



Bangladesh Action Plan

Technical Deep Dive on Seismic Risk and Resilience
March 12 – 16, 2018
Tokyo, Sendai and Kobe



Key Takeaways from TDD (Build-Back-Better: Bring Back to Bangladesh)

- 1. We will never forget – documentation of disasters and sharing lessons learnt**
- 2. Kobe City Experience - Emergency Preparedness and Risk Communication and E-defence knowledge**
- 3. Sendai City Experience – Evacuation Center and Early Warning Systems & Re-built initiative**
- 4. Public participation is key to address seismic risk identification & preparedness (Self help & Mutual help)**





Bangladesh Accomplishments Needed

1. Enforcement and Implementation of Building Code
2. Construction Monitoring System and Building Audit Mechanism
3. Procedure for Building Certification and Third Party Inspection
4. Guidance to Building in Deviation – Illegal Structures.
5. Public Awareness on Building Safety





Bangladesh Actions to be Taken



- **Short-term:**
 - Capacity and Institutional Building, by All relevant agencies
 - Vulnerability Assessment and Retrofit Design of Essential Critical Buildings, by RAJUK and Public Works Department (June 2020)
 - Development of Risk Sensitive Land Use plan, by RAJUK (June 2020)
 - Create and Operationalize Urban Resilience Division, by RAJUK (June 2020)
 - Electronic Construction Permitting System, by RAJUK (June 2020)
 - Professional Accreditation Program for Engineers, Architects, Planners, Bar Binders and Masons, by RAJUK (June 2020)
 - Mechanism for Building Code Enforcement and Implementation, by RAJUK (June 2020)
 - Creation of Early Warning System, by Meteorological Department in coordination with Department of Disaster Management
- **Medium-term:**
 - Retrofitting of Existing Critical Infrastructure/Buildings, by RAJUK and Public Works Department
 - Vulnerability Assessment and Retrofit Design of Critical and Essential Infrastructure (gas, water, electric), Utility Agencies
 - Risk Management and Risk Communication, by Department of Disaster Management, Fire Service, City Corporations, RAJUK, PWD
 - Regional Collaboration and Coordination for Risk Mapping, Bangladesh, India, Nepal, Myanmar
- **Long-term:**
 - Retrofitting of Essential Infrastructure (gas, water, electric), Utility Agencies
 - Ensure resilient new construction



Barrier/Challenge of Implementation of Plan

1. Low public awareness to seismic risk due to long history of last seismic event
2. Lack of sensitization and proactive participation of political leaders associated with seismic risk
3. Deficiencies in Institutional Preparedness and Management Capacity
4. Limited budgetary allocations for proactive measures of DRR mainstreaming
5. Lack of evidence based policy making (need for R&D and policy)
6. Absence of publicly available information and accessibility
7. Weak governance in implementation and enforcement





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Bangladesh Support Needed

- **World Bank:**
 - Investment Projects – Phase 2 of Bangladesh Urban Resilience Project
 - Knowledge Sharing, Training and Capacity Building
- **DRM Hub**
 - South-South Knowledge Exchange
 - Knowledge Sharing, Training and Capacity Building
- **Knowledge Products (Case Studies, Policy Notes, etc.)**
 - Technical Assistance related to Seismic Risk and Resilience – Including TORs, Technical Specifications, Market Survey of Firms
 - Case Studies of other countries
 - Documentation of successful transformation (Japan, Chile, Turkey, Philippines etc.)



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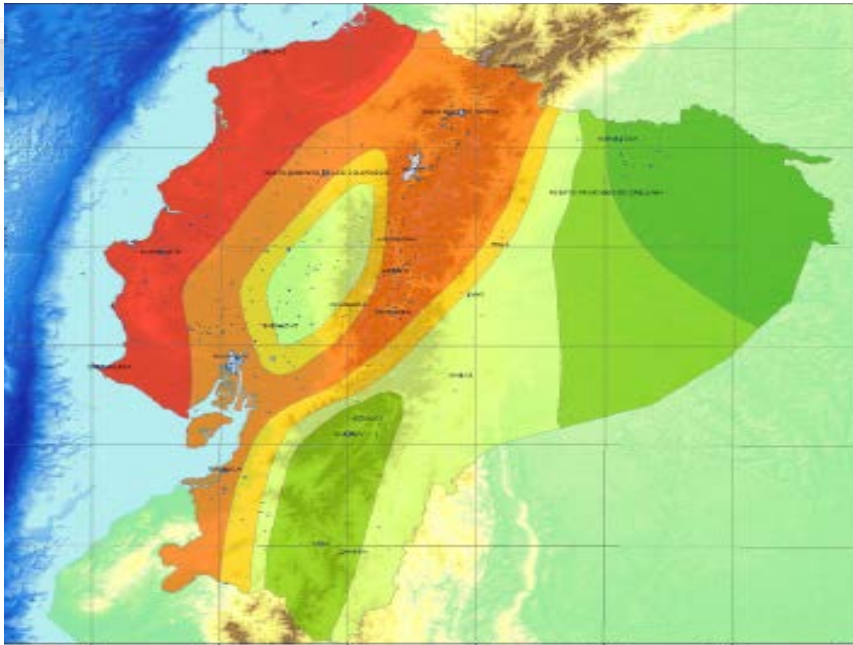


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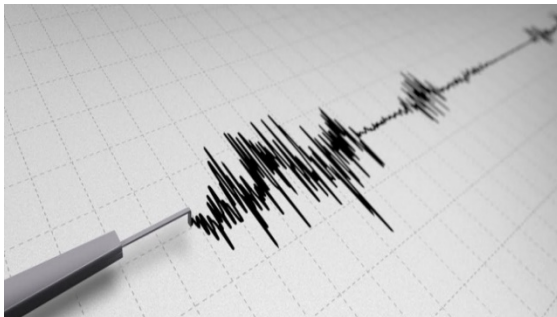
ECUADOR Action Plan

Technical Deep Dive on Seismic Risk and Resilience
March 12 – 16, 2018
Tokyo, Sendai and Kobe
Pablo Armas



ECUADOR Key Takeaways from TDD

1. Seismic Risk Identification
2. Seismic Risk Preparedness
3. Seismic Risk Reduction in the Built Environment
4. Disaster Response



ECUADOR Accomplishments Needed (Part 1)

1. Seismic Risk Identification

1. Update National Seismic Hazard Map
2. Conduct Microzonation (Produce City-Specific Seismic Hazard Maps)

2. Seismic Risk Preparedness

1. Improve/Increase Seismic Monitoring Instrumentation
2. Train Technical staff on new Ecuadorian Building Code (NEC)
3. Train Non-Technical Staff (brick layers, artisans, etc.) on NEC
4. Train Communities on Seismic Risk

ECUADOR Accomplishments Needed (Part 2)

3. Seismic Risk Reduction in the Built Environment

1. Mitigation:

1. Evaluate Essential Buildings
2. Execute Structural Reinforcement of Essential Buildings
3. Build Regulatory Capacity in Line with Recommendations of WB/CRO “Preliminary Building Regulatory Capacity Assessment” for Quito (July 2017)
4. Regulate Engineering Designs and Construction Processes

4. Disaster Response

1. Develop National Response Plan according to Response Strategy developed with WBG support
2. Raise Awareness and Conduct Disaster Response Drills at National, Local and Community levels.

ECUADOR Actions to be Taken

- **Short-term (1 year at least):**

- Update National Seismic Hazard Map – IGEPN & SGR
- Improve/Increase Seismic Monitoring Instrumentation – IGEPN & SGR
- Develop NRP according to Response Strategy developed with WBB – Consultants & SGR
- Raise awareness and conduct drills at National, Local and Community levels – SGR
- Develop a handbook with effective guidelines to regulate and control engineering designs and construction processes Consultants & MIDUVI

- **Medium-term (2-3 years):**

- Conduct Microzonation (City-Specific Seismic Hazard Maps) – Consultants, IGEPN & SGR
- Evaluate Essential Buildings – Consultants, MIDUVI & SGR
- Raise awareness and conduct drills at National, Local and Community levels – SGR
- Train Technical staff on Ecuadorian Building Code (NEC) – MIDUVI & SENESCYT
- Train Non-Technical Staff (brick layers, artisans, etc.) on NEC – Academia
- Train Communities on Seismic Risk – Local Government-SGR
- Build Regulatory Capacity in line with “Preliminary Building Regulatory Capacity Assessment” – Local Government
- Regulate engineering designs and construction processes – Local Government

