

# *Mainstreaming Disaster Risk Management in Infrastructure Investment in Asia*

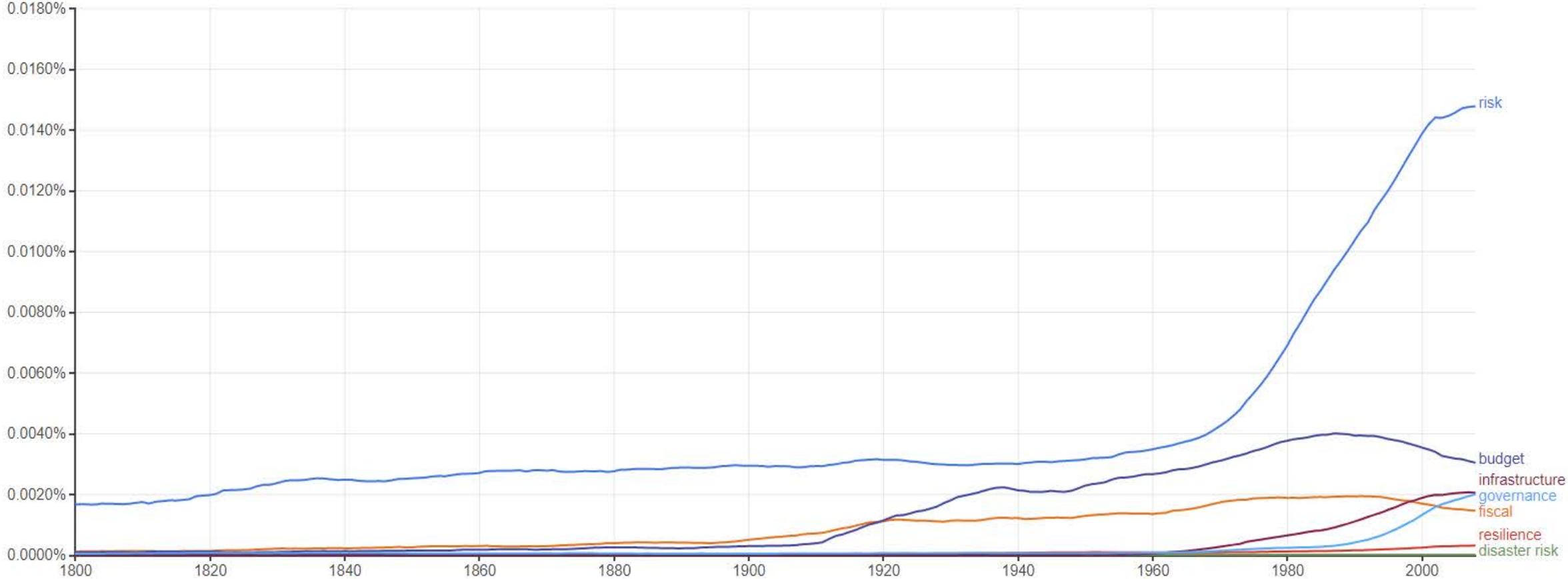
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**Tokyo, Japan, November 2019**

# A fiscal policy and management approach

1. The case for RDRM
2. State of world in public financial management in Asia
3. Approaches to RDRM
4. Other potential sources of disruption
5. Proposed path – iterative and adaptive; specific and systemic

# Disaster risk and resilience are not common expressions



Source: Google ngram viewer

# Asia forecast to have heavy infrastructure spending for SDGs

Average annual cost of investment in the preferred scenario, by sector and region, 2015-30  
% of regional GDP

		SSP region					
		Africa and Middle East		Asia		Latin America and Caribbean <sup>a</sup>	Former Soviet Union <sup>b</sup>
		World Bank region					
Sector	Type of investment	Middle East and North Africa	Sub-Saharan Africa	South Asia	East Asia and Pacific	Latin America and Caribbean	Eastern Europe and Central Asia <sup>b</sup>
Electricity	Capital		1.3		2.4	1.2	5.3
	Maintenance		0.3		0.7	0.2	1.1
Transport	Capital		3.2		0.8	1.4	0.0
	Maintenance		1.0		1.6	0.6	1.8
Water supply and sanitation	Capital	0.9	1.6	0.8	0.3	0.5	0.4
	Maintenance	0.3	0.6	0.3	0.1	0.2	0.1
Irrigation	Capital <sup>c</sup>	0.1	0.4	0.3	0.1	0.1	0.0
Flood protection	Capital	0.2	0.8	0.5	0.3	0.2	0.06
	Maintenance	0.04	0.11	0.07	0.08	0.08	0.01
Total <sup>d</sup>	Capital	5.6	7.2	4.8	4.0	3.4	
	Maintenance	1.6	2.0	2.7	2.5	1.1	

Note: Country groups differ between sectors due to the different regional aggregation of models used. SSP = shared socioeconomic pathway, as used by the Intergovernmental Panel on Climate Change.

