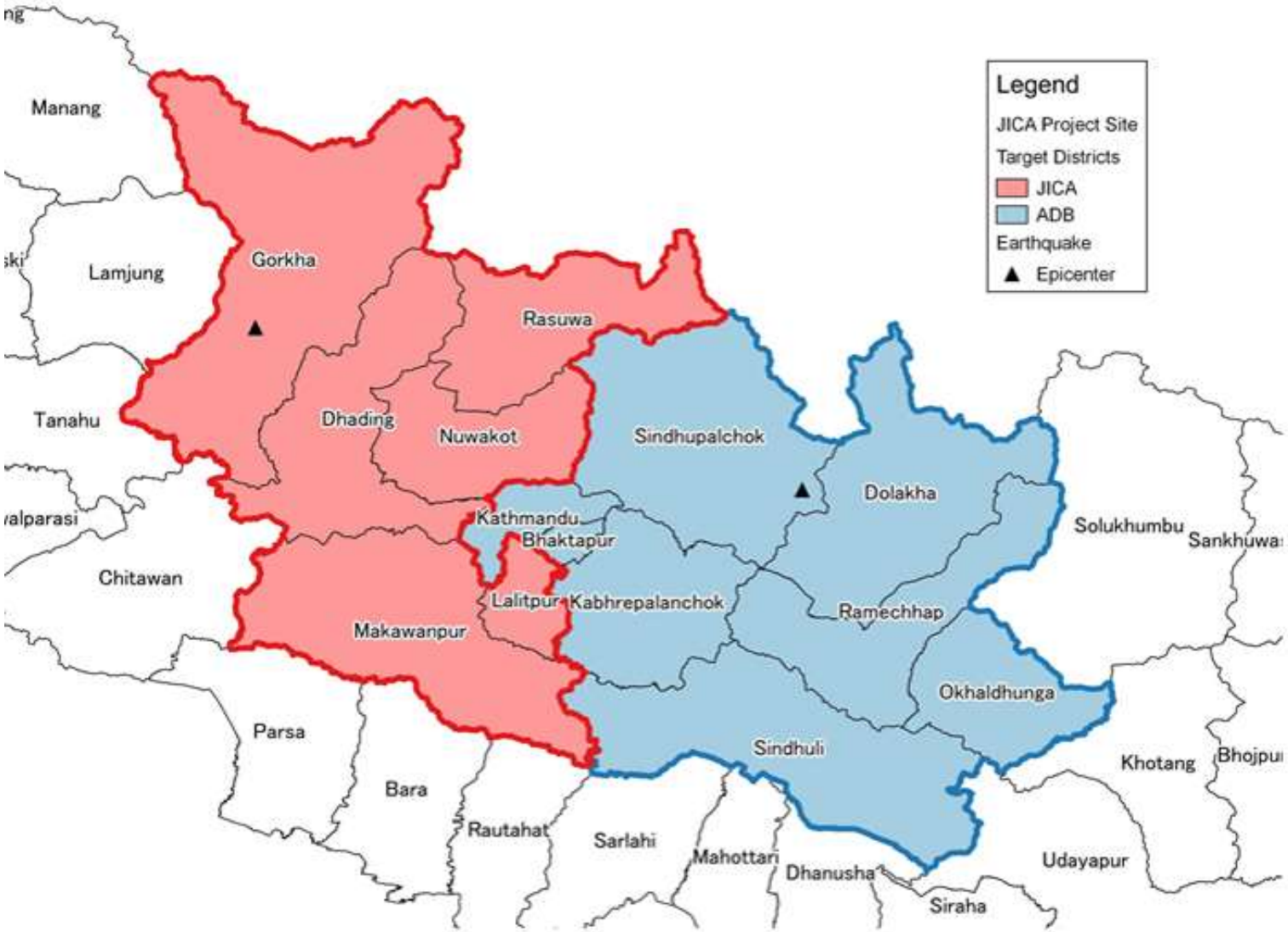
- Civil Works and Procurement of Equipment
- Consulting Service

Modality

- Construction work by Local Contractors under National Competitive Bidding
- Design & Supervision Consultant by Oriental Consultant Global

Target Area

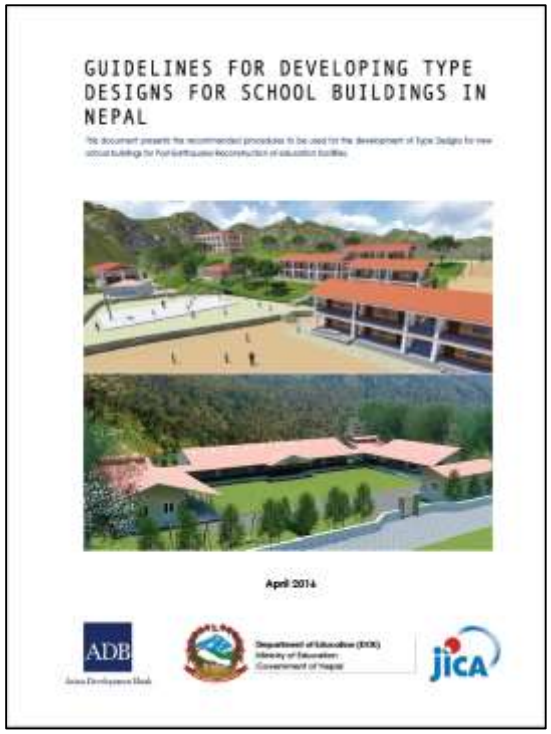
6 Districts supported by JICA:
1) Lalitpur 2) Makwanpur 3) Dhading 4) Nuwakot 5) Rasuwa 6) Gorkha

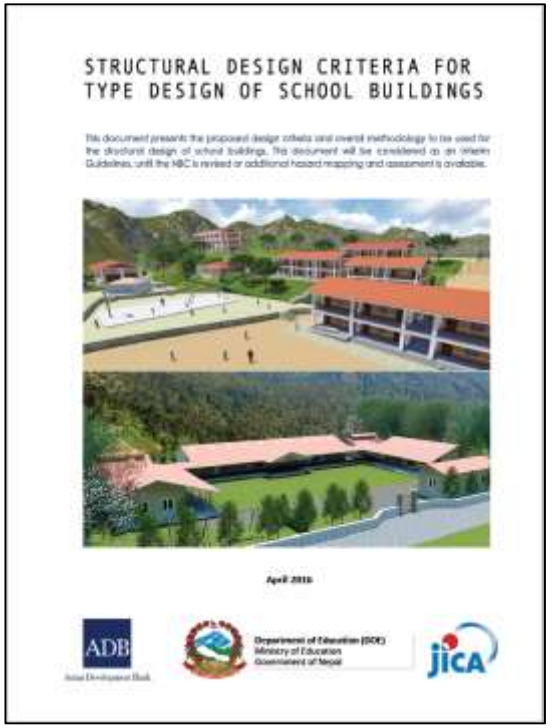


Seismic Resistant Building Guidelines of School

- ESRP is being implemented by JICA together with NRA/CLPIU(Education) based on the guideline which was jointly created by ADB and JICA.

