A modified approach to estimating thermodynamic impact on buildings: A case study of poor urban setting in Lagos state

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Abstract:

Purpose

Managing the urban housing plan of a very fast-growing city may be difficult if the scientific input, i.e. thermodynamic architecture and the climate change challenges, is not factored into its initial framework. Recent building plan in some parts of a growing city located in a developing country was adopted for the purpose of this research. The purpose of this study is to investigate the impact of poor urban planning on humans.

Design/methodology/approach

The reverberation time analysis was carried using the Ecotect software. In total, 15-year surface temperature data were obtained (1999-2013) from the Global Land Data Assimilation System. Thermal distributions were calculated using beta probability and Gaussian distribution. Also, the parametric study of the solar constant was accomplished using possible mathematical outcomes.

Findings

It was discovered that irrespective of the fabrics of building, air properties and materials within a building, the total heat and sound absorptions are high for the life form. Necessary recommendations were made for further study.

Research limitations/implications

Only the outdoor impact was calculated.

Practical implications

There should be more proactive measures by the urban planning authorities.

Social implications

There would be wide spread of diseases and very low thermal comfort.

Originality/value

This paper illustrates on the most ignored parameter in environmental architecture.