

# BUILDING REGULATION FOR RESILIENCE

## Managing Risks for Safer Cities

### Background

In the last decade, low- and middle-income countries have experienced 53 percent of all disasters globally—but have accounted for 93 percent of disaster-related fatalities.<sup>1</sup> This disproportionate impact stems in large part from unsafe and unregulated urban development. According to the 2015 Global Assessment Report (UNISDR), the future expected annual losses in the built environment resulting from disasters such as earthquakes, tsunamis, cyclones and flooding are expected to rise from roughly USD 300 billion to USD 415 billion by 2030.<sup>2</sup> Often, such disaster events disproportionately impact poor and marginalized populations living in unsafe buildings and areas exposed to natural hazards – with hazard frequency and severity likely to increase in the future.

The world—and the developing world in particular—is embarking on a major urban development boom, a trend that makes safe and regulated building practices all the more crucial. Currently, more than 50 percent of the global population is urban, and by 2050, this share is expected to rise to 66 percent. Some 90 percent of this growth is expected in Africa and Asia,<sup>3</sup> while in South Asia and Sub-Saharan Africa, urban development is expected to attract major capital investment. By 2050, 1 billion new dwelling units will be required to house the world's growing population.<sup>4</sup> But most of this growth is expected to occur in cities with weak capacity to ensure risk-sensitive development and construction, and will take place as weather-related hazards become more frequent and intense.



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# Objective

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The proposed program aims to initiate a new building policy and regulatory strategy for the World Bank Group. Specifically, it seeks to develop and promote a new stream of activities to increase regulatory capacity and in turn promote a healthier and safer built environment. By leveraging good practice in building regulation as part of a strategy to reduce both chronic risk and disaster risk, it will set developing countries on the path to effective reform and long-term resilience.

## A Window of Opportunity

In high-income countries, building codes and regulatory frameworks have been incrementally improved over the course of the past century in response to a combination of hazard impacts, structural failures and public health disasters. These mature systems have proven remarkably powerful tools for increasing people's safety and resilience and limiting the risks that they face. For instance, Japan proves that an improved building code can make a significant difference in the rate of building collapses. When the 1995 Kobe earthquake struck, 97% of collapsed buildings had been built under old building codes, while those that complied with the most updated codes accounted for only 3% of the total number of collapsed buildings.<sup>5</sup> In low- and middle-income countries, however, regulatory systems have not developed in the same way (if at all) and do not afford the same protection. What we propose for these countries is an accelerated path to regulatory maturity that avoids a protracted evolution based on tragedy and failure. Instead, by adapting the lessons learned in high-income countries to the local context, low- and middle-income countries can “leapfrog” toward appropriate and effective regulation.

The precise benefits of strong and effective building regulatory frameworks are elaborated in the World Bank–Global Facility for Disaster Reduction and Recovery (GFDRR) report *Building Regulation for Resilience: Managing Risks for Safer Cities* (April 2016) and are summarized below. This report is a resource to assist policy makers, governments, and donor entities as well as key private sector players in leveraging good-practice building regulation to underpin effective risk reduction. By focusing on the role of building regulation in protecting lives and property from both chronic and acute events, the report supports a shift from disaster response to reduction of underlying risks.

Enhanced regulatory implementation in low- and middle income countries has several important benefits:

***Building code compliance saves lives.*** While code compliance may add to initial construction costs, the reduction in loss of life and property in future hazard events more than compensates for this increase. Consider the impact of two different earthquakes, one in Bam, Iran, and one in Paso Robles, California, in 2003. The earthquakes were of similar magnitude, but the death toll in Bam was more than 40,000—nearly half the city's population—while only two people died in Paso Robles. In Bam, the 989 earthquake design codes were poorly implemented, and buildings were primarily unregulated, unreinforced masonry structures. In Paso Robles, by contrast, earthquake design codes had been in place since the 1930s, and the two deaths were due to the failure of a pre-code, unreinforced masonry structure.



**Building code compliance is cost-effective.** New construction with appropriate design can be made disaster-resilient for a small percentage of construction costs, on the order of 5 to 10 percent, whereas ex post retrofits of existing vulnerable structures may require expenditure in the range of 10 to 50 percent of the building value. In general, well-designed building and land use regulations are efficient and cost-effective tools for limiting chronic stresses (i.e. fire, spontaneous collapse, and unhealthful conditions) as well as the shocks of natural catastrophes.

**Strong regulatory frameworks encourage investment in safe structures.** Effective implementation of building regulations assures developers, investors, and insurers that built structures will withstand both chronic stresses and disasters. Demonstrating an ability to ensure and enforce safe building practices can therefore create confidence that buildings are safe and constitute sound investments.

**Safe buildings protect critical assets of the poor and vulnerable.** In developing countries where currencies fluctuate and banking systems are unstable, poor households often invest their savings in incremental housing construction. Thus a single structural failure or natural disaster can destroy not only a building, but also a household's entire savings. Safe construction safeguards households' assets, particularly among poor and vulnerable households. In addition, other contributing institutions and regulatory instruments – all of which are part of a larger regulatory ecosystem – can play an equally important role, including tenure security, accountability mechanisms for building and planning departments as well as clear rules on the liability of building practitioners.