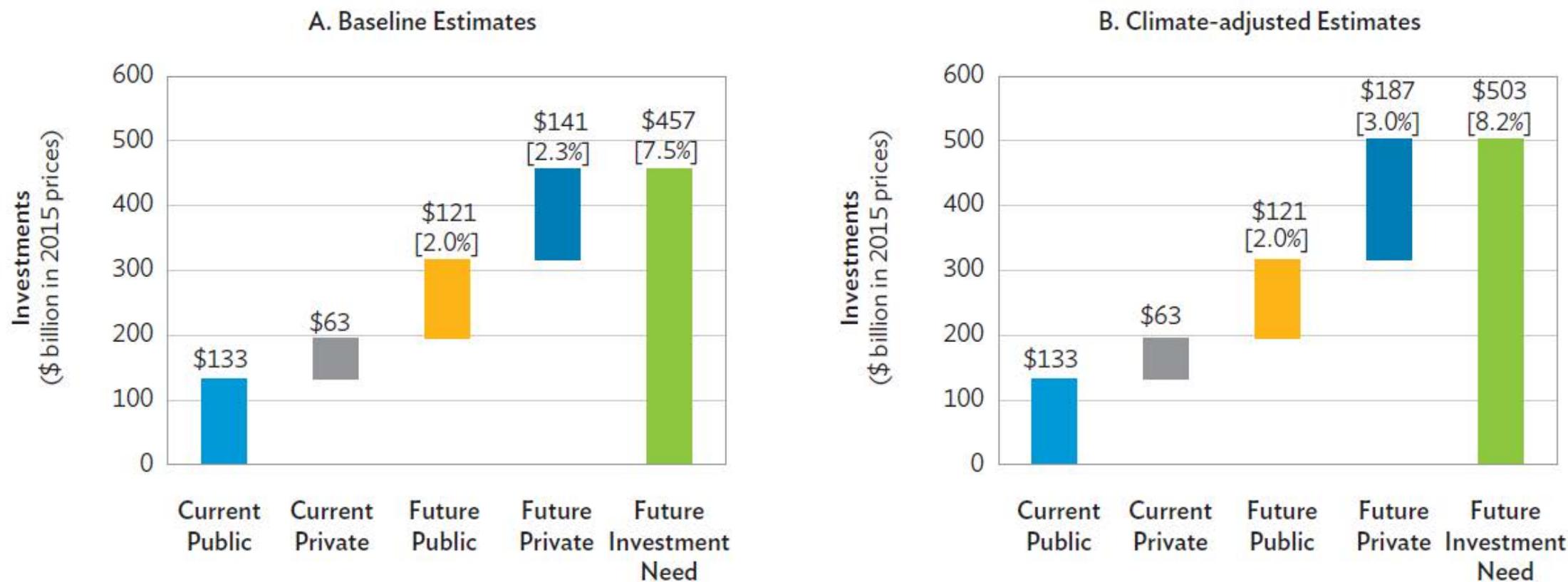
a. The following countries and territories are included in the SSP country group, but not in the World Bank country group: Aruba, The Bahamas, Barbados, Chile, French Guiana, Guadeloupe, Martinique, and Uruguay.

b. The Russian Federation is included in the SSP Former Soviet Union group, but not in the World Bank Eastern Europe and Central Asia group because it is classified as a high-income country.

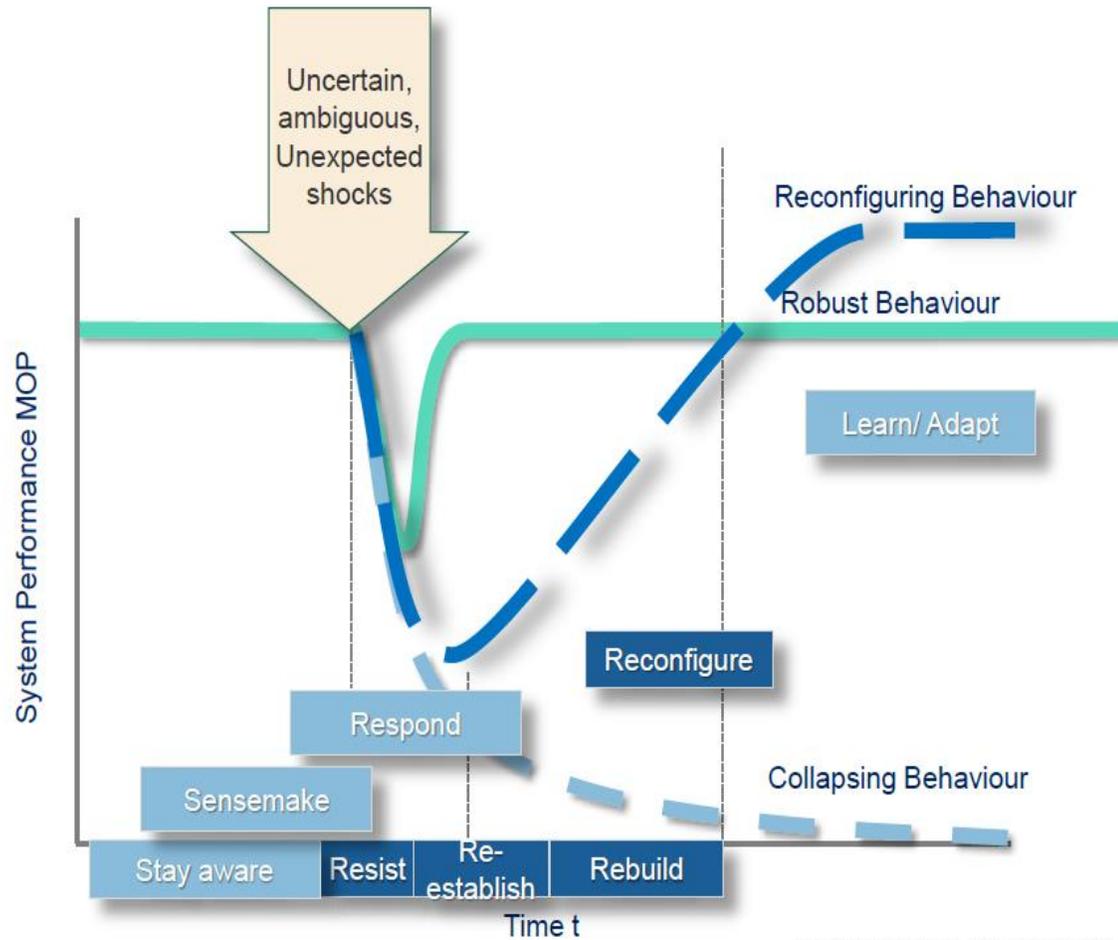
c. Includes maintenance.

d. Based on countries that are included in all studies.

**Figure 5.4: Meeting the Investment Gaps: Selected ADB Developing Member Countries \*, 2016–2020**  
 (annual averages, \$ billion in 2015 prices)



# Resilient infrastructure is dynamic



Courtesy of Hans R. Heinemann, 2019



## G20: Building Resilience against Natural Disasters and Other Risks

4 Given the increasing number and heightened magnitude of natural disasters and slow onset of environmental changes, we face the urgent need to **ensure long-term adaptability and build resilience** of infrastructure against these risks. Infrastructure should also be resilient against human-made risks.