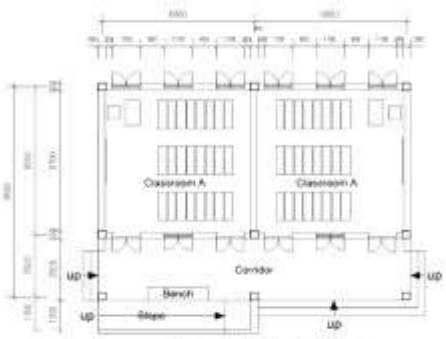
- The guideline consists of two volumes:
  - **Guidelines for Developing Type Designs for School Buildings in Nepal**, which focuses on architectural, mechanical and electrical criteria
  - **Structural Design Criteria for Type Design of School Buildings**, which mentions structural criteria





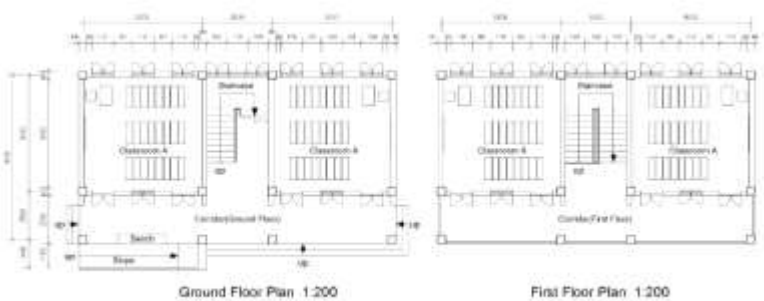
Type Design

- Some new prototypes were designed at the beginning and after that the number was increased 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.
- **153** Type Design approved (2 schools in Lalitpur has special Type Design)



Ground Floor Plan 1:200

Single story



Ground Floor Plan 1:200 First Floor Plan 1:200

Two stories

Source: JICA Project Team

Progress Status (by Districts)

- **A total of 236** Schools were selected.
- Largely secondary/bigger schools under the concept of '**complete school**'.
- Implementation in three batches
  - **Batch 1: 78** schools (From June 2016)
  - **Batch 2**: **27** schools (From August 2017)
  - **Batch 3: 131** schools (From May 2018)
- All procurement was completed in 2018.

Coverage (as of 31 March 2019)

District	Target Schools	Completed Schools
Lalitpur	21	7
Gorkha	61	18
Makwanpur	41	7
Dhading	49	3
Rasuwa	7	1
Nuwakot	57	11
Total 6 districts	**236 schools**	**47 schools**

