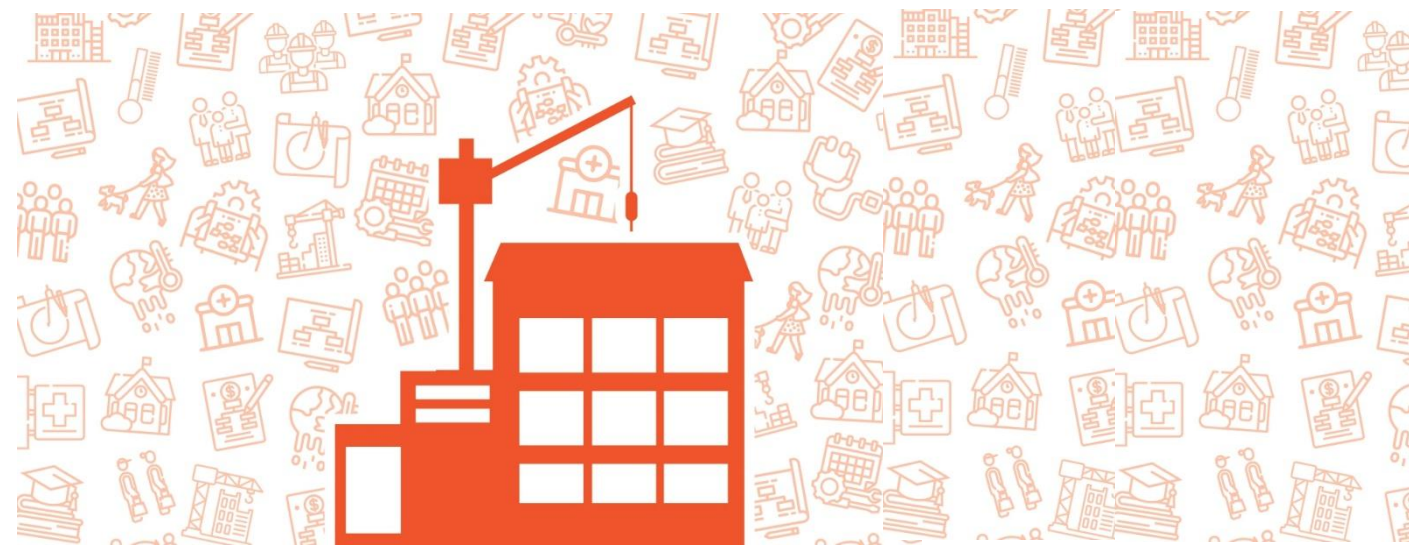


The views expressed in this presentation are the views of the author/s and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy of the data included in this presentation and accepts no responsibility for any consequence of their use. The countries listed in this presentation do not imply any view on ADB's part as to sovereignty or independent status or necessarily conform to ADB's terminology.

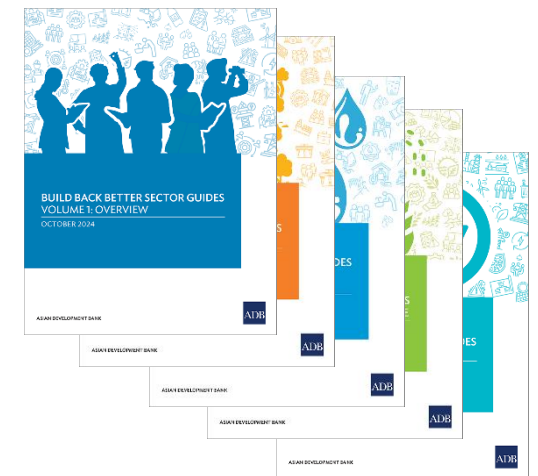
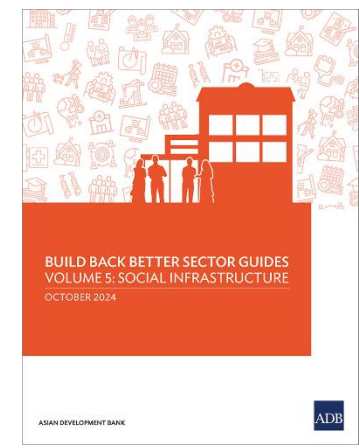
# BUILD BACK BETTER

## Sector Dialogues



# Event 6: Social Infrastructure

Friday 28 March 2025,



<https://www.adb.org/publications/series/build-back-better-sector-guides>



# Lessons from BBB Approach from ADB's School Reconstruction Support

**Naresh Giri**

Senior Project Officer ( Urban Development)



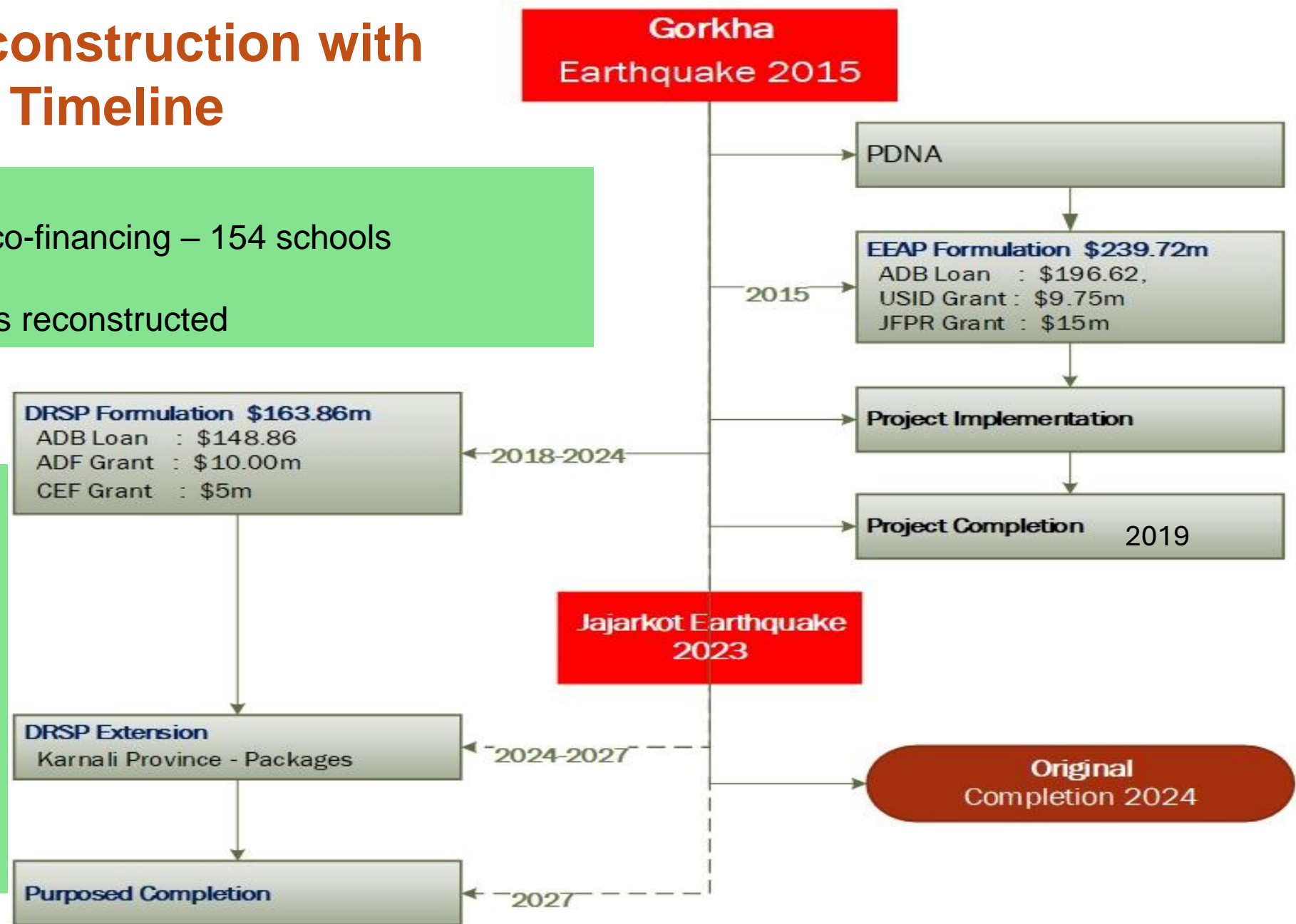
# Earthquake Reconstruction with BBB - Projects Timeline