- **Long-term (4-5 years):**

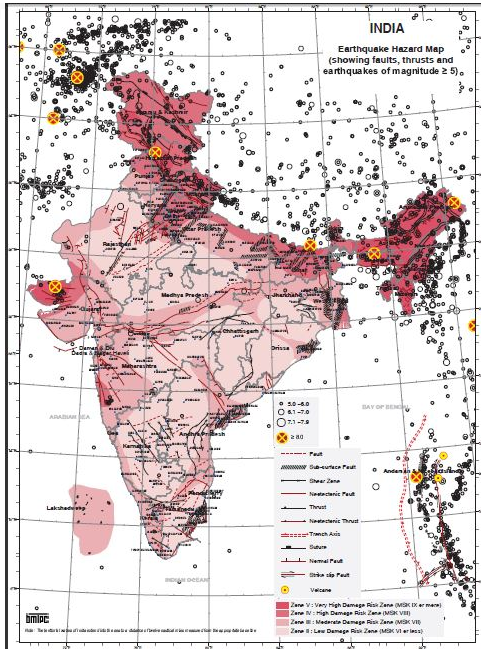
- Execute Structural Reinforcement of Essential Buildings – Contractors, Consultants, Local Government, MIDUVI & SGR


Barrier/Challenge of Implementation of Plan


1. Ecuadorian economic situation (Seek international assistance to complement Government funding)
2. Prioritization of needs/projects of Central Government (Advocate for seismic risk management agenda)
3. Technical Staff familiarity with NEC and its application (Conduct trainings)
4. Community awareness of seismic risk (conduct awareness campaign, training and drills)

ECUADOR Support Needed

- World Bank:
 - Technical assistance and financing
- DRM Hub/TDLC Program
 - Technical assistance on Disaster Risk Management/Seismic Hazard
- Knowledge Products (Case Studies, Policy Notes, etc.)
 - Building regulations, seismic preparedness, structural reinforcement, people relocation and any other policies implemented after Hanshin-Awaji Earthquake




NATIONAL DISASTER MANAGEMENT GUIDELINES
MANAGEMENT OF EARTHQUAKES


 April 2007

NATIONAL DISASTER MANAGEMENT AUTHORITY
 GOVERNMENT OF INDIA



India Action Plan

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India - Key Takeaways from TDD



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1. Long term vision & Strategy, and its translation from national level to local level
2. Incorporating lessons from past disasters to minimize future damages/losses
3. Risk communication as a key strand to build disaster resilience
4. Comprehensive planning and Engagement with the key stakeholders (Govt. Sector, Private sector, Educational institutions/research Institutions, public)
5. Investment in focused R &D, collaboration and global outreach



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India - Accomplishments Needed



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1. Ensuring the incorporation of earthquake resistant design features for the construction of new structures
2. Facilitating selective strengthening and seismic retrofitting of existing priority and lifeline structures in earthquake-prone areas
3. Improving the compliance regime through appropriate regulation and enforcement
4. Improving the awareness and preparedness of all stakeholders.
5. Introducing appropriate capacity development interventions for effective earthquake management
6. Strengthening the emergency response capability in earthquake-prone areas



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India - Actions to be Taken

- **Short-term:**

- Realistic and Scientific Seismic Zonation - *Bureau of Indian Standards, National Centre for Seismology, National Disaster Management Authority (NDMA)*
- Standardized Building Permit System- pilot in selected Urban Local Bodies- *Ministry of Housing & Urban Affairs*
- National Seismic Safety Policy - NDMA

- **Medium-term:**

- Inclusion of Earthquake Engineering in the Curriculum of Civil Engineering and Architectural Engineering - *All India Council of Technical Education (AICTE)*
- Professional Civil Engineers' Bill - *Ministry of Human Resource & Development (MHRD)*

- **Long-term:**

- Centre of Innovation on Earthquake Engineering on the line of NIED, Japan - *MHRD*
- Seismic Retrofitting programme for Lifeline structures - *NDMA*
- Regional Earthquake Early Warning System - *NCS*

Barrier/Challenge of Implementation of Plan

1. Lack of awareness among various stakeholders
2. Inadequate attention to structural mitigation measures in the engineering education syllabus
3. Lack of provision and Inadequate monitoring and enforcement of earthquake-resistant building codes and town planning bye-laws
4. Absence of systems of licensing of engineers and certification of artisans
5. Need for Inter-agency support and coordination

India - Support Needed

- World Bank:
 - Technical Assistance/Project – Risk Assessment, Building Regulation, mitigation & emergency response, Critical infrastructure protection and Asset Management
- TDLC Program
 - TDD on seismic Risk Resilience for Policymakers
 - India-Japan Collaboration for Knowledge Sharing
- Knowledge Products (Case Studies, Policy Notes, etc.)
 - Seismic Safety Policy of Japan and other countries
 - J-Alert by JMA
 - Active-passive devices for earthquake resistant buildings / Regulatory Framework



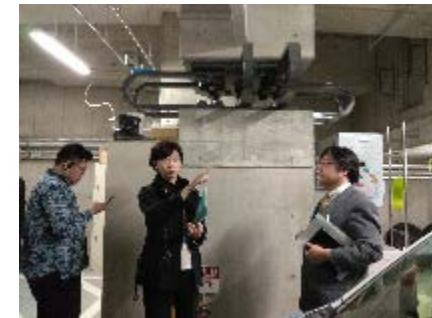
INDONESIA Action Plan

Technical Deep Dive on Seismic Risk and Resilience
March 12 – 16, 2018
Tokyo, Sendai and Kobe



Indonesia Key Takeaways from TDD

1. **Never Forget the History** and impacts of major disasters in our country.
2. **Data and information system**, and **strong capacity** to conduct analysis, is necessary for accurate qualitative and quantitative risk assessments.
3. The importance of **law enforcement** related to building regulations.
4. Need to develop or strengthen **capacity and awareness** of municipal/city governments and local communities.
5. Need to strengthen **communication and coordination** among line ministries, between central and local government, and between government, university, and international organization



Indonesia Accomplishments Needed

1. Improved central government **capacity** to conduct risk assessments that include micro-zonation maps, and dealing with urbanization and remote islands
2. More innovative and alternative methods of **disaster financing and investment** on DRR.
3. Better **knowledge sharing and knowledge management** for disaster management and risk reduction, e.g., sharing stories, books, lessons learned
4. **Harmonization of Disaster Management Master Plan** regulation (forthcoming) and building regulations (existing), as well as other related actions and regulations (e.g., Sendai Framework, Climate Change Agreement, SDGs, etc.).
5. Improve the **capacity of local government agencies**, particularly in conducting risk assessments to prepare disaster risk management action plan and M&E plan.
6. **Increase awareness** through education, public communication, socialization to the public (e.g., building code regulations, operational procedures, drill simulations, community preparedness, community resilience).
7. **Improve collaboration and cooperation** with private sector, university/academia, and NGO stakeholders.

InaRISK
Personal



INDONESIA RISK
ASSESSMENT BOOK



Safe School Implementation In Indonesia



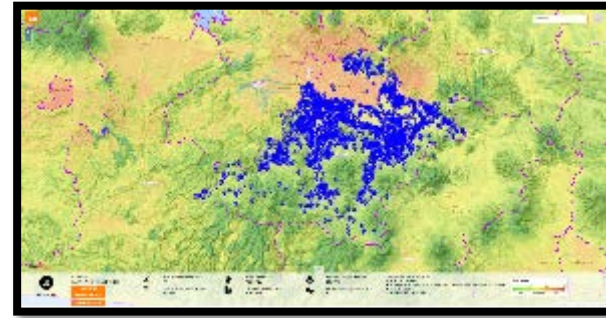


Safe School Implementation In Indonesia



Indonesia Actions to be Taken

SEISMIC HAZARD AND SCHOOL LOCATIONS



Multi-Hazard Early Warning System (MHEWS)



Short-term:

- Harmonize Disaster Management Master Plan regulation (forthcoming) and building regulations (existing), as well as other related actions and regulations (e.g., climate change, SDGs, etc.) by Bappenas/BNPB
- Identify champions and agents of change (e.g., government agencies, researchers) by Bappenas/BNPB
- Build capacity at local and central levels to identify analysis, prepare risk modeling, and conduct regulation/enforcement by MoHA/Bappenas/BNPB

Medium-term:

- Review and improve methodology of disaster risk assessments (e.g., risk maps, risk-informed spatial planning, climate change, environmental safeguards); national standards of building and infrastructure regulations by Bappenas/PUPR/BNPB/BMKG/ATR/BG/universities/private sector
- Strengthen knowledge management of DRM practices – championing especially DRR (e.g., InaRISK, BNPB/BPBD knowledge hub)
- Strengthen capacity of local governments to implement and enforce building codes including building audits, monitoring and inspections by PUPR, private sector, NGOs and universities.

