

An aerial photograph of a city, likely Cairo, Egypt, showing a dense urban landscape with numerous multi-story buildings. In the background, the Great Pyramids of Giza are visible under a clear blue sky. The text is overlaid on the upper portion of the image.

**BUILDING & LAND USE
REGULATORY IMPLEMENTATION
AND COMPLIANCE AT THE LOCAL
LEVEL**

**A PRIORITY FOR THE POST-2015 FRAMEWORK FOR
DISASTER RISK REDUCTION**

This position paper was developed on behalf of the Global Facility for Disaster Risk Reduction (GFDRR), an international partnership managed by the World Bank and funded by 25 global partners, to help high-risk, low-capacity developing countries better understand and reduce their vulnerabilities to natural hazards, adapt to climate change and address chronic risks. This paper advocates the need for the post-2015 framework for disaster risk reduction (DRR) to initiate a bold and coordinated international effort to reduce risks in the built environment.

This paper is primarily intended for the participants of a working session and a public forum, co-organized by UN-Habitat, UNESCO, the World Bank and ISDR. These events are scheduled in Sendai, Japan, during the World Conference on Disaster Risk Reduction, in March 2015. Both events are dedicated to this topic.

Over the past 20 years disasters and natural hazards have affected 4.4 billion people, claimed 1.3 million lives and caused \$2 trillion in economic losses.¹ These disasters have disproportionately impacted the poor and the marginalized.

In terms of human lives lost, low- and low-to-middle income countries suffered 85 percent of total global fatalities.² A report funded by the Global Facility for Disaster Reduction and Recovery (GFDRR) shows that disasters' impact on gross domestic product (GDP) is 20 times higher in developing countries than in industrialized nations.³

For example, since 1980, nine countries⁴ in Central America and the Caribbean experienced a disaster event with an economic impact above 50 percent of their annual GDP.⁵ These impacts pose a fundamental threat to the goals of eradicating poverty and boosting shared prosperity.

Building codes and land use regulatory systems have been significantly overlooked, to date, in disaster risk reduction (DRR) strategies for developing countries. Experience has demonstrated the inappropriate transposition of codes and standards from high-income, developed countries to developing countries.

Building codes and land use regulations have not received adequate and focused attention in investment programs for DRR. Furthermore, building codes and standards can only be effective if they are part of a larger “culture of safety” that includes engineering education, construction skills, legislation, and enforcement.⁶ Although some bottom-up approaches to building regulatory system improvement have emerged, they have not offered scalable and compelling models that can save lives and better protect people's homes, their places of work, and their belongings in large and fast-growing cities.

In this context, GFDRR recently took steps to review recent developments and experiences on the ground with the aim of exploring the feasibility of an international programmatic effort. The goal will be to accelerate the adoption of more effective land use and building code systems in DRR strategies.

Explosion of urban risks

Several factors have contributed to the growth of disaster losses and the continued growth of disaster risk. Urbanization continues to concentrate people and the urban systems they depend on, and this concentration often occurs near natural hazards. This pattern, in tandem with haphazard application of building codes and land-use planning, is increasing urban exposure and vulnerability, and climate change will continue to increase the complexity of hazards cities face, especially for those near coastlines and rivers.

Much of the developing world has been subject to massive rural-urban migration over the past century. This dramatic increase in urban population has largely taken place without the benefit of building or land use regulation. The result is a dramatic expansion of population exposed to

¹ UNDP, 2014

² Munich Re, 2010

³ Natural Hazards, Unnatural Disasters, World Bank, United Nations, 2010

⁴ Antigua & Barbuda, Dominica, Grenada, Guyana, Haiti, Honduras, Jamaica, Saint Lucia and St Kitts & Nevis.