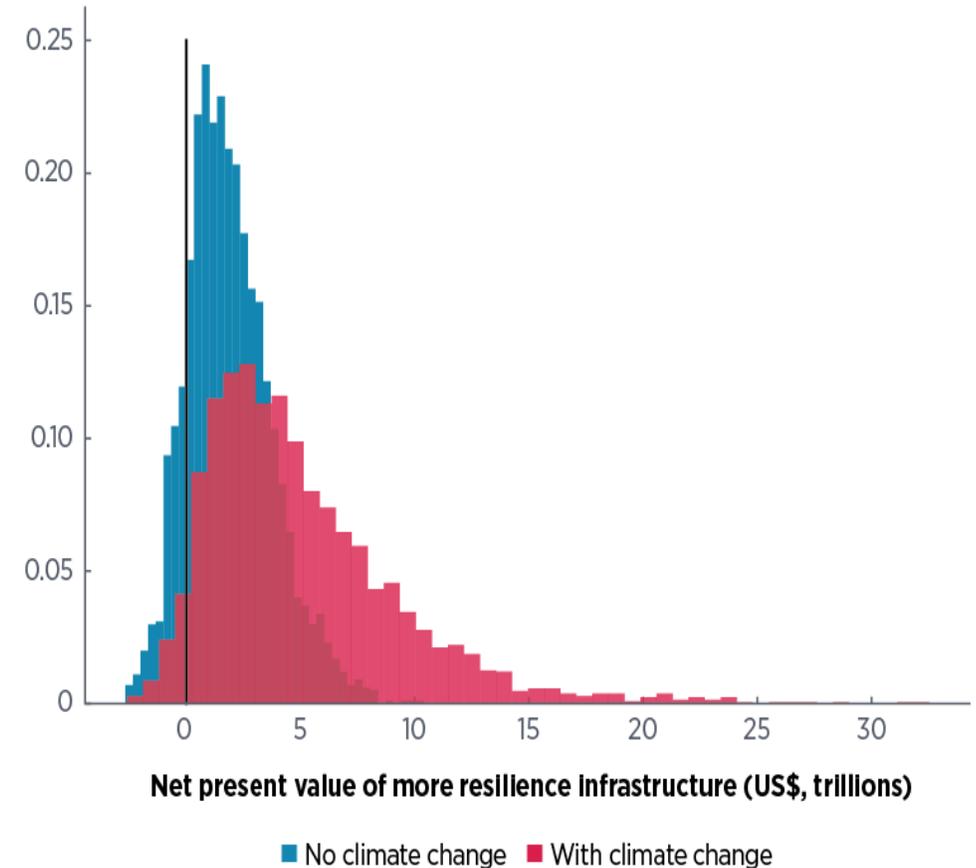
4.1 Sound disaster risk management should be factored in when designing infrastructure. A **comprehensive disaster risk management plan** should influence the design of infrastructure, the ongoing maintenance and consider the re-establishment of essential services.

4.2 Well-designed disaster **risk finance and insurance mechanisms** may also help incentivize resilient infrastructure through the financing of preventive measures.

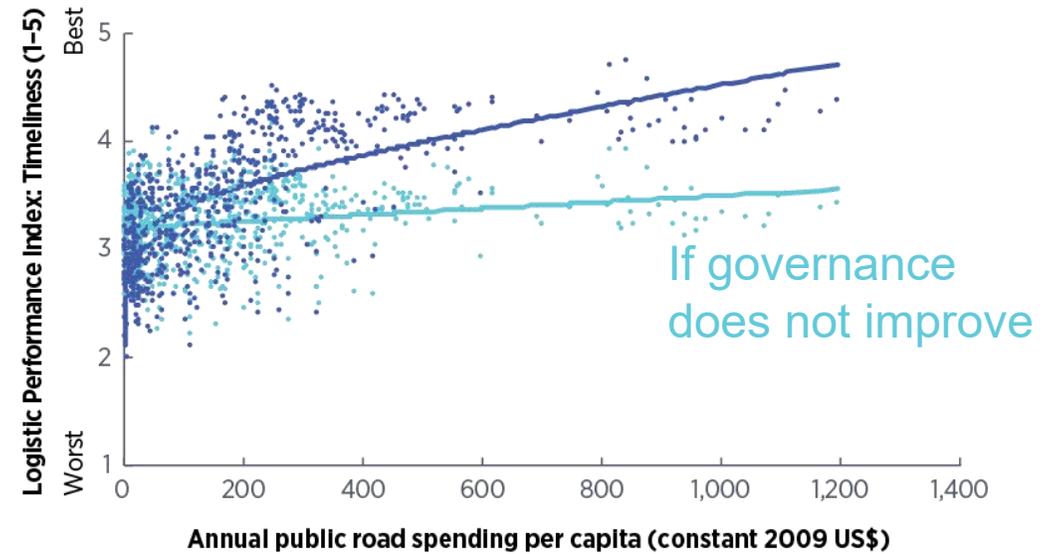
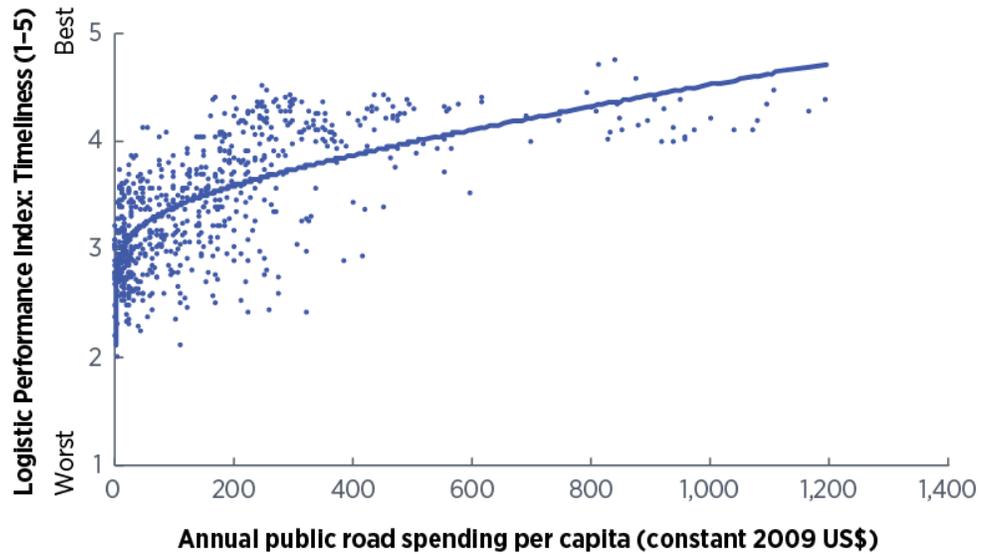
## EAP has high resilience needs;

