

Compendium of Good Practices on Disaster Resilient Infrastructure

CONCEPT NOTE

1. Background

The IPCC states that infrastructure, including transportation, water, sanitation and energy systems have been compromised by extreme and slow-onset events resulting in economic losses, disruption of services and impacts to well-being.¹ The year 2022 witnessed multiple natural disasters globally, including floods, tornadoes, cyclones, wildfires, and earthquakes. The beginning of 2023 was marked by the devastating earthquakes in Turkey and Syria. The compounding and cascading impacts of these disasters were driven by the hazard characteristics and underlying diverse socio-economic vulnerabilities and exposure.² The number of critical infrastructure units and facilities destroyed or damaged by disasters averaged 142,852 per year from 2015 to 2021. In the midterm review of the implementation of the Sendai Framework for Disaster Risk Reduction (SFDRR), forty-four reporting countries recorded disasters contributing to the disruption of more than 363,184 basic services in 2020 and 2021, including health and educational services.³ Small Island Developing States (SIDS) experience the highest frequency of natural disasters such as hurricanes, cyclones and other violent storms resulting in the loss of life, homes and infrastructure. On average, natural disasters cause damage equivalent to 2.1% of GDP every year in SIDS.⁴

Disruptions to infrastructure services result in households and firms in Low- and Middle-Income Countries (LMICs) incurring an additional loss of at least \$390 billion a year, and the indirect effects place a further toll on households, businesses, and communities. It is estimated that the net benefits of investing in resilient infrastructure in LMICs could be \$4.2 trillion over the lifetime of new infrastructure.⁵ Further, designing infrastructure systems that can adapt to emerging local manifestations of climate change is a unique challenge of our times. Infrastructure planners are now posed with the challenge of managing uncertainty in addition to known risks. Also, infrastructure can no longer be viewed as individual assets, such as a power plant, a hospital or a water network, but as part of a system with a portfolio of assets that collectively deliver economic, environmental and social benefits.⁶

¹ IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001.

² <https://www.unescap.org/blog/2022-year-when-disasters-compounded-and-cascaded>

³ United Nations General Assembly (UNGA), 2023. Main findings and recommendations of the midterm review of the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030. <https://sendaiframework-mtr.undrr.org/publication/main-findings-and-recommendations-midterm-review-implementation-sendai-framework>

⁴ <https://unctad.org/news/heavily-indebted-small-islands-resilience-building-best-antidote#:~:text=On%20average%2C%20natural%20disasters%20cause,GDP%20every%20year%20in%20SIDS.>

⁵ Hallegatte, Stéphane; Rentschler, Jun; Rozenberg, Julie. 2019. Lifelines: The Resilient Infrastructure Opportunity. Sustainable Infrastructure. © Washington, DC: World Bank.

⁶ CDRI. 2023. Towards Resilient Infrastructure Systems. Working Paper. 1st Disaster Risk Reduction Working Group Meeting. Gandhinagar

It is therefore essential for countries to integrate an understanding and assessment of disaster, climate, economic, environmental, financial and social risks across the entire lifecycle of projects to avoid locking in unsustainable infrastructure investments in the long term. Investments in resilient infrastructure can reduce damage to assets, enable faster post-disaster recovery, and provide co-benefits of environment, healthcare, education, jobs and prosperity, while contributing to the achievement of the sustainable development goals (SDGs).

The solutions and pathways to embed and achieve resilience of infrastructure must be collaborative, forward-looking, adaptive and risk informed. An enabling ecosystem for inclusive, climate and disaster resilient infrastructure will include responsive policy and governance, technology and innovation, knowledge exchange, capacity development, and sustainable financing. Good practices and solutions in terms of newer technologies, business models and financial mechanisms, instruments and frameworks can augment sustainable and resilient infrastructure investments. These solutions must be recognized and disseminated to enable peer-to-peer exchange, replication and scale up across geographies.

