

Evaluation of Simulated Noise Levels through the Analysis of Temperature and Rainfall: A Case Study of Nairobi Central Business District

Authors : Emmanuel Yussuf, John Muthama, John Ng'ang'A

Abstract : There has been increasing noise levels all over the world in the last decade. Many factors contribute to this increase, which is causing health related effects to humans. Developing countries are not left out of the whole picture as they are still growing and advancing their development. Motor vehicles are increasing on urban roads; there is an increase in infrastructure due to the rising population, increasing number of industries to provide goods and so many other activities. All these activities lead to the high noise levels in cities. This study was conducted in Nairobi's Central Business District (CBD) with the main objective of simulating noise levels in order to understand the noise exposed to the people within the urban area, in relation to weather parameters namely temperature, rainfall and wind field. The study was achieved using the Neighbourhood Proximity Model and Time Series Analysis, with data obtained from proxies/remotely-sensed from satellites, in order to establish the levels of noise exposed to which people of Nairobi CBD are exposed to. The findings showed that there is an increase in temperature (0.1°C per year) and a decrease in precipitation (40 mm per year), which in comparison to the noise levels in the area, are increasing. The study also found out that noise levels exposed to people in Nairobi CBD were roughly between 61 and 63 decibels and has been increasing, a level which is high and likely to cause adverse physical and psychological effects on the human body in which air temperature, precipitation and wind contribute so much in the spread of noise. As a noise reduction measure, the use of sound proof materials in buildings close to busy roads, implementation of strict laws to most emitting sources as well as further research on the study was recommended. The data used for this study ranged from the year 2000 to 2015, rainfall being in millimeters (mm), temperature in degrees Celsius (°C) and the urban form characteristics being in meters (m).

Keywords : simulation, noise exposure, weather, proxy

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