

**APPRAISING AGEING IN PLACE ATTRIBUTES AND
WELLBEING OF ELDERLY IN THE TROPICS**

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature:

Date: 14/05/2024

The above candidate has carried out research for the Masters thesis under my supervision. I confirm that the declaration made above by the student is true and correct.

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2. Dr. C.S.A. Siriwardana	15/05/2024

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ABSTRACT

The concurrence of demographic shifts and warming climate raises heightened concerns for the well-being of older adults residing in tropical regions. Climate change-induced heat waves pose a significant threat to indoor thermal comfort, especially for elderly individuals striving to age in place, who often prefer staying indoors. Thus, there is an urgent need to investigate the indoor thermal environment of elderly households, particularly in low-income communities. The study adopts an integrated approach, encompassing both broad-scale spatial analyses and detailed field investigations, to explore the thermal comfort, skin temperature profiles, and overall thermal well-being of young elders (60 – 74 years) dwelling in single-story masonry and timber residences. Spatial analyses were conducted using ArcMap and satellite imagery to assess the thermal landscape, utilising indices such as the UTFVI, LST, NDBI, and NDVI. A comprehensive investigation was undertaken through a questionnaire survey and personalized exposure assessment involving 150 participants in Mattakuliya, located in the western province of Sri Lanka. The findings reveal, worse urban thermal comfort in Mattakuliya, with indoor environments characterised by elevated daytime temperatures in the range 30°C - 40°C. Resulting in higher predicted mean vote, and mean skin temperatures ranging from 33°C to 39°C, surpassing the neutral temperature of 30.4°C. DesignBuilder simulations suggest inclusion of passive features can drastically bring down the indoor air temperature with natural ventilation alone. Moreover, participants in this study reported grappling with various noncommunicable diseases such as cardiovascular, diabetes, and high blood pressure as part of the aging process. The adverse effects of extreme heat exacerbate these symptoms and complications, underscoring the urgent need to address the thermal challenges faced by this vulnerable group.

Keywords: *Ageing in place, indoor overheating, infrared thermography, thermal comfort, tropics*

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LIST OF ABBREVIATIONS

Abbreviation	Description
LST	Land Surface Temperature
NDBI	Normalized Difference Built-up Index
NDVI	Normalized Difference Vegetation Index
UTFVI	Urban Thermal Field Variance Index