## EEAP (2015 to Dec 2019)

- ADB Loan and USAID co-financing – 154 schools reconstructed.
- JFPR – 8 model schools reconstructed

## DRSP (2018 to 2024, extended till Mar 2027)

- ADB Loan, ADF and CEF grant
- 230 schools reconstruction,
- 141 schools retrofitted.
- 130 schools Solar powered



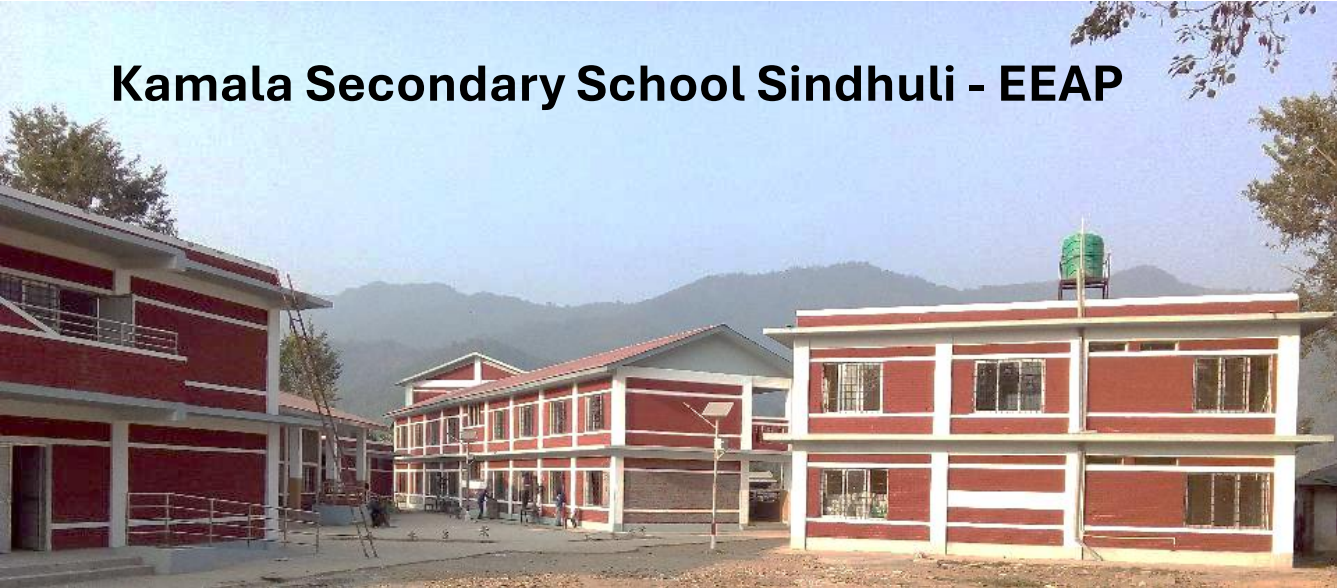


# BUILD BACK BETTER

Sector Dialogues



**Kamala Secondary School Sindhuli - EEAP**



# Institutional Framework

**Initial Arrangement** – Department of Education (DOE) of Ministry of Education, PDNA Sector Lead

- Initiated the rapid assessment and planning for Emergency Reconstruction work.

**Challenges:** Overwhelmed with infrastructure and Educational support/restoration, inadequate technical and management capacity, no dedicated authority.

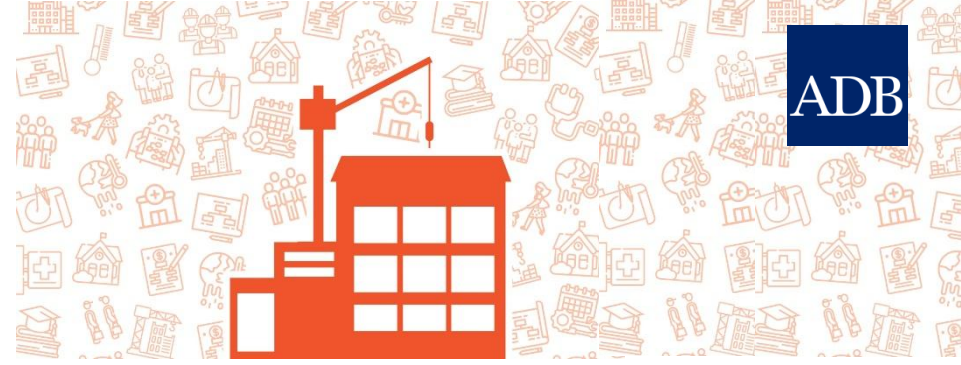
**Initiatives:**

- National Reconstruction Authority (NRA) established in Dec 2015.
- NRA developed PDRF
- Sector wise Central Level Project Implementation Units (CLPIUs) formed.