2. Compendium of Good Practices on Disaster Resilient Infrastructure

The G20 Disaster Risk Reduction (DRR) Working Group will develop a compendium of good practices that showcases innovative approaches towards climate and disaster resilience of new and existing infrastructure. The aim of this compilation would be to create opportunities for shared learning through dissemination of good practices, understand the impact of these solutions including the indicators of success, and provide recommendations to take forward the emerging trends and opportunities.

2.1 Objectives:

- To foster peer-to-peer exchange, knowledge sharing and communication among G20 countries and beyond
- To create opportunities for replication and scale up of existing solutions and good practices
- To showcase the benefits of resilient infrastructure in reducing disaster losses as well as to boost economic development and the wider co-benefits
- To bring to light any implementation challenges, and the indicators of success for these resilient infrastructure solutions

2.2 The compendium will bring together good practices and innovative approaches of infrastructure systems which address the following aspects of resilience:

- Recover faster or provide continuous service delivery during and after an extreme event
- Ensure improved quality of lives and livelihoods
- Reduce risk at the local and regional level
- Cater to the most vulnerable

- Provide environmental and social co-benefits such as healthcare, education, jobs and prosperity

2.3 The good practice case studies can cover the following areas:

a) Governance

- Integrated multisectoral initiatives using systems thinking approaches
- Regulatory frameworks, design standards and codes for infrastructure implementation
- Institutional capacity building at multiple levels of governance
- People-centred and service-oriented approaches to ensure quality and reliability of infrastructure

b) Planning and implementation

- Nature-based solutions (focussed on green-grey infrastructure)
- Asset management (including resilience of new and emerging low-carbon infrastructure systems; and mechanisms for managing downstream risk from infrastructure)
- Tools and processes to enable adaptive planning and design (including optionality within systems to provide redundancy during extreme events)

c) Data

- Multi-hazard risk-information integrated in planning and design
- Access to information and platforms for data sharing

d) Finance

- Risk-informed infrastructure investments (new and retrofits)
- Disaster risk transfer mechanisms
- Disaster risk financing (DRF) strategy to ensure build back better during recovery and reconstruction

3. Potential Contributors

G20 countries and international organisations, and invited countries and international organizations.

4. Case Studies

G20 member countries and international organizations, and invited countries and international organizations are invited to contribute case studies of initiatives that have positively impacted the most vulnerable by reducing disaster risks, improving the quality of lives and livelihoods, enabling faster recovery and reconstruction, and providing environmental and social co-benefits. The contributions may demonstrate good practices related to governance, planning and implementation, data and finance with the objective of enhancing the resilience of infrastructure to disaster risks.

The case studies will be presented in a concise and informative manner supported by pictures and illustrations. Contributors are encouraged to provide images, videos and supporting documentation to facilitate a factually-sound presentation of the good practice.

CASE STUDY FORMAT

Solution title	
Sector	Critical Infrastructure (power/transport/telecom)/Urban/Social Infrastructure
Innovative approach	Based on 2.2 above (e.g., data and risk-information/regulatory frameworks/technology/finance/institutional capacity building/post-disaster recovery/combining gray green infrastructure/people-centric/community-based)
Focus group	<i>System/Asset/Community</i>
Brief description of the solution(s) and	In ~500 words <ul style="list-style-type: none"> • Location (project deployed at) • Type of natural hazard/disaster addressed • Description of the innovative approach/good practice • Collaborators/Partners • Links to supporting documents/additional information
Evidence of the solution(s) effectiveness or potential impact	<ul style="list-style-type: none"> • Stage of implementation: • Description of impact (potential/achieved) including co-benefits (job creation/health care/climate mitigation and/or adaptation/environment/economic/social etc.)
Implementation challenges (if any) and mitigation strategies	
Opportunities for further development or improvement	Scalability/Replicability/Adapting to local context in other geographies and geo-climatic regions

5. Process and Timeline

Consult with advisory group on the proposed compendium outline	May 2 nd Week 2023
Present Compendium Outline (for inputs) at G20 DRR Working Group	May 25 2023
Source case studies (online submissions through portal)	May - July 2023
Development of online repository of good practices	June – July 2023
Launch of online repository of Compendium at G20 DRR WG	July 24 – 26 2023
