



Task Force 3:
LiFE, Resilience, and Values for
Wellbeing



CATALYSING INVESTMENTS FOR CLIMATE- AND DISASTER-RESILIENT INFRASTRUCTURE

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Abstract







Building infrastructure that is both climate- and disaster-resilient can facilitate rapid response to, and recovery from, natural disasters, particularly for developing countries and among disadvantaged communities. India's G20 presidency motto, 'One Earth, One Family, One Future,' provides a unifying call to action that places universalist values above nationalism. With the collective power and reach of the G20, the grouping can launch a long-term, partnership-based effort to catalyse investments

for climate- and disaster-resilient infrastructure that could usher a new era of quality infrastructure. Climate resilience is part of the larger concept of disaster resilience, but deserves special consideration. Bodies such as the UN's Intergovernmental Panel on Climate Change (IPCC) have pointed to alarming future scenarios if climate change is not reversed. Building such infrastructure in urban and rural systems requires better integration of engineers into the decision-making process.



Introduction

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This Policy Brief outlines how the G20 can launch a long-term, partnership-based effort to catalyse investments for climate- and disaster-resilient infrastructure. Greater inflows of such investments can be facilitated by higher procurement standards to attract more private funding from pension funds, sovereign wealth funds, and other such investors. A thorough and complete lifecycle cost

comparison would assure them that the proposed projects are being built to withstand the impact of climate change over time. Apart from protecting climate, public and private financing, when executed at scale, can provide manifold benefits to disadvantaged and vulnerable populations. The following points summarise the key principles of climate- and disaster-resilient infrastructure.

Climate- and Disaster-Resilience Principles

1. Build infrastructure that is safe, sustainable, and resilient, prioritising inclusivity and equity, with particular focus on uplifting poor, marginalised, indigenous, and vulnerable populations in developing nations.
2. Develop new financing and funding models to combat rising carbon emissions and mobilise financial support. Establish a new, robust infrastructure investment class.
3. Encourage countries to finalise their National Adaptation Plans¹ that incorporate climate- and disaster-resilient infrastructure principles, standards, and codes.
4. Increase the pipeline of bankable climate- and disaster-resilient infrastructure projects through wide adoption of engineering strategies to de-risk them at every stage.
5. Encourage close collaboration between government leaders, engineers, policy analysts, pension funds, asset managers, banks, insurance and reinsurance companies, MDBs, and financial institutions to stimulate greater investments in climate- and disaster-resilient infrastructure.
6. Help MDBs bridge the perceived divide between addressing climate change and eradicating poverty by demonstrating how climate- and disaster-resilient infrastructure is a means to achieve a unified agenda with multiple benefits.
7. Rebalance the funding and prioritising of the Nationally Determined Contributions and National Adaptation Plans,² treating climate- and disaster-resilient infrastructure as a means to achieve both.
8. Scale up investments in climate- and disaster-resilient infrastructure by increasing technical expertise in the project development process, which will lead to cost savings in operations.

Climate- and Disaster-Resilience Principles


9. Raise engineering standards in accordance with global endeavours such as FAST Infra and the Blue Dot Network.
10. Adopt procurement requirements for lifecycle cost comparisons to ensure resilient infrastructure that can withstand climate change disasters.
11. Implement engineering standards at the national, provincial, and local levels of operation to protect and restore ecosystem health and safeguard biodiversity.
12. Facilitate bilateral exchanges between advanced and developing countries of peer-to-peer engineers, infrastructure professionals, and local government officials to share best practises and new technologies.
13. Provide technical and organisational exchanges between advanced nations and small island developing states which are on the frontline of climate change and need disaster-resilient infrastructure most urgently.
14. Promote public, private, and non-profit partnerships for climate- and disaster-resilient infrastructure.
15. Tailor engineering and financing to the specific local conditions of each country. While climate change is global in nature, its impacts are local.
16. Strengthen the integration of scientific and engineering organisations to facilitate the integration of theory and practice.
17. Include engineers at every stage of the decision-making process.



