Assessing the vulnerability of Kota Kinabalu buildings

ABSTRACT

A gradual increase in moderate and low seismic activity has occurred in Sabah over the course of several years due to the presence of certain moderately active fault lines in the region. Around 300 moderate earthquakes with magnitudes ranging from MW 4.0 to 7.0 have occurred in the last 120 years. The majority of existing buildings in Sabah are wind and gravity loaded. This study proposes a preliminary seismic vulnerability assessment methodology based on empirical and analytical vulnerability method for 250 existing buildings in Kota Kinabalu city. The empirical vulnerability assessment focuses on building evaluation utilizing a standard Rapid Visual Screening (RVS) method and the FEMA 154 guidebook's moderate seismicity assessment form. A field survey was conducted on the buildings ranging in height from low-rise to high-rise. As a result, when subjected to moderate-intensity earthquakes, 60% of the buildings are classed as susceptible and vulnerable to seismic hazard. The current study included the use of nonlinear static analysis to seven different building cases for further investigation. The findings of the analysis demonstrate that the majority of the buildings respond linearly elastical when subjected to peak ground acceleration (PGA) at 0.17g, which indicate that, buildings without seismic design accumulate damage early when subjected to moderate earthquake loadings.