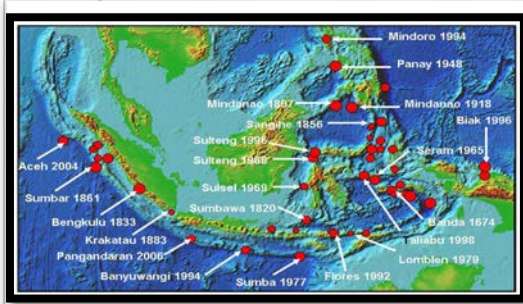
Long-term:

- Identify options for effective disaster risk financing, insurance, and investment by Bappenas/MoF/PUPR
- Develop an effective EWS to communicate seismic risk information across Indonesia (need to increase number of monitoring stations and improve risk information and data dissemination) by BMKG/BNPB

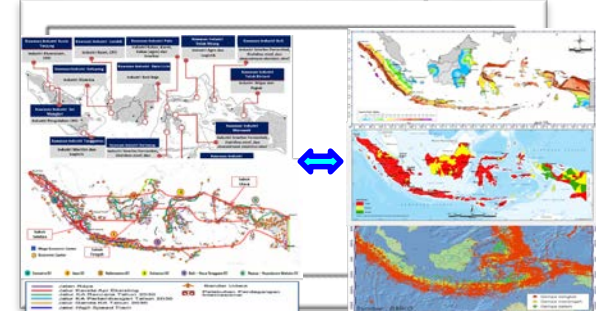
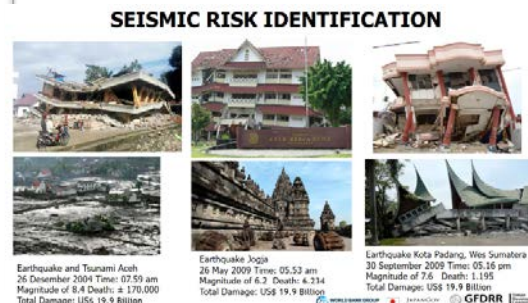


Barrier/Challenge of Implementation of Plan

- 1. Gaining supports** from the Parliament and Political Parties. Need more public discussion and consultation to mainstreaming law and regulation.
- 2. Disseminating data and information equally and effectively** to the local governments particularly in the remote areas. Sharing information through InaRisk.
- 3. Improving quality and priority on budgeting.** Eventhough Disaster Risk Management become one of the national priority program in the Annual Budget, but mostly focusing more on curative actions.
- 4. Improving awaranness of the local communities** with diffeent sosical and culture. Need more communication, socialization and sharing information using.
- 5. Convincing and involving actively private sectors** on the implementation of Disaster Risk Management. Need more sharing



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Indonesia Support Needed



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- **World Bank:**
 - Technical assistance on the knowledge center on Disaster Management and Risk Reduction.
 - Training/Course/Sharing Knowledge and Experience
- **TDLC Program**
 - Technical Training for the National and Local Government staffs
 - Improve the Methodology of Risk Assessment
- **Knowledge Products (Case Studies, Policy Notes, etc.)**
 - Regulation on Building Code
 - Success story of Disaster Risk Management



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International Standards



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1. **ISO 22327 (Landslide Early Warning System)** was Enacted in Sydney, 15 March 2018.
2. Proposed a series of Standards for Specific Hazards e.g. **Flooding, Volcanic Eruption and Tsunami** (ISO/TC 292 Next Meeting Plenary in Norway)



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Terima Kasih
Doomo Arigato Gozaimasu
Thank You



HAKONE IKIMASHOO



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Kenya Action Plan

Technical Deep Dive on Seismic Risk and Resilience
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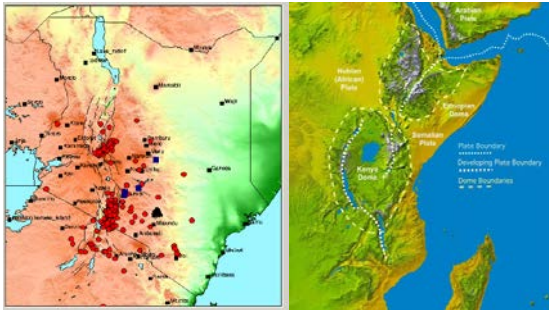
Kenya Key Takeaways from TDD

1. Preparedness is expensive but not doing so is even more expensive
2. Neighboring countries face similar challenges, we should share experiences and data and look for regional cooperation (i.e. seismic hazard mapping)
3. Roles and responsibilities for emergency response and early warning systems should be clearly defined (who coordinates, who participates and who supports)
4. Building regulations have proven to be effective importance to keep updating with the lessons from the different events
5. Technical capacity is a fundamental pillar and should be continuously improved



Kenya Accomplishments Needed

1. Improved seismic network and hazard/ risk information
2. Strengthen building regulations and implementation capacity
3. Create risk awareness



Kenya Actions to be Taken for the improvement of seismic information



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- **Short-term:**
 - Mapping stakeholders (Metereological Dept., University and line Ministries) – Ministry of Mining
 - Organizing a regional workshop and development of a road map - Ministry of Mining with WB support
- **Medium-term:**
 - Creating coordination mechanism for seismic risk monitoring
 - Collecting existing information and identification of gaps for a national seismic hazard map to inform building regulations
- **Long-term:**
 - Developing a national seismic hazard map to inform building regulations
 - Designing a seismic network and road map for implementation



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Kenya Actions to be Taken to strengthen building regulations and implementation capacity



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- **Short-term:**

- Stakeholder validation workshop to discuss current draft of the built environment bill
- Finalizing the bill and submit for cabinet and parliament approval
- Definition of road map for legislation (regulation framework and standards) and capacity building

- **Medium-term:**

- Development of the regulations and standards including sanction mechanisms
- Assessment of capacities and gaps of approval process (siting, design, inception, construction, up to decommission)
- Strengthen audit and inspection of building and other structures for safety
- Start capacity building implementation (local governments, practitioners, professional bodies, developers, etc.)

- **Long-term:**

- Develop a prototype of the approval of development projects
- Continue capacity building implementation (local governments, practitioners, professional bodies, developers, etc.)
- Conduct periodic regulation reviews
- Conducting comprehensive vulnerability assessment of buildings (critical and high population density buildings)
- Formulation and implementation of land use plans at the country level

Kenya Actions to be Taken for Create risk awareness and sensitization



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- **Short-term:**
 - Creating political awareness – lobby for the incoming regulations – statistics and human and economic effects of the building collapses
 - Community sensitization of main causes of building collapses
- **Medium-term:**
 - Dissemination of building regulations and standards
 - Design and implement a media campaign
- **Long-term:**
 - Revise professional curricula for architects and engineers
 - Technical vocational training
 - Training of trainers
 - Development of user friendly / simplified guidelines for different security and safety issues



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Barrier/Challenge of Implementation of Plan

1. Political interference – corruption
2. Lack of awareness about building security from tenants
3. Impunity
4. Lack of ethics
5. Rapid rural-urban migration increasing demand for housing
6. High poverty levels make people live in squalid conditions



Kenya Support Needed



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- **World Bank:**

- DRM and Urban Policy dialogue through the CAT DDO
- Expertise in seismic hazard mapping and regional workshop
- Support in building regulation road map (BRR support) and built environment bill validation workshop
- Development of communication materials

- **DRM Tokyo Hub**

- Capacity building opportunities in built environment
- Capacity in seismic monitoring and link to JMA on the design of the seismic and tsunami network

- **Knowledge Products (Case Studies, Policy Notes, etc.)**

- Support Revision and validation of the built environment bill
- Support seismic hazard / vulnerability studies



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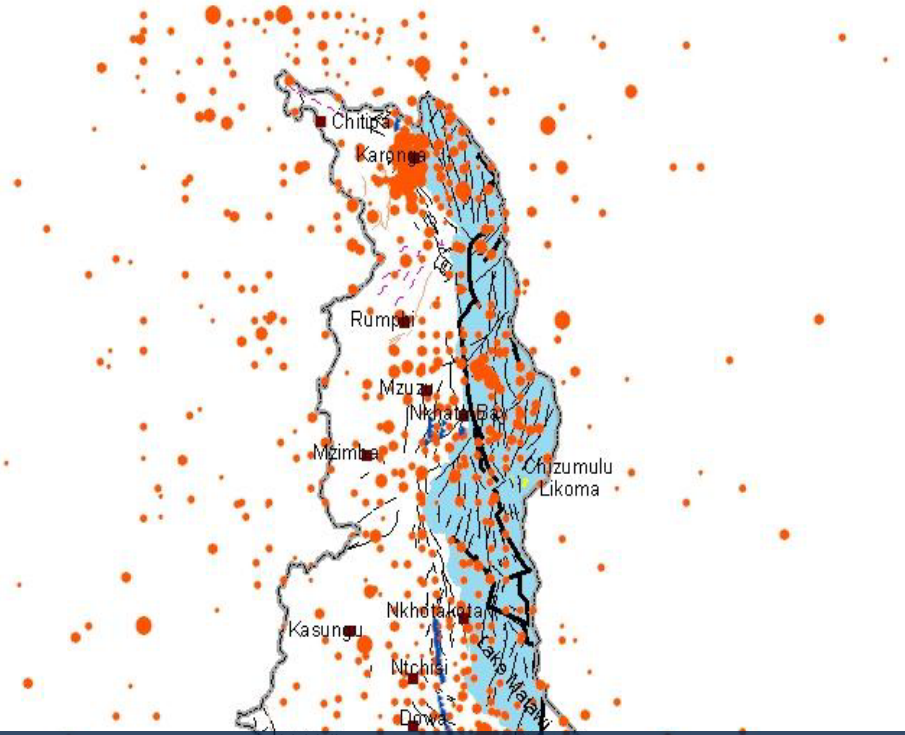
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DEPARTMENT OF
DISASTER MANAGEMENT AFFAIRS
OFFICE OF THE PRESIDENT AND CABINET