Shree Bal Kalyan LSS, Chyangli, Gorkha

Shree Dharmodaya SS, Mirkot, Gorkha

Shree Awagaman Primary School, Salyantar, Dhading

Shree Udaykharka SS, Bajrabarahi, Lalitpur

PUBLIC FACILITIES & INFRASTRUCTURE

Key Approaches for Reconstruction

- Improved structural design for earthquake resilience

Foundation beams

Rebar in hollow block walls

Simplification of rebar alignment

- Quality control & on-the-job training
- Safety management & training

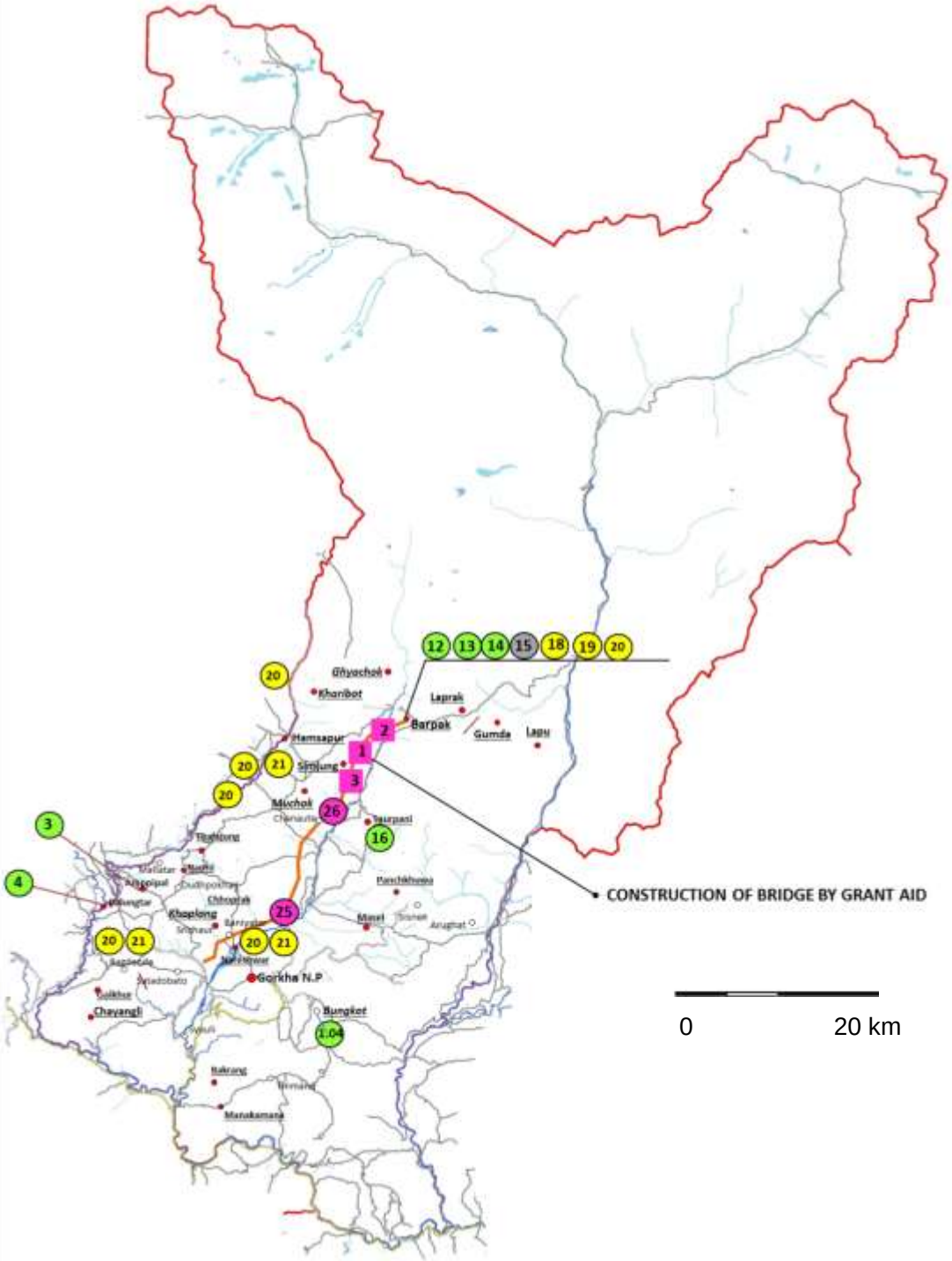
Gorkha District

QIP'S

- Public Facility
- Infrastructure
- Livelihood

GRANT AID

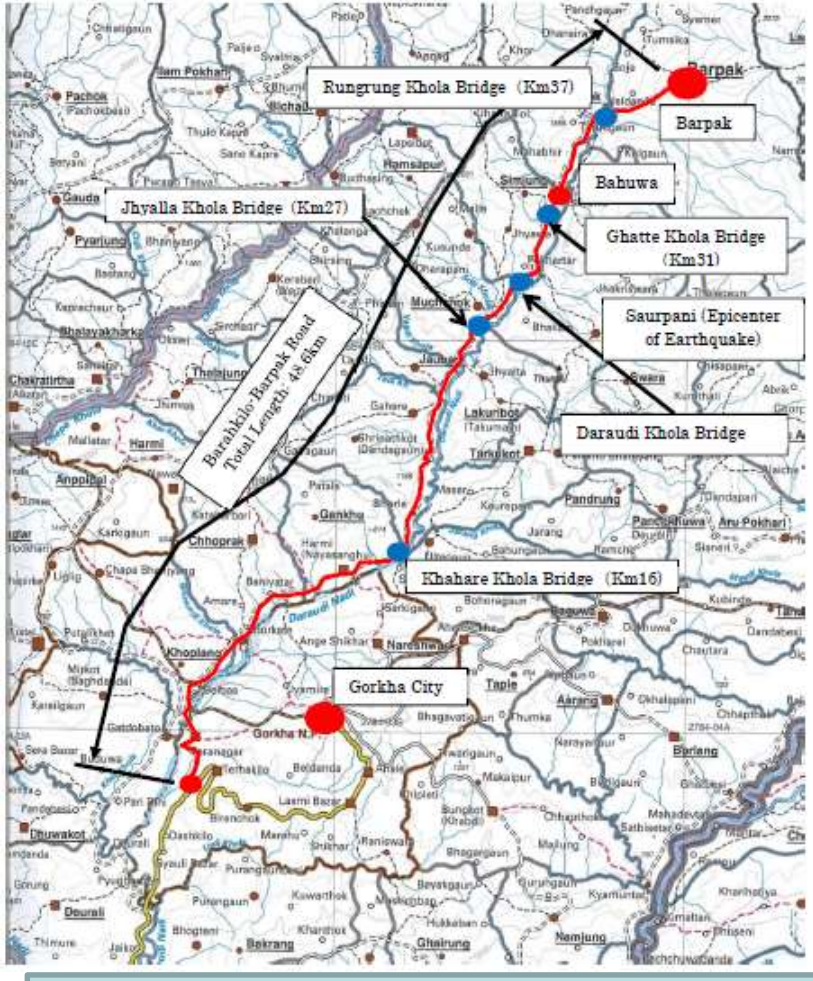
- Infrastructure



Source: Prepared by the Project Team
(Based on Map of Survey Department)

