



BUILDING REGULATION FOR RESILIENCE PROGRAM



Benefits of a comprehensive and resilient building regulatory system

Buildings are an essential component of societies and economies, providing safe and healthy environments for people to live and work. They provide protection from the weather, climate, fire, and natural hazard events. They house critical infrastructure necessary to keep government and business in operation. They represent significant cultural heritage. In many countries they represent a significant percentage of gross national product through construction, the operations they house and tourism.

To facilitate well-performing buildings, comprehensive building regulatory frameworks are needed. Components of the building regulatory framework function holistically to assure

that a particular building, on a particular site, exposed to well-characterized hazards, is able to achieve the minimum levels of performance. Building regulations establish minimum levels of performance in terms of health, safety, accessibility, community welfare and sustainability. They are also used to address emerging societal objectives such as accessibility for all, affordability and resource efficiency. Building regulation also facilitates economic development and stability by establishing competent and reliable regulatory practices that incentivize economic investment, providing the market with a clear set of design and construction requirements and quality standards and competency expectations.

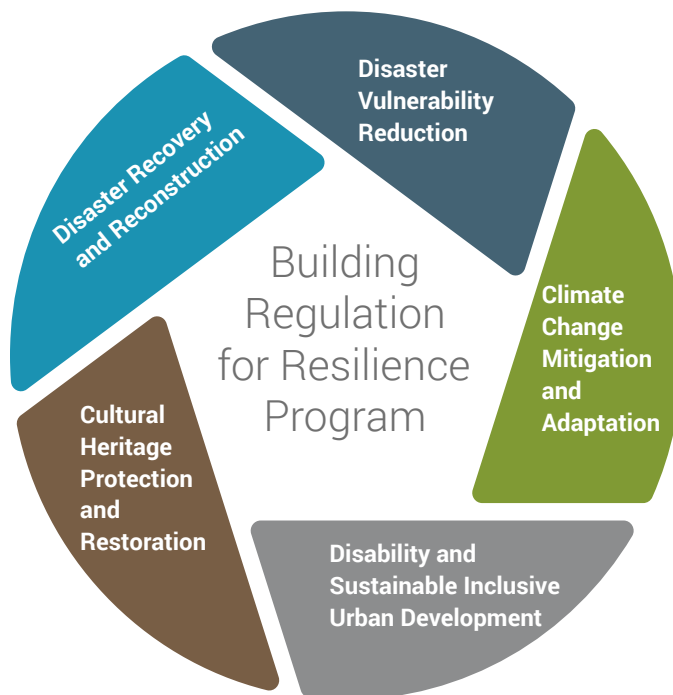
Sectors of engagement

Disaster Risk Reduction / Vulnerability Reduction Programs

Risk and vulnerability reduction strategies must balance mitigation opportunities and associated costs against potential risks and associated losses. Building regulatory frameworks are mechanisms for optimizing societal risk reduction as associated with reducing both disaster and chronic (e.g. fire and spontaneous building collapse) risks in the built environment. This includes vulnerability reduction in new building stocks as well as existing ones (e.g. retrofitting).

Climate Change Mitigation

Carbon contributions from the built environment are a recognized concern. More than half of all resources consumed globally are used in construction and almost half of all energy generated globally is used to cool, light, and ventilate buildings. The Intergovernmental Panel on Climate Change estimates building-related GHG emissions



Applicability of the Building Regulation for Resilience Program



to double by 2030 under a high-growth development scenario. This increase would take place almost entirely in the developing world. Effective building regulatory frameworks combined with financial and non-financial incentives are powerful tools to support market transformations. Combining both instruments (such as the IFC EDGE Program — edgebuildings.com) can promote green buildings as well as construction materials and construction industries with lower carbon footprints.

Climate Change Adaptation

With the changing climate, many parts of the world are vulnerable to new or more extreme hazards than any time in recent history. This requires adjustments in building siting, design, and construction to avoid or withstand increased force and frequency of hydro-meteorological hazards such as extreme wind, flood, storm surge and sea level rise. Adaptation to these dynamic hazards requires future oriented hazard mapping and calculation of expected hazard loads on structures. It is of critical importance that the mechanisms of land use and building regulation are established to guide future investment and development. Protection of existing settlements in a cost-effective manner requires a dynamic regulatory approach that guides adaptation in advance of growing hazard effects. Addressing new urban development, particularly in coastal areas, requires a pro-active approach to land use management (development controls for flood and storm surge zones) and flood and wind resistant building regulations. Examples of “anticipatory” regulation are harder to find in developing countries. Jamaica is currently carrying out a coastal hazard mapping with the intent to update land use regulation while the authorities continue to successfully enforce minimally intrusive and low-cost hurricane straps in residential buildings.

