



World Bank Technical Deep Dive (TDD) on Seismic Risk and Resilience

March 12-16, 2018

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THE WORLD BANK
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GFDRR
Global Facility for Disaster Reduction and Recovery

**Tokyo
Development
Learning
Center**

1. Who is here at this Technical Deep Dive (TDD) on Seismic Risk and Resilience?

Magnitude of Last Major Earthquake in Your City or Country?



Indonesia (9.1-9.3 - 2004)



Chile (8.8 - 2010)



JAPAN (9.0 - 2011)



Philippines (6.7 - 2017)



Ecuador (7.8 - 2016)



Myanmar (6.8 - 2016, 5.8 - 2017)

“A moderate M5.8 earthquake damaged concrete supports of a critical water supply pipeline serving nearly 1 million Yangon residents. These supports are not in good condition and more extensive damages to these supports will compromise the integrity of the water supply system.”

Exposure to Earthquakes and Tsunamis

More than **1.3 million people** are exposed to earthquakes of intensity VI+ each year in our 11 countries.

| Earthquake and Tsunami Annual Average Exposure by Country | | | | | |
|---|-------------------------------|----------------------------|---|---|---|
| Country | Earthquake (Scale of 0-10) | Tsunami (Scale of 0-10) | Physical exposure to earthquake MMI VI | Physical exposure to earthquake MMI VIII | Annual Expected Exposed People to Tsunamis |
| Nepal | 9.9 | - | 59,595 | 41,262 | - |
| Japan | 9.4 | 10.0 | 207,695 | 113,310 | 36,837 |
| Philippines | 9.4 | 9.1 | 155,287 | 90,565 | 3,150 |
| Ecuador | 9.4 | 9.0 | 33,015 | 12,481 | 931 |
| Myanmar | 9.3 | 8.5 | 105,139 | 27,385 | 1,125 |
| Peru | 9.2 | 9.1 | 52,408 | 25,386 | 1,599 |
| Bangladesh | 8.7 | 8.5 | 266,067 | 25,242 | 2,110 |
| Indonesia | 8.4 | 9.6 | 428,042 | 7,304 | 10,468 |
| India | 7.9 | 8.3 | 819,762 | 84,880 | 4,018 |
| Kenya | 4.2 | 5.6 | 29,409 | - | 33 |
| Malawi | 4.0 | - | 15,143 | - | - |
| Total | 9.2 | 8.0 | 1,307,247 | 342,935 | 56,221 |

Source: INFORM Index (<http://www.inform-index.org/>)

Seismic Risk Assessment

71%

of participants noted they had a seismic risk assessment for their city/country.

Many noted **limited use and challenges** so

How can challenges be overcome?

Current / Planned Uses:

- Urban / Land-Use Planning
 - Targeting Bldg Regulation/Retrofit
- Emergency Preparedness and Response
 - Critical Infrastructure

Bangladesh
Indonesia
Kenya
Myanmar
Nepal
Philippines

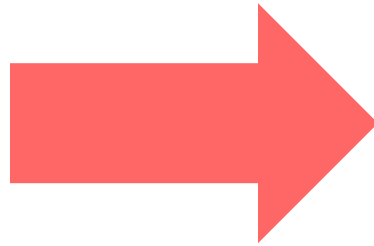
Reach out to the teams here: what works for communicating risk?

Learn from the Japanese and international examples.

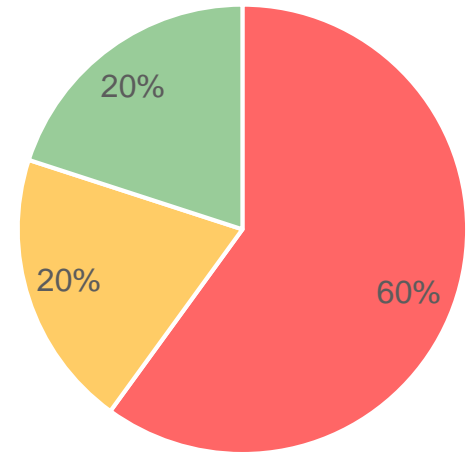
Seismic Monitoring and Alert Systems

~50%

of participants noted they had a seismic risk monitoring and alert in their city/country.



How effective were the systems in the last earthquake?