Bridge Construction along Barhakilo-Barpak Road

3 bridges by Grant Aid project, 2 bridges by RRNE QIPs



5 Bridges, totally 289 meter long.
Completed in November 2018.

Local Government & Police Office

Saurpani VDC

Barpak VDC
and Demo Model House

Palungtar Police Office

Health Care Facilities

Amppipal Hospital

Barpak Health Post

Community Centers

Bungkot CTC

Women Community Center

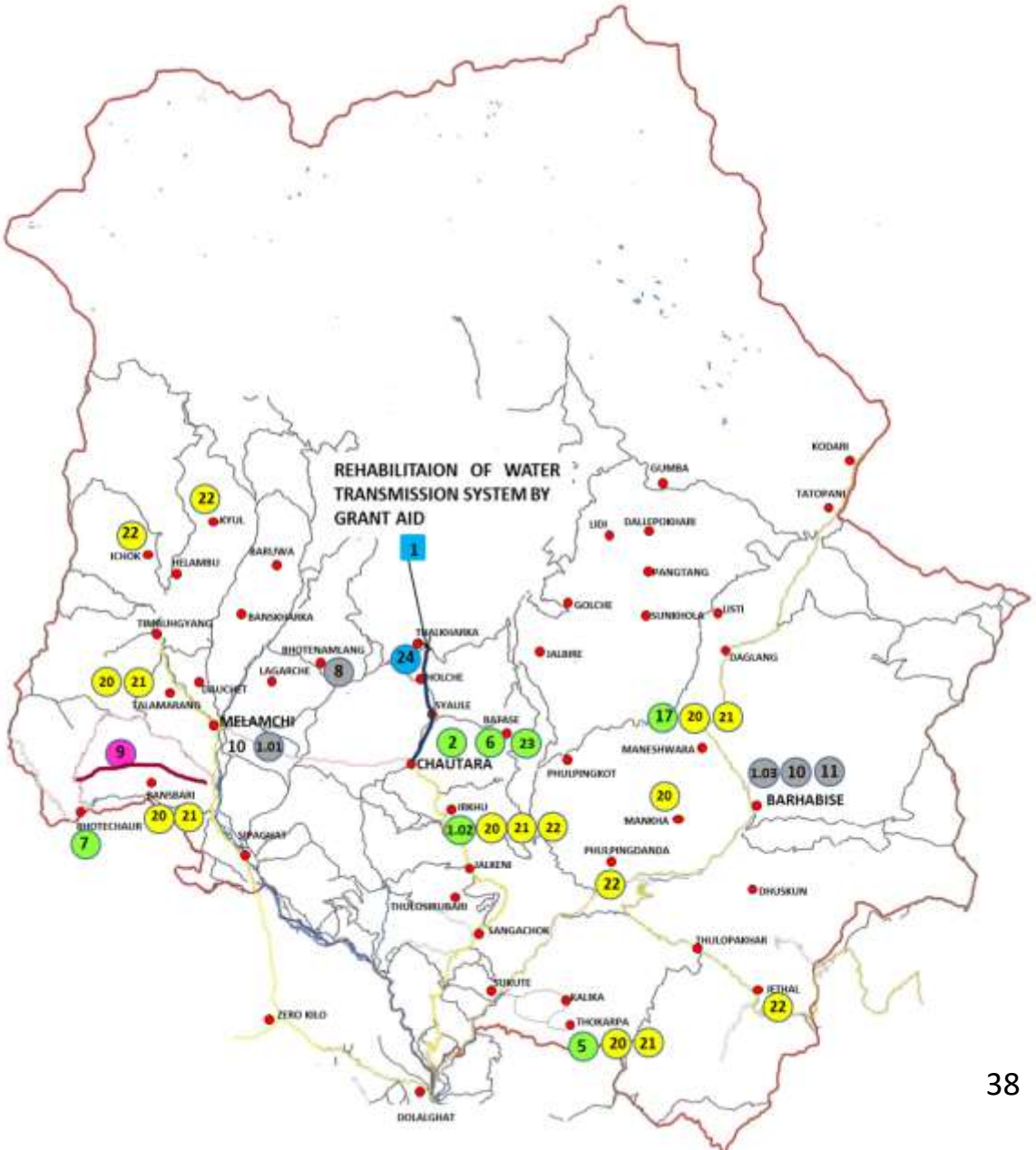
Sindhupalchowk District

QIP'S

- Public Facility
- Infrastructure
- Livelihood

GRANT AID

- Infrastructure

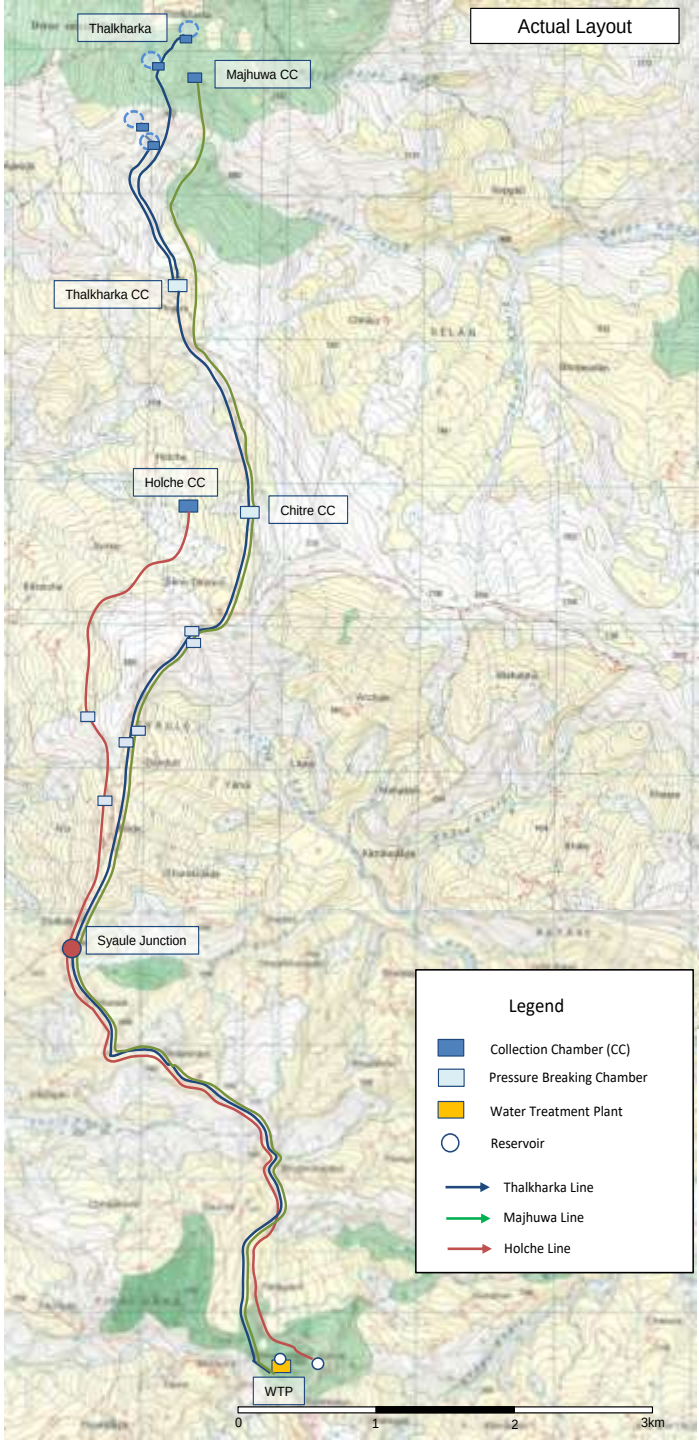


Source: Prepared by the Project Team
(Based on Map of Survey Department)

Water Transmission System in Chautara

By Grant Aid project & QIPs

- Renewal of pipeline totally 21.8 km long
- Applied seismic resistant pipe material
- 5952 beneficiaries
- Completed in July 2018



District Offices

DADO Office, Chautara

WCO Office, Chautara

Local Government Offices & Community Center

Maneshwara VDC

Thokarpa VDC

Irkhu CTC

Agricultural Facilities

Small Farmer Agriculture Product Collection Centre in Bhotechaur

Bhotechaur Road & Irrigation Facilities

Seed Storage in Ichok

Seed Storage in Phulpingdanda

Seed Storage in Irkhu

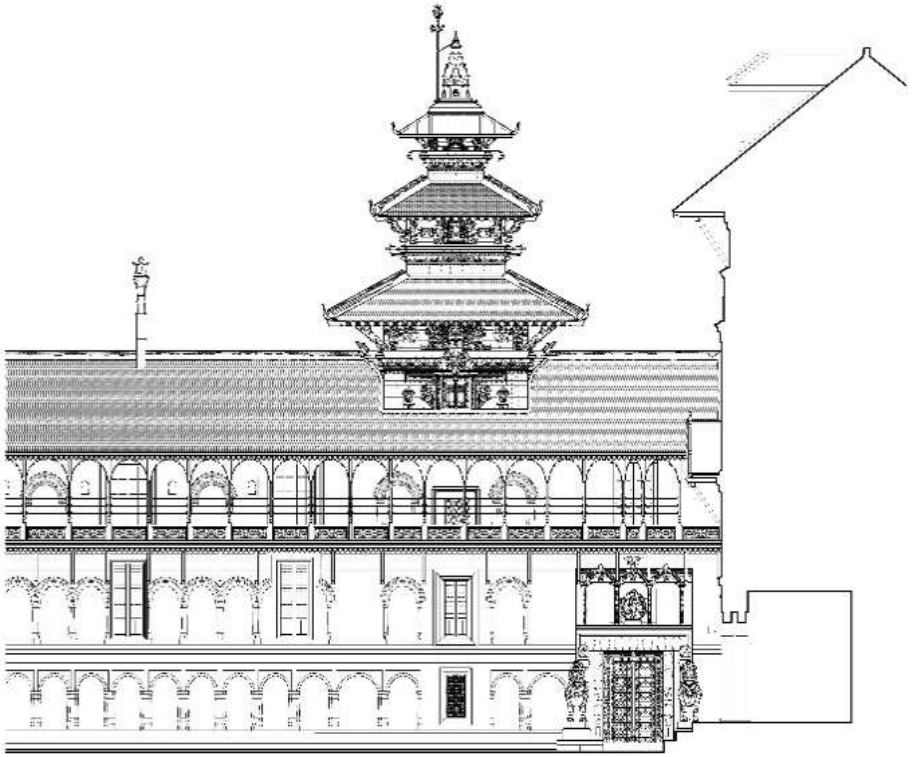
Seed Storage in Kiwool

Kathmandu & Lalitpur

Paropakar Maternity and Women's Hospital (in Kathmandu)

Bir Hospital (in Kathmandu)

Disaster Management Park (in Lalitpur)



CULTURAL HERITAGE

Support for Cultural Heritage Restoration

- Dispatch of Japanese Experts to the Department of Archeology on Heritage Restoration Technique
- Rehabilitation will be implemented together with local communities
- For supporting rehabilitation of 3 temples in Kathmandu and Lalitpur
  - Aganche Temple (Kathmandu Durbar Square)
  - Shiva Temple (Kathmandu Durbar Square)
  - Degu Talle Temple (Patan Durbar Square)

LIVELIHOOD RECOVERY

Livelihood Recovery Support

Key Concept

- Recover Conventional Livelihoods in a Sustainable Manner
- Active Women Involvement in Rehabilitation and Recovery

Main Activities

- Improved vegetable farming for women's groups
- Improved maize farming practices
- Quality seed production and seed storage construction
- Improved goat farming
- Establishment and enhancement of a women's cooperative