Wb Region	scenario	Cost of resilience (billions per year)	Increase compared with investment needs.
East Asia and Pacific	min	5.0	2.9%
East Asia and Pacific	max	33.0	3.7%
Latin America and Caribbean	min	2.5	2.2%
Latin America and Caribbean	max	13.0	3.2%
Sub-Saharan Africa	min	0.7	1.2%
Sub-Saharan Africa	max	3.1	1.4%
Eastern Europe and Central Asia	min	0.1	0.3%
Eastern Europe and Central Asia	max	1.9	1.4%
Middle-East and North Africa	min	0.6	1.2%
Middle-East and North Africa	max	2.6	1.4%
South Asia	min	1.4	2.9%
South Asia	max	9.1	3.7%

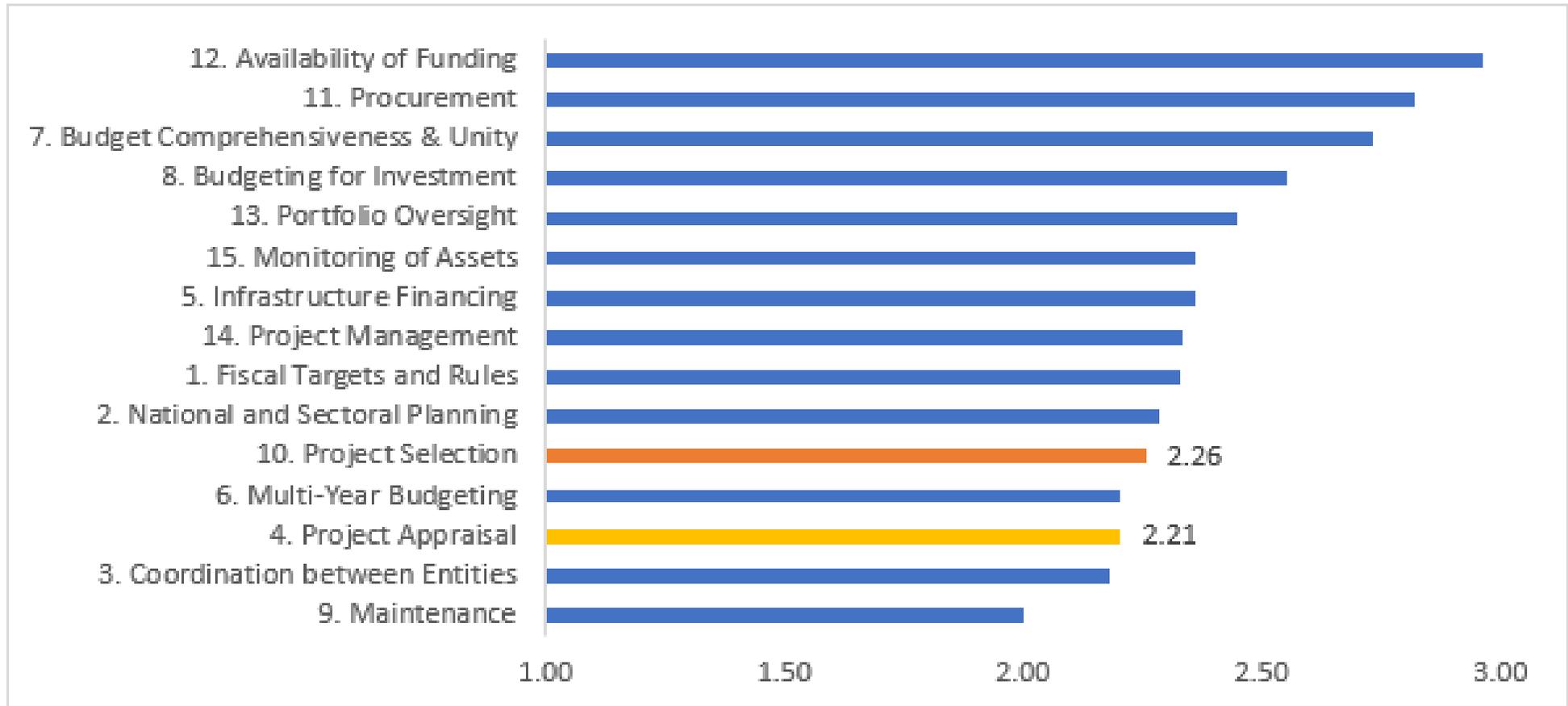
## Returns are also high



# Its not just spending...governance needs to improve as well



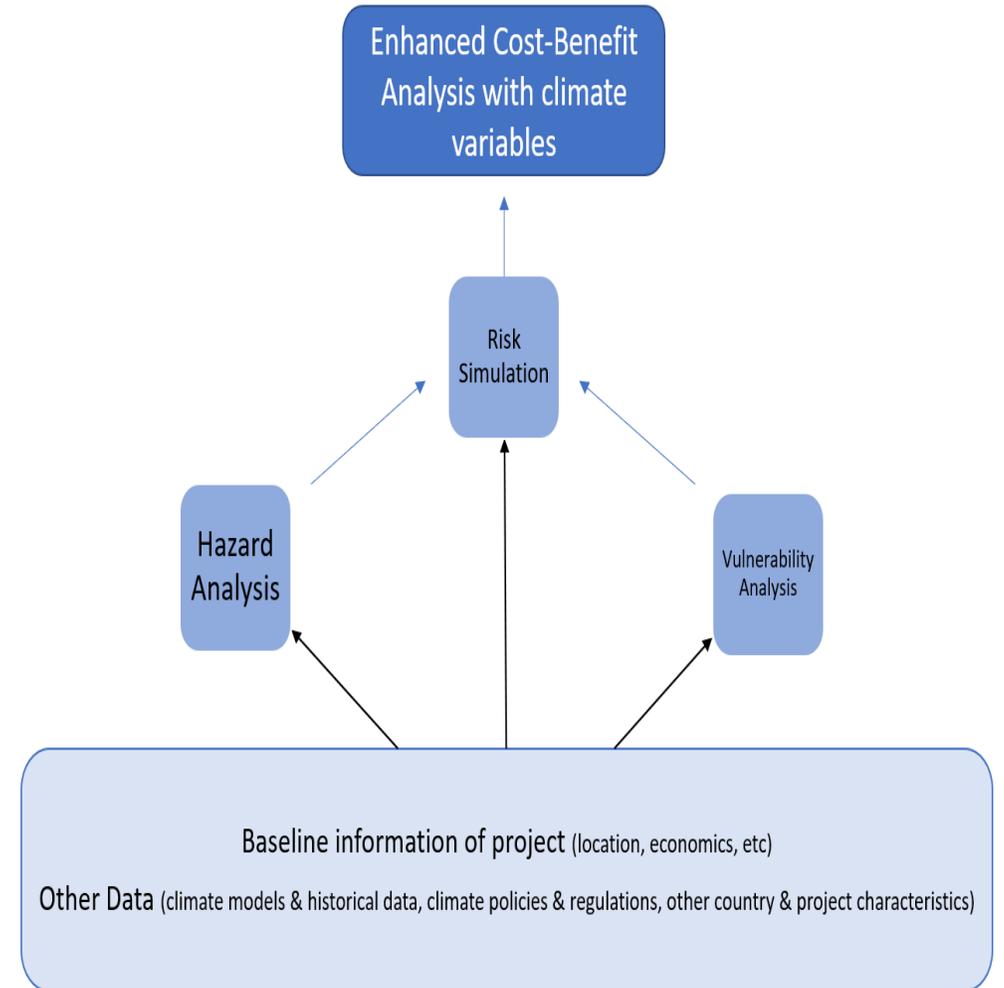
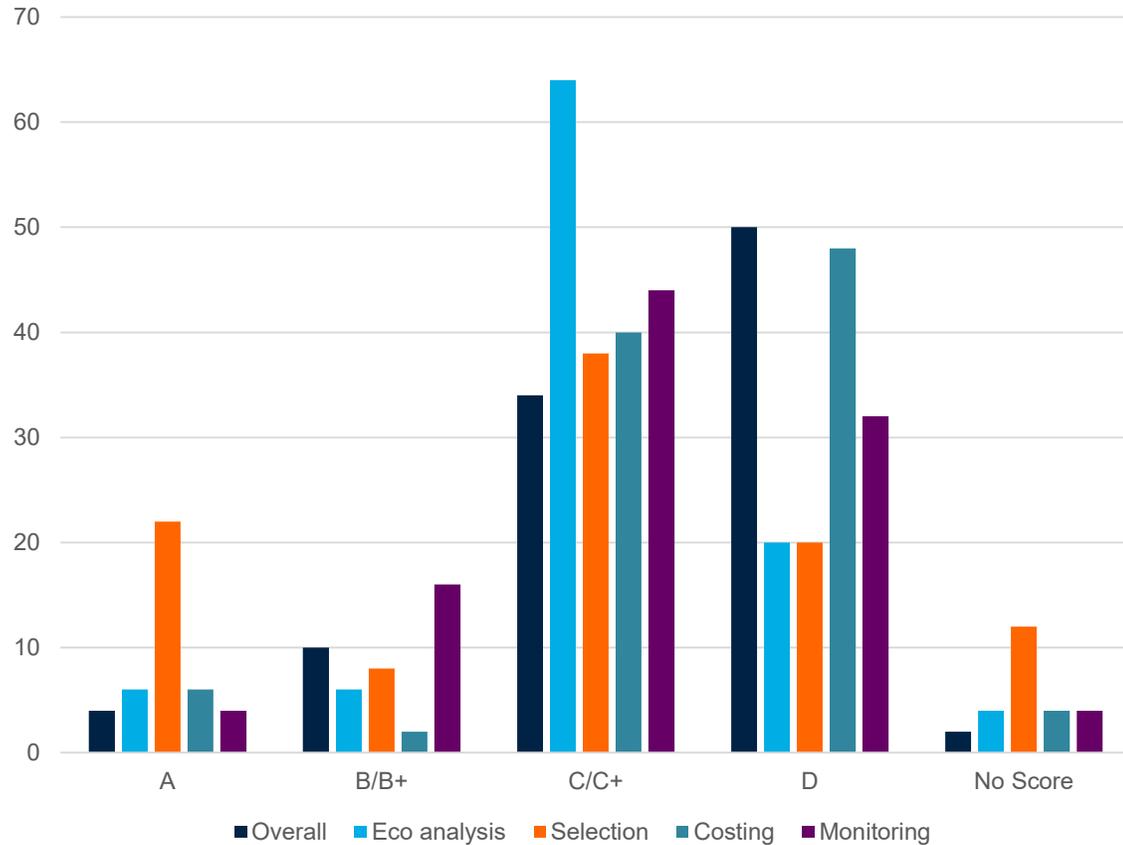
## Developing countries perform most poorly on PIM where it matters most for RDRM



Source: World Bank/IMF staff calculations using PIMA dataset.