⁵ Charles, Keren Carla, 2013

⁶ Jo da Silva, 2013

disaster loss in vulnerable buildings on hazardous sites. The number of people expected to be exposed to tropical cyclones and earthquakes in large cities will more than double by 2050, from 310 to 680 million for cyclones and from 370 to 870 million for earthquakes.⁷

These urban expansion areas are most often established without the benefit of risk reduction guidance from building or land use regulations. Informal settlement often gives rise to slums that are characterized by over-crowding, lack of basic urban services including clean water, sanitation, and electric power, access to transportation, employment, and access to health and educational facilities. Land use and building regulation address both the acute problems of a disaster and the chronic problems of uncontrolled development.

The safety and health of dense urban populations is dependent on functioning and well-maintained critical infrastructure. This dependency on urban service systems makes building and land use regulation essential to humane living conditions.

Rapid urbanization without effective regulation has dramatically increased urban disaster risk throughout the developing world. As the world will witness the construction of 1 billion new dwelling units by 2050 and a doubling of urban building stocks in the next 20 years⁸, the international community needs to actively pursue more effective approaches to regulations through building codes and land-use management.

Successful mechanisms of risk reduction and hazard adaptation in the developed world have relied in large part on effective and efficient regulation. Following Hurricane Charley in 2004, it was found that conformance to current building codes reduced the severity of losses by 42 percent and loss frequency by 60 percent.⁹ Extending these lessons to disaster risks, studies show consistent conclusions about the “high returns” of investing into functioning building code systems and how they reduce exposure to natural hazards.

Today, in OECD countries, the added cost of a functioning permitting and inspection system is about 1.7 percent of construction costs.¹⁰ Building and land use regulation has been essential to the protection of health, safety, and welfare in the cities of the developed world.

It is now a priority for the disaster risk community to ensure that this collective experience be better understood, appropriately adapted to local conditions and incorporated into sustainable regulatory implementation systems.

What has been accomplished?

The Hyogo Framework for Action 2005–2015 (HFA) made an explicit call for rigorous enforcement of building codes by encouraging:

“[...] the revision of existing or the development of new building codes, standards, rehabilitation and construction practices at the national or local levels, as appropriate, with the aim of making them more applicable in the local context, particularly in informal and marginal human

⁷ Brecht, Deichmann & Wang, 2010

⁸ Bilham, 2009

⁹ Insurance Institute for Business & Home safety, 2006

¹⁰ Doing Business, World Bank, 2015

*settlements, and reinforce the capacity to implement, monitor and enforce such codes, through fostering disaster-resistant structures”.*¹¹

A multi-stakeholder review of HFA in May 2014 has indicated that while significant progress has been made over the past 10 years in the passage of DRR-related legislation at the national level, a major gap remains at the local and municipal level where regulatory implementation actually must take place.¹²

There is a serious need to enhance good practices in DRR, including standard setting for building codes and land use and effective delivery of building control. The review observed that the HFA has realized some success in encouraging member states to adopt legal and regulatory frameworks that incorporate DRR into urban planning and building codes. For example, some progress were reported in Guatemala to train masons on all aspects of building safety. In Nepal, municipalities, central government and NGOs initiated a process to train masons to construct earthquake safe buildings and provide them with licenses. However these efforts remained generally isolated and relatively modest in scale. In the majority of developing countries, building codes and regulations have been consistently neglected in DRR strategies and disaster risk has continued to increase.

Consistent with the lack of progress in developing effective building code regulatory frameworks, many high-risk countries have received negligible levels of financing for DRR compared with emergency response. In fact, the great majority of recipients of response funding received less than 4 percent of their disaster-related aid as DRR in the past 20 years.¹³ Supporting effective building code implementation is one concrete opportunity for the international community to shift the focus towards reducing risks and building resilience.

What came in the way of progress in low- and middle income countries?

The reason why people end up in dangerous areas or informal unsafe buildings is primarily related to income levels and the affordability of the formal housing stock. The fewer people who can afford formal housing, the greater the number of people living in informal solutions.

Larger social and institutional contexts determine whether private and public actors comply with any notional codes that may exist.

While land use and building regulatory regimes should improve access to safe and affordable housing, they have often contributed to achieving quite the opposite by fomenting informality, and by increasing exposure to risks.

The factors that have led to this outcome have included:

- Ineffective land use systems
- Flaws in legislative, building code and standards
- Weak incentives, institutional and implementation mechanisms.