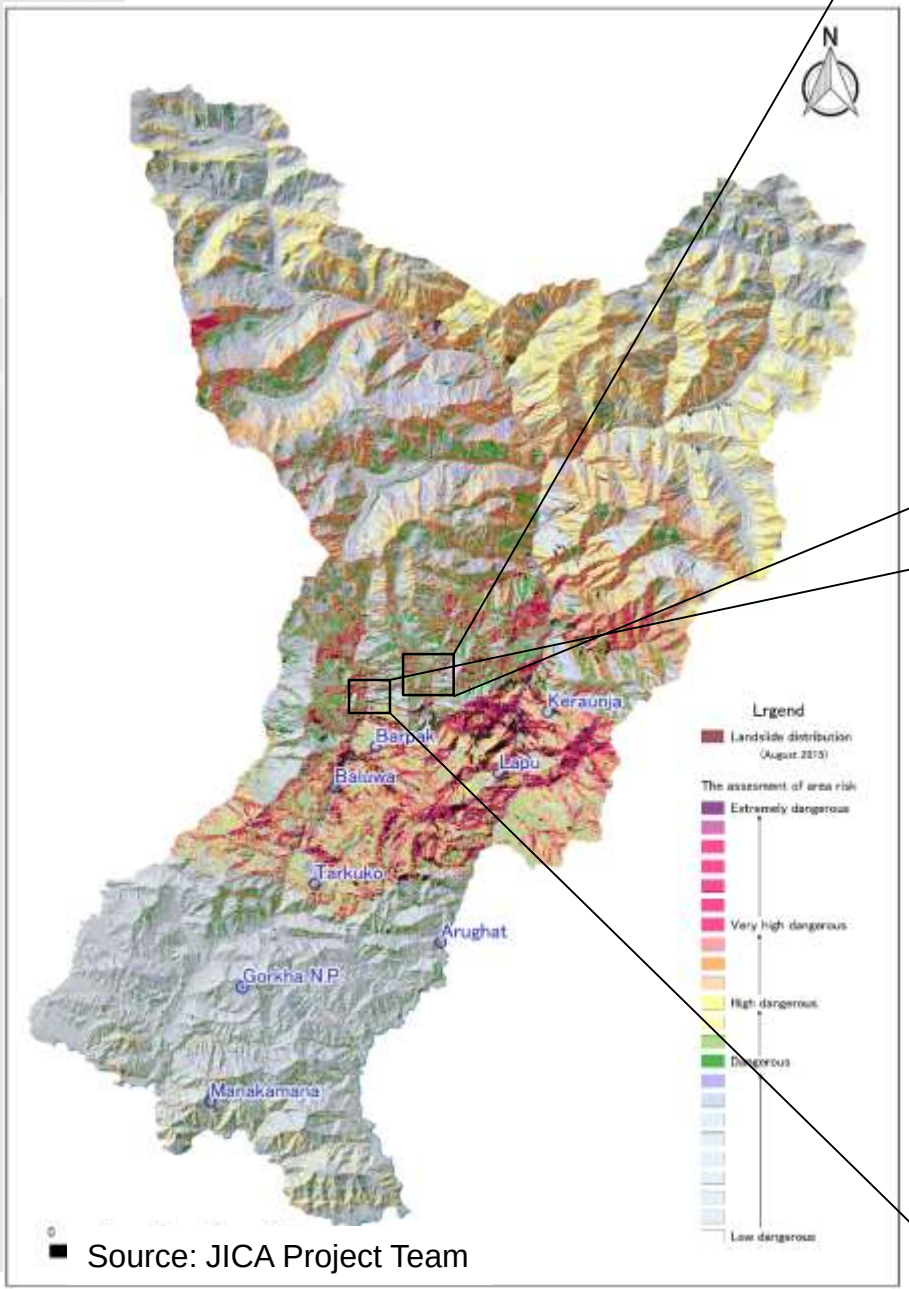
Target Beneficiaries

- Over 1,500 people in Gorkha and Sindhupalchowk
- About 80% are women

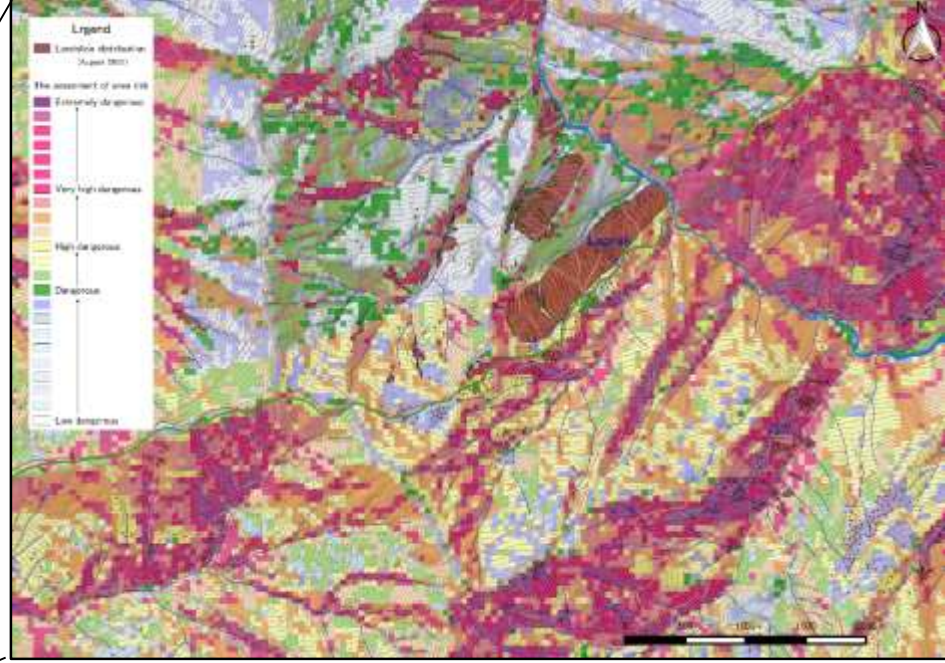


RECOVERY & RESILIENCE PLANNING

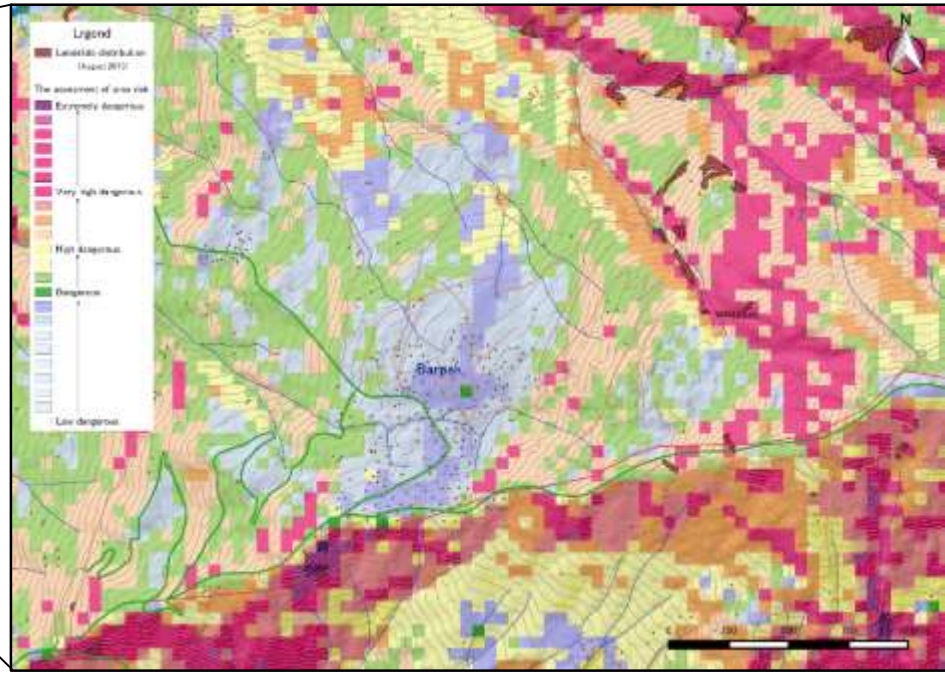
1. Hazard Maps



Source: JICA Project Team

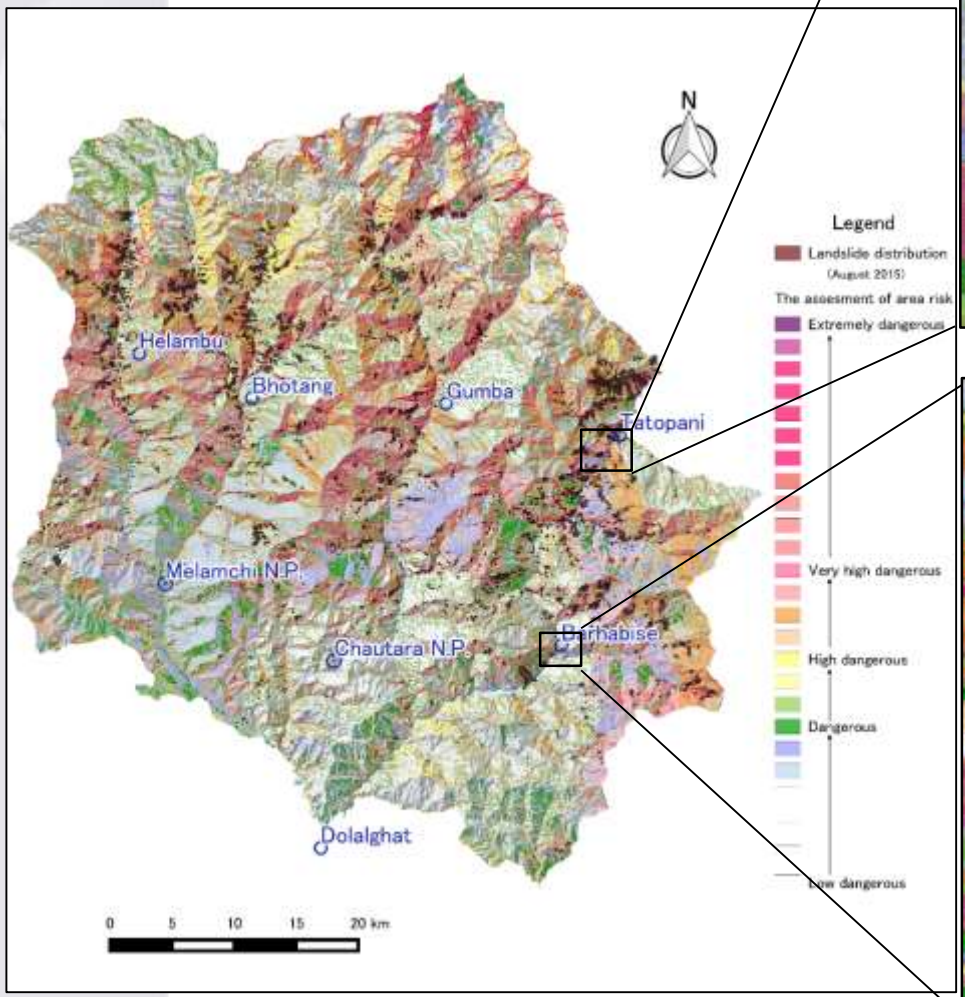


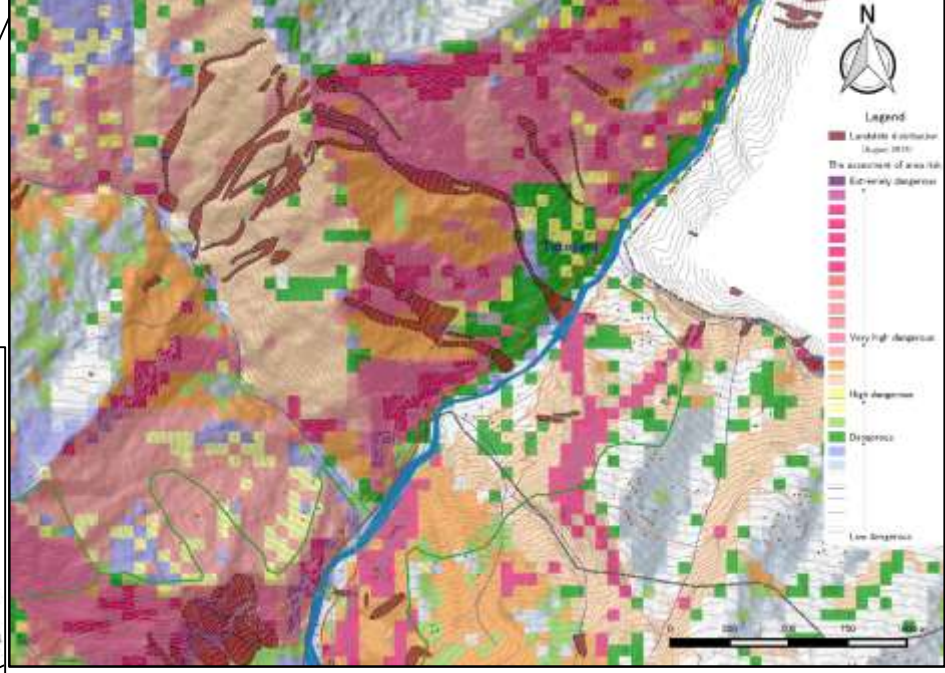
Enlargement of Hazard Map (Laprak)



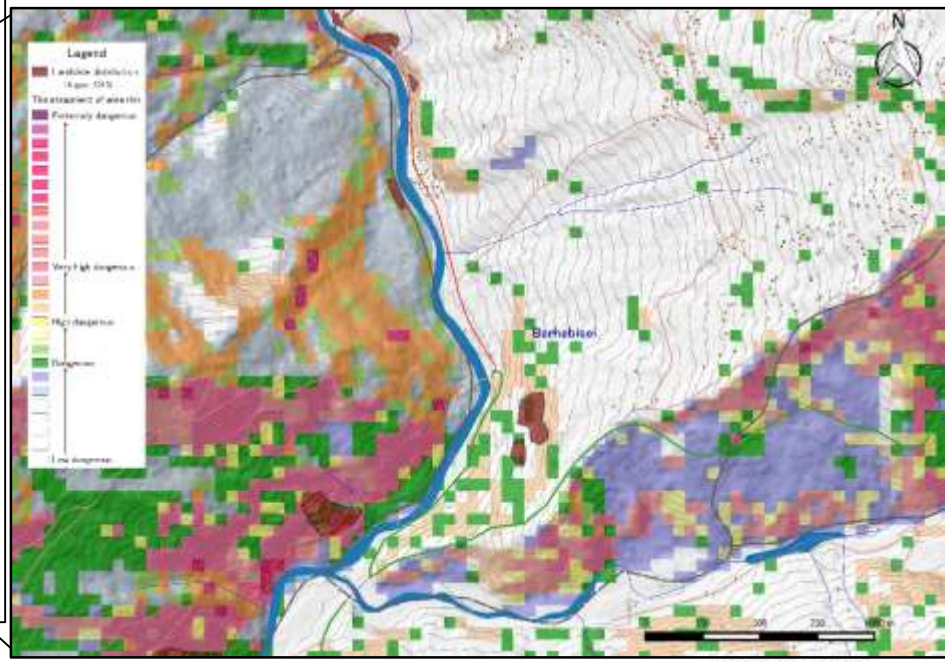
Enlargement of Hazard Map (Barpak)

1. Hazard Maps





Enlargement of Hazard Map (Tatopani)



Enlargement of Hazard Map (Barhabise)

Source: JICA Project Team

2. District Rehabilitation and Recovery Plan

Planning Period : 2016- 2026 (10 years)

Basic Policy

- **Recovery of Daily Lives**