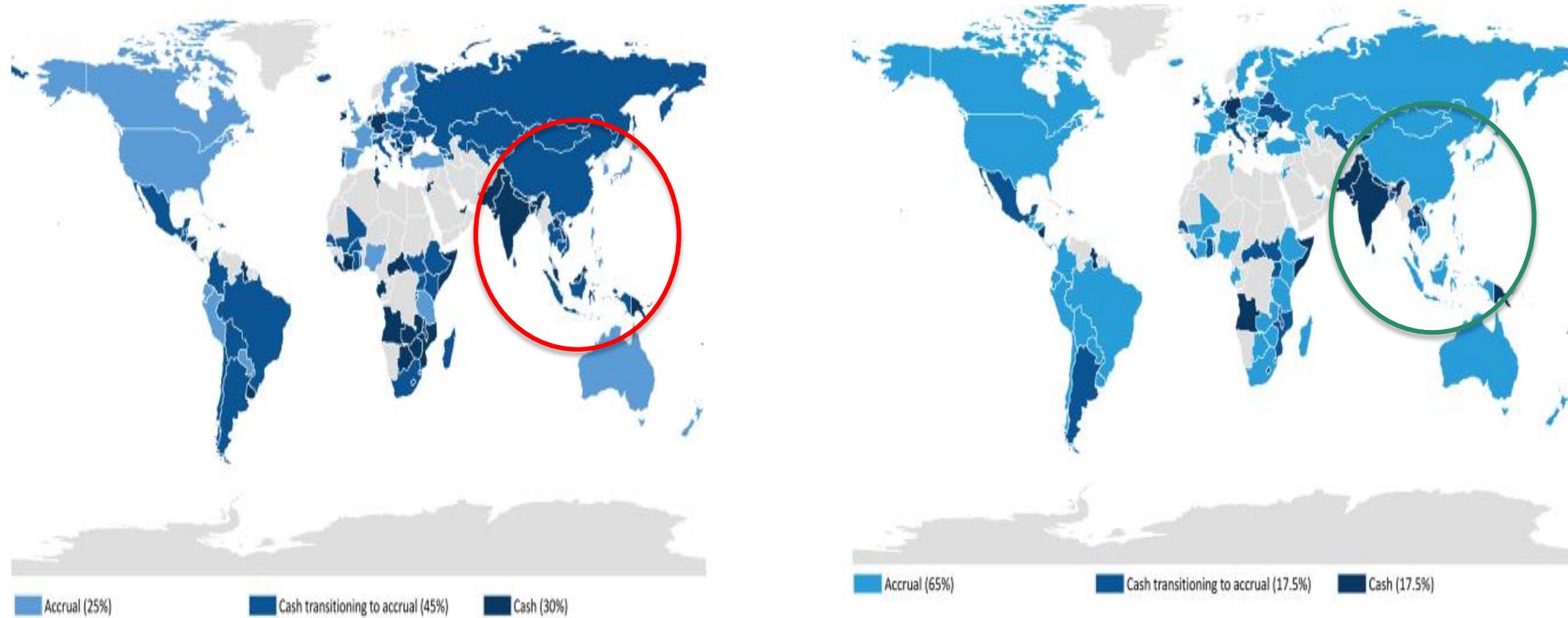
# Developing countries need to invest in basic and enhanced PIM

PEFA Indicator 11  
(n=50; in percentage terms)



Source: Le, Leow & Seiderer, 2020

# ...and the core accounting systems to support this



Source: IFAC / CIPFA International Public Sector Financial Accountability Index  
Data from 150 countries

# Countries use combination of ex ante and ex post instruments...

## *Ex ante financing instruments*

1. **Disaster reserve fund:** A dedicated disaster response fund, where undisbursed funds can be rolled over.
2. **Contingency budget:** A separate budget line that is drawn down in the event of a disaster shock.
3. **Contingent credit:** A loan arranged in advance that provides immediate liquidity once a predetermined trigger is met.
4. **(Sovereign) risk transfer instruments:** Instruments such as insurance and catastrophe bonds that allow governments to transfer disaster risks to the markets and rapidly access payouts in the event of a major disaster.

Source: World Bank 2017a.

## Asian examples:

1. Chinese Taipei, Indonesia, Japan, the Philippines, Vietnam
2. Chinese Taipei, Indonesia, Japan, Vietnam
3. All APEC members
4. Chinese Taipei, Indonesia, Japan, New Zealand, the Philippines

## *Ex post financing instruments*

5. **Budget reallocation:** Redistribution of funds from other programs to cover emergency response and recovery needs.
6. **Borrowing:** Raising of funds by issuing bonds or contracting loans for recovery and reconstruction.
7. **Tax increase:** Temporary or permanent tax increase as a last resort to finance post-disaster activities.
8. **International aid:** External development partners' assistance, which is often unpredictable.

## Asian examples:

5. Australia, Chinese Taipei, Indonesia, Japan, NZ, the Philippines, Vietnam
6. Chinese Taipei, Japan, NZ, the Philippines
7. Australia, Japan
8. Indonesia, Japan, the Philippines, Vietnam

# Asia's fiscal institutions need strengthening to create RDRM infrastructure



- 1.1: Introduce and enforce regulations, construction codes, and procurement rules
- 1.2: Create systems for appropriate operation, maintenance, and post-incident response
- 1.3: Provide appropriate funding, financing for infrastructure planning, construction, and maintenance
- 2.1: Implement a whole-of-government approach to resilient infrastructure, building on existing regulatory system
- 2.2: Identify critical infrastructure and define acceptable and intolerable risk levels
- 2.3: Ensure equitable access to resilient infrastructure
- 3.1: Consider resilience objectives in master plans, standards, and regulations, and adjust them regularly to account for climate change
- 3.2: Create financial incentives for service providers to promote resilient infrastructure services
- 3.3: Ensure that infrastructure regulations are consistent with risk-informed land use plans and guide development toward safer areas
- 4.1: Invest in freely accessible natural hazard and climate change data
- 4.2: Make robust decisions and minimize the potential for regret and catastrophic failure
- 4.3: Build the skills needed to use data and models and mobilize the know-how of the private sector
- 5.1: Provide adequate funding to include risk assessments in master plans and early project design
- 5.2: Develop a government-wide financial protection strategy and contingency plans
- 5.3: Promote transparency to better inform investors and decision makers

# From resilience to wellbeing – dealing with disruptions

	Threat	Opportunities
<b>Urbanization</b>	Concentrated People & Assets at Risk Dis-economies (congestion, environment)	Agglomeration economies “Smart Cities”
<b>Technology</b>	New dependencies and vulnerabilities, including cybersecurity and privacy, illicit financial flows	Smarter management of public infrastructure resilience (planning, budgeting, and implementation)  Better build options
<b>Ageing</b>	Diminishing demographic Dividend / tax base, greater pressures for social transfers	“Post-material” trajectories
<b>Global Connections</b>	Vulnerabilities to global value chain dislocations and disruptions	Rapid technology/innovations diffusion, lower cost/prices

Source: McKinsey (2015)



## Choices Insight/Foresight Technologies

A government’s stock of information “big data” assets can help better navigate threats and opportunities across planning, budgeting, implementation horizons

# Digital assets gaining in relative importance

Data is the new oil, concrete...

Cloud Technologies reduce exposure and fixed/sunk costs  
Reduced relative exposure of physical assets, but new class of treats...