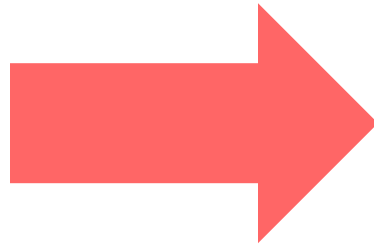


■ Not Effective ■ Partially Effective ■ Effective

Seismic and Tsunami Preparedness

~40%

of participants have
seismic
preparedness
training for residents
and communities.



Drills
took
place in
our
countries
on:

13-Oct-07
26-Apr-17
10-Nov-17
29-Dec-17
1-Jan-18
15-Jan-18
28-Jan-18
18-Feb-18

Japan's
National Disaster
Prevention Day is
September 1st.



Resilient Infrastructure and Building Regulation

~100%

of participants partially integrate resilience into planning, design, construction, operation, and maintenance of infrastructure (e.g., roads, rails, ports, water supply, sanitation, power plants) and building stock

Nevertheless, Challenges Still Prevent Greater Integration of Resilience:

- Priority / Planning
- Lack of Enforcement
- Policy / Technical Standards
- Cost / Budget
- Data / Information (e.g., historical)
- Capacity / Knowledge (e.g., lack of qualified professionals)
- Agency Coordination

2. How will this TDD in Japan advance our approaches to Seismic Risk and Resilience?

We Are Already Investing Together in Seismic Resilience

US\$2.5 billion

in World Bank-supported projects in your countries to address seismic risk

Bangladesh

- Multipurpose Disaster Shelter Project (P146464)
- Bangladesh Urban Resilience Project (P149493)
- Bangladesh Weather and Climate Services Regional Project (P150220)

Ecuador

- ECUADOR RISK MITIGATION AND EMERGENCY RECOVERY PROJECT (P157324)

India

- Uttarakhand Disaster Recovery Project (P146653)
- Uttarakhand Disaster Recovery Project - (P164058)

Indonesia

- DRM Program - (P156711)

Kenya

- Kenya CAT DDO - (P161562)

Malawi

- Malawi CAT-DDO - (P165056)

Myanmar

- Myanmar SEA DRM Project (P160931)

Nepal

- MDTF funding for EHRP (P162067)
- Nepal EHRP Additional Financing (P163593)
- Earthquake Housing Reconst Project - (P155969)

Peru

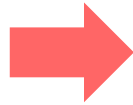
- IMPROVING DISASTER RISK MANAGEMENT IN PERU (P165816)

Philippines

- Reducing Vulnerability to Natural Disaster (P148631)
- Second Disaster Risk Management Development Policy Loan with a CAT-DDO (P155656)

3 Objectives for this TDD

This TDD should help you identify, prepare, and then implement investments in seismic resilience.



1. What are the Facts to Make the Case?

Confirming the importance, economic arguments, and feasibility of investing in seismic resilience.

