



MANAGING RISKS FOR A SAFER BUILT ENVIRONMENT IN SRI LANKA

Building Regulatory Capacity Assessment EXECUTIVE SUMMARY

Building Regulation for Resilience Program
August 2020



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Acronyms

BPA	Building Planning Approval	EIA	Environmental Impact Assessment
BRCA	Building Regulatory Capacity Assessment	GFDRR	Global Facility for Disaster Reduction and Recovery
BRR	Building Regulation for Resilience Program	IESL	Institute for Construction and Development (now CIDA)
BS	British Standard	LECO	Lanka Electricity Company
CAD	Civil Aviation Department	NA	National Annex (to Eurocode)
CCA	Climate Change Adaptation	NBRO	National Building Research Organisation
CCD	Coast Conservation Department	PPC	Preliminary Planning Clearance
CEA	Central Environmental Authority	SLIA	Sri Lanka Institute of Architects
CEB	Ceylon Electricity Board	SLLRDC	Sri Lanka Land Reclamation and Development Corporation
CEN	European Committee for Standardization	SLSI	Sri Lanka Standards Institution
CIDA	Construction Industry Development Authority	SLTDA	Sri Lanka Land Tourism Development Authority
CMA	Condominium Management Authority	SSE	Society of Structural Engineers
CMC	Colombo Municipal Council	SSESL	Society of Structural Engineers Sri Lanka
CZMP	Coastal Zone Management Plan	UDA	Urban Development Authority
DMC	Disaster Management Center		
EC	Eurocode Standard		

Definitions

Act (of Parliament, for example) indicates high-level legislation that is passed by the legislative arm of government in a country.

Building codes create legal requirements in the construction process of any infrastructure or building development and must be enforced. Building codes must refer to appropriate building standards. They are promulgated by local or national governments and have an independent legal value.

Building guidelines are technical documents (e.g., disaster-resilient construction manuals) that supply guidance to practitioners on planning, building design, and fire-protection measures. They are not enforceable by law.

Building regulatory framework is the overarching national framework in place that determines how a building is constructed. A building regulatory framework is composed of three core components: a legal and administrative framework, a building code, and building code implementation at the local level. Building regulatory frameworks rely on an ecosystem of supporting institutions and system elements, such as the mortgage finance system, frameworks for secure tenure, property and tax regimes, professional societies, and training institutions for the labour force.

Building standards define test methods to determine product performance. Standards and specifically “building standards” do not have any independent legal status, but they provide an essential reference in any building process. There are around 4,000 building-related standards in the world.

Chronic risk is a risk distributed over time and space, such as individual building fires and individual spontaneous collapses. These risks do not stem from one isolated event but arise from continuous conditions, which accumulate over time.

Compliance documents are legally binding implementation regulations of the building code. A design code may form part of a suite of compliance documents.

Design codes are reference standards addressing structural design provisions (e.g., Eurocodes, ASCE 7-16, etc.). When specific standards are referenced in the building code, and the building code is adopted into law, they become legally enforceable.

Disaster risk is the potential loss of life, injury, and destroyed or damaged assets that could occur in a system, society, or community in a specific period and can be defined through the combination of three terms: hazard, exposure, and vulnerability.

Fire regulations are the set of rules, standards, and recommendations intended to reduce to a minimum the destruction caused by fire. Fire regulations are intended to prevent the ignition of an uncontrolled fire and to limit the development and effects of a fire after it starts. The National Fire Protection Association (NFPA), for example, has developed more than 300 consensus codes and standards aimed at eliminating death, injury, and property and economic loss due to fire, electrical, and related hazards.

Hazard is defined by a process, phenomenon, or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption, or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin. Natural hazards are predominantly associated with natural processes and phenomena. Anthropogenic, or human-induced, hazards are induced entirely or predominantly by human activities and choices. Hazards may be single, sequential, or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency, and probability.

Definitions *(continued)*

Hazardscape represents the existing and potential sources of threats (hazards) for a country. This includes natural hazards and chronic hazards.

