

HARNESSING AI TO BUILD A RESILIENT FUTURE FOR ALL

When a disaster occurs, resilient infrastructure ensures an effective response and quick recovery, thereby preserving the continuity of vital services. Imagine communities where AI-powered early warnings enable timely evacuation, and resilient bridges withstand flash floods. Such outcomes aren't futuristic; they are achievable with appropriate investment, inclusive technology, and global collaboration.

Across continents, there is a growing resolve to fortify public infrastructure against climate volatility and geophysical shocks. Resilient infrastructure is not merely a safety net; it's a foundation for sustainable development. That's also the core vision of Coalition for Disaster Resilient Infrastructure (CDRI), a global coalition launched by India in 2019 at the UN Climate Action Summit. Today, CDRI brings together over 50 countries and a dynamic network of experts, UN agencies, development banks, academics, and private players to strengthen infrastructure resilience against climate and disaster risks.

Addressing the Infrastructure Gap with Digital Technology

When integrated ethically and inclusively, AI is revolutionising how nations assess and respond to risks, turning reactive crisis management into proactive resilience.

AI and machine learning (ML) are already reshaping infrastructure planning in vulnerable regions. In South Asia and the Pacific, projects are yielding significant impacts. In India, ML models are assessing the seismic vulnerability of heritage structures. In Bangladesh, image classification algorithms support cyclone risk modelling and analysis of housing patterns. Nepal's mountainous terrain is being mapped with ML and satellite imagery to assess landslide vulnerability. The Maldives is using AI models to monitor sea level rise, while in Fiji, drone footage



Amit Prothi
Director General

Coalition for Disaster
Resilient Infrastructure (CDRI)

is swiftly processed to direct recovery efforts post-disaster.

These field-tested, scalable tools are driving real change by using AI/ML to reshape how we design and manage infrastructure under stress.

Yet, the promise of AI remains unevenly distributed. In Least Developed Countries (LDCs) and Small Island Developing States (SIDS), lack of digital infrastructure, data fragmentation, and limited institutional capacity often hinder the ability to fully harness AI.

To address these challenges, CDRI's 'Data and Technology Programme' is aimed at helping governments strengthen resilience by embedding AI & technology across infrastructure lifecycles, from design and regulation to operation and financing.

Some communities begin with basic dashboards mapping flood zones; others leap ahead with AI-enhanced hazard simulations. But regardless of the technology tier, the objective remains constant - empower institutions to understand and act on risk.

Resilience isn't solely about technology; it's rooted in sound governance. CDRI aids member nations in building infrastructure asset registries, training officials in data analytics, and using platforms like the Global Infrastructure Risk Model and Resilience Index (GIRI). Increasingly, these efforts incorporate AI to enhance predictive modelling and early warning capabilities.

Towards Collaborative, Ethical, Inclusive AI Innovation

CDRI harnesses academic research, private sector innovation, and global experience to ensure member nations access the latest in geospatial intelligence, IoT, remote sensing, and immersive technologies like AR/VR. More importantly, these partnerships promote equity. Technology isn't delivered top-down; it's co-created. This ensures solutions are culturally informed, locally relevant, and tailored to diverse risk profiles.

For example, a CDRI Fellowship grant helped develop an AI simulator for the Dominican Republic to model climate threats, analyse impacts, and plan responses, while assisting communities and leaders in enhancing readiness, resilience, and sustainability.

AI's potential to revolutionise infrastructure must be matched by ethical responsibility. AI must be inclusive, transparent, and designed with community realities in mind because its purpose isn't just efficiency, it's equity. India,

with its prowess in technology and diplomacy, is uniquely positioned to lead this shift by investing wisely, partnering inclusively, and governing responsibly.

A Resilient Tomorrow

Infrastructure should never be a barrier; it should be a bridge. AI, when harnessed thoughtfully, transforms risk into resilience. But technology alone won't solve our challenges. It requires collective will, visionary governance, and a shared commitment to safety and prosperity.

As the climate crisis intensifies, the resilience of infrastructure will no longer be judged by how well we build, but by how wisely we prepare for disaster management and risk reduction. With AI as our ally, we can shape systems that protect, empower, and adapt, not just for some, but for all, transforming today's vulnerabilities into tomorrow's strengths.

