

RETROFITTING FOR SUSTAINABILITY: INTERVENING THERMAL PERFORMANCE OF EXISTING NON-DOMESTIC BUILDINGS

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Retrofitting existing buildings for energy sustainability is a recently developed area of research and study in architectural design. A significantly high share of energy is used to maintain indoor thermal comfort in non-domestic buildings due to their poor thermal performance. Therefore existing buildings in developing countries can benefit greatly from low cost passive retrofits to reduce energy use.

Passive architectural elements of a building are important design variables which act as modifiers of outdoor climate into favourable indoor climates in buildings. Passive elements in a building include the microclimate, form, and the building envelope. Intervening thermal performance of these elements in existing buildings can improve indoor thermal comfort conditions.

This paper consists of a critical case study building describing its thermal performance and climatic response to illustrate problems in non-domestic buildings in Colombo. The outdoor to indoor thermal comfort modification was analyzed using air temperature, humidity and air velocity data and measures. The results concluded that the poor thermal performance of the building is caused by the building's poor climatic response. Critical areas of the building were identified to have the potential for retrofitting passive design strategies to improve building energy sustainability.