Accessible and Sustainable Inclusive Urban Development

The World Bank estimates that 15 per cent of the world's population have some kind of disability, with 80 per cent living in developing countries. Effective implementation of building and urban development standards for accessibility and protection of persons with disabilities and elderly requires policies and principles to be translated into actual change in the configuration of the built environment. Implementation of policies for the inclusion

and protection of persons with disabilities and elderly depends significantly on the capacity and competence of building regulatory institutions.

Upgrading of Informal Settlements

A characteristic of many large urban environments are informal settlements. According to UN-Habitat, one in eight people (one billion) live in informal settlements and the number continues to grow. Shortcomings in building regulatory framework governance can place inhabitants at much higher risk to illness and injury, with the potential impact from chronic hazards, such as fire, resulting in far more extensive damage than for similar events that might impact regulated buildings.

Protection of Cultural Heritage & Restoration

While many historically significant buildings have stood the test of time with respect to resiliency against a wide range of hazard events, they may not be constructed in a way that reflects current social norms regarding accessibility, safety or energy efficiency. Adding features to facilitate these objectives, in a historically- and culturally-sensitive manner, can be a challenge. In addition, inadequately implemented modifications over decades or centuries may have inadvertently reduced the building's resiliency to various hazards. A well-designed building regulatory system can help protect historic architectural patrimony which is often a significant source of regional income, while delivering on health, safety, accessibility, sustainability and resilience objectives.

Disaster Recovery Projects

When a disaster occurs, there is an opportunity to assess the factors that contributed to the catastrophe, including gaps in the building regulatory system, and to implement measures that can reduce the probability for a similar event to reoccur in the future. Buildings siting, construction, operation and maintenance can be addressed via building regulatory systems. Improved construction and inspection practices and improved regulatory governance are critical elements of the “Building Back Better” concept that can be promoted in post-disaster reconstruction projects.



Products

The BRR program provides a package of services and interventions in two main areas:

1. Technical assistance to support efficient and effective building regulatory frameworks

A package of inter-related products can be deployed to support more efficient and effective building regulatory systems, starting with technical assessments, targeted legal or building code reviews, formulation of legal and regulatory foundations for building safety, training for certification of building regulators, professionals and workforce, re-engineering of building departments with appropriate building code administration software solutions, accreditation programs and targeted educational programs for the informal sector.

2. Investment in critical building quality assurance mechanisms and retrofits

This includes instrumentation for monitoring of seismic, wind and flood activities, laboratories and testing equipment for building materials, products and assemblies, and retrofitting of critical facilities.

Technical Assistance	Investment
<p>Functional diagnostics and capacity assessment</p> <ul style="list-style-type: none"> ▶ Projected physical damage & loss estimations in the built environment ▶ Evaluation of risks in existing buildings structures ▶ Building Regulatory Capacity Assessment (BRCA) 	<p>Instrumentation and laboratories</p> <ul style="list-style-type: none"> ▶ Instrumentation for monitoring of seismic, wind and flood events ▶ Laboratories & testing equipment for building materials, building products & assemblies ▶ Equipment for on-site inspection and nondestructive testing
<p>Legal and regulatory foundations for building safety</p> <ul style="list-style-type: none"> ▶ Legal advice and technical review for building legislation and building codes (participatory process and local relevance) ▶ Qualification requirements, plan reviews, inspection, permitting, certification & accreditation of design professionals and testing laboratories ▶ Support to enabling environment (insurance, incentives, mortgage finance, etc.) 	<p>ITC infrastructure</p> <ul style="list-style-type: none"> ▶ Improved efficiency in communication with permit applicants and effective record keeping ▶ ICT infrastructure & software equipment to support automation of building departments and multi-agency approval processes
<p>Capacity Building of Regulators, Building professionals & Builders</p> <ul style="list-style-type: none"> ▶ Accreditation of control organizations, incl. building departments and soil, building materials testing facilities ▶ Development of training for building professionals & construction workforce. ▶ Development of informal sector strategy 	<p>Retrofitting of critical facilities</p> <ul style="list-style-type: none"> ▶ Evaluation and retrofit of vulnerable facilities critical to disaster response and recovery ▶ Developing of retrofitting technologies