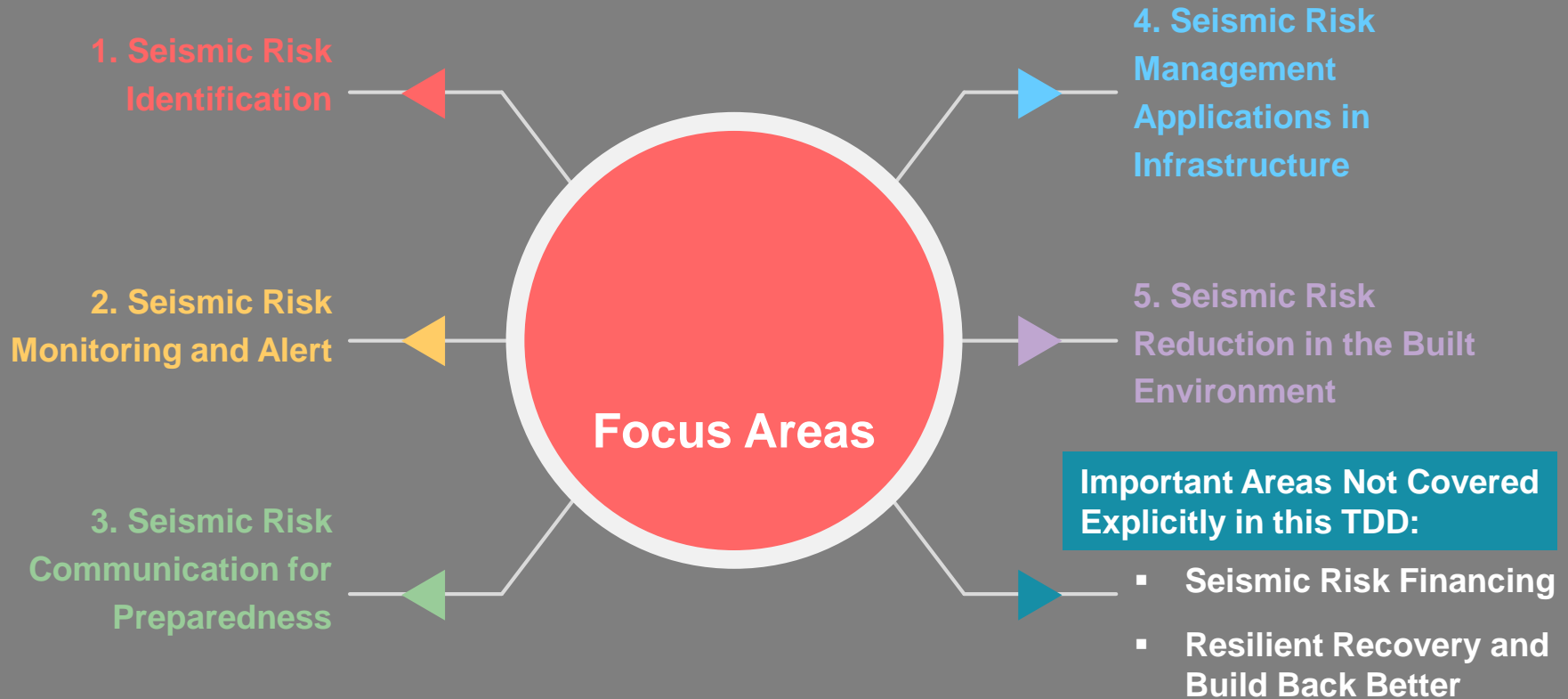
2. What are the Investment Options to Plan and Design?

Opening the range of interventions and investments available to take on seismic risk.

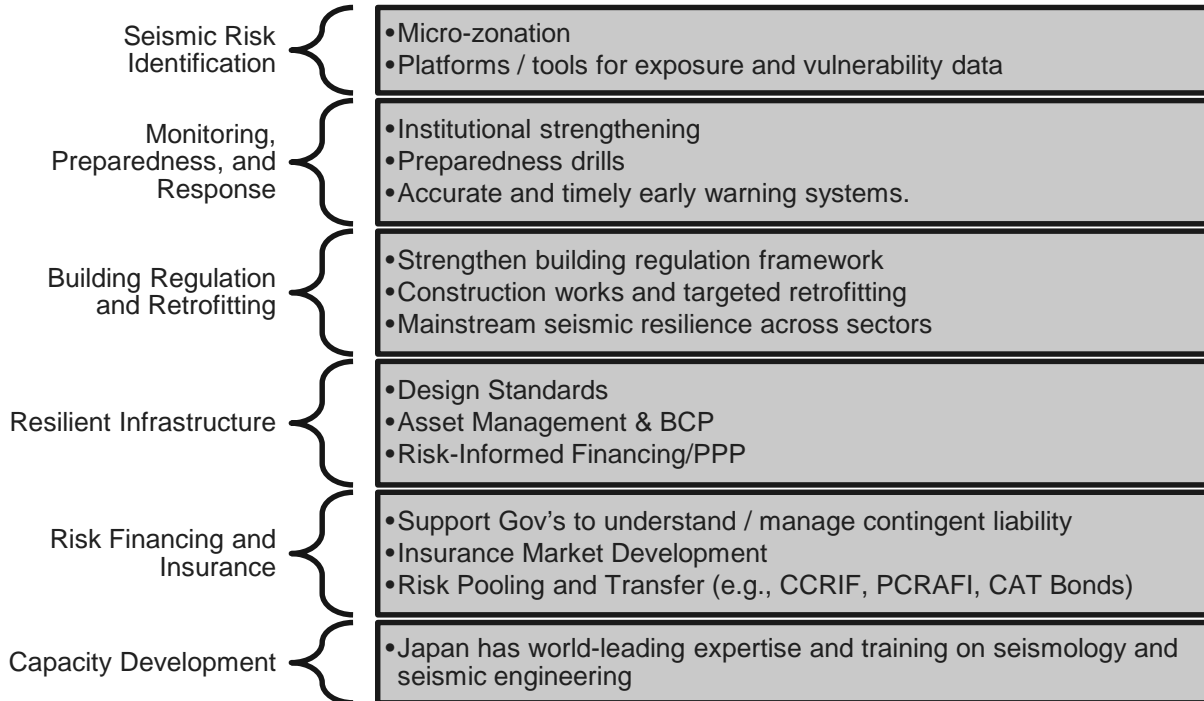
3. What are the Technical Details to Implement?