# Institutional Framework

**BUILD BACK BETTER**  
Sector Dialogues



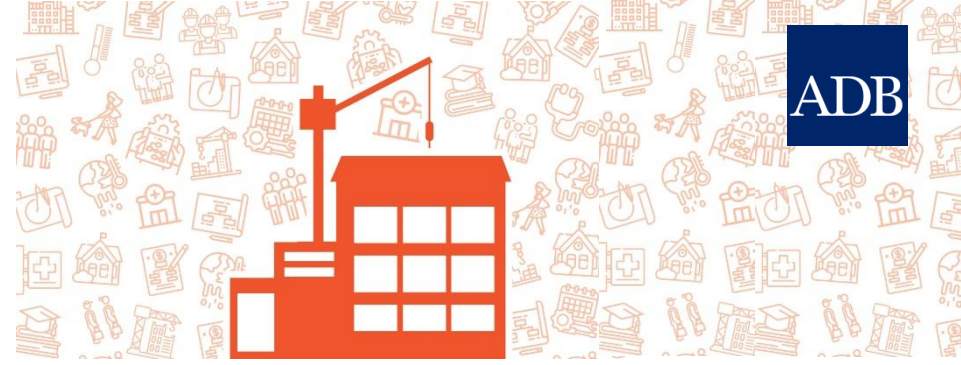
## Lessons from NRA's Establishment:

- Efficient and effective in resource generation, management and mobilization, efficient implementation, quality assured and completion ensured.
- Implemented **Fast Track** approach in processes and procedures.
- Effective implementation of BBB approach (Resilient, inclusive and climate responsive infrastructure, hazard mapping and disaster mitigation)
- **Frequent transfer of NRA chief affected smooth implementation.**

# Site Selection

**BUILD BACK BETTER**  
Sector Dialogues

ADB



## Challenges and Limitation:

- Short available time to conduct site wise damage assessment
- Rely on Government data from preliminary assessment
- Lack of accurate data, precise assessment and initial planning.
- Remoteness and scattered school sites – Hilly Terrain
- Geo-physical condition of affected areas

## Approach:

- Deploy ADB TA consultant in DPR preparation
- Priority to assessable schools, risk free construction site, risk mitigation or school relocation from hazard prone sites
- Primary level schools in first phase, big schools in following phase.

# Site Selection

## Lessons:

- Inventory of Schools - EMIS
- Allocate adequate time in planning phase to acquire reliable data and conduct detail site survey to control time and cost overrun
- Easy Access, Ownership, disaster mitigation, WASH need.
- Community consultation on site selection,

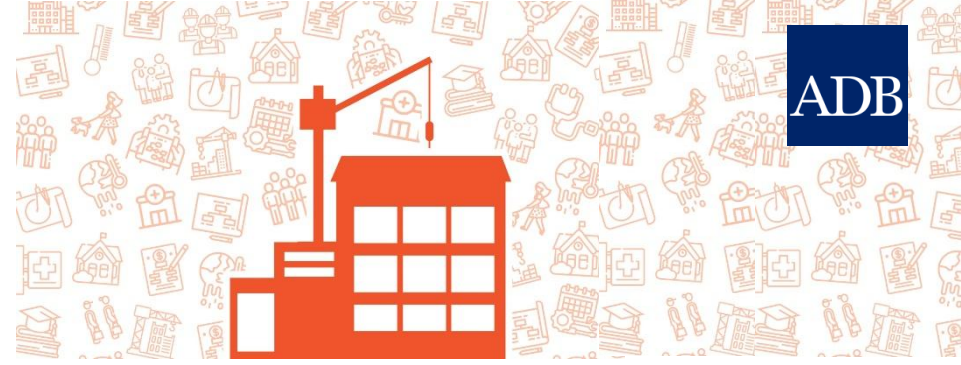


**Massive Site Development and Protection Works**



# Design and Planning - Reconstruction

**BUILD BACK BETTER**  
Sector Dialogues



## Challenges and Limitation:

- Insufficient land for buildings and WASH facility planning.
- Not possible to prepare separate designs for each individual schools in mass scale emergency reconstruction.
- Different agencies prepared their own type of designs, lacked harmonization with local architecture in designs implemented by them.

## Approach:

- Primary school design prepared by ADB TA support for project readiness.
- 16 standard type designs for large schools developed to meet desired performance standards ensuring resilience, climate and GESI responsive, inclusive, child and disable friendly.
- Developed robust school design standard criteria to comply with prevailing codes and school design guideline.
- Enhanced Inter Agency coordination for harmonized designs and mutual collaboration.
- Remote school designs developed and tested through ADB TA support,
- Climate responsive school WASH integrated in reconstruction plans.
- National Building Code revised

# Design and Planning - Reconstruction

**BUILD BACK BETTER**  
Sector Dialogues



ADB

## Lessons:

- Appropriate design and careful planning is the first step to ensure BBB and resiliency.
- Readily available standard type designs help to ensure resiliency, ensure BBB approach and save preparation time.
- Interagency coordination is important to exchange lessons and best practices.
- Design Basis Report by the agencies
- Collaboration with JICA / USAID/ India was particularly important to exchange designs, tools and harmonized design approach.
- Climate responsive resilient design, Incorporation of school WASH, provision of separate toilets for girls and menstrual hygiene facilities, accessible toilets and buildings for people with disability, and greenery development enhanced inclusiveness ensured resiliency and BBB approach, and increased enrolment.

# Design and Planning – Retrofitting

**BUILD BACK BETTER**  
Sector Dialogues



## Challenges and Limitation:

- No standard damage/structural vulnerability assessment tools readily available.
- No specific codes no separate norms in place for retrofitting.
- Limited availability of adequately trained detail vulnerability assessment and retrofit design engineers.
- No contractor led retrofitting experience in the past

## Approach:

- Damage/ structural vulnerability assessment tools for schools developed.
- Codes and norms available for new design used for retrofit design and costing.
- Technical Committee formed to review and certify retrofit design.

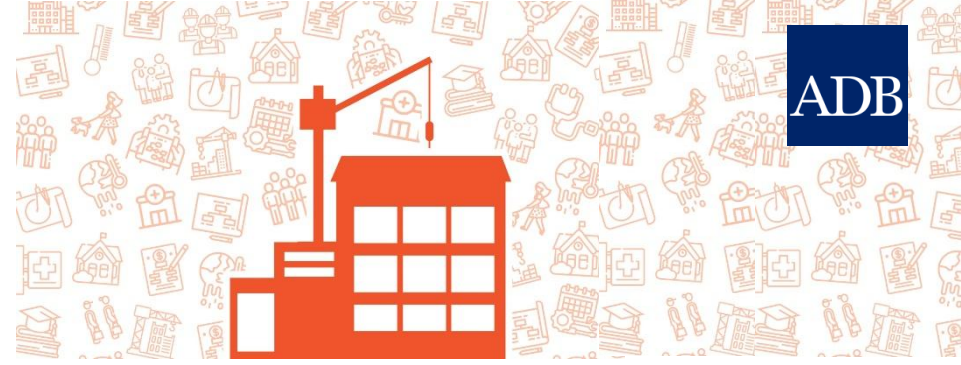
## Lessons:

- Comprehensive Retrofitting rather than only Structural Retrofitting
- At the initial stage, the community showed less interest in retrofitting compared to new construction. The acceptance was high at completion as the cost and time required was less.
- Separate code and norms for retrofitting is required for accurate vulnerability assessment, appropriate and economic retrofit design.