Living with Earthquakes

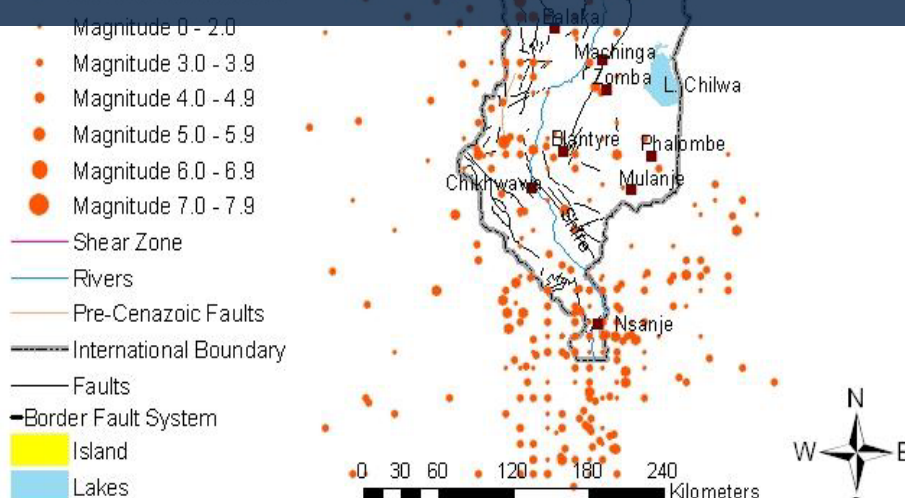


Our Vision: 'A Nation Able to Cope with Disasters'



- Legend
- Districts
 - Monoclinical Structures
 - Magnitude 0 - 2.0
 - Magnitude 3.0 - 3.9
 - Magnitude 4.0 - 4.9
 - Magnitude 5.0 - 5.9
 - Magnitude 6.0 - 6.9
 - Magnitude 7.0 - 7.9
 - Shear Zone
 - Rivers
 - Pre-Cenozoic Faults
 - International Boundary
 - Faults
 - Border Fault System
 - Island
 - Lakes

Malawi Action Plan



Technical Deep Dive on Seismic Risk and Resilience

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Malawi's Key Takeaways from TDD



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1. Seismic risk reduction, just like other risks, requires investment and prioritization
2. Effective building regulations that are enforced are key to seismic resilience
3. Taking stock of previous disasters, learning from them and doing things differently based on the lessons learnt
4. Seismic resilience requires working with multiple stakeholders with different expertise: local and national government, academia, research institutions, private sector, development partners, NGOs, media, communities, professional bodies, professional institute etc.
5. Utilizing multiple ways of communicating to public and among actors
6. Capacity building across the board, tailor-made for different players



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Malawi Accomplishments Needed



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1. Capacity of key players built for seismic risk management
2. Seismic hazard mapping finalized to guide design of programmes, support design and implementation of regulations
3. A nation aware of seismic risk, including what to do to mitigate, prepare and respond to seismic risk
4. Building Act in place
5. Building regulations that integrate resilience finalized (process underway)



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Malawi Actions to be Taken

Short-term (1 – 6 months):

- Undertake stakeholder mapping/analysis
 - Lead: Department of Disaster Management Affairs (DoDMA), Department of Geological Surveys (DGS), Dept. of Buildings
- Develop seismic risk communication strategy and undertake public awareness
 - Lead: DoDMA, DGS, Min. of Information, Dept. of Buildings
- Capacity assessment/mapping
 - Lead: Dept. of Buildings/DGS
- Participate in regional workshop to learn/share experiences and develop roadmap
 - Lead: World Bank, Dept. of Buildings, DoDMA

Malawi Actions to be Taken



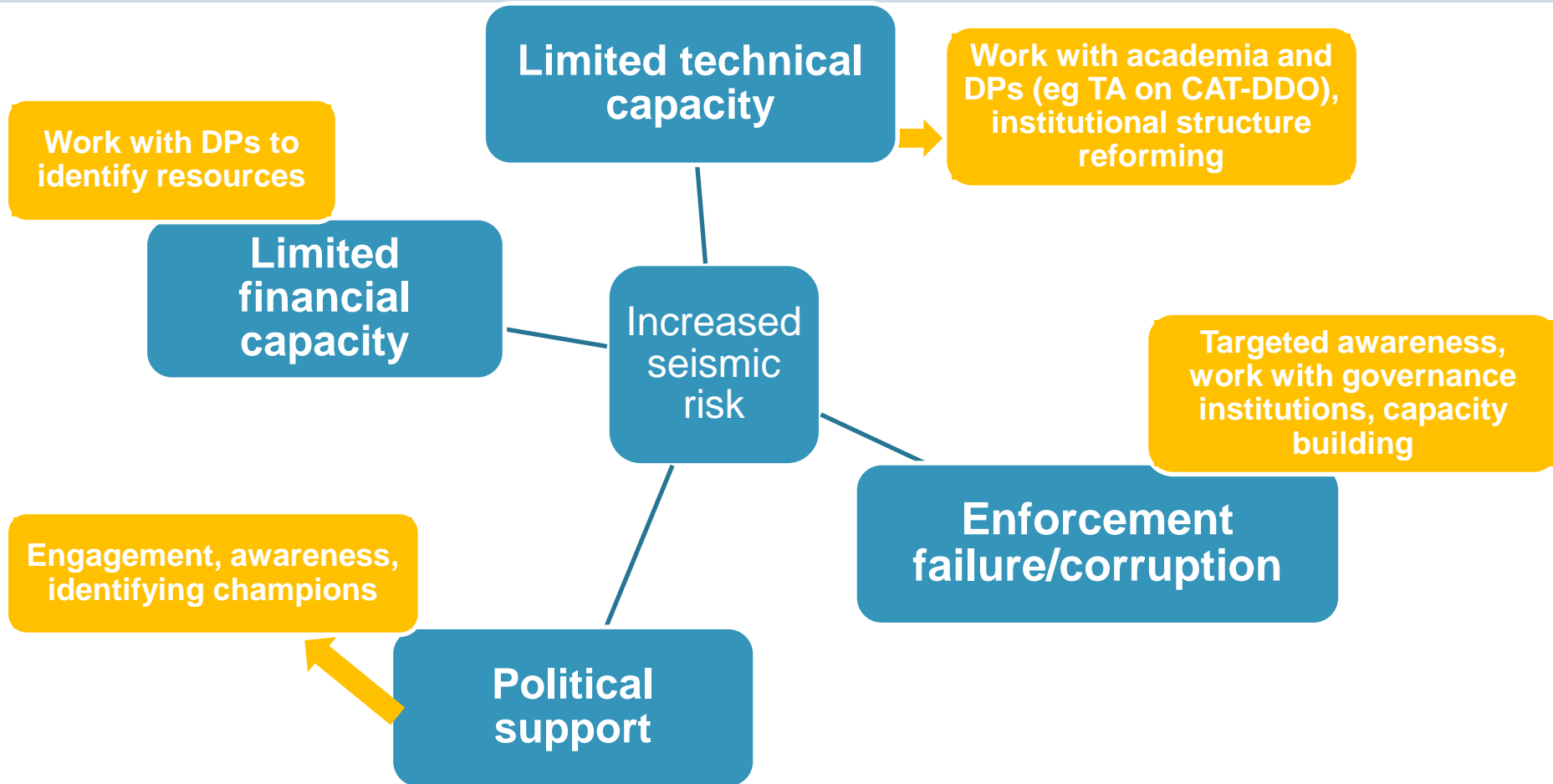
Medium-term (7 months to 2 years):

- Capacity building and institutional strengthening (buildings legislation, seismic monitoring)
 - Lead: DGS, DoDMA, Department of Buildings
- Finalize building regulations
 - Lead: Department of Buildings
- Undertake seismic risk mapping/assessment
 - Lead: Department of Geological Surveys
- Develop Buildings Regulations
 - Dept. of Buildings
- Develop a Buildings Act
 - Lead: Department of Buildings

Long-term (over 2 years):

- Review curriculum at primary, secondary and tertiary levels to integrate seismic risk and support long-term training programmes
 - Lead: DGS, Dept. of Buildings, DoDMA
- Investment in seismic monitoring systems (eg. equipment)

Barrier/Challenge of Implementation of Plan



Key
Blue: Barrier
Amber: Effort to address

Support Needed

World Bank:

- Support requested for ff. country-driven initiatives:
 - regional workshop on experience sharing and developing roadmap
 - seismic risk communication strategy and conduct public awareness
 - capacity assessment on seismic risk (identification, monitoring, early warning, etc)
 - seismic risk mapping
 - buildings act and building regulations

TDLC Program

- Facilitate learning, through exchange of knowledge and experience
- Technical support in designing of programmes (awareness, regulations, Act, etc)

Knowledge Products (Case Studies, Policy Notes, etc.)

