Quality Infrastructure Investment: Resilient Approaches and Examples from East Asia and the Pacific

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Tokyo, February 3, 2017
Concentration of Assets and People Increases Disaster Risk

Outdated standards, poor enforcement of building codes

Weak land use planning

Limited risk management infrastructure, systems, and coordination

And many others…

Infrastructure poorly constructed/maintained = highly vulnerable to disasters

Infrastructure investments in flood plains and coastal areas prone to hazards

Limited capacity to manage/respond to disaster events

Concentration of infrastructure assets and people at risk

And many others…
Opportunities: ‘Triple Dividend’ of Disaster Resilience

**Dividend 1: Saving Lives, Avoiding Losses**
- Reduced damage and loss = economic benefit

**Dividend 2: Unlocking Economic Potential**
- Stimulating economic activity due to reduced risk

**Dividend 3: Generating Development Co-Benefits**
- Economic, social and environmental co-benefits from investments in resilience = additional functionality


The poor are disproportionally affected by disasters: Poor people suffer only a fraction of economic losses caused by disasters, but they bear the brunt of their consequence

Opportunities: The World Bank Project Cycle

- Policy Dialogue
- Lending
- Technical Assistance

Policy and Operational Change

Maintenance & Asset Management

Quality Supervision

Capacity Building

Analysis & Policy Support

Country Assistance Strategy

Evaluation

Project Identification

Implementation Completion

Implementation and Supervision

Preparation

Approval

Appraisal

Risk Assessment

Cost-Benefit Analysis

Uncertainty & Failure

Technical Design & Specifications

Emergency Arrangements
Steps to Building Resilient Infrastructure

- Managing disaster risks and building resilient infrastructure requires consideration of institutional, economic and financial, infrastructure and social aspects.
- DRM interventions require a systematic and cross-sectoral approach.

- **Locational Mitigation**: Risk-sensitive land-use planning.
- **Structural Mitigation**: Infrastructure upgrading to resilient designs, flood protection measures.
- **Operational Mitigation**: Emergency preparedness & recovery planning; institutional set-up.
Robust Decision-Making

- Forget about optimal design and anticipating all risks
- Instead focus on “robust” design, simple rules of thumb
- Consider the consequences of failure in design
- Cascading effects
- Invest in data, emergency preparedness and response
- Reduce risk to as low a level as reasonably practicable (ALARP)
Resilient Built-in Environment

“Earthquakes don’t kill people, buildings do”

- **Weak building code regulation and enforcement costs lives**
  - Slums and sub-standard housing increase vulnerability of poor to disasters

- **Catalyzing investment in regulatory capacity saves lives**
  - Building codes developed and maintained nationally and implemented locally have potential to reduce disaster fatalities and economic losses

Examples from EAP: Resilient Urban Infrastructure

Scaling up opportunities

- **Myanmar**: vulnerability assessment, prioritization, and upgrading of select critical infrastructure, drainage and flood risk reduction in Yangon

- **The Philippines**: revisions to the national building code, vulnerability assessment and development of structural options to reduce the multi-hazard risk of schools and cultural heritage assets

- **Vietnam**: new generation of urban infrastructure upgrading in Mekong Delta cities + flood risk reduction infrastructure + coastal resilience (ports and fishing communities)

18% fatalities projected in 100 public schools

= 3% of public schools in Metro Manila

<table>
<thead>
<tr>
<th>Number of buildings (out of 3,821 total)</th>
<th>Costs</th>
<th>Student lives saved</th>
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<tbody>
<tr>
<td>186 most vulnerable buildings (5%)</td>
<td>US$40 million–80 million (PhP1.7–3.5 billion)</td>
<td>6,390 (25% of predicted casualties)</td>
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<tr>
<td>1,466 most vulnerable buildings (40%)</td>
<td>US$178 million–356 million (PhP7.7 billion–15.3 billion)</td>
<td>19,330 (80% of predicted casualties)</td>
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Source: Miyamoto 2013.
Resilient Transport

Transport is a sector facing substantial disaster risk

Adopt life-cycle approach to resilient transport planning

- Considers all aspects of resilience in transport infrastructure investments throughout project cycle
Examples from EAP: Resilient Transport in East Asia

- **Vietnam**: climate proofing of rural and national road infrastructure
- **Lao PDR**: policy and technical guidance support, including investment pilots followed by lending Lao PDR the Road Sector Project
- **Cambodia**: proposed SEA DRM Project will support disaster resilience of rural roads in select 6 flood-prone Provinces
- **China**: Lushan EERP project investments in improved road network design (evacuation roads) and construction standards

1. Sectoral Risk Assessments for Roads
2. Technical specification, building codes, bio-engineering, construction manuals; public investment, monitoring guidelines, disaster risk audit guidelines
3. Enhance capacity at national, provincial, district, and community level
4. Physical investment
Examples from EAP: Vietnam Dam Safety Study and Improvement

**Improving dam safety management**

- **Objective**: improve the safety of dams to protect downstream communities and economic activities through priority investments and capacity enhancement.
- **Costs and benefits**: US$415 million; 2.7 million beneficiaries
- **Components**:
  - Dam safety rehabilitation
  - Dam safety management

In parallel, WB also conducting Dam Safety Study to institutionalize best practices in dam safety rehabilitation and management for Vietnam and elsewhere.
Conclusion

✓ Resilience needs to be incorporated at every stage of the infrastructure project cycle

✓ Risk reduction has to be applied in all key types of assets (housing, public buildings, transport, lifelines, etc.)

✓ At the same time, investments in DRM require prioritization
Thank you!

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