



“Gheorghe Asachi” Technical University of Iasi, Romania



AN OVERVIEW OF BIOCLIMATIC DESIGN STRATEGIES OF THE BUILT ENVIRONMENT

Mahadev Bera*, Pranab Kumar Nag

*School of Environment and Disaster Management, IRDM Faculty Centre, Ramakrishna Mission Vivekananda Educational
and Research Institute, Kolkata, West Bengal 700103, India*

Abstract

Buildings significantly contribute to climate change through their energy consumption and carbon emissions. This study explores bioclimatic design strategies that aim to create environmentally sustainable and energy-efficient buildings. The approach taken in this review involves a comprehensive analysis of various bioclimatic design principles, including passive solar design, natural ventilation, and thermal mass, and green infrastructure. By examining a diverse range of case studies and real-world applications, this review highlights innovative approaches and successful implementations of bioclimatic design across different climates and building types. In addition, this study lies in its synthesis of contemporary bioclimatic practices with a focus on their practical application and effectiveness in real-world scenarios. Unlike traditional reviews that might offer a broad overview, this work provides a detailed evaluation of how specific bioclimatic strategies contribute to improved thermal comfort, reduced energy consumption, and enhanced indoor environmental quality. Despite the extensive review, a notable finding is the variability in the effectiveness of bioclimatic strategies based on regional and climatic differences. This indicates that while bioclimatic designs offer significant benefits, their success is highly context-dependent. Further research is needed to address these variations and to develop more universally applicable solutions. Furthermore, bioclimatic design is an architectural approach that aims to enhance building performance by taking into account the natural elements and local climate conditions. The review provides an overview of the application of bioclimatic design strategies in creating sustainable buildings that are energy-efficient and offer better thermal comfort and indoor environmental quality.

Key words: bioclimatic design, built environment, energy efficiency, indoor environmental quality, thermal comfort

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* Author to whom all correspondence should be addressed: e-mail: beramahadev1990@gmail.com; Phone: (+91) 6290646050