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Editorial Article

Integrating Climate Responsiveness, Environmental Resilience, and Human Experience in the Built Environment

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Abstract

This editorial introduces the latest edition of BEI (Built Environment Journal) Vol. 1 No. 2, which presents a collection of studies addressing environmental performance, resilience, and human-centered design within the built environment. The papers featured in this issue explore themes ranging from microclimate regulation through green open spaces, thermal comfort in semi-outdoor coastal architecture, place attachment in urban park development, and geotechnical stability in slope engineering. Although differing in scale and methodology, these studies collectively highlight the importance of integrating environmental sensitivity, climatic adaptation, and sustainable planning in contemporary built environments. The findings emphasize the role of vegetation in regulating campus microclimates, the influence of natural ventilation and materiality in semi-outdoor tropical structures, the social and cultural dimensions that shape public space utilization, and the engineering strategies required to ensure infrastructure stability in hazard-prone areas. Together, these contributions demonstrate the interdisciplinary nature of built environment research and provide valuable insights for planners, architects, engineers, and policymakers aiming to develop resilient, comfortable, and sustainable environments.

Keywords: Built Environment; Thermal Comfort; Green Open Space; Coastal Architecture; Place Attachment; Slope Stability; Sustainability.

Introduction

The built environment today faces increasingly complex challenges related to climate change, rapid urbanization, environmental degradation, and infrastructure resilience. Addressing these issues requires interdisciplinary approaches that integrate environmental science, architecture, urban planning, and engineering. In tropical regions, particularly coastal and rapidly developing urban areas, the interaction between natural systems and human-built structures becomes especially critical.

This edition of BEI (Built Environment Journal) presents four studies that collectively examine how environmental factors, design strategies, and engineering interventions shape the performance and sustainability of the built environment. The articles explore different scales of

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analysis—from campus landscapes and semi-outdoor buildings to urban parks and slope stabilization in transportation infrastructure. Despite their varied focus, each study contributes to a broader understanding of how environmental conditions influence comfort, safety, and human experience.

The first study investigates the role of green open space in regulating thermal comfort within a tropical university campus [1]. The second explores the thermal performance of semi-outdoor buildings in coastal environments, highlighting the interaction between natural ventilation and building design [2]. The third study examines strategies to enhance place attachment in urban parks through a socio-spatial perspective [3]. The final paper focuses on slope stability analysis in landslide-prone areas, presenting engineering solutions using volcanic ash stabilization [4]. Together, these studies provide a comprehensive view of how environmental and technical considerations shape the quality and resilience of built environments.

Discussion

The articles included in this issue collectively demonstrate how environmental conditions, design strategies, and engineering interventions interact to shape the quality and resilience of the built environment. One of the central themes emerging from the published papers is the importance of climate-responsive design and environmental management in tropical regions, where high temperatures, humidity, and environmental risks significantly affect both human comfort and infrastructure performance.

Research by Farrel et al. highlights the role of green open space in regulating microclimate conditions within a tropical university campus. Through the use of the Normalized Difference Vegetation Index (NDVI) and field measurements of temperature, humidity, and wind speed, the study reveals that vegetation density significantly influences thermal comfort levels. The results show that the campus area is largely dominated by low vegetation and built surfaces, while high-density tree canopies occupy only a small proportion of the landscape [1]. Areas with greater vegetation coverage provide more shading and exhibit lower air temperatures, resulting in more favorable Temperature Humidity Index (THI) values. These findings emphasize that strategic planning and distribution of vegetation are critical for mitigating heat stress and improving outdoor thermal comfort in tropical academic environments.

Complementing this perspective on outdoor environmental conditions, the study in conducted by Riskia et al. investigates thermal performance within semi-outdoor architectural spaces located in a coastal tropical environment. Using a combination of field measurements and Computational Fluid Dynamics (CFD) simulations, the research examines the interaction between airflow patterns, solar exposure, and building configuration. Although the recorded air temperatures remained relatively stable, high humidity levels and solar radiation increased perceived thermal discomfort, as indicated by PMV and PPD indices [2]. The study also demonstrates that areas exposed to direct sea breezes experienced improved thermal conditions due to increased natural ventilation. These results underscore the importance of passive design strategies—such as building orientation, ventilation pathways, and shading elements—in improving comfort levels in semi-outdoor tropical architecture. Additionally, the use of timber materials contributes to moderating surface temperature fluctuations, supporting the role of appropriate material selection in climate-responsive design.

Beyond environmental comfort, social and cultural dimensions also play a crucial role in shaping the quality of urban spaces. The study by Permatasari et al. explores the concept of place attachment in several historically significant urban parks in Banda Aceh. Through qualitative analysis using SWOT and Interpretative Phenomenological Analysis (IPA), the study identifies key factors influencing public engagement with these spaces. Social interaction opportunities,

historical identity, and strategic urban locations were identified as key strengths that contribute to stronger emotional connections between visitors and park environments [3]. However, the study also identifies several challenges, including limited facilities, insufficient climate-responsive design features, and fragmented management. Strengthening collaboration among government institutions, community groups, and private-sector initiatives is therefore considered essential to enhance the attractiveness and sustainability of urban parks.

Infrastructure resilience also remains an important component of built environment development. The research conducted by Munirwansyah et al. examines slope stability in landslide-prone areas, particularly along road infrastructure located in Lamreh, Aceh Besar Regency. Using finite element modeling with Plaxis 2D software, the research evaluates slope safety factors under different loading conditions, including self-weight, traffic loads, and soil stabilization measures. The results indicate that the slope initially exhibited marginal stability with safety factor values slightly above one, suggesting a high potential for landslides [4]. However, after applying soil stabilization using a volcanic ash mixture, the safety factor increased significantly and exceeded the minimum stability requirement. This finding demonstrates that locally available materials can provide effective and cost-efficient solutions for improving slope stability while reducing infrastructure risks in vulnerable environments.

Taken together, the studies published in this issue illustrate the interconnected nature of environmental design, social dynamics, and engineering resilience in shaping sustainable built environments. Each paper contributes valuable insights that support the development of climate-responsive, socially meaningful, and technically resilient spaces.

Conclusion

The papers presented in this issue of BEI (Built Environment Journal) illustrate the multidimensional nature of built environment research. From campus landscapes and coastal architecture to urban parks and slope engineering, each study contributes unique insights into how environmental conditions, design strategies, and technical interventions influence the quality and resilience of human habitats.

A common theme emerging from these studies is the need for integrated approaches that combine environmental sensitivity, social considerations, and engineering solutions. Vegetation planning can significantly improve thermal comfort in urban spaces, while passive design strategies enhance the performance of buildings in tropical climates. At the same time, strengthening social connections to public spaces and ensuring infrastructure stability remain essential components of sustainable urban development.

Together, the contributions in this second edition reinforce the importance of interdisciplinary collaboration in addressing the complex challenges faced by contemporary built environments. By bridging architecture, planning, environmental science, and engineering, researchers and practitioners can develop more resilient, comfortable, and sustainable spaces that support both human well-being and ecological balance.

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Conflict of Interest

The authors declare no conflicts of interest.

Author Contribution Statement

Siti Zahrina Fakhrana: Writing-Original draft preparation. **Evalina Zuraidi:** Writing-Reviewing and Editing.

Data Availability Statement

The data used to support the findings of this study are included within the article.

Ethics Approval

Not required.

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