Informal building includes both structures that are built according to national standards, but have not obtained formal planning permission, as well as semi-permanent structures that do not meet official standards and are most frequently built by low-income households themselves, or by landowners for rental. This broad definition of the informal sector means that most of the national housing stock fits within the informal category.

Land-use regulations are the ordinances of Government, including permits and codes, created to ensure that land resources align with national and local policy interests. Regulations are not restricted to controlling existing buildings and uses; in large part, they guide future development. Mapping and master plans are essential to land-use regulation, which can be conceived to determine land use at all territorial scales.

Mitigation refers to activities that lessen or minimize the adverse impacts of a hazardous event.

Non-engineered construction includes buildings that use traditional building practices without any or with little intervention by qualified architects and engineers in their design.

Policy is a plan or course of action, as of a government, intended to influence and determine decisions, actions, and other matters.

Reference standards address the performance, quality, design installation, test, and maintenance of all types of materials, systems, and products. When specific standards are referenced in the building code, and the building code is adopted into law, they become legally enforceable.

Resilience is the capacity of a system, community, or society that is exposed to hazards to resist the hazard effects, adapt to the hazard or recover from a disaster. For social systems, this is determined by the degree to which they are capable of learning from past disasters and organising themselves to reduce risk from future hazard events. From a building (engineering) perspective, resilience is commonly defined in terms of the ability of the structure to preserve life-safety, and continued function after a hazard event.

Vulnerability defines the conditions determined by physical, social, economic, and environmental factors or processes that increase the susceptibility of an individual, a community, assets, or systems to the impacts of hazards.

Executive Summary

The Accumulation of Risk in the Built Environment in Sri Lanka

Sri Lanka is a tropical island with a land area of 65,000 km². The total population is estimated at 21.7 million people, with an estimated annual growth of approximately 1.1 percent. Unofficial estimates report that as much as 33 percent of Sri Lanka's entire population may be living in urban areas. Patterns of sprawl and ribbon development characterise the rapid urban growth on the periphery of major cities and transport arteries. It is estimated that 50 percent of the poorest 40 percent of the country's population live within 30 km of urban areas.¹ Although this represents a significant socio-economic issue for the country, urbanisation also has the potential to improve certain economic opportunities and living conditions. However, there are also several challenges associated with this shift and concentration of population. Over 80 percent of the buildings in Sri Lanka are non-engineered² and are highly vulnerable to natural hazards. Many such houses are sited in areas prone to landslides and floods. Wetland encroachment has led to increased vulnerability of urban centres to flash floods. Incremental construction practices have also led to incidents of building collapse, such as the 2017 building collapse in Colombo that killed one and injured 22 people.³

Sri Lanka is exposed to a wide range of hazards, particularly floods, landslides, fire, and cyclones (with associated high winds and storm surges).⁴ The country also has a loss earthquake hazard and is vulnerable to distal tsunami. However, the majority of development projects in the country do not consider

these hazards in their design and siting.

In many ways, Sri Lanka is at a crossroads in its efforts to urbanise and develop toward upper-middle income status following the end of conflicts in 2009.⁵ Strong governance exists and great progress has been made in reducing poverty. Regulatory decisions made now will have a significant impact on the long-term safety, productivity and resilience of the urban built environment.



¹ World Bank (2015). [Leveraging Urbanization in Sri Lanka](#). Available online.

² Census of Population and Housing (2012). Department of Census and Statistics, Colombo.

³ The Associated Press (2017). [Building Collapse in Sri Lanka's Capital Kills 1, Injures 22](#). Available online.

⁴ World Bank, GFDRR (2020). [Think Hazard - Sri Lanka](#). Available online.