- Previous/current samples of building regulations/Acts that have integrated resilience
- Reports on previous/current processes to undertake related work: legislation, hazard mapping, capacity assessment
- Public awareness kits on seismic risk



Myanmar Action Plan

Technical Deep Dive on Seismic Risk and Resilience

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Myanmar Key Takeaways from TDD



Regulatory

Building Code
Building Act
Subsidy Program
Building Confirmation

Law Enforcement
Building Capacity
Implementation
Mechanism

Seismic

Vulnerability Map
Macro Hazard Zoning
Micro Seismic Geotechnical
Zoning

Risk Score
Risk & Cost Analysis
Seismic Design

Disaster Preparedness

Redundancy of Information
Preparedness counter Measure
Disaster waste management

J Alert & L Alert
CSO Prevention Measure
Prototype Buildings
Awareness Program



Myanmar Accomplishments Needed

Through our program, we are aiming to improve the resilience and safety of the built environment in Yangon.

What We Need to Do Now:

- Strengthen & Modernize the Building Regulatory Framework**
 - Build capacity of EDB to understand and address drivers of risk
 - Develop a regional-level approach for (i) rules and regulation and (ii) enforcement
- Ensure seismic resilience of critical public facilities**
 - Retrofit critical buildings with high occupancy (e.g., markets, schools, hospitals)
 - Preserve and protect Cultural Heritage value
 - Assess vulnerability of critical lifelines (e.g., water supply network)

Related Next Steps Needed:

- Develop options for reducing the risk in the existing private building stock
- Develop a seismic vulnerability map & Risk and Cost Analysis



Myanmar - Actions to be Taken

Engineering Department (Buildings) - EDB and the Yangon City Development Committee (YCDC) have a busy year ahead!

	Short (0-6 months)	Medium (7-12 months)	Long (12+ months)
Water Supply Network	Preliminary risk assessment of water supply network and water reservoir intake structure	Detailed risk assessment and design of retrofit of water supply system	Retrofit pumping stations, air compressor stations. and water supply infra
Building Infra	Building Regulatory Capacity Assessment	<p>Detailed design of retrofit solutions for priority public facilities (e.g. markets)</p> <p>Deploy Database or other Software Solution to enhance permit review and enforcement (e.g., building database, plan archive)</p>	<p>Retrofit priority public facilities (e.g. markets)</p> <p>Implement Action/ Investment plan to strengthen/modernize building regulatory framework</p> <p>Assessment of seismic vulnerability of residential and public buildings (collaboration with Myanmar Engineering Society – MES)</p> <p>Develop and pilot retrofit guidelines for existing unsafe apartment buildings</p>

Barrier/Challenge of Implementation of Plan

☹ Experience with Technology Implementation

- Working with Development Partners (DPs) to support, but still tough!

Financial Constraints

- Work with TA and Credit from World Bank and DPs

Limited HR and Capacity

- Training and Capacity Development

Poor Regulatory Enforcement

To be enhanced by the Actions to be Taken (last slide) – Role Clarification and Empowerment

Poor Coordination (e.g., Gov, Education, NGOs, DPs)

Lack of Experience with DPs

- That's why we're here!

Myanmar Support Needed

The World Bank is supporting YCDC through the US\$117 million Myanmar Southeast Asia DRM project and GFDRR/ DRM Hub is supporting with a Resilient Urban Infrastructure TA grant. More support will be needed to take on this challenge.

DRM Hub through this TDD:

- Enhance partnership with World Bank and JICA for future operations
- Connect/partner with Kobe City, Japanese ministries, and universities (e.g., Kyoto U, Kobe U, tech institutes) to train EDB staff on structural analysis, geo-seismic engineering, practical lessons on enforcement from Japan (e.g., Kenchikushi, confirmation vs. approval)

Knowledge Products:

Building Regulation:

- Sample TOR for base isolation
- Guidance/lessons from retrofitting incentive program in Kobe

Water Supply



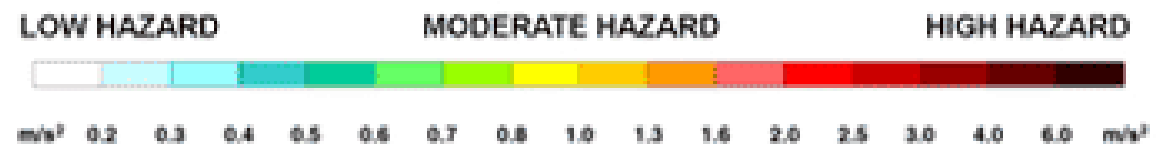
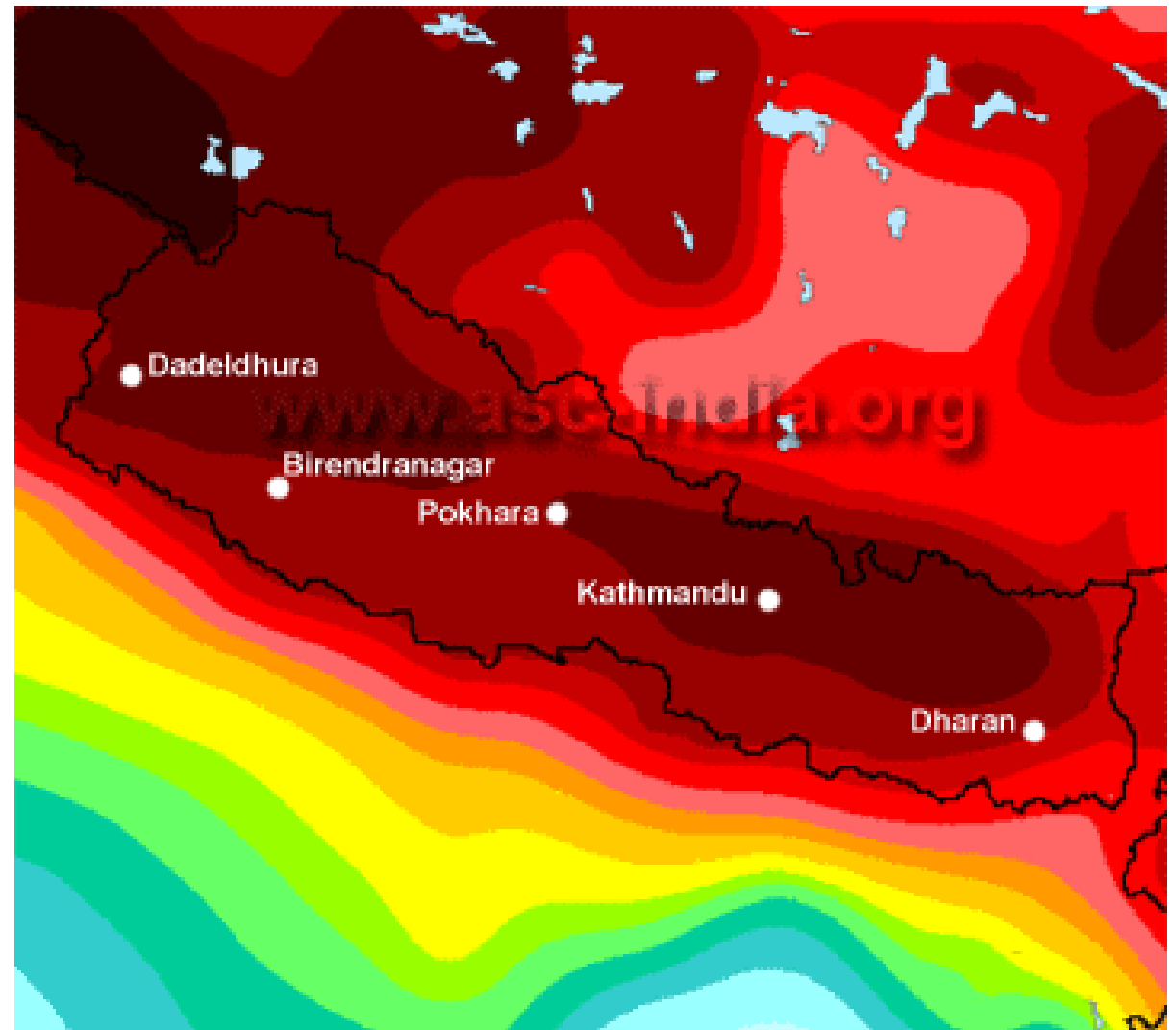