Connecting the expertise, solutions, and technical and policy details that can support and enhance interventions and investments.

Focus Areas of this TDD



Development Support for Seismic Resilience

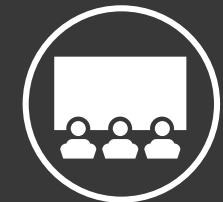


\$8+ billion

In World Bank projects in support of seismic resilience (2005-2017)

\$1.36 billion

World Bank issued **sustainable development bonds in Feb 2018 providing earthquake protection** to Chile, Colombia, Mexico and Peru (CAT Bond)



Financing Engaged: Investment Project, Development Policy, Cat Deferred Drawdown (CAT DDO), P4R, Treasury Operations, Technical Assistance (TA)



Tokyo

- **Focus Area 1: Seismic Risk Identification**
- **Focus Area 2: Seismic Risk Monitoring and Alert for Preparedness**



Sendai

- **Focus Area 3: Seismic Risk Communication for Preparedness**
- **Focus Area 4: Seismic Risk Management Applications in Infrastructure**



Kobe

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Tokyo, Sendai, and Kobe

- **Focus Area 5: Seismic Risk Reduction in the Built Environment**

Areas identified for support after the TDD

Overall Strategy



74%

Risk Identification



68%

Monitoring and Alert



53%

Communication for Preparedness



58%

Resilient Infrastructure



53%

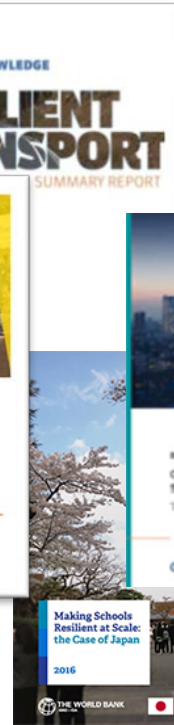
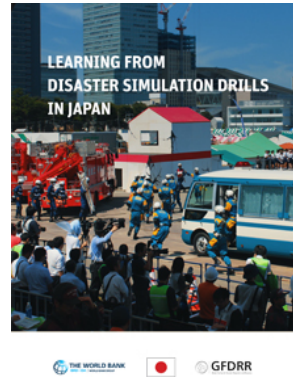
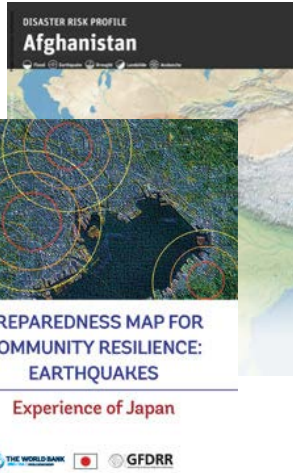
Built Environment



68%

Information is at your Fingertips

Please ask us for the Case Studies and Technical Guidance you are looking for.



1. Seismic Risk
Identification

2. Seismic Risk
Monitoring and Alert

3. Seismic Risk
Communication for
Preparedness

4. Seismic Risk
Management
Applications in
Infrastructure

5. Seismic Risk
Reduction in the Built
Environment

This TDD is just the beginning

What resources are available to keep supporting you?

During this week, please look for the support you need:

1. Expert Consultation / Deployment
2. Technical Assistance
3. Knowledge Notes and Technical Publications
4. Additional Support from Partner Institutions


You will see many things. Ask questions:

- Are TORs, case studies, etc. available?
- If not, can they be translated?
- Is there an expert who can help?

Use the Parking Lot questions board.

 Cabinet Office

 **MLIT**
Ministry of Land, Infrastructure and Transport

 **気象庁**
Japan Meteorological Agency

 **NIED** 国立研究開発法人 防災科学技術研究所
National Research Institute for Earth Science and Disaster Resilience

 **Sendai City**

 **KOBE**

 **TOHOKU**
UNIVERSITY

 **jica**



Tokyo



Sendai



Kobe

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**Thank You and
Welcome to the
World Bank
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on
Seismic Risk and Resilience**

