

# Climatic conditions and the resilience of buildings along Lagos coastline

Olajide Julius Faremi, Oluranti Olupolola Ajayi,  
Kudirat Ibilola Zakariyyah and Olumide Afolarin Adenuga  
*Department of Building, University of Lagos, Lagos, Nigeria*

## Abstract

**Purpose** – The study investigates the extent to which defects in coastline buildings are influenced by the climatic conditions within the coastal zones.

**Design/methodology/approach** – The study conducted both desk study and field survey. The primary data for the study were collected through a cross-sectional survey of facilities and maintenance managers of randomly selected coastline buildings. Of the 120 self-administered structured questionnaires, 102 were successfully retrieved representing an 85% response rate. Data collected were analysed using charts, relative prevalence index and Spearman's rho correlation visualization technique.

**Findings** – Saltwater intrusion, ocean overflow, extreme rainfall, debris flow, floods and droughts are the prevalent climatic conditions along the coastline. Steel corrosion, foundation settlement, spalling of concrete and fading of finishes are prevalent defects in coastline buildings. The result shows a positive significant correlation between climatic conditions and defects in coastline buildings.

**Research limitations/implications** – The study compliments literature on buildings resilience and maintenance management, and also provides a basis for streamlining future research on coastline buildings.

**Practical implications** – The results provide information on climatic conditions and prevalent defects that should be considered during the design and construction of coastline buildings. The information provided could assist construction stakeholders in improving the resilience of coastline buildings.

**Originality/value** – The study established that coastline buildings are vulnerable to a rapid rate of defect and deterioration which threatens the sustainability of coastline cities. It suggests measures that could improve the resilience of the elements and components of coastline buildings and consequently enhance the safety of life and property, and improve the physical and economic performance of coastline buildings.

**Keywords** Buildings, Climatic condition, Coastline, Defects, Deterioration

**Paper type** Research paper

## Introduction

About 41% of the world's population is concentrated within the coastal zones due to their rich resources, high economic activities, recreational and cultural attractions among others (Neumamm *et al.*, 2015). Pussella *et al.* (2015) defined the coastline as the contact line between the land surface and the ocean surface or the region within 100 km of the coast. The high level of economic activities along the coastlines results in several human activities and attending increased building developments within the coastal zones.

Faremi and Adenuga (2012) posit that although it is desirable but hardly feasible to produce maintenance-free buildings. Defect and deterioration are common phenomena in many buildings. While defects refer to some level of damage due to poor construction, environmental attack or due to the loads applied to the structure, deterioration refers to a more general loss of performance (Ahzahar *et al.*, 2011). All buildings are vulnerable to defects and deterioration but the degree of vulnerability varies from one building to another depending on numerous factors such as the quality of construction, associated environmental conditions among others (Adenuga *et al.*, 2007). Defect relates to the nonconformity of a component or system to a defined characteristic standard. Mydin *et al.* (2012b) opined that building defect could include any issue that lowers the value of a home, condominium or