Thank You



Action Plan: Nepal

March 16, 2018



What I take



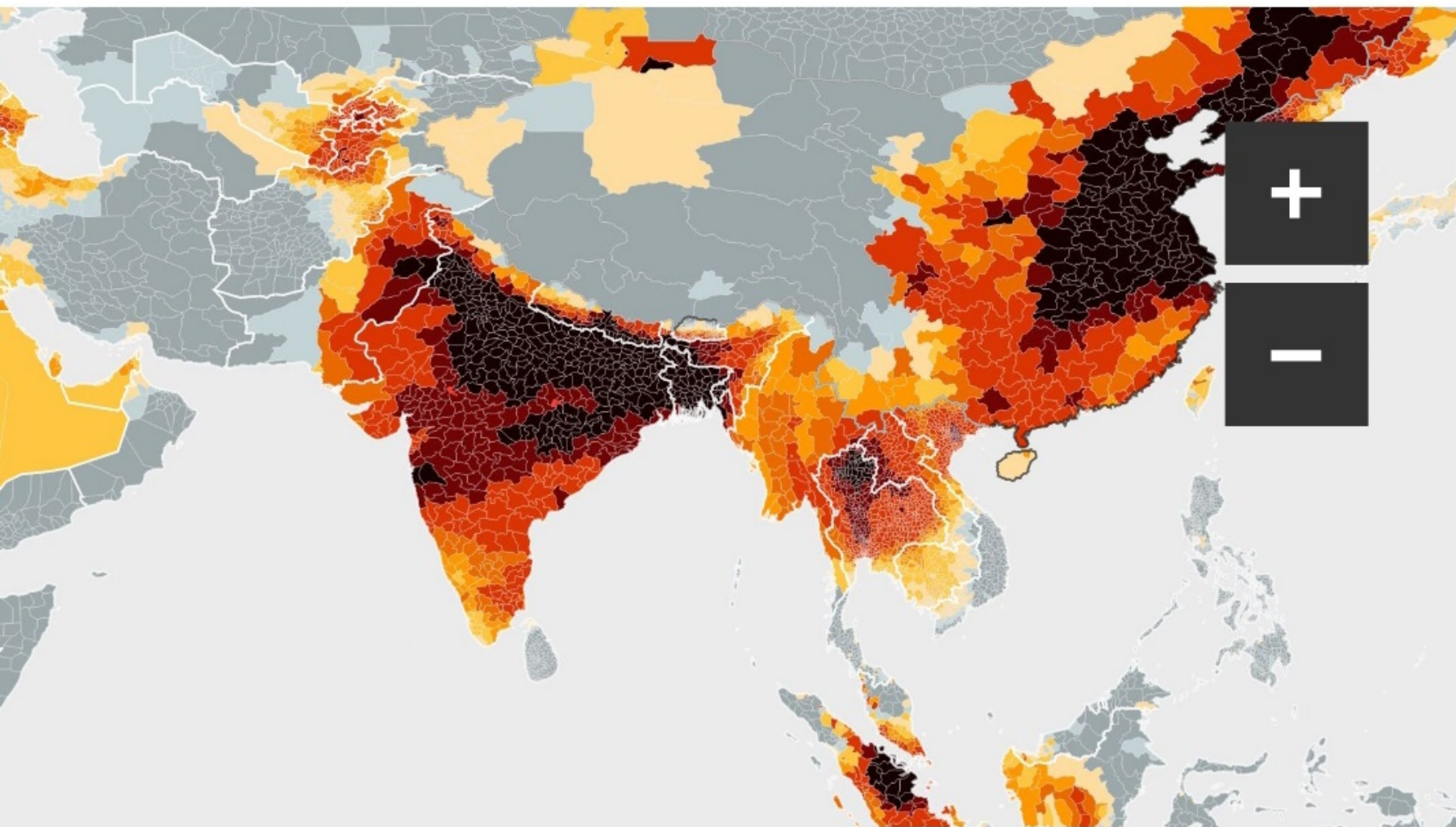
What I take Why is a bigger question..

- Change is taking place, but
- Please recall “violators are publicly named and they lose social trust ”
- “culture of interdependence, of communal participation, or combined responsibility, with sense of sympathy for others.” – *Amartya Sen**
- Giri (義理) defined by one dictionary as “the proper way of things”, others define it as ‘duty’, ‘obligation’
- Wa (和) is a Japanese cultural concept, simple English translation “Harmony”: Rationality of cultural harmony
- Banging – experience retention – preparedness – long-term orientation (Confucius stream)
- *<http://factsanddetails.com/japan/cat19/sub120/item642.html>

Context: Nepal

- Disaster prone
- Rapid unplanned urbanization
- Coordination/ Enforcement
- Composite hazard risk assessment**
- Preparedness/ Risk Assessment not an election issue
- Poverty
- Transition
- DRM Concurrent Subject
- Climate Risks (1.6-2.2°C)/2050

** Asian Disaster Preparedness Center (ADPC), Norwegian Geotechnical Institute (NGI) and Centre for International Studies and Cooperation (CECI)

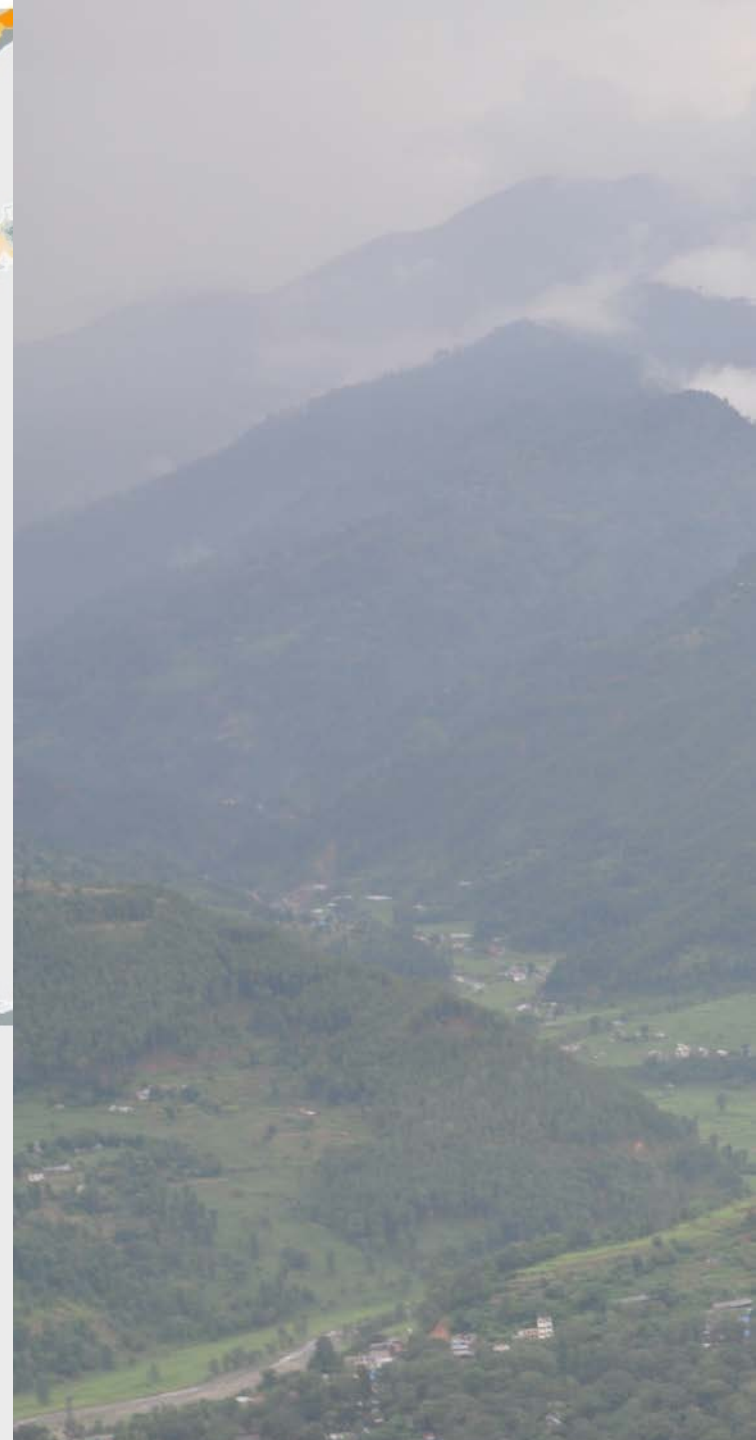


Number of years saved if country meets WHO standard



0.1 0.3 0.6 0.9 1.2 1.5 2.5 3.5

https://aqli.epic.uchicago.edu/wp-content/uploads/2017/09/AQLI_1Pager_Final.pdf



Action Plan



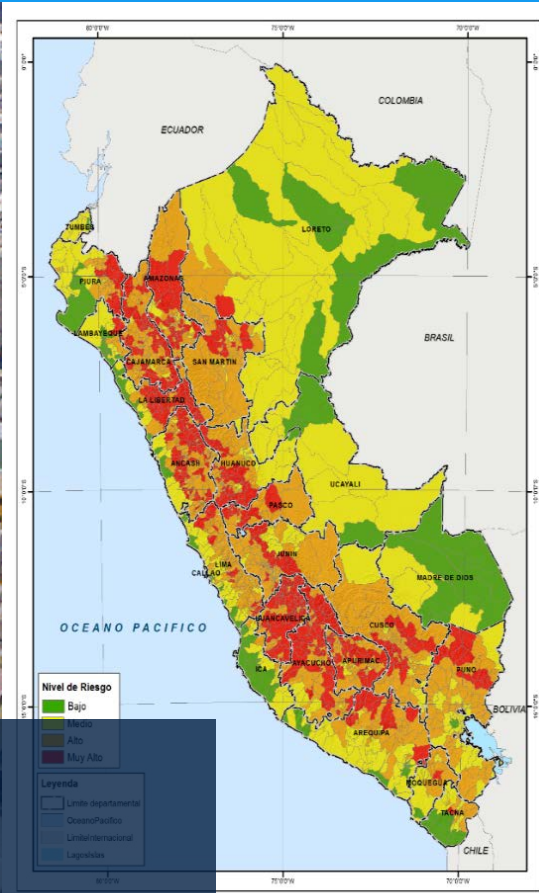
Action Plan: Balance

- Climate Risk: Regional Linkages/ Analysis
- Stocktaking
- Supporting government in decentralization of DRM
 - Review of DRM Act
 - Proactivity
 - Institutional setups
 - Centre
 - Provinces
 - Local governments
 - Rules of business
 - Coordination mechanisms
 - Capacity building / micro-zonation
- Awareness – community based pilot (law is will of the people)
- Ideal: political issue (in long run)
- Support: All the above (ToRs/ Expertise)