  Housing Reconstruction, Restoration of Public Services (Administration, Health, Education and Social Welfare), Livelihood Restoration of Vulnerable population

- **Building Resilient District Structure**

  Utilization of Hazard Map, Restoration of Resilient Infrastructure, Establishment of DRR System

- **Recovery and Development of Regional Economy**

  Restoration of Agriculture, Restoration of Tourism, Restoration of Cottage and Small Industries

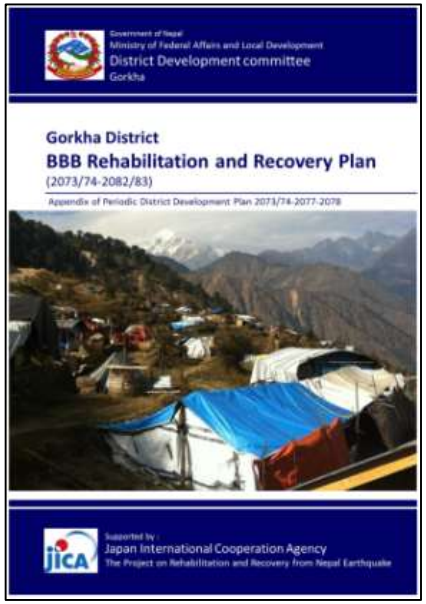
Formulation Process

- Consultative workshops (2016-17)
- Aligned with PDDP formulation
- DDC/DCC approved RRPs and distributed to municipalities

2. District Rehabilitation and Recovery Plan

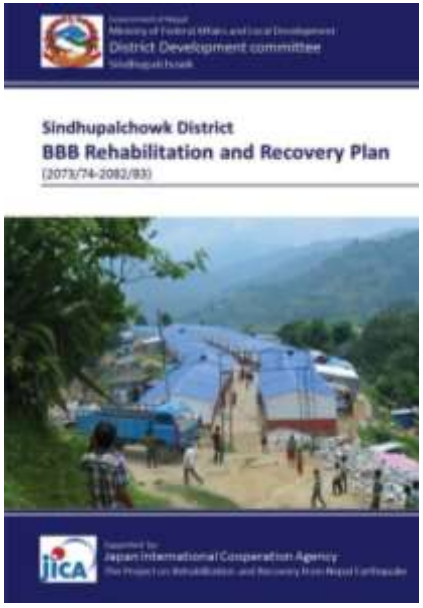
Gorkha District's Recovery Vision

"Beautiful, Equitable and Prosperous Gorkha through Agriculture, Tourism and Resilient Infrastructure"