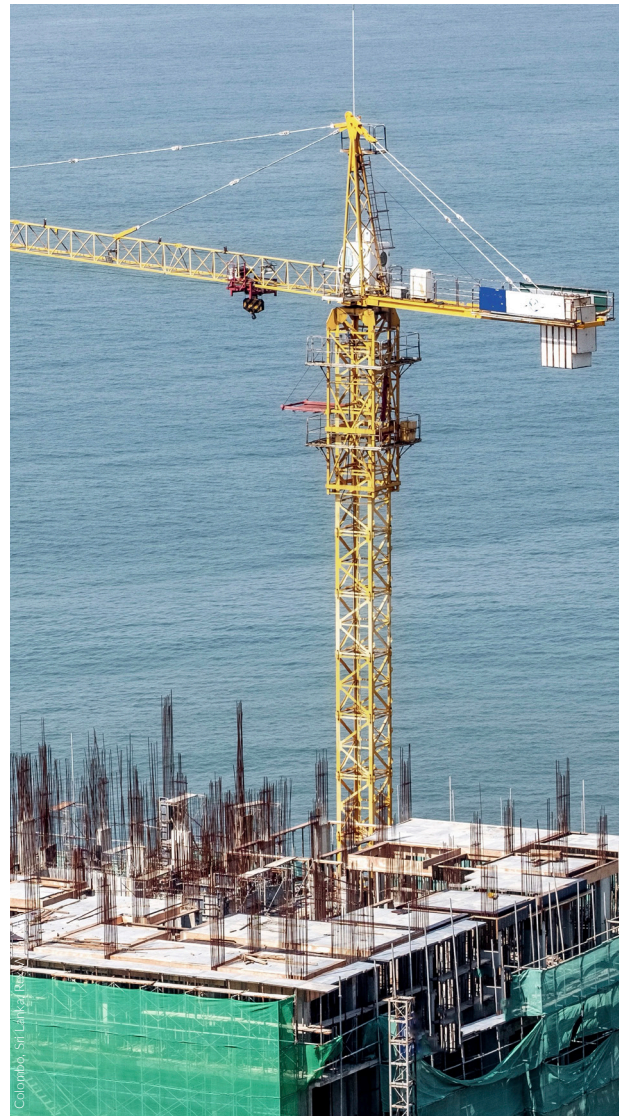
⁵ World Bank (2018). [Sri Lanka Development Update](#). Available online.

Why Is an Effective Building Regulatory Framework Important for Sri Lanka?

To facilitate the construction of safe and resilient buildings, comprehensive and effective building regulatory frameworks are needed.⁶ The components of a building regulatory framework, including building and land-use regulations, enabling legislations, and local compliance mechanisms, function together to ensure that a particular building, on a particular site, achieves minimum levels of performance and resilience.

Building regulatory frameworks can be a cost-effective mechanism for optimising risk reduction and can also support other societal objectives such as: accessibility and usability for people with disabilities; sustainability through energy-efficient buildings; hazard resilience of the built environment; and preservation of national heritage sites.⁷

An efficient and transparent building regulation process can also incentivise economic investment in the construction sector by providing the market with a clear set of design and construction requirements, quality standards, and competency expectations. In 2014, Sri Lanka's construction sector expanded by more than 20 percent and it accounted for 9.6 percent of national GDP.⁸ This pace of growth is putting pressure on existing legislative and regulatory provisions and particularly on institutional capacities to implement them. However, the country does not have its own national building code, but relies on British standards, locally developed guidelines, other international standards and guidelines. To support resilient and healthy urban environments, the Government has recently started its own initiative to develop the first national building code for Sri Lanka.



⁶ World Bank, GFDRR (2015). [Building Regulation for Resilience – Managing Risks for Safer Cities](#). Available online.

⁷ Ibid.

⁸ Oxford Business Group. [Sri Lanka's Construction Sector Sees Increased Investment and Development](#). Available online.

Report Approach

This report follows the Building Regulation for Resilience (BRR) Program's Building Regulatory Capacity Assessment (BRCA) methodology.¹ It results in a series of recommendations for the enhancement of building regulatory capacity and implementation mechanisms in Sri Lanka, which are tailored to local aspirations, resources, and priorities. This is achieved by conducting the assessment in stages supported by consultations with a steering committee of local experts and wider stakeholder consultations with academic, and private construction and design professionals.