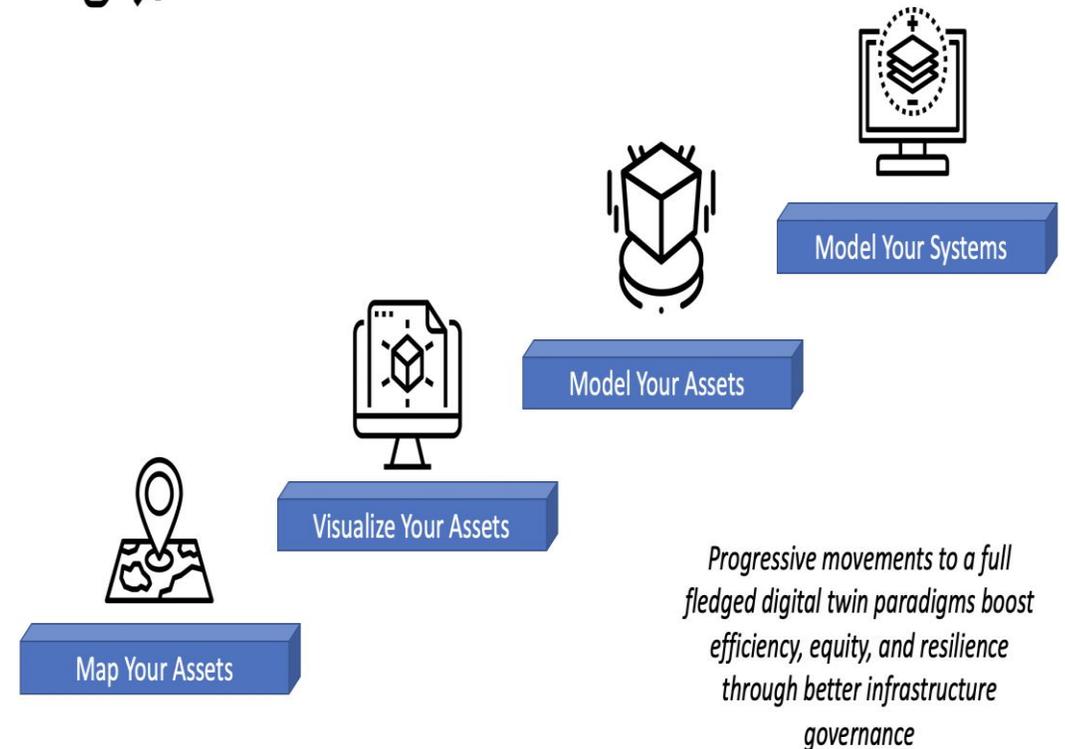
Marriage of digital and physical worlds for public sector management

Enhance capabilities, with lower user-cost and complexity to manage

“Smart” implies continuous/real time data processing



Public Sector Infrastructure Governance:  
A Platform Approach Towards Digital Twin Transformations

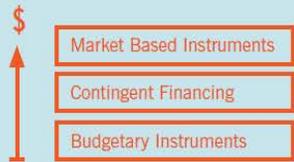


# Specific and systemic steps needed



## 1. Data and analytics

To make sound financial decisions, governments need the right information. Appropriate risk information allows public and private decision makers to assess the costs of disasters and make informed investment decisions in allocating public resources.



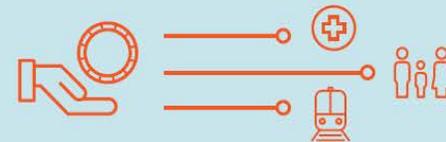
## 3. Risk layering

No single financial instrument can meet funding needs for all risks. The combination of financial instruments making up the government's financial protection strategy should match the frequency and severity of expected disaster events along with associated funding needs.



## 2. Timeliness of funding

Speed matters, but not all resources are needed at once. While rapid mobilization of funds is crucial to support relief efforts and early recovery, the government has more time to mobilize resources for reconstruction.



