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A GEO-BASED MODELLING AND MANAGEMENT TOOL FOR DETERMING URBAN MORPHOLOGY AND NATURAL VENTILATION POTENTIALS

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Abstract

The provision of fresh air in cities is one of the main drivers for sustainability, helping to preserve occupants' health and comfort both indoors and outdoors. Moreover, it is well known that there is a crucial correlation between the natural ventilation potential (NV) and the composition of urban morphology in built environments. However, only limited information on natural ventilation design within cities is available to local authorities and designers when considering urban planning strategies, and this is having a crucial influence on subsequent building design.

This paper is going to explain the ideas and problems behind the proposed research and the strategies to tackle over as well. With helps from up-to-date Geography Information System (GIS) and Computational Fluid Dynamics (CFD) programmes, strategic guidelines and standards for urban morphology, microclimate and energy density can be identified and represented in a serious of GIS-based climate maps. The methodology adopted for this study may be applied generally to provide data in other locations which will make a significant contribution to evidence-based policy-making and management.

Keywords: GIS, urban morphology, CFD, natural ventilation potentials, energy performance