# Implementation- Reconstruction

**BUILD BACK BETTER**  
Sector Dialogues



## Challenges and Limitation:

- Quality assurance and maintaining construction progress was a major challenge to ensure BBB and resiliency basically due to -
  - Remoteness of school sites, poor accessibility and scattered school sites.
  - High demand and limited production/supply of quality construction material.
  - Shortage of skilled workers in disaster resilient construction and retrofitting.
  - Inadequate technical and management capacity of contractors to handle large size contracts.
  - Inadequate supervision skills among DSC technical staff on quality assurance of earthquake resistant construction.
  - High turnover rate of trained supervision staff (as more opportunities after the earthquake).

# Implementation- Reconstruction

**BUILD BACK BETTER**  
Sector Dialogues



## Lessons:

- Regardless of several challenges, the contractor led construction modality for large schools worked well to ensure timely completion.
- Role of NRA and CLPIU was very supportive in timely completion.
- ADB TA supported Project Monitoring Information System (PMIS) and establishment of extended Monitoring Hub was effective in real time progress and quality monitoring.
- Provision of dedicated site engineer in each site was effective.
- Training to technical staff on resilient construction is essential to ensure construction quality.
- Providing overall education infrastructure needs (Class room, Science Lab, ICT Lab, Library, Office, furniture, power backup plant, WASH) is a good initiative to enhance quality education.
- Whole school safety approach in DRSP (Reconstruction and retrofitting) ensured disaster resiliency.

# Implementation- Reconstruction

**BUILD BACK BETTER**  
Sector Dialogues



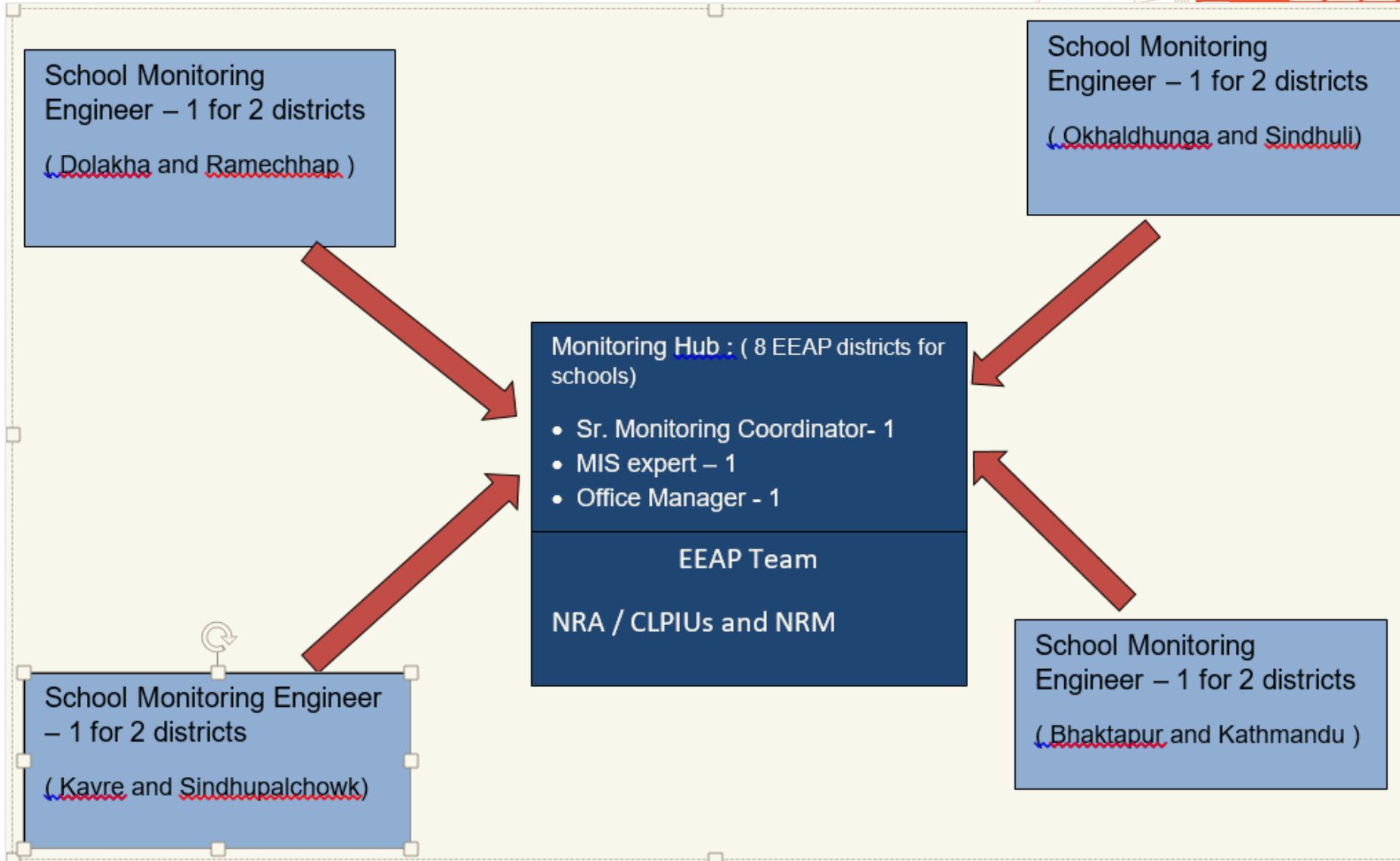
## Best Practices:

- 1. Introduction of Monitoring HUB - Near Earthquake impacted area**
  - Physical Progress
  - Quality Monitoring
  - Safeguards Compliance
- 2. Project Monitoring Information System ( PMIS) –**
- 3. Type Designs for Remote Schools with Stones and Mud ( Local materials )**
- 4. School DRM Plans**