The Challenge

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To catalyse investments for climate- and disaster-resilient infrastructure at scale, governments, financial institutions, and engineers³ must come together to raise infrastructure standards and procurement requirements, to build long-lasting quality infrastructure that is inclusive, protects the environment, and reduces the impacts of climate disasters. According to the World Meteorological Organization’s ‘Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019)’, climate hazards accounted for losses of US\$3.64 trillion during this 50-year period, apart from causing over 2 million deaths, more than 91 percent of them in developing countries.⁴ The US’s National Oceanic and Atmospheric Administration reports that since 1980, the US alone has experienced 348 weather and climate disasters whose costs exceeded US\$1 billion, including 18 such in 2022.⁵

Unprecedented Infrastructure Needs

“The amount of infrastructure that will be built by midcentury is about four times as much as the total available today,” says business leader, politician, and

philanthropist Michael Bloomberg.⁶ The G20 Infrastructure Hub’s Infrastructure Monitor 2022 report concludes that US\$3.7 trillion per year will be needed between today and 2040 to meet the demand, which will be 19-percent higher than if current trends remain.⁷

Infrastructure as Proxy for Quality of Life and Economic Growth

Almost every action, be it turning on a tap or a light, buying food, driving down a road or crossing a bridge, relies on engineered systems, which is to say infrastructure, for its successful completion. Infrastructure that is in line with the decisions taken at the historic 2015 Paris Conference of Parties (COP) on climate change and is supportive of the UN’s Sustainable Development Goals (SDGs) will play a vital role in supporting daily life and impact people of all economic and social backgrounds.

The importance of building resilient infrastructure cannot be overstated, especially for developing countries that may lack adequate capacity, advanced technology, and financial resources to facilitate prompt response to, and recovery from, disasters.



Climate-Driven Risks to Infrastructure

Scientists warn that climate change will accelerate the frequency and severity of disasters.⁸ The investment needed for climate-resilient infrastructure will take more than public finances, and private capital will be needed to fill the gaps.

Inadequate Infrastructure Exacerbates Inequities

When rising carbon emissions combine with poor infrastructure, the cascading effects can be devastating. Low-income communities often bear the brunt of the impacts, and they lack the resources to rebuild and recover quickly. Without sufficient resources, widespread poverty, displacement, and social unrest can occur.


Women and children are often among the most vulnerable. When drinking and wastewater systems are inadequate or fail altogether, pregnant women and young children are at highest risk of contracting waterborne diseases that can stunt physical and mental development and even cause early death. Proximity to hazardous waste sites has similar effects. Poor infrastructure even prevents school-aged children from attending school.



The G20's Role

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To build better before disasters strike, the global community must scale up investments in infrastructure to historic levels. Fortunately, all elements are in place to achieve this goal. What is needed is concerted and consistent leadership in every sector and a collective effort to employ de-risking strategies.

The Coalition for Disaster Resilient Infrastructure is the world's premier organisation in this endeavour, leading governments, multilateral development banks (MDBs) and UN agencies, and designing programmes towards a new paradigm for quality infrastructure. It needs stakeholder support, and the G20 can play a key role.

Engaging All Stakeholders


Financial institutions want procurement requirements and quality standards that meet their investment portfolio goals. As the impacts of climate change come into focus, investors can avoid asset losses by factoring engineering assessments⁹ into their investment strategies. The three big rating agencies¹⁰ will increasingly base their ratings on resilience and sustainability as lifecycle cost analysis

and climate mitigation and adaptation become crucial.

Sustainable infrastructure needs technical expertise, governmental leadership, and financial support. Unfortunately, engineers are often excluded from the decision-making process, which can negatively impact planning, execution, and outcome quality. It could also hinder attracting the level of financing required. At every opportunity, governments should involve engineers in early planning and decision-making.

Establishing infrastructure as a highly attractive asset class recognised as such by the big three rating agencies will lead to societal progress. Rating agencies need to be assured that the projects are safe, climate-resilient, and sustainable. This can be done through infrastructure assessment with multiple infrastructure representatives.

The problem of people working in silos is best resolved by taking a systems approach. Assessments and solutions should consider the economic, social, environmental, demographic, cultural, political, ethical, health, and technological aspects of



projects, anticipating future needs and challenges. Engineering principles must be applied.

