What will it take?

2030 - 50

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Understanding Risk Forum (London)
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Average Annual Loss

US$25.4 million

US$4.8 million

US$8.2 million

US$12.4 million

3.0% of GDP lost annually
What will it take?
2030-50

Current Absolute Value: US$25.4 million
Average Annual Loss

Total Risk

Risk informed Economic Growth
Cost-efficient risk reduction and prevention
Cost-efficient financial protection for residual risk
Maximum bearable loss
Asset Inventory & Management System (planning, operation and maintenance)

Historic Disaster Impacts
Post-emergency assessments
Hydro-meteorological Observations
Etc.

Risk Assessment Model & System
Hazard models
Exposure & vulnerability functions
Asset Inventory & Management System

Risk Assessment Model & System

Risk Baseline

Risk over time (Monitoring with Risk Indicators)

Disaster

Risk Reduction Investments

Analysis of risk reduction alternatives (e.g. with cost-benefit analysis)
Disaster risk reduction benefits measured by future savings due to avoided disaster losses

\[ \bar{R}^i = \frac{\bar{L}_{w/o}^i - \bar{L}_w^i}{I^i} \]

- **Direct Losses**
- **Savings**
- **Loss without retrofitting (Lw/o)**
- **Loss with retrofitting (Lw)**
- **Maintenance**
- **Risk Reduction Investment (I)**
- **Disaster**

Cost ($) vs. Time
Continuous updating

Infrastructure inventory and management system

Risk Assessment Model & System

Time [years]

1 2 3 4

Risk Baseline

Evaluation of Risk Reduction Alternatives & Prioritization

Risk Reduction Investments

Risk Monitoring

Reevaluation

Reevaluation
## Infrastructure Inventory and Management System

### Risk Assessment Model & System

**Risk Baseline**

**Evaluation of Risk Reduction Alternatives & Prioritization**

**Risk Reduction Investments**

**Risk Monitoring**

<table>
<thead>
<tr>
<th>Cost* [US$]</th>
<th>Principal Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1.5 M</td>
<td>Ministry of Works, Public Utilities, Physical Planning.</td>
</tr>
<tr>
<td>Up to 2 M</td>
<td>Technical Ministry and/or Regional Partner</td>
</tr>
<tr>
<td>TBD</td>
<td>Ministry of Finance and Ministry of Works</td>
</tr>
<tr>
<td>TBD</td>
<td>Coordination by Ministry of Finance with Ministry of Works</td>
</tr>
<tr>
<td>Up to 100,000 per year</td>
<td>Coordination by Ministry of Finance with input from line ministries</td>
</tr>
</tbody>
</table>

*Assuming country has no advances and acts alone*