# Implementation- 1. Monitoring HUB :

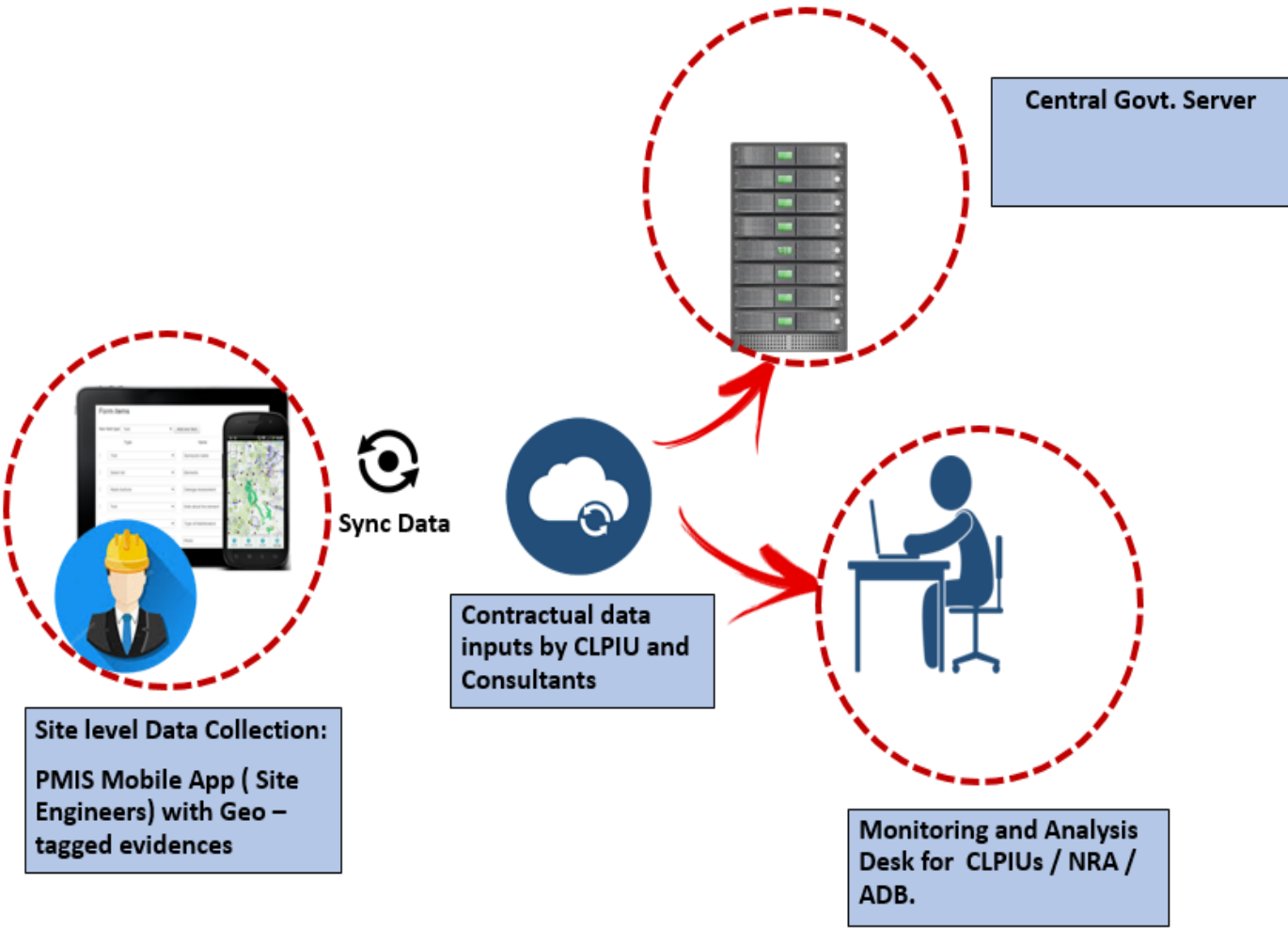
**BUILD BACK BETTER**  
Sector Dialogues

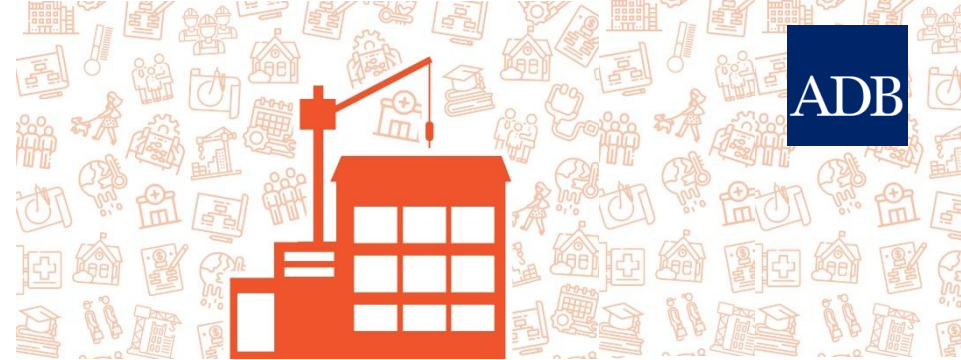


**Inside Monitoring Hub :**

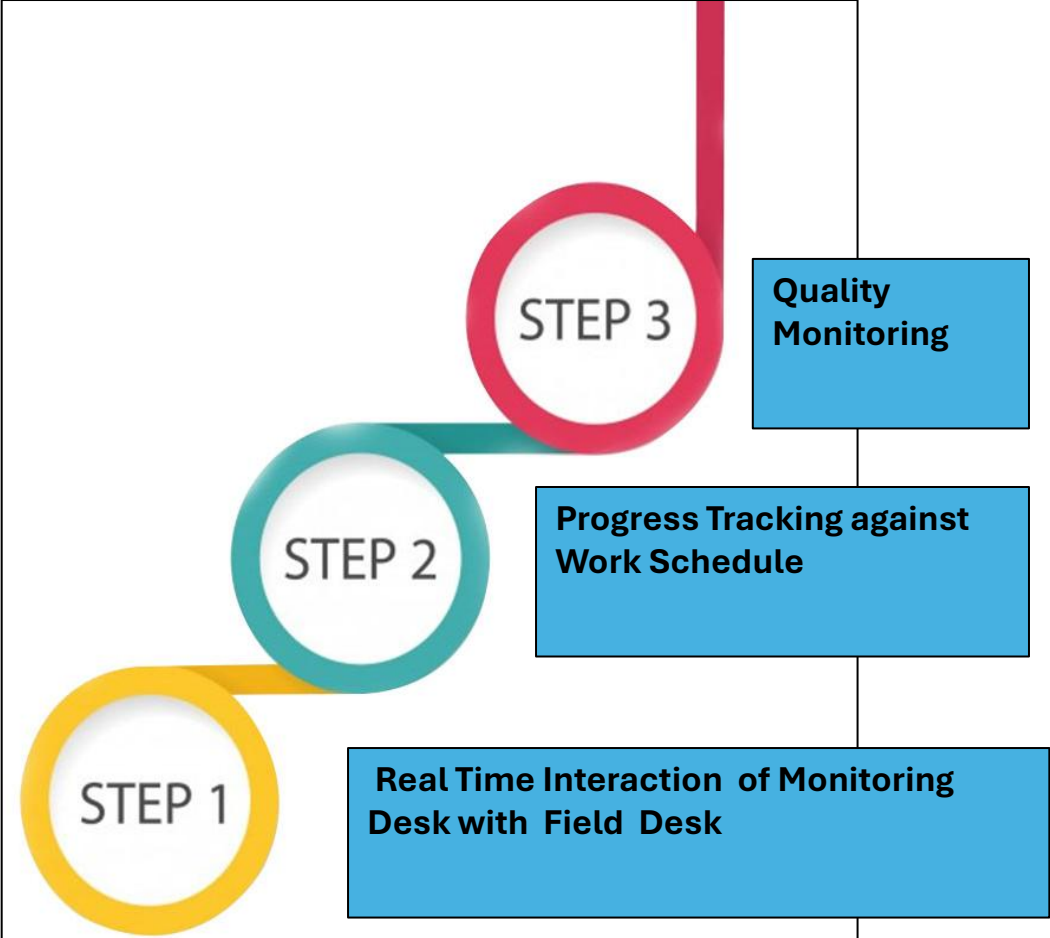


**• How it works ?**





## 2. Use of Project Monitoring Information System (PMIS)



- **Cloud based project Monitoring Software**
- **Mobile Apps for real-time progress tracking in diverse geography**
- **A platform for complete information related to Reconstruction Project – EEAP**
- **Tracking Details project information**