Climate- and Disaster-Resilient Infrastructure Aligns with G20 Principles

Investments should focus on both the built and the natural environment. In a circular economy, every infrastructure sector—be it water, transport, energy, telecommunications, agriculture and food security, sanitation, industrial plants, schools, hospitals, or public facilities—affects all the others.

Procurement policies should be guided by the international agreements that inform the planning and construction process. Careful and precise alignment with the 2015 Paris Accord, the Sendai Framework for Risk Reduction and Recovery, the Charter of the Coalition for Disaster Resilient Infrastructure, and the UN SDGs is indispensable.


These international agreements are testament to the power of global diplomacy. The priorities outlined are calls to action for every profession and government.

The G20 Can Enable Climate- and Disaster-Resilient Infrastructure Action

International agreements are most effective when they have an engine to drive them towards their desired ends. As the Economist Intelligence Unit (EIU) has noted: “Infrastructure is the enabler and driver of the SDGs.”¹¹

Climate- and disaster-resilient infrastructure has the potential to be the engine of the SDGs. The SDGs include climate action, poverty eradication, food security, safe water, clean energy, economic growth, infrastructure, and all forms of social and environmental protection.

Climate- and disaster-resilient infrastructure depends on engineers finding innovative and cost-effective solutions while prioritising public safety, health, and welfare. Engineers should analyse likely future scenarios as outlined by the IPCC. Engineering analysis includes evaluating financial, technological, and material resources. Programme analysis should be grounded in science and engineering,



avoiding either underestimating climate impact, which can lead to infrastructure failure, or overestimating it, which can escalate costs.

To bring finance into alignment with the multiple benefits of climate- and disaster-resilient infrastructure, engineering societies have been urging the adoption of higher standards that drive better procurement requirements. Global efforts to raise standards are underway. The US-based Institute for Sustainable Infrastructure's (ISI) 'Envision' framework, the Finance to Accelerate Sustainable Transition (FAST) Infra initiative backed by 80 public and private institutions, and the Blue Dot Network of the US, Japan and Australia to provide assessment and certification of infrastructure projects globally—would all be improved if they worked more closely with the global engineering community, which can provide a professional assessment of how their standards should be implemented.

The Gravitas to Attract Requisite Global Financing

The extensive literature on the G20 provides a clear view of its trajectory and global significance. The contributions of


G20 finance ministers, the work of G20 task forces, and the perspectives of G20 engagement groups add important dimensions to the G20 and weight to its declarations.

The G20's policies and communiqués have grown in stature and impact since its founding in 1999. With its members comprising 85 percent of the world's GDP and 67 percent of its population, the G20 is uniquely positioned to speak both for advanced countries and the largest developing nations.

Climate- and disaster-resilient infrastructure must be properly planned, designed, and built. Plans can inform government decision-making, and guide MDBs to target transformational investments that provide multiple benefits across the spectrum of human needs. To establish higher standards, engineers should be invited to work with MDBs to drive procurement requirements.

The Role of Engineers

Engineers can help appraise a pipeline of bankable, climate-resilient projects that reduce risks and offer attractive opportunities for private investment. Engineers have the education,



training, and experience to determine strategies to de-risk a project, starting at the earliest stage and maintaining meticulous diligence at every step.

Engineers can provide the technical and professional analysis needed to ease tensions between the World Bank and other MDBs over the issue of climate investments versus their traditional investments for poverty eradication and economic development.¹² As the driver of the SDGs, climate- and disaster-resilient infrastructure can align the entirety of climate and development agendas.

Multiple Benefits

By prioritising climate- and disaster-resilient infrastructure investments, MDBs can tackle climate priorities and poverty eradication simultaneously.

The UN's Global Commission on Adaptation has noted how resilience and adaptation efforts worldwide are "gravely insufficient."¹³ As of 24 March

2023, only 44 of the 153 developing countries had submitted completed National Adaptation Plans.¹⁴ These plans should incorporate climate- and disaster-resilient infrastructure principles, standards, and codes that will catalyse new levels of funding for quality infrastructure, encourage more data sharing, and facilitate greater technology transfers from advanced countries to developing countries.