¹¹ Priority 4.4

¹² UNISDR, 2014

¹³ Financing Disaster Risk reduction, GFDRR, 2013

1. *Ineffective land use systems*

- Land use planning and management systems in low- and middle-income countries are often ineffective. They fail to limit settlements in hazardous areas and serve to exclude a large proportion of the urban population from legal land and housing markets. These factors dramatically increase urban disaster risks. Cities in low-income countries rapidly expand on to hazardous territory without clear title or critically needed infrastructure. Such informal developments are often subject to exploitation resulting from insecurity of tenure. Even where provision is made to limit development in hazardous areas, land use plans are often not adequately supported by effective enforcement or broader compliance mechanisms.

2. *Flaws in legislative, building code and standard infrastructure*

- *Unaffordability of building standards.* The process of designing and adopting appropriate building standards has often been a top-down directive with insufficient consultations of stakeholders, including private sector representatives, building professionals, and local communities. This has often led to unaffordable standards. Building codes in low-income countries have often set the bar at unrealistically high technical levels. At times, they increased the dependency of developing countries on imported manufactured building materials and stifled local innovation.
- *No recognition of prevailing building practices.* Post-disaster reconstruction projects have highlighted the need for more contextual approaches that do not focus only on effective and efficiently built products, but that directly contribute to poverty reduction, sustainable and, ultimately, long term reduction of vulnerability and risks. People and builders in low-income settings have often integrated risks into their daily practices, developing particular coping strategies that should be considered for the enhancement of local resilience. The widespread practice of “incremental housing”¹⁴ is almost never recognized by formal systems of land use and building codes, which widens the gap between the formal and informal built environment. An example is *dhajji dewari*, a form of timber and masonry infill construction common in Northern Pakistan. Physical testing established that this form of construction can safely withstand forces associated with earthquakes when built properly.¹⁵ The building code system had not recognized this form of construction. In turn, this factor prevented large scale funding of *dhajji dewari* in the aftermath of the 2005 earthquake.

3. *Weak incentives, institutional and implementation mechanisms*

¹⁴ “Incremental housing” can be described as a phased process by which to satisfy the basic and fundamental right to adequate housing. This process intends to help address such need in a way that allows more people to access housing opportunities, starting with right of tenure with rudimentary service followed by basic services and then eventually acquiring a house through a self-build process.

¹⁵ Jo da Silva, 2013

- ***Dysfunctional regimes of building controls.*** Permitting and inspections services in developing economies are often characterized by a number of governance and system failures such as ineffective administration, insufficient qualification of local building officials, designers and contractors, a limited appreciation of risk management objectives, opaque and complex bureaucratic procedures.
- ***High compliance costs.*** Compliance costs act as strong deterrent to meeting legal requirements. For example, in the city of Mumbai, India, the formal cost of going through a planning and construction permitting process is equivalent to 46 percent of the construction cost. The same process costs only 0.6 percent in Japan.¹⁶
- ***Corruption and regulatory capture.*** Corruption in building code enforcement has been associated with extensive building failure and loss of life in disasters. Recent statistical evidence shows that 83 percent of all deaths from earthquakes in the past three decades have occurred in countries considered most corrupt by Transparency International.¹⁷ The authors suggest that the correlation is striking and point out that the majority of fatalities from earthquakes can be attributed largely to the effects of corruption. The related process of regulatory capture in building code implementation can considerably alter regulatory outcomes. It can lead to reducing safety standards to benefit the regulated industry or, conversely, increase safety standards to unsustainable or unaffordable level for local owners and builders

For a more robust regulatory reform agenda in HFA2

In the course of the past 20 years, significant advances in the natural sciences have made possible the characterization and mapping of hazard events in terms of frequency, intensity, and location for hydro, meteorological, and geophysical hazards. Engineering research has dramatically improved the understanding of material and structural performance of buildings and infrastructure. Building and land use regulatory regimes have provided the primary channel for the effective and efficient introduction of scientific and engineering knowledge into construction practices.

