Disaster risk reduction and COVID-19 pandemic: Changing policy perspective

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Cascading risks
– climate extreme, COVID-19 and vector/water-borne diseases
CASCADING SCENARIO

Scenario A
Risk Drivers
- Poverty
- Inequality
- Rapid urbanization and unsustainable development
- Population density

Scenario B
Natural Hazards
- Climate change
- Flood
- Cyclone
- Drought

Scenario C
Recurring Biological Hazards
- Vector/Water borne diseases
- Zoonotic diseases

Scenario D
Novel Biological Hazards/Large shocks
- COVID-19
- Emerging viruses
Predictive analytics for visualizing cascading risk scenarios

Predictive Analytics: Prediction and forecasting

- Satellite
- Simulation
- Social media
- Sensor web and IoT

Data sources and platforms


Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.
Prescriptive analytics for visualizing cascading risk scenarios

Multi-hazard Risk Assessment and risk informed policies (data sources/platforms)

- Satellite: 12%
- Simulation: 33%
- Social media: 17%
- Sensor web and IoT: 17%
- Crowdsourcing: 8%
- Mobile GPS and CDR: 13%

Cyclone Amphan colliding with COVID 19

Sources: ESCAP based on ESRI and John Hopkins University Coronavirus COVID-19 Cases V2, 16 June 2020 and Cyclone Amphan on NASA’s Aqua satellite the Moderate Resolution Imaging Spectroradiometer (MODIS), 20 May 2020.

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**SCENARIO 1: Risk Hotspots**
Flood affected vulnerable populations

**SCENARIO 2: Cascading Risks**
Flood affected vulnerable confronting with COVID-19

**SCENARIO 3: Systemic Risks**
Vulnerable in midst of floods and COVID-19 and @ risk of vector-borne diseases

8 per cent of the population in 6 districts affected by flood UNOSAT-UNITAR, 2020
Key message: With high transmissibility and no effective vaccine or therapy, countries have maintained low COVID-19 per-capita mortality rates by adopting digital technology and integrating it into policy and health care.
Systemic risks
– Sendai Framework of Disaster Risk Reduction 2015-2030
System Approach for Building Resilience

**HYOGO FRAMEWORK (2005-2015)**

- **HAZARD**
  - Earthquake
  - Tsunami
  - Riverine Flood
  - Cyclonic Wind
  - Storm Surge

- **VULNERABILITY**
  - Economic

- **EXPOSURE**
  - Structural

- **SCALE**
  - Global
  - National

**MANAGING DISASTERS**

**SENDAI FRAMEWORK (2015-2030)**

- **HAZARD**
  - Volcano
  - Tsunami
  - Flooding

- **VULNERABILITY**
  - Agricultural
  - Basic Services

- **EXPOSURE**
  - Fire
  - Biological
  - Technological

- **SCALE**
  - Economic
  - Social
  - Environmental

- **SYSTEMS**
  - Human
  - Ecological
  - Economic

Managing Risk, Prevention and Resilience
Modeling Framework for Systemic Risks, Scenario-based Approaches

Risk Analytics
- Hazards models
- Exposure models
- Probabilistic/Deterministic models
- Ensemble models
- Vulnerability models (Social/Ecological)
- Risk models
- Climate risk models

Cascading Risks + Inter-Connected Risks

Hazards
- Global
- National
- Subnational
- Local

Exposure
- Human
- Economic
- Ecological
- Infrastructure
- Political

Vulnerability

Stark reminder of systemic risk

Source: Modified form Global Assessment Report 2019, UNDRR
Systemic risks are characterized by high complexity.

Systemic risks are transboundary and global in nature.

Systemic risks are characterized by stochastic relationships between trigger and effects.

Systemic developments are non-linear and include tipping points.

Systemic risks are often underestimated in public policy arenas and public perception due to uncertainties of point of occurrence and extent of damage.

Established methods of science cannot identify the probability of occurrence. Instead, science utilizes models of scenario building to sketch out the stochastic nature of systemic risks.

Understanding Systemic Risks
- key to COVID-19 response and recovery

Source: Dr. Pia-Johanna Schweizer, Institute for Advanced Sustainability Studies Potsdam, Germany
A Scenario Development Framework for Systemic Risks

1. Scope the Risk.
2. Conduct Background Research
3. Frame the Scenario(s)
4. Develop Candidate Scenarios
5. Develop a Narrative
6. Assess Impacts and Materiality
7. Communicate and Act
8. Evaluate and Update

Source: Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School.
How can systemic risk scenarios benefit stakeholders and enable policy response?

<table>
<thead>
<tr>
<th></th>
<th>Improve Understanding of Risks</th>
<th>Support Decision Making</th>
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<tbody>
<tr>
<td>01</td>
<td>To understand the various dimensions of a specified risk that cause negative impacts</td>
<td>To inform and enhance effective disaster risk management strategies</td>
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<td>02</td>
<td>Explore Emerging Futures</td>
<td>Support Decision Making</td>
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<td>To imagine and comprehend new, evolving, and novel combinations of risks.</td>
<td>To inform and enhance effective disaster risk management strategies</td>
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<td>03</td>
<td>Address Uncertainty</td>
<td>Support Decision Making</td>
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<td></td>
<td>To expand understanding and define a range of plausible future outcomes</td>
<td>To inform and enhance effective disaster risk management strategies</td>
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<td>04</td>
<td>Systems Thinking</td>
<td>Support Decision Making</td>
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<td></td>
<td>To capture the controlling interconnections between complex systems</td>
<td>To inform and enhance effective disaster risk management strategies</td>
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<td>05</td>
<td>Support Decision Making</td>
<td>Support Decision Making</td>
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<td>To inform and enhance effective disaster risk management strategies</td>
<td>To inform and enhance effective disaster risk management strategies</td>
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<tr>
<td>06</td>
<td>Aid Communication</td>
<td>Aid Communication</td>
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<td></td>
<td>To contextualize complex risks and facilitate stakeholder engagement</td>
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<td>07</td>
<td>Allocate Resources</td>
<td>Aid Communication</td>
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<tr>
<td></td>
<td>To plan what and where the effectively distribute resources</td>
<td>To contextualize complex risks and facilitate stakeholder engagement</td>
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<td>08</td>
<td>Identify Biases</td>
<td>Aid Communication</td>
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<tr>
<td></td>
<td>To ensure viewpoints and decisions remain objective</td>
<td>To contextualize complex risks and facilitate stakeholder engagement</td>
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UNESCAP

– Some related initiatives
Launched on 18 November
@ GISTDA

1. Regional platform for Multi-hazard early warning systems

2. Knowledge for policy – Asia-Pacific Disaster Report, Policy Research

3. Technology innovations and applications

4. Data and statistics – Multi-hazard risk hotspot analysis

5. Disaster and health nexus – cascading impacts, systemic risks

Asia-Pacific Disaster Resilience Network [APDRN]
Managing risks is key to resilient future of Asia-Pacific

The ‘riskscape’ is rapidly emerging to be systemic: it is complex and cascading, interconnected and cyclical. The COVID-19 pandemic is a stark reminder.

Intersection of COVID-19 with climate extremes aggravates crisis and slows down the recovery
Thank you for kind attention!

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