

Applying Sustainability and Liveability Principles in Planning a Residential Neighbourhood in an Arid Climate in Egypt

M. Shaker¹, M. Omar², F. Alaa Eldin², G. Mohammed², E. Yousry², N. Hussien², D. El Sheikh²

¹Lecturer, Architecture Department, Modern University for Technology & Information, Cairo 11585, Egypt

²Student, Architecture Department, Modern University for Technology & Information, Cairo 11585, Egypt

Corresponding author's e-mail: mariam.abd-alem12@eng1.cu.edu.eg

Abstract. This study introduces a comprehensive framework for assessing residential neighbourhoods, focusing on sustainability and liveability indicators in hot arid climates. Utilizing quantitative analysis, a residential neighbourhood model situated near Cairo International Airport, between Nasr City and Fifth Settlement, was developed to gauge sustainable and liveable indicators. The evaluation encompasses various sustainable indicators including housing typology, density, mixed-use zoning, education access, transportation infrastructure, parking management, green space provision, and sustainable materials adoption. Liveability was evaluated by analysing thermal comfort metrics such as wind direction, wind speed, air temperature, and relative humidity using ENVI-met software. Results indicate successful achievement of sustainability indicators, illustrating the efficacy of implemented strategies in fostering sustainable residential environments. However, inadequacies in meeting liveability standards underscore the need for additional sustainable solutions to address escalating air temperatures and enhance resident satisfaction. Proposed solutions include enhancing accessibility, promoting sustainable transportation, diversifying land uses, implementing eco-friendly materials, and augmenting green spaces. Prioritizing shaded areas and increasing tree coverage are recommended to alleviate temperature levels and ensure thermal comfort and community engagement.