Building on these foundations, it is proposed that HFA2 incorporate a commitment to promote effective and efficient regulations with a greater focus on regulatory and institutional delivery capacity at the local level. In the absence of a competent regulatory regime and compliance mechanisms, DRR will only remain an aspiration.

Specifically, we call for a coordinated international effort articulated around the following major directions:

1. ***Developing the capacity of national and subnational institutions.*** A coordinated effort should address the specific need for adequate funding, staffing and execution to implement land use management and building inspection at the local level. This requires specific support for training and compensation for building officials. It also demands a

¹⁶ Doing Business, World Bank, 2015

¹⁷ Bilham, Ambraseys, 2011

parallel effort in developing building and land use related education, financial, and insurance mechanisms for the management of risk and public understanding of the importance of safe siting and construction practice.

2. ***Focusing on the poor and vulnerable.*** Low-income and lower middle-income countries have the least capacity to cope with disaster losses. Where regulations are unknown, unenforceable, or excessive, they tend to be disregarded by the majority of people, especially the poor. Moving forward, standards and implementation mechanisms should become appropriate and affordable for the disadvantaged segments of the population. This approach should be promoted through a process of incremental regulation, by promoting modest initial standards of development to enable the poor to enter the legal housing market and improve their housing conditions over time. Consistent with this approach, we should support measures to improve security of tenure and reduce the cost of entry to the legal land and housing market.
3. ***Rolling out innovations in effective building controls.*** Experience generated in the past 20 years points to the potential of leveraging private sector resources into more robust and affordable verification mechanisms. Modern compliance tools include improved information systems on risks, building practitioners' qualification, private third party checks, and the use of insurance mechanisms into building controls. Numerous experiences in the field also demonstrate that compliance and efficiency in planning and building regulations can be achieved by promoting greater transparency. This can be implemented through small and incremental steps. These steps can typically include measures that reduce excessive discretion in planning and building permit approvals and improve disclosure of information related to technical and administrative requirements. Following a huge landslide, in February 2001, in La Paz, Bolivia, the municipality initiated, in 2012, a sweeping reform of the construction permitting procedure. The reform included introducing a parametric module that allows users to verify whether the project being executed is in compliance with the standards in force. This tool included a matrix designed to assess the risks to the building and a matrix designed to assess usage risks. A simplification of permitting procedures combined with this transparency effort led to an increase of 30% in issuance of construction permits¹⁸, pointing to positive trends towards increased compliance and building formalization.
4. ***Limiting the expansion of new risks.*** With building stocks expected to double within the next two decades, there is a strong case to reduce the development of new risks in future urban development. Disaster resistance can be achieved in new construction at considerably less cost than in retrofit of existing vulnerable construction. This approach should not disregard the plight of those living and working in vulnerable buildings on hazardous sites. High priority must be also placed on the inspection and assessment of existing buildings to determine the feasibility of risk reduction measures. The development of regulatory capacity for new construction will provide a foundation for the extension of regulatory practice for the improvement of existing structures.

¹⁸ International Finance Corporation, 2015

5. ***Creating a shared purpose.*** Reducing risks in the built environment will happen only if we now undertake to set clear goals, build accountability, and share knowledge. To enable this process, we should develop baselines with the aim of setting targets and measuring progress in disaster risk reduction. Global leadership mechanisms should be adequately resourced to carry out this effort. While loss reduction in the built environment is the ultimate desired outcome, the approach could include measuring interim accomplishments such as the gradual take up of effective design and delivery of regulatory systems.

None of these actions will be simple and easy to implement, as they will strongly interact with larger socio-economic constraints and with more entrenched resource and governance challenges in developing cities.

Building on tangible progress made in engineering and construction technology in the past few decades, we should now shift the focus to how institutional arrangements can deliver safer buildings on the ground and save lives.

GFDRR, together with partners such as UN-Habitat, UNESCO, and private sector entities has called for the launch of a collaborative initiative that will provide the framework for implementing the proposed strategic directions, for sharing knowledge and for measuring progress in reducing risks in the built environment.

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