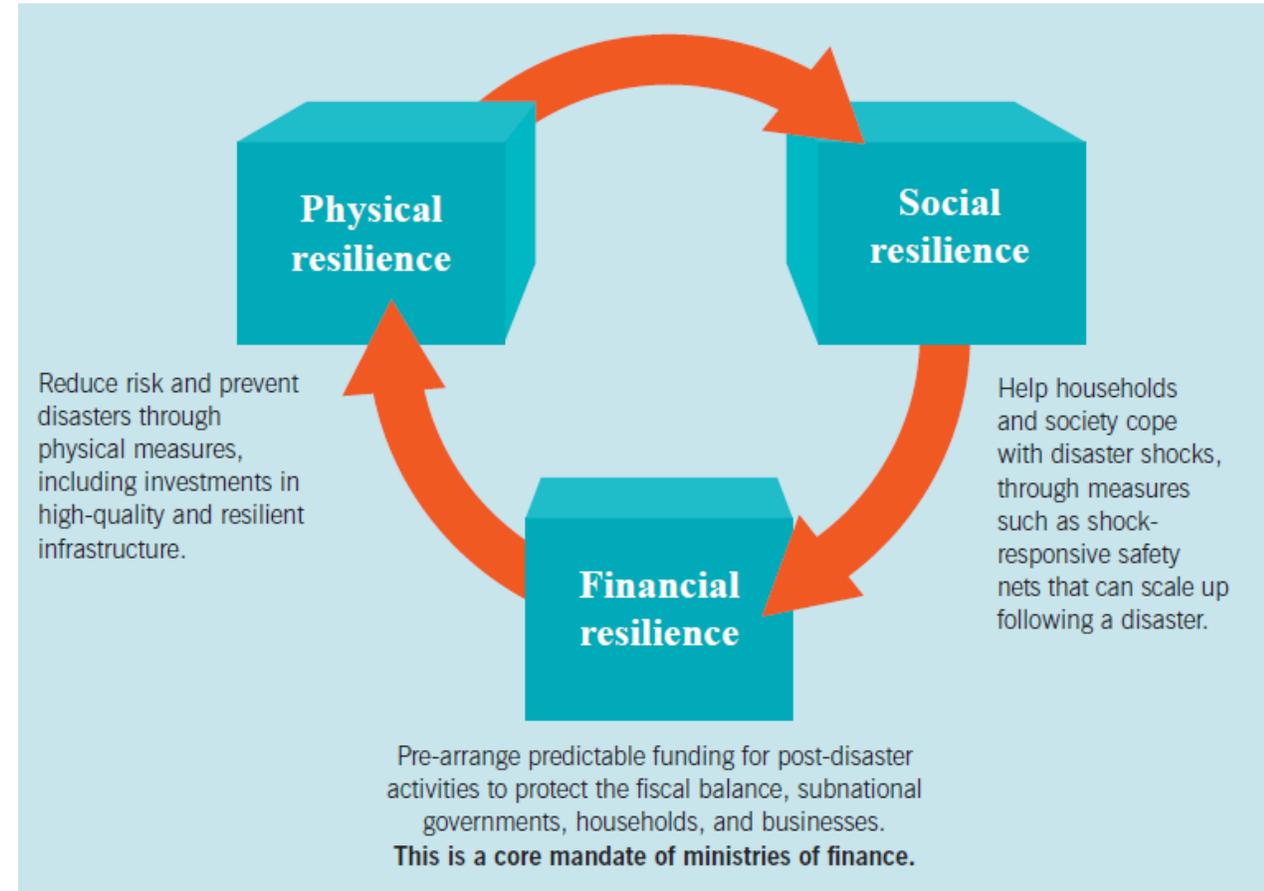
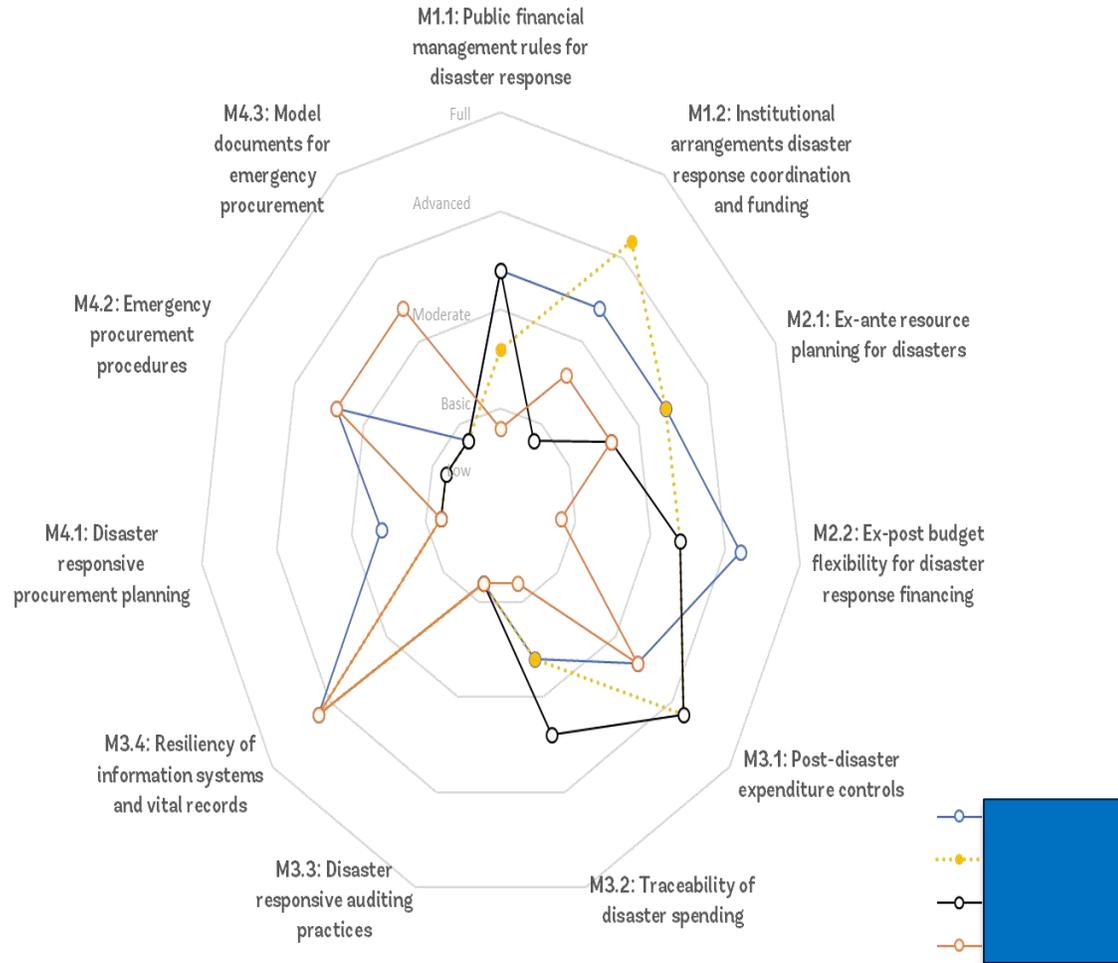
## 4. Disbursement of funds

How money reaches beneficiaries is as important as where it comes from. Governments require dedicated mechanisms and expertise to effectively allocate, disburse, and monitor recovery and reconstruction funds.

## Resilience should thrive where

- Macro fiscal projections consider effects of disasters; consideration of buffers
- Budget preparation considers rigorous appraisal of public investments, and factors in resilience dividend
- Budget selection is informed by this, and reasonable scheduling of new projects
- Execution occurs in line with budget but with specific ability to speed disbursement post disaster; layered financial risk approach, possible regional approach; financial protection for households designed
- The community influences choices
- Contractual obligations are clear; within government and with private parties, across different types of risk

# PFM an important foundation to mainstreaming



# Some useful sources

- Le, Leow & Seiderer, *Building Resilience in Infrastructure to Climate Change*, IMF, 2020. (forthcoming)
- WBG, *Disaster Response – a PFM Review Toolkit*, WBG, 2019
- Hallegatte, Rentschler & Rozenberg, *Landlines*, WBG, 2019
- Rozenberg & Fay, *Beyond the Gap*, WBG, 2019
- WBG, *Boosting Financial Resilience to Disaster Shocks: Good practices and new frontiers, Contribution to G20 Finance Ministers*, 2019
- ADB, *Meeting Asia's Infrastructure Needs*, ADB, 2017
- Jha and Stanton-Geddes, *Strong, Safe and Resilient – A Strategic Policy Guide for Disaster Risk Management in EAP*, WBG, 2013