The assessment covers three main components of the building regulatory system:

1. National legal and institutional framework

This focuses on identifying whether the necessary legal (acts, decrees, laws) and institutional structures are in place to enable the enforcement of land-use and building regulations. To be effective, the legal, administrative, and institutional structures should include provisions for all steps of the life cycle of a building, including the project's siting, design, construction, maintenance, retrofit, and decommissioning.

2. Building code development and maintenance

This examines the adequacy of the building regulations (building code) and how they are maintained over time. The assessment focuses on the extent to which these regulations reflect an up-to-date scientific understanding of how buildings perform against chronic risks, disaster events, and climate change and have been adapted to reflect local conditions and construction practices. Land-use regulations are also examined to determine whether they include provisions for the safe and resilient siting of buildings.

3. Local implementation

This examines the implementation and management of building and land-use regulations at the county level. Different entities handle implementing and enforcing planning, building, and fire regulations, and their capacity (in terms of staff, skills, and resources) plays a key factor in determining the adequacy of the control system. The level of education and training of professionals and workers in the construction industry also has a significant influence.

Beyond these three components, building regulatory systems also relies on an ecosystem of supporting elements such as insurance markets, mortgage finance systems, frameworks for secure land tenure, and property and tax regimes.



¹ World Bank, GFDRR (2017). [Building Regulatory Capacity Assessment: Level 2](#). Available online.

The Government of Sri Lanka's Efforts to Strengthen the Building Regulatory Framework

The government of Sri Lanka has been taking important steps towards strengthening the building regulatory framework. Following the catastrophic Indian Ocean Tsunami in 2004, new legislative and institutional arrangements were enacted to improve disaster risk management in the country, leading to the establishment of the Disaster Management Centre (DMC) in 2005.

The National Building Research Organisation (NBRO), the technical centre under the Ministry of Defence in charge of landslide mitigation, has developed and enforced planning and zoning regulations to address the vulnerability of the building stock to landslide hazard, with particular focus on non-engineered housing. They have also issued a manual for the introduction of hazard resilient features in non-engineered housing.¹

An online “one-stop shop” for development approvals in Declared Urban Areas has been introduced by the Urban Development Authority (UDA), the agency in charge of regulating the urban development process in Sri Lanka. This has improved the building approval process efficiency and its transparency.

Recently, consensus has grown on the need for a country-specific building code to address the challenges posed by rapid urbanisation and increasing exposure to natural and chronic hazards. While the BRCA was being conducted in March 2019, the Cabinet approved the development of a National Building Code for Sri Lanka, and empowered the Construction Industry Development Authority (CIDA) and NBRO to coordinate this in close collaboration with UDA and the Department of Building (DoB).² A multi-agency technical committee, the “Code Committee,” has already been set up to initiate code development.

To further strengthen the Government's own initiative in improving the building legal and regulatory framework, the BRCA comes at a time when there is already significant progress toward a more efficient building approvals system and strong awareness of the need for more resilient and sustainable construction and urban development.



¹ National Building Research Organisation (2015). [Hazard Resilient Housing Construction Manual](#). Available Online.

² Cabinet Memorandum: MHCCA/HC/2019/21

Key Challenges

A selection of the key challenges identified through the BRCA are outlined below. These challenges are explored in greater depth throughout the report and are linked to the later recommendations.

Overlaps and gaps in building regulations and institutional mandates are leading to inefficiency. A strong set of building regulations exists, founded on a long history of building regulation reaching back to colonial times. Incremental and reactive changes to laws have, however, led to overlaps and some confusion as to the mandates of different authorities. This means that obtaining the approvals necessary for new developments remains a key challenge for contractors and developers, particularly with regard to land and procurement.

Development plans are not available for all Sri Lanka. Currently, development plans are available for most declared areas under the UDA, whilst local development plans for Pradeshiya Sabha¹ are largely absent. Although there is input on land use from a number of agencies, the level of coordination between the regulators and agencies appears to be insufficient to deliver hazard resilience in planning.

There is currently no national building code for Sri Lanka. Current practice in Sri Lanka sees a complex set of building regulations, implemented through the use of varied international building codes coupled with local material standards. This mix of regulations provides an unclear picture of the level of safety, resilience, and sustainability actually realised in new developments. A coherent system of building regulations is required to reflect local conditions, skills, and resources. This has been recognised by the Sri Lankan government, and the Cabinet has recently approved the development of a National Building Code for Sri Lanka.