Sindhupalchowk District's Recovery Vision

"Safe, Prosperous and Beautiful Sindhupalchowk"



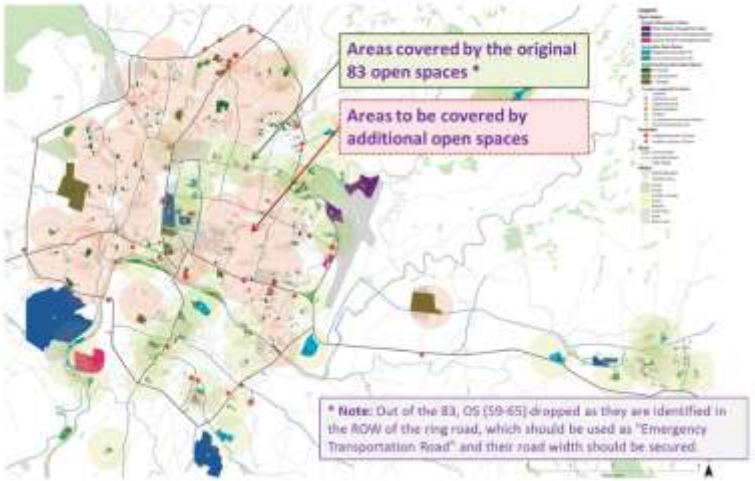
3. Kathmandu Valley Resilience Plan (KVRP)

Importance of KVRP

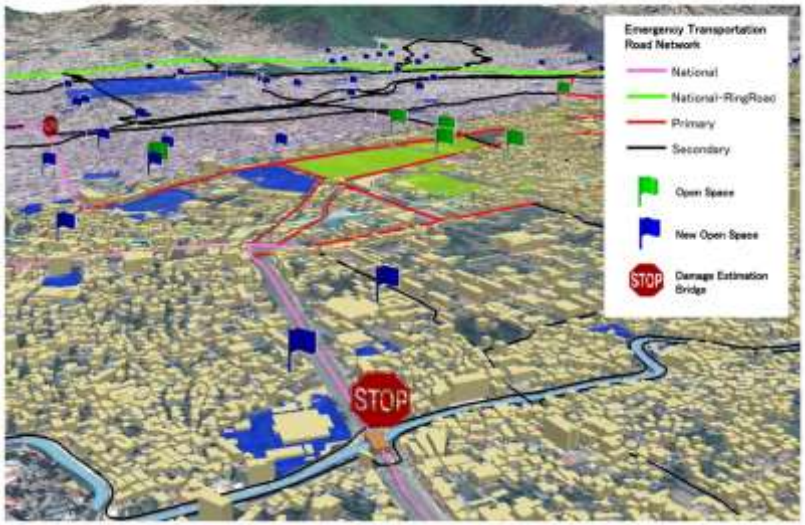
- Nepal is one of the most vulnerable countries to natural disasters, including large-scale earthquakes.
- The Kathmandu Valley is the political, economic and cultural center of the country.
- If the scenario earthquake hit the Kathmandu Valley, significant damages will occur.

A long-term (20 yrs), multi-sectoral plan for building resilience against future earthquakes