← Project preparation & monitoring →



Process of Project Development

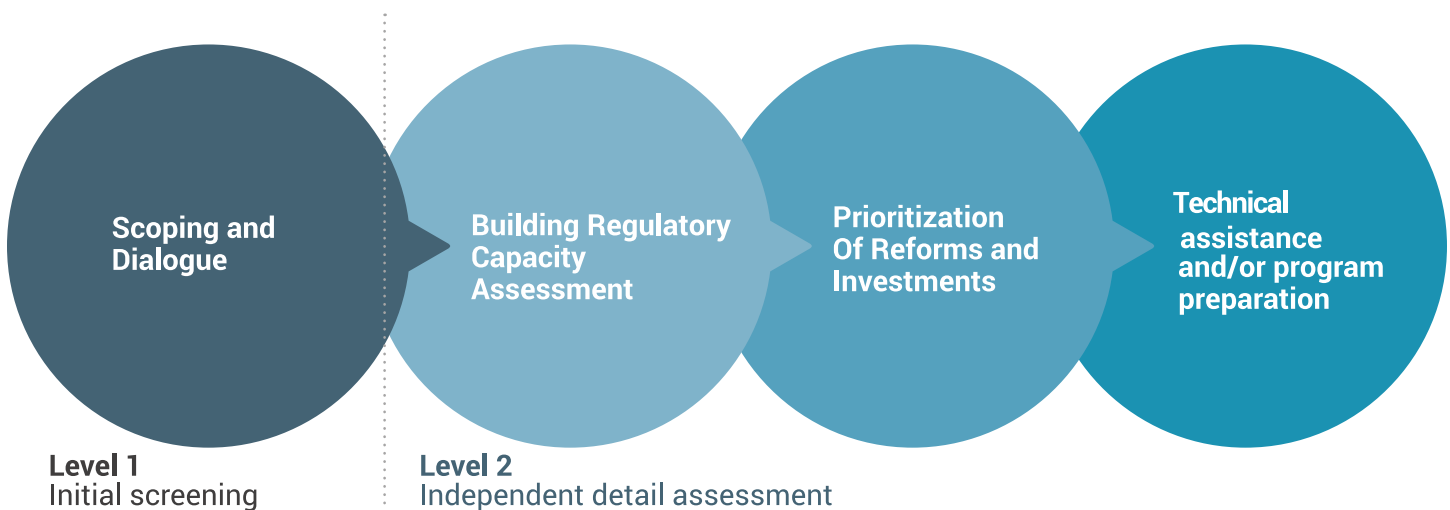
Building Regulation for Resilience projects are initiated with a preliminary policy dialogue and scoping of the building regulatory framework. The Building Regulatory Capacity Assessment (BCRA) can be used as a tool to initiate the collection of critical information about the building regulatory framework in a particular jurisdiction, identify where critical gaps exist, and develop a baseline for formulating technical assistance and training activities. It builds on the findings and recommendations provided in the **Building Regulation for Resilience report** (gfdr.org/sites/default/files/publication/BRR%20report.pdf) and aims to support project implementers in the definition of priority areas for intervention and project design. The BCRA focuses on three critical components of building regulatory frameworks, namely:

- Legal and administrative;
- Building code development and maintenance;
- Implementation of building regulations.

These components, are considered along with several support elements in a two-level evaluation: an initial screening (Level 1), which a project manager can undertake, that aims to quickly

identify critical information and issues to inform initial project decisions, and a detailed exploration (Level 2), intended to be carried out by independent experts in policy and engineering / disaster mitigation, which will result in detailed strategies for the jurisdiction.

A Level 1 assessment describes why a building regulatory framework is important, how an effective building regulatory framework can be helpful in facilitating specific project objectives, provides a set of initial screening questions on the building regulatory framework currently in place for a particular client, and identifies a set of basic information to be collected about that framework. The Level 1 assessment recognizes that any project manager and equivalent decision-makers may not be expert in building regulatory frameworks. However, by identifying and tabulating the quantity of elements within each building regulatory component, it provides an initial baseline for determining the completeness of the building regulatory framework, and therefore its likelihood to enhance project objectives as is, or with enhancements in the core areas.



Building Regulation for Resilience Program: Process of Project Development