There are shortcomings in availability of comprehensive hazard maps and their institutional ownership. This is due to the lack of high-resolution hazard maps for floods and problematic soils for most of the country. The hazard maps that do exist are good but are based on limited high-quality data, due to the relatively short history of event recording and the infrequency of such extreme events. Thus the maps are associated with high levels of uncertainty and have had limited validation. Hence hazards in general are not considered in a systematic way in zoning for urban development. The exception to the above is the hazard mapping for landslides carried out by NBRO; a similar sense of “ownership” for mapping other hazards is not as evident.

The building approval process is not yet fully comprehensive. The building approval process is central to the entire building regulatory system. Although improvements have been made in some areas (e.g., the UDA “one-stop shop” online portal), this needs to be strengthened to ensure efficiency and transparency. This online system is currently available only for UDA-approved buildings, and not all clearing agencies have signed on to it. Another challenge is the lack of clarity among both professionals and the public about procedures.

¹ Pradeshiya Sabhas are the legislative bodies that preside over third-tier municipalities in Sri Lanka. At the time of writing the report, there were 276 Pradeshiya Sabhas. (The Parliament of Sri Lanka. [Pradeshiya Sabhas Act](#)).

Key Challenges (continued)

The systems and capacities for enhanced inspection are weak. The lack of an efficient inspection process has led to space violations and insufficient resilience in buildings. Inspections of buildings are only conducted at the end of construction, and local authorities lack the capacity to increase the number of inspections to also examine developments during construction. A skills gap also exists in terms of inspections for resilient features in construction. If hazard-resilient construction is to become a reality, hazard-related studies (e.g., zoning, structural provisions) must become part of the

training imparted in technical training institutions, where local authority inspectors are educated.

Building regulations are not easily accessible by the public. A factor that can potentially be detrimental to education on building regulations is the lack of public access to key documents comprised in the regulatory framework. While Acts and Gazette Notifications are available online, technical regulations (e.g., ICTAD regulations) and national reference standards (SLSI standards) are not immediately available to practitioners, students, and the wider public.

Recommendations

Based on the detailed assessment and building on the existing efforts the Government has made to promote this agenda, a set of recommendations has been made that builds on existing Government capacity and mechanisms. These recommendations are intended to support the Government of Sri Lanka in launching comprehensive building regulatory reform going forward and resulted from a prioritization process. Two Action Planning workshops were carried out in July and August 2019 with stakeholders nominated by the Ministry of Housing; they provided feedback on the full set of recommendations included in the BRCA.

Among the stakeholders attending the Building Regulatory Capacity Assessment Sri Lanka Action Planning Workshops were key government officials from the Urban Development Authority (UDA), the National Building Research Organisation (NBRO), the Construction Industry Development Authority (CIDA), the Ministry of Housing, Construction and Cultural Affairs, the National Building Research Organisation (NBRO), the Disaster Management Centre (DMC), and the Colombo Municipal Council. Their input determined both the actions to prioritize and the potential planning roadmap to implement them.

Next Steps

The Government of Sri Lanka continues its own initiative to strive for developing the country's first National Building Code, making it a priority, and accompanying it with multiple initiatives to strengthen code compliance and implementation mechanisms. These efforts have been jointly supported and coordinated among key institutions: CIDA, NBRO, and UDA. The analysis and recommendations outlined in the report provide inputs that the Government of Sri Lanka can use to develop and initiate a building regulatory reform action plan.