Thank you

EEE



PERU Action Plan

Technical Deep Dive on Seismic Risk and Resilience
March 12 – 16, 2018
Tokyo, Sendai and Kobe



Peru - Key Takeaways from TDD



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1. Importance of Disaster Risk Identification – sharing information and coordination between different government agencies. Incorporate risk assessment into decision making in the different levels of government – for urban planning and improving/updating Building Regulations Codes. Financial Risk Profile as a tool to help identify the costs involved if risk identification is not addressed.
2. National Action Plan for Disaster Emergency Response defining roles and responsibilities in every level of government. Plan that needs to be revised continuously



Peru - Key Takeaways from TDD

3. Communication, Education and Public awareness on Disaster Risk Prevention – communication for preparedness – NEVER FORGET. Learn from the past.
4. Develop Urban Plans and revising and updating Building Codes Regulations including Risk Disaster Prevention and Management. Implementing and enforcing these Plans and Regulations
5. **Infrastructure management and hazard reduction in the build environment – diagnose situation of utilities infrastructure and existing buildings. Mandatory evaluation and retrofitting**



Peru - Accomplishments Needed



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1. Develop Hazard and Risk Maps (seismic, floods and landslides) for major urban areas prioritizing cities with high populations
2. Inclusion of hazard and risk management into Territorial and Urban Planning
3. Enforcement by local governments of building codes regulation in existing and new buildings
4. Development and implementation of National Emergency Response Plan



Peru - Actions to be Taken



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- **Short-term: 6 month**

- Scope and methodology (depending on the population) to update/develop the urban planning with the inclusion of hazard and risk analysis, by Ministry of Housing, Construction and Sanitation (MHCS), CENEPRED (National Center for Disaster Prevention) and local governments
- Update the disaster hazard information for major cities > 1.000,000 population by CENEPRED
- Revise and re-launch the National Subsidiary Program for existing house retrofitting, by MHCS and Ministry of Finance (MEF)
- Capacity building for the enforcement of Building Regulation Codes at local government, by MHCS (in partnership with Universities, ONGs, Engineering/Architecture Associations)
- Develop a Public awareness campaign including different targets (general public, public employees and private sector) by National Institute of Civil Defense (INDECI)
- Diagnosis and update of schools curricula for the inclusion of hazard and risk prevention by Ministry of Education

- **Medium-term: 24 month**

- Update/Develop of the Territorial Planning for major cities > 1.000,000 population, by MHCS and local governments
- Update the disaster hazard information for municipalities > 100,000 population by CENEPRED
- Develop the urban cadaster for major cities by (National Agency for Land Formalization) COFOPRI



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Peru - Actions to be Taken

- Medium-term: 24 month
 - Introduce of mandatory vulnerability assessment for private and public existing buildings, and definition of a subsidiary Program for financing the assessment and strategic communication plan, by MHCS, MEF, INDECI and Architecture/engineering Associations
 - Update or develop the National Emergency Response at National Level and guidance for the development of subnational plans, by INDECI
- Long-term: 5 years
 - Update/Develop of the Urban Planning for municipalities > 100,000 by MHCS and local governments
 - Develop the urban cadaster for municipalities > 100,000 by COFOPRI
 - Retrofit Program for existing building and Subsidiary Program for its financing by MHCS, MEF and Local Governments

Barrier/Challenge of Implementation of Plan

1. Lack of technical capacity at National and Local levels for implementing a large scale effort for hazard risk mapping
2. Recent changes in the legal and Institutional framework on Disaster Risk Management (affected the coordination on DRM) – CENEPRED under Ministry of Defense instead of the Prime Minister Office
3. Priorization on DRM into National Budget by the MEF



Peru - Support Needed



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- **World Bank:**
 - Technical assistance in the inclusion of hazard and risk analysis into territorial planning
 - Initial stage on preparation of Investment Project Financing (IPF) with the Ministry of Finance including finance to improve National Seismic Network
- **TDLC Program**
 - Technical assistance to capacity building on building regulation and enforcement process
 - Technical assistance on Public awareness and co-responsibility
- **Knowledge Products (Case Studies, Policy Notes, etc.)**
 - Policy note on DRM to support the project preparation (IPF)



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Philippine Action Plan



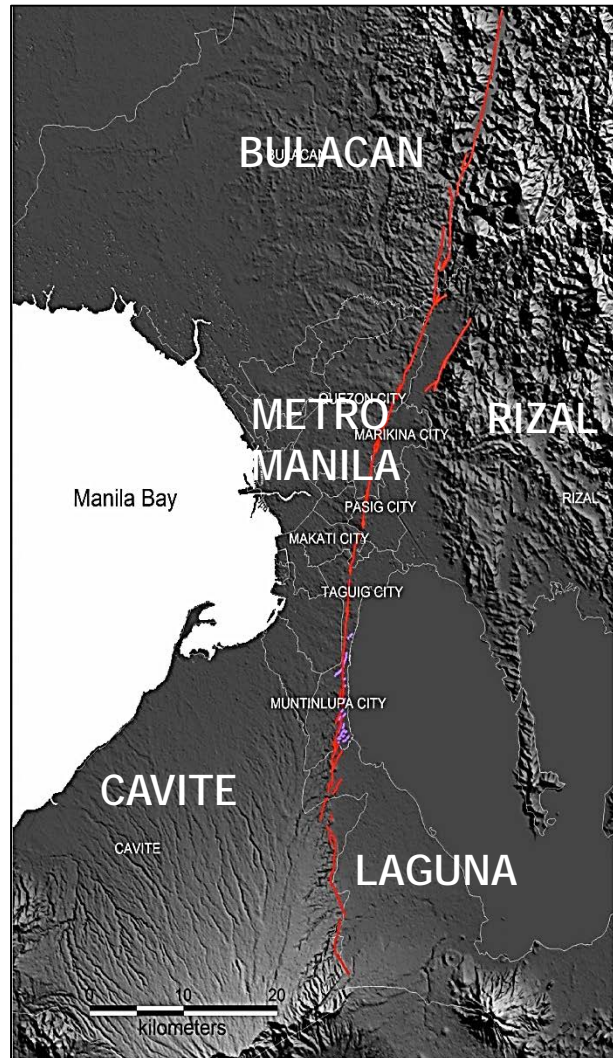
Philippines - Key Takeaways from TDD

1. The Level of Public Awareness on Seismic Risk is Very Important.
2. Cost (\$) is a big consideration that affects policy and implementation.
3. The Value of Private Sector and Community-Based Programs is high.
4. Lack of Enforcement of policies is a common problem.
5. Interface of the National and Local Government Agencies is crucial

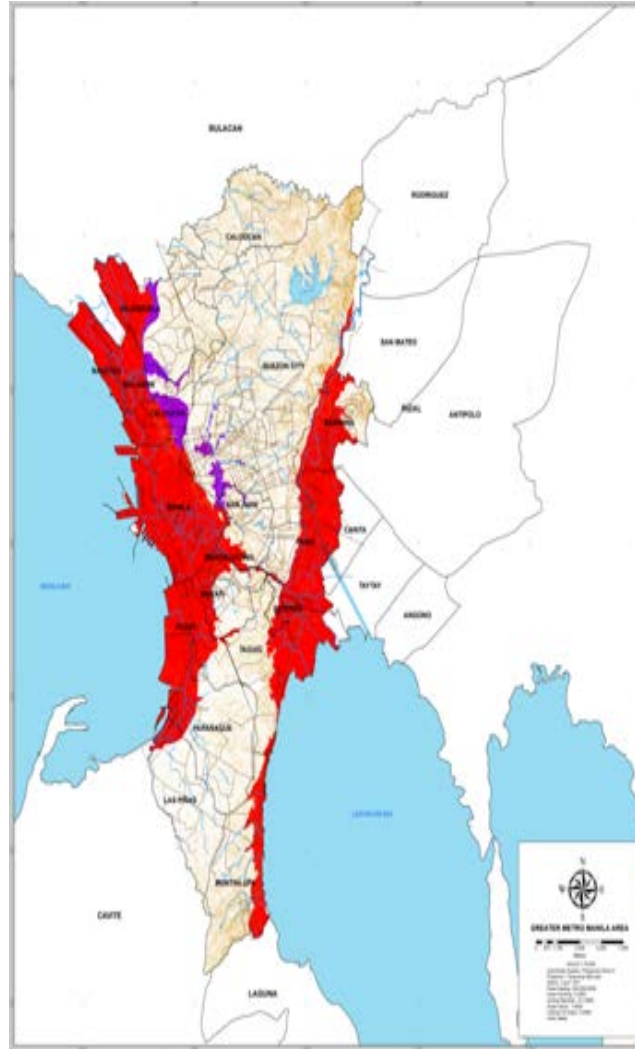


The “Big One”

