



**Developing Design Concepts for Climate
Change Resilient Building**

**Summary of Interim Report
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Table of Contents

Introduction	3
Technical Assessment.....	5
Legislative Assessment.....	7
Economic Assessment	9
Green Paper No. 2/2010 Review	10

Introduction

Climate change is considered one of the most damaging threats to the growth and sustainability of developing nations, particularly small island developing states (SIDS). The occurrence of these severe weather conditions are particularly damaging to SIDS with large coastal populations and fragile economies that are heavily dependent on tourism and agriculture. The impact of climate change has resulted in rising temperatures, sea level rise, increased rainfall, coastal flooding, drought and an increase in extreme weather systems such as hurricanes and tropical storms.

The concept of resilience refers to the ability to:

survive, recover from, and even thrive in changing climatic conditions. It includes the ability to understand potential impacts and to take appropriate action before, during, and after a particular event, such as a typhoon, major flooding or prolonged drought, to minimize negative effects and maintain the ability to respond to changing conditions, even unpredictable conditions (ACCCRN)¹.

Combating the damaging impact of climate change on SIDS requires a strategic approach that encompasses institutional change, economic and policy review, and adjustment in regulations regarding environmental protection and development. Urban development planning based on hazard mapping, implementing the use of greenhouse gas emission inventories, promoting the benefits of investing in climate change resilient development, and policy reviews that support the utilization of clean and resilient development all play a pivotal role in effectively addressing climate change (USAID 2012: p. 9)². Central to this discourse is the concept of utilising building stock that is resilient to the long term effects of climate change. This process involves investing in construction ideas that support the efficient use of water, energy and resource-efficient materials; enhancing public awareness of construction concepts that are designed to safeguard homes and businesses from the effects of severe weather conditions and other natural hazards created as a result of climate change, and improving public awareness of the benefits of supporting climate change resilience construction initiatives. In so doing, states adopting these

¹ Asian Cities Climate Change Resilience Network [Online] Available at: <http://www.acccrn.org/uccr/what-urban-climate-change-resilience>

² USAID (2012) Climate Change & Development Clean Resilient Growth: Climate Change & Development Strategy 2012-2016

strategies will essentially safeguard its social, economic, political and physical infrastructure from decline while improving its ability to compete equally within the global political economy.

Technical Assessment

Infrastructural development, especially in developing countries, plays a pivotal role in realizing sustainable development. Taking into consideration the impacts of climate change along with the cost and life span of infrastructure, the present focus should be to invest in climate resilient initiatives that can withstand climatic extremes. The Caribbean has commenced work (policy development, research and projects) in the area of climate change resilience which incorporates a social dimension. The Caribbean Community Climate Change Centre manages the region's response to climate change and has been instrumental in guiding the adaptation process. However, the International Institute for Sustainable Development notes that gaps in the regional adaptation program include limited national level projects responding to individual needs; limited implementation of adaptation actions on the ground; and limited action related to various sectors including tourism, forestry, and biodiversity dimensions of climate change, etc.

A major threat to developing climate change resilience is budgetary constraints at the national and local levels. In the case of Jamaica, policies have not been adequately financed, therefore impeding implementation. Another key risk for Jamaica relates to the economic policy, which seeks to secure employment at the expense of environmental conservation and resilience. For example, the construction and operation of large hotels on the north coast provides employment for Jamaicans but has a negative impact on coastal areas. Similarly, the development control process is cumbersome and time consuming and is informed by outdated policies. There is also a lack of planning and enforcement. This has resulted in formal and informal developments in high risk areas and the degradation of the natural environment. In Jamaica, a major issue is the autonomy of the Urban Development Corporation and the Ministry of Housing, facilitated by their respective Acts, which have influenced the inconsistency of development standards and the exploitation of loopholes in the regulatory framework by developers.

There are several initiatives that can be taken by the state to effectively and efficiently address climate change resilience. These include:

- Program financing at the national and local levels
- Research on risk appetite and economics of climate change
- Innovation in adaptation to climate change
- Mainstreaming specific adaptation measures into physical planning and development policies at the national and local levels
- Development and use of modern mechanisms for integrated planning

- Implementation of adaptation measures on the ground, which specifically address national and local needs
- Enforcement of planning and environmental regulations
- Political will to develop and implement policies (e.g. no build zones and relocation) at the national and constituency levels

Legislative Assessment

Jamaica's current legislative background presents a somewhat limited and delayed response to legitimising climate change resilience regulation in the state's physical planning, zoning, and environmental protection frameworks. There are however several key legislations that address environmental control and physical planning which will in turn provide the basis for the enactment of climate change resilience legislation that regulates building codes and standards. The Town and Country Planning Act 1958 (TCP Act) and the National Resources and Conservation Authority Act 1991 (NRCA Act) are the main legislations that regulate environmental and physical planning in Jamaica.