Summary of Recommendations

Table Key		
	Short Term	Activities that could be carried out, starting immediately. Generally, these activities should be completed within a three-year time span.
	Medium to Long Term	Activities implementation of which will take longer: medium term, four to six years; long term, seven to ten years.
NATIONAL LEGISLATIVE AND INSTITUTIONAL FRAMEWORK		
Recommendations	S	M-L
Laws		
1. Reduce gaps and overlaps in legislation, regulation, and institutional mandates. *		
2. Ensure that planned revisions to the Flood Protection Act 22/1955 are effected and implemented.		
Policies & Regulations		
3. Integrate DRR in all large projects and all projects in hazard-prone areas. *		
4. Ensure the rights and needs of poor, marginalised, and excluded populations through policy and guidelines.		
5. Develop a policy framework for the sustainable use of all types of reservations around the country.		
6. Incorporate subdivision regulations into the land titling and registration system of Sri Lanka.		
Institutions		
7. Improve the integration of existing planning systems.		
8. Strengthen institutional capacities and resources (human, financial, technical).*		
(i) Improve training.		
(ii) Undertake additional additional staff recruitment and efforts to retain staff.		
(iii) Build capacity in Sri Lanka's Survey Department.		

* These recommendations were selected by the stakeholders as being of the highest priority.

BUILDING CODE DEVELOPMENT AND MAINTENANCE

Recommendations	S	M-L
Building Code for Sri Lanka		
9. Develop a building code for Sri Lanka that is locally relevant in terms of hazards, design & construction practices, and resource constraints.*		●
10. Develop a concerted effort to promote sustainability in buildings.*	●	
11. Address the hazard resilience of non-engineered construction.		●
12. Make building sector professionals and the general public aware of the building code by providing educational activities and granting public access to building regulations.*	●	
Hazard Maps, Data, and Zoning		
13. Promote institutional coordination and technical practice for the updating and improving the hazard maps.		●
14. Designate the Disaster Management Centre (DMC) as the curator for all hazard maps and data.	●	
15. Encourage a concerted effort to improve hazard data collection.		●
16. Establish a clear process for converting the hazard maps into zoning regulations.		●

* These recommendations were selected by the stakeholders as being of the highest priority.

LOCAL BUILDING REGULATORY CAPACITY AND IMPLEMENTATION

Recommendations	S	M-L
Building Approval Process		
17. Facilitate the building approval process by strengthening UDA-led measures and applications in partnership with professional institutions and local authorities.*	●	
18. Set up a licencing system for different professionals in the construction industry.	●	
19. Create avenues for public participation in building regulation.		
(i) Strengthen Housing Forum.	●	
(ii) Introduce an ombudsman for building regulation violations.		●
20. Enhance the capacity of local authorities.		●
Checking and Inspection System		
21. Initiate a system of registered checking engineers.	●	
22. Formalize and strengthen inspection during construction.*	●	
23. Rationalize penalties and introduce incentives.		●
Education and Training Activities		
24. Include building regulations, hazard-resilient design, and hazard zoning provisions in the curricula of technical training institutions.*	●	
25. Give priority to the discipline of fire engineering.		
(i) Deliver continuing professional development (CPD).	●	
(ii) Initiate a new tertiary-level education program and institution.		●
26. Develop and promote training programmes for construction workers to achieve “skilled worker” status.		●

* These recommendations were selected by the stakeholders as being of the highest priority.



This report provides an assessment of the building regulatory framework in Sri Lanka. Research and recommendations were developed by the World Bank with the strategic objective of improving building safety and resilience across the country.

The analysis and recommendations outlined in the report provide inputs with which the Government of Sri Lanka can launch a comprehensive process of building regulatory reform. The recommendations proposed build on the existing efforts the Government has made to promote this agenda.

As part of the Global Facility for Disaster Risk Reduction (GFDRR), the Building Regulation for Resilience Program develops and promotes activities to increase regulatory capacity to promote a healthier, safer, and more sustainable built environment. By leveraging good practice in building regulation as part of a strategy to reduce both chronic risk and disaster risk, it sets low- and middle-income countries on the path to effective reform and long-term resilience.

The GFDRR is a global partnership that helps developing countries better understand and reduce their vulnerabilities to natural hazards and adapt to climate change. Working with over 400 local, national, regional, and international partners, GFDRR provides grant financing, technical assistance, training, and knowledge sharing activities to mainstream disaster and climate risk management in policies and strategies. Managed by the World Bank, GFDRR is supported by 34 countries and 9 international organizations.



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