THE FUTURE OF
GLOBAL
DISASTER
RISK REDUCTION

# Chapter 8: Science, Technology and Innovation for Disaster Risk Reduction of Megacities


Prof. Kenichi Tsukahara
Kyushu University, Faculty of Engineering

Dr. Shohei Matsuura
National Research Institute for Earth Science and Disaster Resilience (NIED)

# Rationale

1. **Megacities face multi-dimensional, highly interconnected disaster risks**

   Megacity risks stem from interacting hazards, dense populations, high exposure and vulnerability, and are further intensified by social fragility, degraded infrastructure and governance gaps. Together, these factors create a complex risk environment that cannot be addressed through isolated or single-sector approaches.

2. **Scientific advances are not reducing disaster losses**

   Scientific advances are not reducing disaster losses because scientific evidence is not sufficiently incorporated into the decision-making processes that governs urban DRR. The continued occurrence of severe disasters illustrates how this misalignment weakens the translation of scientific knowledge into policy, planning, and operational practice.

# Part 1: Transdisciplinary Approach for DRR in Megacities

- Megacities face complex, multi-layered, and cascading disaster risks that exceed sector-specific countermeasures.
- Addressing these risks requires a transdisciplinary approach (TDA), in which scientists, policymakers, practitioners, private sectors, and communities co-design, co-produce, co-deliver co-implement DRR interventions.
- Scientific evidence and monitoring data must be translated and embedded into disaster policy formulation and revision.
- Such processes strengthen risk-informed decision-making by ensuring that knowledge is continuously integrated into the systems that govern urban DRR.

# Part 2: STI Platform & Strategic Policy Recommendations

- Complexity of megacity risks makes it essential to establish an institutionalized DRR platform that coordinates diverse range of stakeholders that implement TDA.
- Guiding functions of the platform include:
  - Provision of strategic recommendations: Providing science-based inputs on urban DRR issues, reflecting societal needs to support policy and decision-making.
  - Development and standardization of DRR technologies: Joint development and standardization of technologies that combine conventional and innovative approaches to solve urban DRR issues.
  - Facilitation of capacity building and exchange: Cross-disciplinary and practice-oriented programs for young to mid-career DRR practitioners, researchers and local champions
  - Network building and diversification of DRR financing: Stronger linkages among research institutions, government agencies, international organisations, private-sector actors and communities, promoting cooperation and broader DRR financing options.

# Science, Technology and Innovation for DRR of Megacities

- **Recommendation 13:**
  Establish and institutionalize a Science–Technology–Innovation platform for DRR in megacities to coordinate scientists, policymakers, communities, and private sectors (e.g. ASEAN STI Platform for Disaster and Climate Resilience).

- **Recommendation 14:**
  Continuously provide strategic, STI-based policy recommendations aligned with societal needs for improved DRR measures in megacities