## Alignment with Sendai Framework for Disaster Risk Reduction (2015–2030)

In accord with Priority 3 of the Sendai Framework for Disaster Risk Reduction (2015–2030),<sup>6</sup> the program responds to and reinforces the growing international consensus on the importance of building and land use regulation. The program aims to implement a vigorous building regulatory reform agenda by means of the following actions:

- Ensuring the safety of new construction and reducing the risk of existing vulnerable settlements through regulatory reform
- Orienting regulatory and governance reforms toward compliance advice and support rather than just enforcement
- Developing the capacity of national and subnational institutions to implement building regulations that address chronic health and safety issues as well as disaster risk (i.e., ensuring sufficient funding, staffing, and training at the local level)

- Developing building standards that are accessible, affordable, and implementable by the poor and vulnerable, while also improving tenure security and reducing the cost of entry to legal land and housing markets
- Promoting innovation for effective building control, including simplifying administrative procedures and reducing regulatory compliance costs
- Leveraging private sector technical resources to expand the qualified workforce for regulatory implementation.

<sup>1</sup> Munich Re, Geo Risks Research, Natcatservice, 2013, in United Nations Integrated Strategy for Disaster Reduction, Global Assessment Report on Disaster Risk Reduction (Geneva: UNISDR, 2015).

<sup>2</sup> United Nations Integrated Strategy for Disaster Reduction, Global Assessment Report on Disaster Risk Reduction 2015 (Geneva: UNISDR, 2015).

<sup>3</sup> United Nations, Department of Economic and Social Affairs, Population Division, World Urbanization Prospects: The 2014 Revision (New York: United Nations, 2014).

<sup>4</sup> R. Bilham, "The Seismic Future of Cities," Bulletin of Earthquake Engineering 7 (2009): 839.

<sup>5</sup> [https://media.worldbank.org/secure/learning\\_from\\_megadisasters/full\\_report\\_learningfrommegadisasters.pdf](https://media.worldbank.org/secure/learning_from_megadisasters/full_report_learningfrommegadisasters.pdf) (page 34)

<sup>6</sup> The Sendai Framework was adopted at the Third United Nations World Conference in Sendai, Japan, in March 2015. Priority 3, "Investing in disaster risk reduction for resilience," seeks to "encourage the revision of existing or the development of new building codes and standards . . . with the aim of making them more applicable within the local context . . . and reinforce the capacity to implement, survey and enforce such codes . . . with a view of fostering disaster-resistance structures."

## Call for Action: Building Regulation for Resilience Program

The program aims to bridge the implementation gap that arises when concepts from mature regulatory systems are transferred to developing countries without specific adaptation to local cultural, economic, social and institutional factors affecting compliance. It considers a localized and calibrated approach, along with awareness of the wider socioeconomic and development context, to be essential. With a specific focus on vulnerable settlements in low- and middle-income countries, the program aims to develop the larger regulatory “ecology” of institutions that support effective building code implementation. These institutions provide the legal and financial mechanisms as well as certified technical competence required to achieve regulatory compliance. Special efforts will be made to engage and galvanize a wide range of relevant partners; maximizing their comparative strengths and experiences will make it possible to address all types of construction.

The program includes four broad components:

**National level legislation.** This component establishes or improves the national legislative framework responsible for mandating the construction of safe buildings and enables the construction process to proceed efficiently. Activities will be based on nationally defined priorities. In addition, future financial investments (by governments, donors, and/or multilateral institutions) will fund national hazard mapping programs.

**Building code development and maintenance.** This component supports the development of national model codes based on local context and consensus. It establishes the basic institutional capacity to develop, adapt, and update appropriate standards of construction through participatory and transparent processes at the national level. It will pay particular attention to the safe utilization of indigenous materials and to criteria for evaluating and strengthening vulnerable existing buildings.

**Local implementation.** This component focuses on the practical administration of local building departments. It includes managing the core functions of building technical assistance, plan review, site inspection, permitting, and enforcement, with the goal of facilitating voluntary compliance. Advisory activities will prioritize outreach services for informal sector builders in order to expand access to the benefits of the building safety and regulatory processes.

**Knowledge sharing and measurement.** The component builds a collaborative knowledge platform for exchange of experience and innovation related to building regulatory implementation. It develops and maintains common core methodologies and resources for the assessment of regulatory capacity, effectiveness, and efficiency. It also carries out diagnostics, risk audits, and evaluations of regulatory system capacity and develops specialized and standardized tools for assessment and rating purposes.

## Partners

The Building Regulation for Resilience program will be a partnership of governments, international development institutions, and key public, private and non-governmental actors in the building sector—specifically professional associations and societies related to codes of practice; leading academic institutions in engineering, architecture, urban planning, construction, and building technology; accredited training institutions for the construction labor force; bodies responsible for licensing procedures for building professionals; and implementers of quality control processes for building materials.

The program will seek to maximize the respective strengths of the public, private and nongovernmental sectors to create a comprehensive building regulatory regime. In particular, partners will be sought to help develop and enforce modern compliance tools for improved information and communications systems aimed at risk management, building practitioners’ certification, private third-party accreditation to provide review and inspections, and the use of insurance mechanisms to augment building control.

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