# Project Monitoring Information System (PMIS)

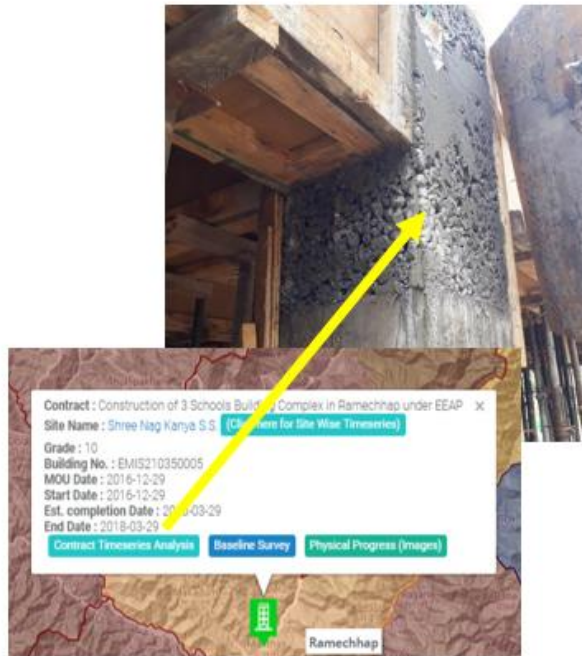
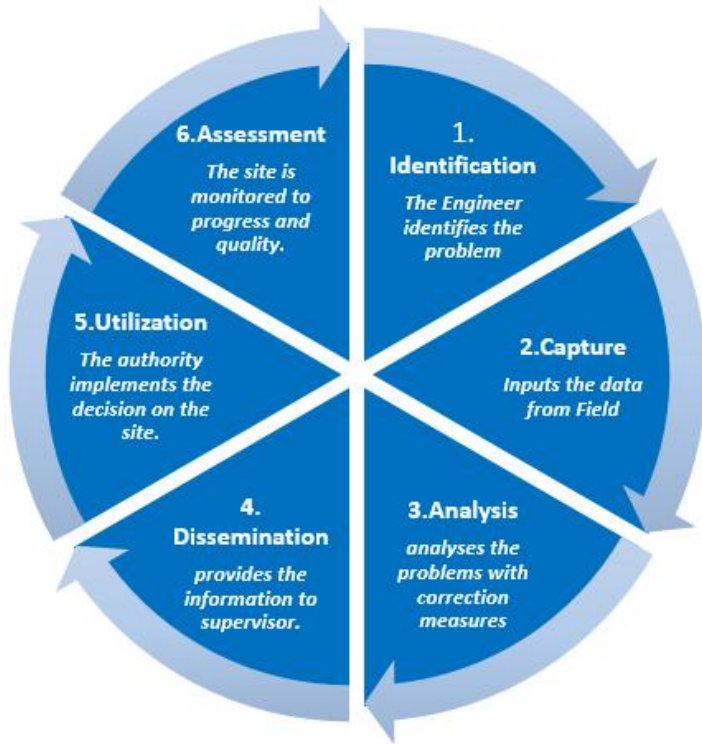
## BUILD BACK BETTER Sector Dialogues

ADB



### Quality Control Assessment in a real case - Using PMIS Visual Monitoring Method in Nag Kanya School, Ramechhap

### • How it works ?



**Problem Identified and Captured**

#### Inside Monitoring Desk :



Realtme Monitoring of

Physical & Financial Progress

Construction Quality

Safeguards

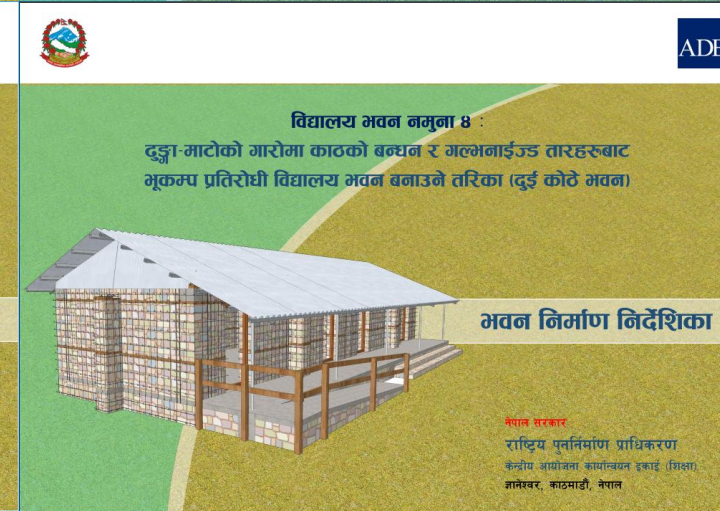
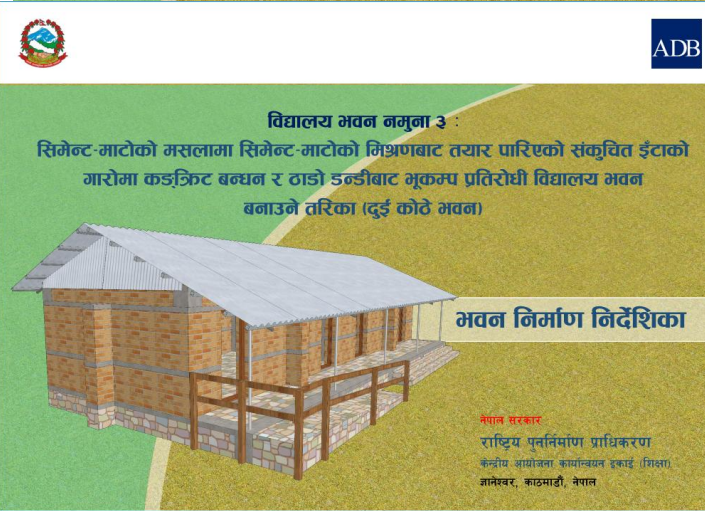


# 3. Type Designs

## for Remote Schools Using Local materials

### For easy dissemination

- Illustrative guidelines (for each Type design)
- Videos (for each Type design)





# Reconstruction of school buildings



**RC frame buildings with masonry infill  
in accessible areas**



# Reconstruction of school buildings in Remote Areas

- Physical inaccessibility to cement and steel and skills
  - Transportation cost
  - Logistical challenges (material delivery, technological, etc)