Additionally, climate- and disaster-resilient infrastructure can marry mitigation efforts for climate action and adaptation outcomes for disaster resilience, poverty alleviation, and economic, social, and environmental progress. Many engineering standards have also been worked out to help design and build infrastructure using adaptation and resilience strategies.




Recommendations to the G20

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1. Governments should bring in policymakers, investment expertise, and infrastructure professionals to sit at the same decision-making table to plan, design, and build projects and programmes with governments and financial institutions.
 2. Governments can attract capital markets to leverage public sector investments by reducing risks through higher standards and procurement requirements that are resilient, inclusive, and sustainable over the decades of a project's life.
 3. Governments should use their convening power to increase collaboration on investment financing by bringing key stakeholders together, including scientists, civil society organisations, to develop a pipeline of climate- and disaster-resilient infrastructure projects in developing countries that align with national priorities, values, cultures, and history.
 4. The G20 governments should work with multilateral development banks for a unified agenda on climate-resilient infrastructure investments that will also address poverty reduction and economic development.
 5. The G20 should establish bilateral relationships between infrastructure professionals, local government leaders, and other stakeholders to establish common agendas and trust in accordance with local, regional, national, and international best practices.
 6. The G20 should establish an Engineering Engagement Group to work with the other G20 Engagement Groups to ensure that policy considerations include in-depth analysis of infrastructure risks and higher standards for environmental and social concerns that are incorporated in the procurement requirements.



The mantra ‘none alone’ emphasises the necessity to work in harmony with an agenda that will build quality infrastructure for future generations and reduce the impact of climate disasters. Climate- and disaster-

resilient infrastructure will require mobilising political will, financial resources, and technical expertise, and the G20 can show leadership in this domain.

Attribution: Thomas Smith, Ashok Kumar Basa and Navinchandra Vasoya, “Catalysing Investments for Climate- and Disaster-Resilient Infrastructure,” *T20 Policy Brief*, May 2023.



Endnotes

- 1 United Nations Climate Change (UNCC), “NAPCentral,” accessed March 24, 2023, <https://napcentral.org/submitted-naps>.
- 2 UNCC, “NAPCentral.”
- 3 Modern infrastructure is not possible without engineers. Engineers create the strategies that de-risk infrastructure, attract private capital to complement public investments, and build infrastructure that is not only safe and reliable but also sustainable and climate resilient.
- 4 World Meteorological Organization, *WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019)*, WMO-No. 1267 (Geneva: WMO, 2021).
- 5 NOAA National Centers for Environmental Information. *U.S. Billion-Dollar Weather and Climate Disasters* (Asheville, NC: NCEI, 2023).
- 6 Michael Bloomberg, “City Century: Why Municipalities Are the Key to Fighting Climate Change,” *Foreign Affairs* 94, no. 5 (2015): 116–24, <http://www.jstor.org/stable/24483743>.
- 7 Oxford Economics and Global Infrastructure Hub, *Global Infrastructure Outlook: Forecasting Infrastructure Investment Needs and Gaps, 50 Countries, 7 Sectors to 2040* (Oxford: Oxford Economics, 2017).
- 8 IPCC, *Climate Change 2021*.
- 9 Engaging engineers early in the planning process is paramount to a project’s success and will lead to better collective assessment of structural and nonstructural solutions and their economic, environmental, and social impacts.
- 10 These are Moody’s Investor Services, Standard and Poor’s, and Fitch.
- 11 Economist Intelligence Unit, *The Climate and Disaster Resilient Infrastructure Role of Infrastructure for the SDGs* (New York: EIU, 2019).
- 12 Financial institutions want to fund infrastructure projects that benefit disadvantaged communities and vulnerable populations while supporting healthy ecosystems and biodiversity. They will be attracted to engineering standards that build such requirements into the procurement documents.
- 13 Global Commission on Adaptation. *Adapt Now: A Global Call for Leadership on Climate Resilience* (Netherlands: Global Center on Adaptation, 2019), 1.
- 14 UNCC, “NAPCentral.”



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