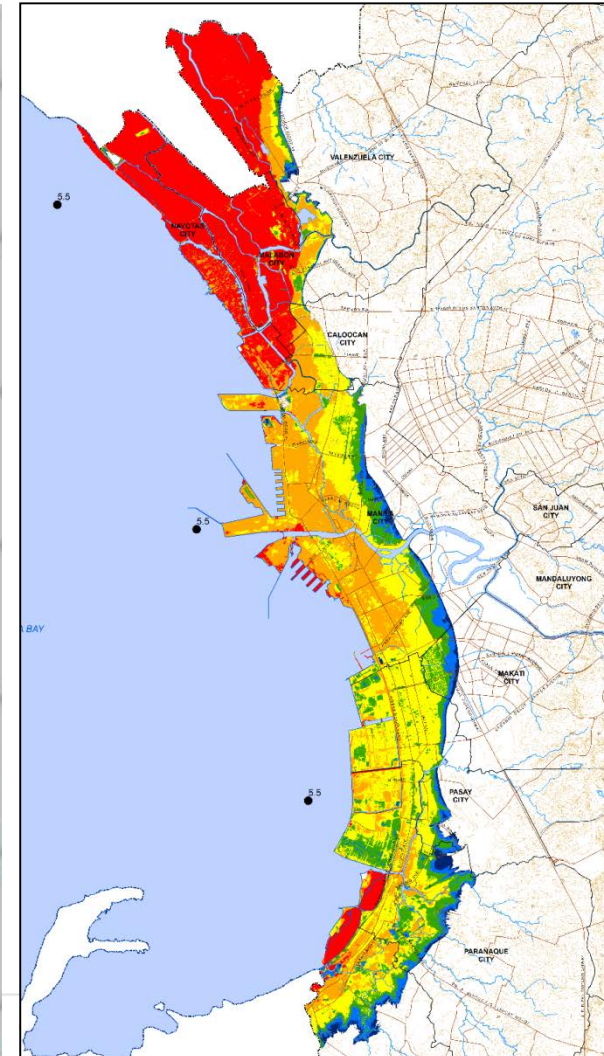
West and East Fault Lines



Liquefaction Potential



Tsunami Scenario



Risk Analysis Results for GMMA

(Metro Manila + 5 LGUs of Rizal – Rodriguez, San Mateo, Antipolo, Cainta, Taytay)

Total Floor Area in Collapsed Damage (sqm)		11,053,000	8,169,000
Total Floor Area in Complete Damage (sqm)		89,089,000	66,646,000
Total Floor Area in Extensive Damage (sqm)		70,490,000	57,082,000
Total Floor Area in Moderate Damage (sqm)		76,704,000	73,819,000
Total Floor Area in Slight Damage (sqm)		44,804,000	50,218,000
Total Fatalities		37,000	27,000
Total Injuries	Very Serious	16,000	12,000
	Serious	132,000	102,000
	Slight	456,000	359,000
Total Economic Losses (millions of PhP)		2,473,000	1,940,000

Philippines - Accomplishments Needed



1. Complete and reliable data (i.e. people, inventory of private buildings, informal settlers/structures, critical infrastructure) for vulnerability assessment and sustainable action plan
2. Cohesive Policy Framework on Seismic Resilience, Response & Rehabilitation
3. Networked Communications System for Early Warning and Pre and Post Earthquake Scenarios
4. Develop funding and resource base pre-disaster (\$ sources, evacuation centers, pre-positioned goods, disaster risk financing and insurance strategy)
5. Develop and Implement an Integrated Seismic Risk and Resilience Program (strengthening of schools, hospitals, public buildings, and critical infrastructure, networked communications and emergency management system, capacity building for government personnel)

Disaster-Resilient Framework (Philippines)

	Resilient Communities	Resilient Infrastructure	Government and Business Continuity	Financial Resiliency
Short-term	<ul style="list-style-type: none"> • Information and education campaign • Purchase of emergency response vehicles and equipment • First batch of LGUs that will undergo capacity building 	<ul style="list-style-type: none"> • Adopt a Building Regulatory Reform Agenda • Prioritization criteria for retrofitting/ reconstruction of infrastructure • 1st phase of retrofitting/ reconstruction of government buildings, schools, and hospitals • Pursue the adoption of a Philippine Conservation Guidelines 	<ul style="list-style-type: none"> • Command and control center • Secure information systems 	<ul style="list-style-type: none"> • Establish Disaster Resilience Financing Facility • City level exposure database • Inventory of all government assets • Insurance of retrofitted infrastructure • Microinsurance
Medium-term	<ul style="list-style-type: none"> • Volunteer system • Second batch of LGUs that will undergo capacity building 	<ul style="list-style-type: none"> • 2nd phase of retrofitting/ reconstruction of abovementioned infrastructure • 1st phase of retrofitting/ reconstruction of bridges and utilities infrastructure (power and water) 	<ul style="list-style-type: none"> • Emergency/ Contingency Management for government continuity • Redundancy of critical processes 	<ul style="list-style-type: none"> • Develop a city level risk pooling • Insurance of retrofitted infrastructure • Capacitate GSIS to take on growing needs for insurance of government assets
Long-term	<ul style="list-style-type: none"> • Third batch of LGUs that will undergo capacity building • Emergency communication networks • Search and rescue certification 	<ul style="list-style-type: none"> • 3rd phase of retrofitting/ reconstruction of abovementioned infrastructure • 2nd phase of retrofitting/ reconstruction of transport and utilities infrastructure (power and water) • 1st phase of retrofitting/ reconstruction of public housing 	<ul style="list-style-type: none"> • Emergency/ Contingency Management 	<ul style="list-style-type: none"> • Insurance of retrofitted infrastructure • Involvement of private insurance companies

Philippines - Actions to be Taken

- Short-term:

- Community Resilience Programs – Department of Interior and Local Government
- Rapid Vulnerability Assessment of public buildings and critical infrastructure – DPWH, DEPED, DOH, DOST, PHIVOLCS
- Awareness Campaign – Philippine Information Agency, Presidential Communications Office

- Medium-term:

- Passage of Philippine Building Act and other enabling laws – DPWH, Congress, Academe, Professional Organizations
- Strengthening/Retrofitting of public buildings and critical infrastructure – DPWH, DEPED, DOH
- Establishment of a Command Center, Government Redundancies – NDRRMC, BCDA, OP
- Develop and Implement Disaster Risk Financing and other Financial Arrangements (loans, contingent credit, insurance)

- Long-term:

- Well-established Information Campaign – PIA, Local Government Units, National Agencies
- Institutionalized systems, standards and protocols for seismic risk response

Barrier/Challenge of Implementation of Plan

1. Lack of enabling policies and laws to allow full implementation of proposed program
– *Creation of inter-agency TWG to focus on harmonization of policies*
2. Lack of financial and other resources (\$ and technical capacity) – *Inventory of existing resources and gaps, Department of Finance to prepare a DRFI strategy*
3. Lack of a strong agency to lead and manage the seismic risk and resilience programs – *Creation of a Department for Disaster Resilience and Emergency Management (Sub-unit dedicated for Seismic Risk and Resilience)*
4. High poverty rate – *Create special programs to capacitate poor people for community-based programs*
5. “Politicking” and Term Limits – *Lodge decision-making authority on head of DREM agency; Provide security of tenure; Impose mandatory strategic plans at the national and local levels*

Philippines Support Needed

- World Bank:
 - Technical Assistance to develop the Seismic Risk and Resilience Program
 - Viable financing option to implement the program (parametric insurance, cat-ddo2)
 - Foreign financing for expensive seismic technology (simulators, dampers, base isolators)
- DRM Hub
 - Informal Working Group Post-TDD to continue engaging with other countries
 - Just-in-Time Advisory Services, deployment of experts, “lease” of the shaking tables, etc. for testing of key infrastructure projects
- Knowledge Products (Case Studies, Policy Notes, etc.)
 - Share ToRs, Case Studies, and Policy Notes, Existing Regulations from different countries (global good practice)
 - Materials on risk communication and establishing “memorials/museums” post-disaster (for people to remember and share lessons learned), IEC materials on earthquake preparedness