# 4. School DRM Plan prepared and implemented



# Recommendation

**BUILD BACK BETTER**  
Sector Dialogues

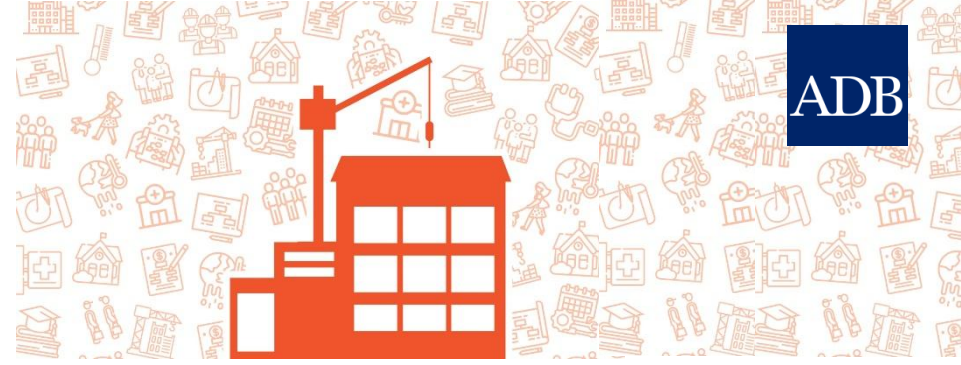


- Dedicated Institutions like NRA is essential in emergency recovery and reconstruction.
- Provision of readily available standard type designs
- Web based monitoring tools such as PMIS, should be employed for in remote and scattered sites to track work progress and quality.
- Priority should be given in Supervision and quality monitoring to ensure compliance with the design performance standard.
- Skill development package should be included in construction packages.
- Separate code and norms for retrofitting should be developed.
- Orientation to material producers on quality production should be conducted.
- Complete school safety approach should be implemented in future reconstruction.



# Recommendation

**BUILD BACK BETTER**  
Sector Dialogues



- WASH and Resilience measures to be included in the package.
- Safety of school buildings not rebuilt.
- Technical assistance support for timely start-up of emergency projects.
- Challenges with adopting building back better concept.
- Strengthening capacities in procurement, management, and contract management.





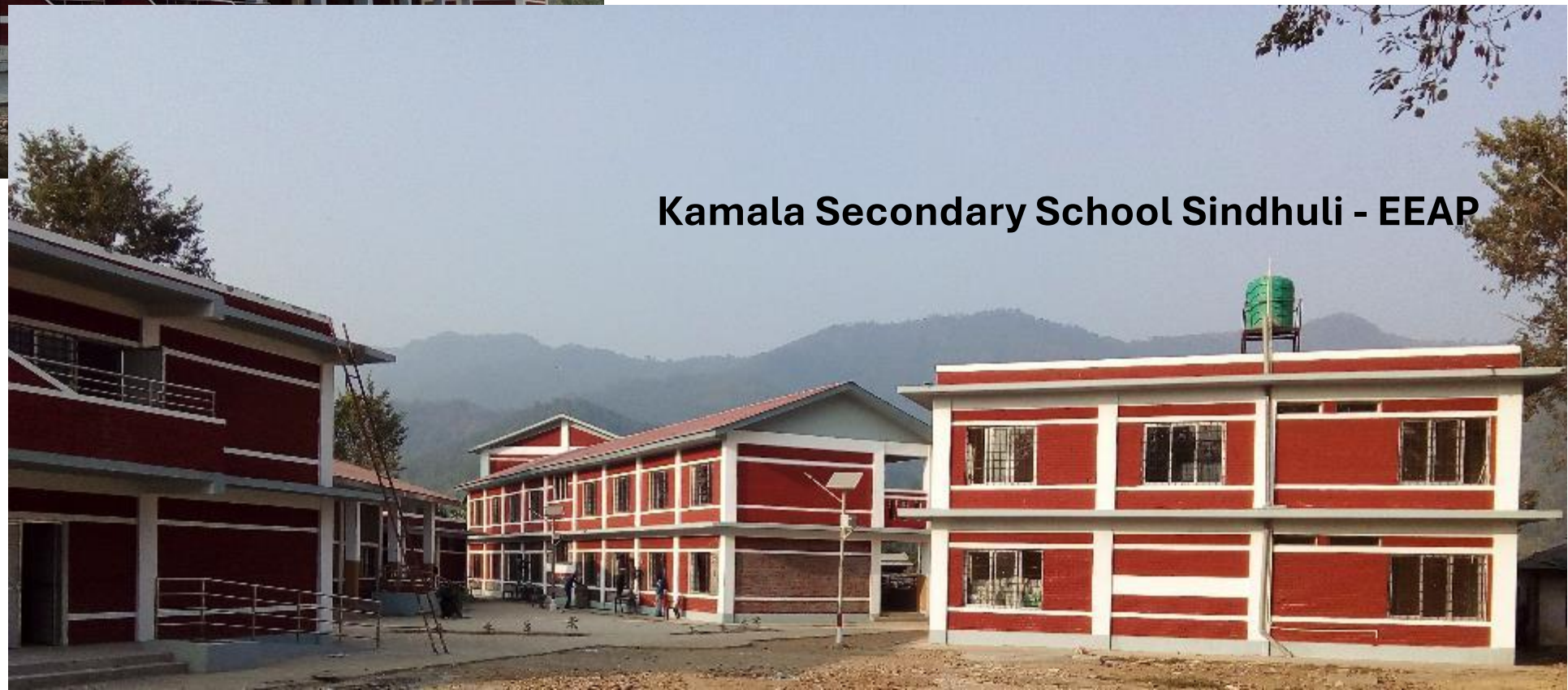
# Gourishankar Secondary School of Ramechhap Before and after reconstruction







**Janajagriti Secondary School Sindhuli - EEAP**



**Kamala Secondary School Sindhuli - EEAP**



Janta SS Sindhuli - EEAP



Panitanki SS Sindhuli - EEAP





Solar Plant



2019/08/08 12:27

Safe Water



2019/08/08 12:27

Age Specific Furniture



2019/08/08 12:21

Climate Risk Mitiga



2019/08/07 10:32



# IEC Materials developed and disseminated

The image displays several IEC materials developed and disseminated, including posters and a central infographic. The materials focus on environmental and climate change awareness in Nepali.