Proposed Emergency Evacuation Open Space at Community Level

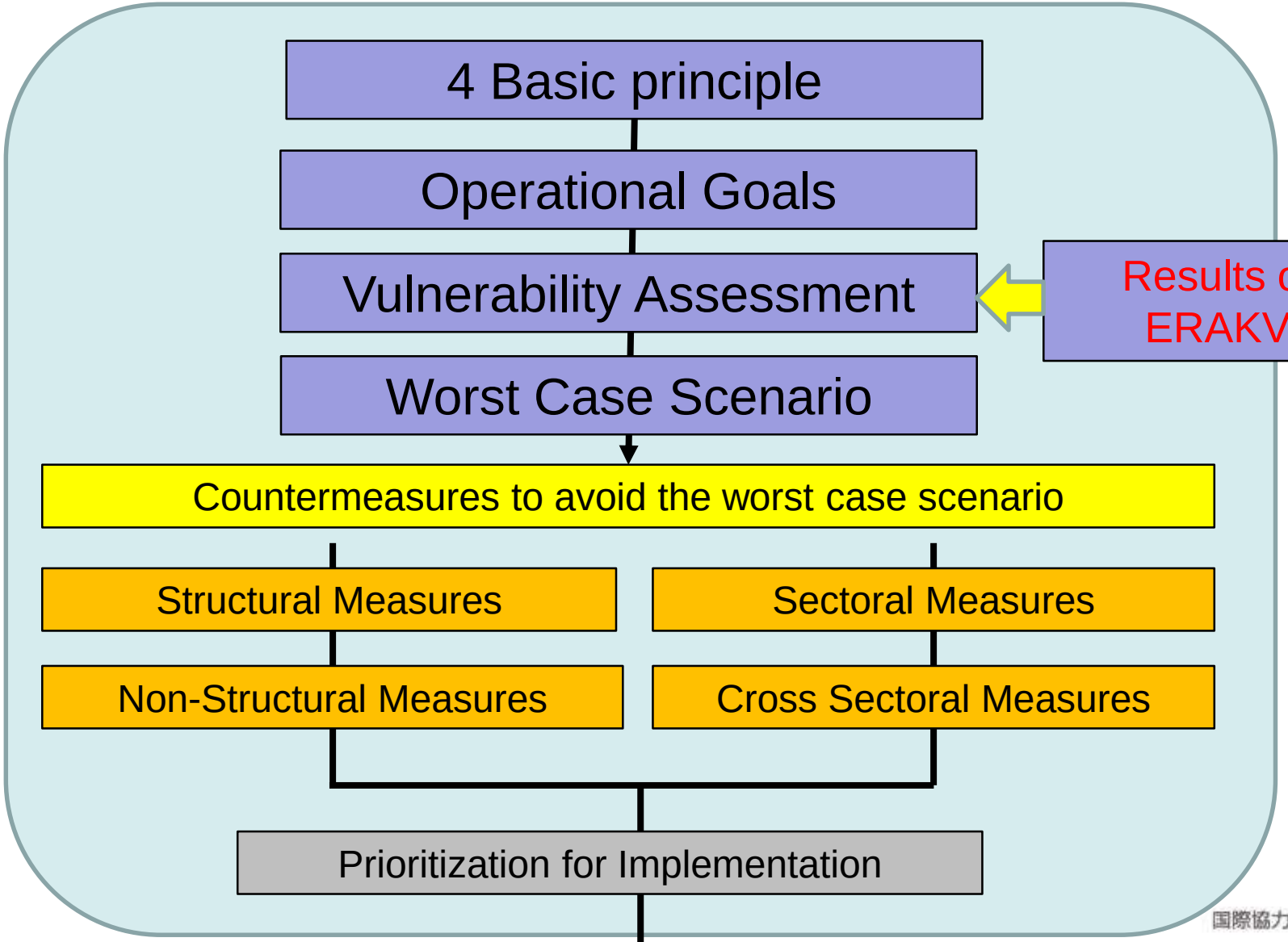


View of Emergency Road Network and Open Spaces



3. Kathmandu Valley Resilience Plan (KVRP)

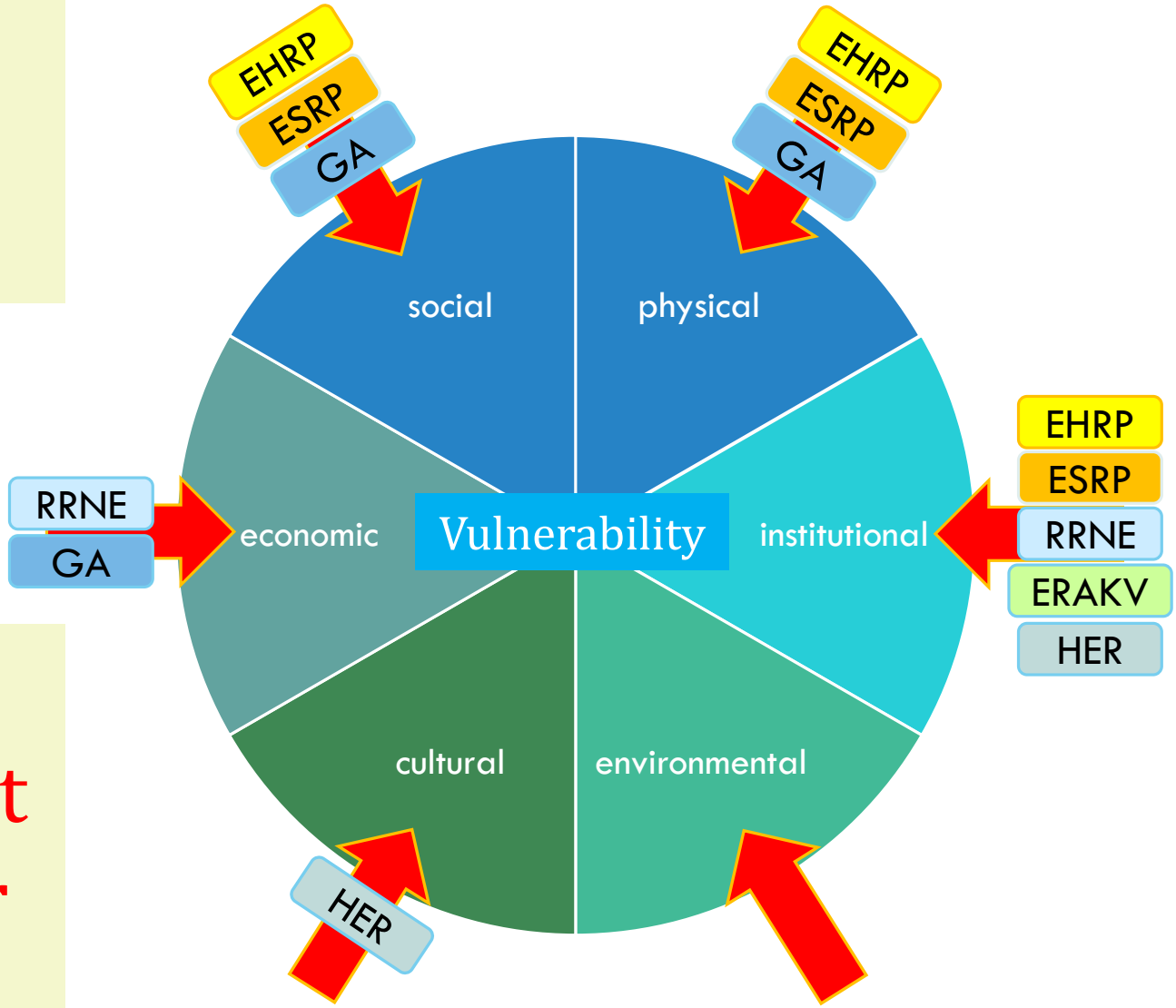
Structure of the KVRP



Source: JICA Project Team(ERAKV)

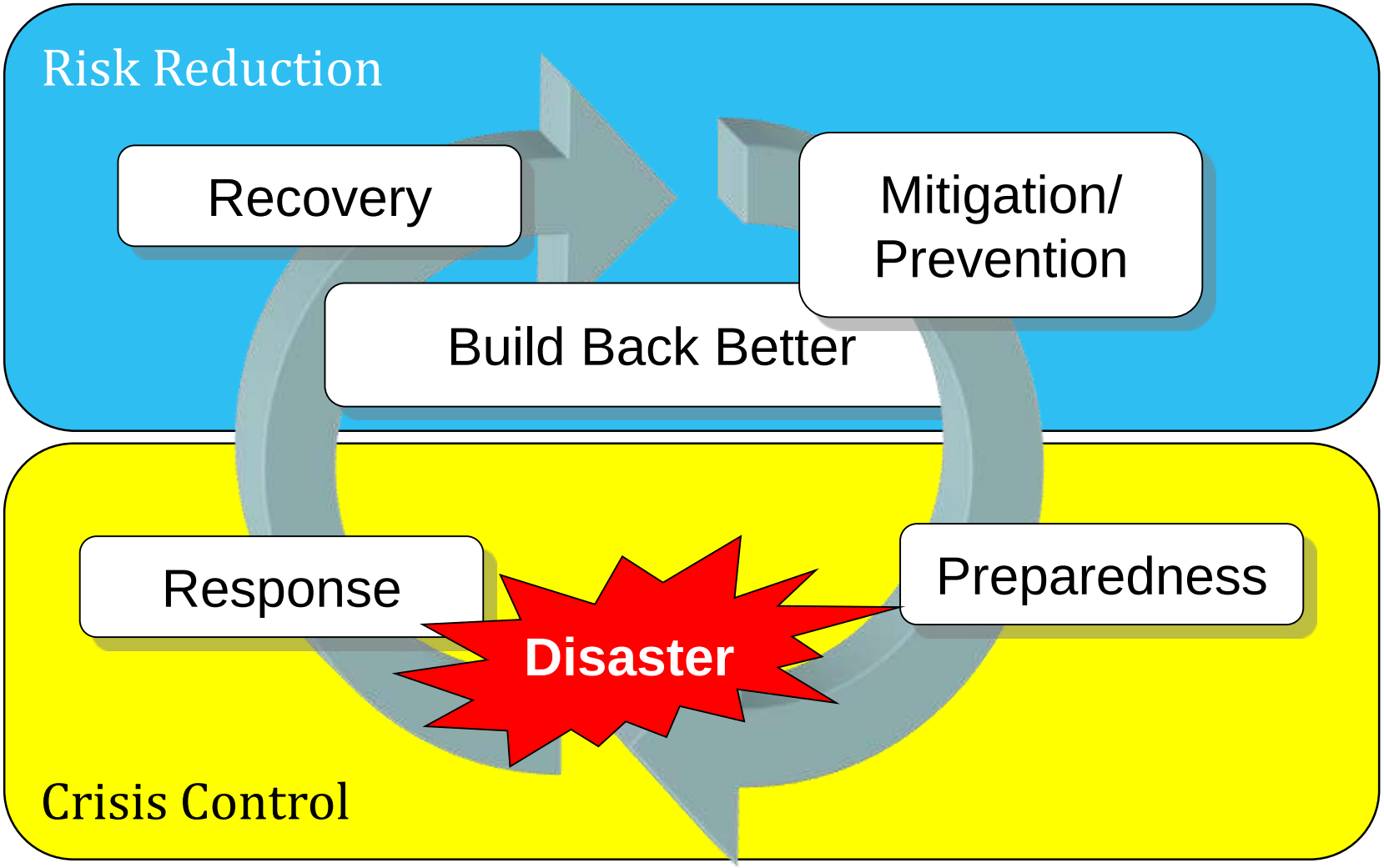
JICA's Approach to BBB

Removing pain is not BBB.



Capacity Development is the key for BBB.

The way forward:
Disaster Management Cycle & DRR



Thank you for your attention

国際協力機構