The NRCA Act is designed to support the management, protection and conservation of the physical environment. As such, the Act maintains zoning capabilities that restricts development in areas that are vulnerable to the effects of climate change by declaring these areas protected or natural parks. The NRCA's stated function to effectively manage the island's physical environment fits comfortably into a general framework for the promotion of climate change resilient buildings. The TCP Act legislates the execution of physical planning in Jamaica through a centralized Town and Planning Authority that works in tandem with local planning authorities in each of the fourteen parishes of Jamaica. Both entities eventually merged to form the National Environmental Planning Agency (NEPA).

Although Jamaica has relatively good building practices, the devastations experienced during flood events, as well as reports on areas vulnerable to earthquakes and other hazards, show that there are still major risks. These risks have led to significant losses from infrastructural damage and destruction caused by weather events of the past. As a result, several industries, which the Jamaican economy heavily depends, now require that buildings are constructed and maintained according to international building codes and standards and current building laws are in an advanced state of review. The new Building Bill 2011, if passed into law, represents the most explicit requirement in Jamaican law for buildings to reflect sound environmental principles in their construction and design. It recognizes international building standards and has a stated object to promote the construction of environmentally and energy efficient buildings. It seeks to establish an effective and efficient system for issuing building permits and establishes Local Building Authorities which are the parish councils.

Economic Assessment

The most severe impacts of climate change are likely to take place along Jamaica's coastal areas which has significant economic implications as most of Jamaica's population, tourism facilities, urban centres and industries are located along the island's coastlines. The construction sector and regulatory bodies play a significant role in the reduction of greenhouse gases that will reduce the potentially severe impacts of climate change. In order to limit the state's role in the production of greenhouse gas emissions the imperative is to develop and implement cost efficient climate resilience strategies (including building designs) into its economic development plans and strategies. Regulatory authorities have a responsibility to ensure that there is adherence to the provisions of the laws, through clearly communicated standards, consistent monitoring and the application of sanctions where there are breaches of the stipulated guidelines.

The Latin America and Caribbean region has been able to reduce greenhouse gas emission by 11% through improvements in land use and energy efficiency (IDB 2012)³. Land use policies and greater energy efficiency are therefore integral to developing design concepts for climate change resilient buildings in Jamaica. There is an overdependence on energy from fossil fuels that is exacting a high cost on the economy. Climate change resilient building which are recognisably energy-efficient by design, can contribute significantly to this goal. As the impacts of climate change become more pronounced the required improvements to standards and adjustments (through retrofitting, relocation or removal) must be carried out expeditiously, to save lives, property and the economy from collapsing under the strain of reconstruction and recovery costs.

³ Inter-American Development Bank (IDB) (2012) The Climate and Development Challenges for Latin America and the Caribbean – Options for Climate Resilient Low Carbon Development

Green Paper No. 2/2010 Review

The intent of Green Paper No. 2/2010 is to outline a framework of corrective measures that will ultimately streamline planning in Jamaica into one state body, the Environmental Regulatory Authority (ERA). More specifically, the Green Paper highlights the problems associated with the current arrangements for planning and the management of the environment in Jamaica. These include the inadequate protection for important ecological sensitive sites; the encroachment into wetland areas, damage to coral reefs, deforestation, land degradation and water pollution; and the confusing and overlapping rules, regulations, procedures and agency remits for developers forcing them to deal with a number of separate government agencies with inconsistent demands and requirements. It further provides an integrated approach to managing the natural assets and built areas in the country. These all have implications for policy related to climate change resilience in the building stock of Jamaica.

The Green Paper purports that to correct the negative impact of climate change on the development of Jamaica there should be significant modifications to the country's regulatory and planning systems. These include the establishment of an ERA which will assume the responsibility of environmental monitoring and enforcement; the development of a National Spatial Plan (leading to the creation of no-build zones) which will be maintained by NEPA; and authorizing NEPA to assume the lead role in helping to solve environmental problems. The Green Paper advocates for substantive legislative reform to address and simplify the complex operations of NEPA as it relates to the re-structuring of the body). Additionally, the Green Paper addresses the inefficiencies in the planning and regulatory systems in Jamaica that are related to environment management, climate change resilience and physical development. Proposing an integrated approach to planning and regulation supports greater policy coherence and the replacement of outdated laws. As a result, the numerous pieces of legislations, governing the operations of NEPA and key agencies would be removed, adjusted and updated.