### पहिरो (Hazard)

**पहिरो जोग्यता पूर्व नजुवाउँ कार्याहरु**

- पहिरो आउनु सक्ने स्थानमा खोजिनु नभै
- पहिरोबाट सुरक्षाका लागि तयारी गर्नु
- सम्बन्धी जानकारी प्राप्त गर्नु
- सुरक्षाका लागि तयारी गर्नु
- सुरक्षाका लागि तयारी गर्नु
- सुरक्षाका लागि तयारी गर्नु

**पहिरोको सम्बन्धमा नजुवाउँ कार्याहरु**

- पहिरोको सम्बन्धमा जानकारी प्राप्त गर्नु
- पहिरोको सम्बन्धमा तयारी गर्नु
- पहिरोको सम्बन्धमा तयारी गर्नु
- पहिरोको सम्बन्धमा तयारी गर्नु

**पहिरो नजुवाउँदा नजुवाउँ कार्याहरु**

- पहिरो नजुवाउँदा तयारी गर्नु
- पहिरो नजुवाउँदा तयारी गर्नु
- पहिरो नजुवाउँदा तयारी गर्नु

### मौसम र जलवायु परिवर्तन (Season and Climate Change)

**मौसम र जलवायु परिवर्तन परिचय**

**मौसम:** वायुमण्डलमा हुने छोटी समयको परिवर्तित अवस्था हो।

**प्रत्यक्षतया:** लामो समय अघिदेखि वातावरणमा देखिने परिवर्तन हो। यसलाई सामान्यतया लामो समयको नैसर्गिक तन्त्रात्मकहरूको आधारमा मान्न गरिन्छ।

**मौसम र जलवायु परिवर्तन कारणाहरु**

अत्यधिक कार्बन तथा हरितगृह (कार्बनडाइअक्साइड, नाइट्रस अक्साइड, मिथेन, ओजोन, क्लोरो फ्लोरो कार्बन, सल्फर हेक्साफ्लोराइड, हाइड्रोक्लोरो कार्बन) ग्रीहसङ्कलन।

वन विनाश, जनसङ्ख्या वृद्धि, अव्यवस्थित विकास निर्माण (पुर्वानुमानित उत्सर्जन)।

**मौसम र जलवायु परिवर्तन अनुकूलनका उपायहरु**

प्राकृतिक स्रोतको संरक्षण तथा व्यवस्था उपयोग गर्ने।

परवरण कारोबारको निर्माण गर्ने, स्थानीय जन्तुमा मोटोबिचमाइक लागू गर्ने।

परिवर्तित मौसम अनुसारक बालीपाती लागू गर्ने। जैविक नलको प्रयोग गर्ने।

स्रोतको कम खपत, पुनः प्रयोग र पुनः उत्पादन (Reduce, Reuse and Recycle) गर्ने।

नलसामु परिवर्तन अनुकूलन सम्बन्धि सामुदायिक अभियान सञ्चालन गर्ने।

**मौसम र जलवायु परिवर्तन असरहरु**

तापक्रम वृद्धि, मौसम परिवर्तन, समुद्री सतहमा वृद्धि।

अतिवृष्टि, अल्पवृष्टि, चण्डवृष्टि, बेकैसमी बर्फ, बाढी, पहिरो, सडेरी, महाभूकम्प, प्राकृतिक स्रोतको क्षति।

कृषि उत्पादनमा कमी, परिवर्तित प्रमाणीय परिवर्तन।

बालीपाती, पशुपाती तथा मानिसमा विभिन्न रोगको प्रकोप बढ्नु।

### बाढी (Flood)

**बाढी जोग्यता पूर्व नजुवाउँ कार्याहरु**

- पहिरो आउनु सक्ने स्थानमा खोजिनु नभै
- पहिरोबाट सुरक्षाका लागि तयारी गर्नु
- सम्बन्धी जानकारी प्राप्त गर्नु
- सुरक्षाका लागि तयारी गर्नु
- सुरक्षाका लागि तयारी गर्नु
- सुरक्षाका लागि तयारी गर्नु

**बाढी जोग्यताको बेला नजुवाउँ कार्याहरु**

- पहिरो आउनु सक्ने स्थानमा खोजिनु नभै
- पहिरोबाट सुरक्षाका लागि तयारी गर्नु
- सम्बन्धी जानकारी प्राप्त गर्नु
- सुरक्षाका लागि तयारी गर्नु
- सुरक्षाका लागि तयारी गर्नु
- सुरक्षाका लागि तयारी गर्नु

**बाढी नजुवाउँदा नजुवाउँ कार्याहरु**

- पहिरो नजुवाउँदा तयारी गर्नु
- पहिरो नजुवाउँदा तयारी गर्नु
- पहिरो नजुवाउँदा तयारी गर्नु

### वद्याड (Drought)

**वद्याडको सम्बन्धमा नजुवाउँ कार्याहरु**

- वद्याडको सम्बन्धमा जानकारी प्राप्त गर्नु
- वद्याडको सम्बन्धमा तयारी गर्नु
- वद्याडको सम्बन्धमा तयारी गर्नु
- वद्याडको सम्बन्धमा तयारी गर्नु

**वद्याडबाट बच्न नजुवाउँ कार्याहरु**

- वद्याडबाट बच्न तयारी गर्नु
- वद्याडबाट बच्न तयारी गर्नु
- वद्याडबाट बच्न तयारी गर्नु

### शीतलहर / हिमपात (Cold Wave / Snowfall)

**शीतलहर / हिमपात जोग्यता पूर्व नजुवाउँ कार्याहरु**

- शीतलहर / हिमपात आउनु सक्ने स्थानमा खोजिनु नभै
- शीतलहर / हिमपातबाट सुरक्षाका लागि तयारी गर्नु
- शीतलहर / हिमपात सम्बन्धी जानकारी प्राप्त गर्नु
- शीतलहर / हिमपातबाट सुरक्षाका लागि तयारी गर्नु
- शीतलहर / हिमपातबाट सुरक्षाका लागि तयारी गर्नु
- शीतलहर / हिमपातबाट सुरक्षाका लागि तयारी गर्नु

**शीतलहर / हिमपातको सम्बन्धमा नजुवाउँ कार्याहरु**

- शीतलहर / हिमपातको सम्बन्धमा जानकारी प्राप्त गर्नु
- शीतलहर / हिमपातको सम्बन्धमा तयारी गर्नु
- शीतलहर / हिमपातको सम्बन्धमा तयारी गर्नु
- शीतलहर / हिमपातको सम्बन्धमा तयारी गर्नु

### महामारी (Epidemic)

**महामारी जोग्यता पूर्व नजुवाउँ कार्याहरु**

- महामारी आउनु सक्ने स्थानमा खोजिनु नभै
- महामारीबाट सुरक्षाका लागि तयारी गर्नु
- महामारी सम्बन्धी जानकारी प्राप्त गर्नु
- महामारीबाट सुरक्षाका लागि तयारी गर्नु
- महामारीबाट सुरक्षाका लागि तयारी गर्नु
- महामारीबाट सुरक्षाका लागि तयारी गर्नु

**महामारीको सम्बन्धमा नजुवाउँ कार्याहरु**

- महामारीको सम्बन्धमा जानकारी प्राप्त गर्नु
- महामारीको सम्बन्धमा तयारी गर्नु
- महामारीको सम्बन्धमा तयारी गर्नु
- महामारीको सम्बन्धमा तयारी गर्नु

**महामारी टाढीपछि नजुवाउँ कार्याहरु**

- महामारी टाढीपछि तयारी गर्नु
- महामारी टाढीपछि तयारी गर्नु
- महामारी टाढीपछि तयारी गर्नु



**Thank You**

