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EDITED AND REVIEWED BY  
Debalina Sengupta,  
Texas A and M University, United States

\*CORRESPONDENCE  
Waqas Ahmed Mahar  
✉ waqas.faculty@aror.edu.pk

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# Editorial: Advancing sustainability, battling climate change

Waqas Ahmed Mahar<sup>1,2\*</sup>, Mohd Faris Khamidi<sup>3</sup> and  
Pau Chung Leng<sup>4</sup>

<sup>1</sup>Department of Architecture, Faculty of Architecture and Town Planning (FATP), Aror University of Art, Architecture, Design and Heritage, Sukkur, Pakistan, <sup>2</sup>Sustainable Building Design (SBD) Lab, Department of Urban & Environmental Engineering (UEE), Faculty of Applied Sciences, Université de Liège, Liège, Belgium, <sup>3</sup>Department of Architecture and Urban Planning, College of Engineering, Qatar University, Doha, Qatar, <sup>4</sup>Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Skudai, Johor, Malaysia

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## Editorial on the Research Topic

### Advancing sustainability, battling climate change

Climate Change is a major threat to humanity, affecting our health, wellbeing, economy, security, agriculture, livelihoods, biodiversity, water, infrastructure, etc. (IPCC, 2018; Raihan, 2023). With the increasing global warming the adverse effects of climate change may become more severe. Human lifestyle, behavior and consumption also play a significant role in causing climate change (Steg, 2023). Efforts have been made to combat climate change and advance toward sustainability. Climate change mitigation strategies have been developed, applied and documented (Fawzy et al., 2020). These efforts, however, are very low or limited in many parts of the world and need to be accelerated considering the risks related to climate change. Some solutions are indigenous, but their impact can be global. Not all climate actions and efforts have been acknowledged, and the contribution of many people needs to be highlighted.

As such, the Research Topic titled “*Advancing sustainability, battling climate change*” in the field of environmental research is a remarkable example of innovative thinking and unwavering commitment to addressing crucial global challenges. This collection aims to promote sustainability and resilience amid global climate change by providing an essential platform for advanced research and groundbreaking ideas. This Research Topic consists of five influential essays that promote sustainable practices and innovative approaches to addressing the broad implications of climate change. These academic contributions have the potential to initiate substantial revolutionary changes and influence the fields of environmental conservation and climate advocacy. This Research Topic aims to advance the development of a more sustainable and climate-resilient world by supporting collaborative efforts and innovative ideas. It emphasizes a multidisciplinary perspective and a strong commitment to practical solutions.

Iqbal et al. discussed climate change with respect to the design of external shading devices in Mansehra, Pakistan. The study highlights the passive design solutions

and their importance in the traditional architecture of Pakistan. Moreover, it focuses on the practical use and advantages of using a shading device in the selected city and under specific climatic conditions. Modern life mainly focuses on active technologies for climatic modifications in buildings. Considering global warming, the energy crisis and climate change, passive design solutions can be adopted in modern buildings to contribute to sustainability. The research examined the effectiveness and performance of shading devices in summer and winter, emphasizing daylighting and heat gain in the selected houses. The authors used fixed overhangs as shading devices in six houses, and the SketchUp to Curic Sun was used for performance analysis. The results reveal that the design, type, and use of shading devices, taking into account building orientation may increase energy efficiency.

The study by Peroni et al. considered the urban riparian ecosystem as a nature-based solution (NBS) to counteract climate change in Padua, Italy. The article focused on the urban riparian ecosystem in Padua from World War II to date, estimated the effectiveness of carbon sequestration, and assessed the afforestation process as a mitigation strategy against climate change. INVEST models were used to map land use and land cover in Padua and to assess carbon sequestration. The study suggests that the increase in impervious surfaces affects the urban riparian ecosystem, which may impact carbon sequestration. It is essential to focus on the targets of carbon neutrality in urban management and policies, and the use of existing nature-based solutions such as urban riparian ecosystems can be a useful strategy.

In their article, Yao et al. investigated the regional differences in urban vulnerability and adaptation preparedness for climate change, consequently highlighting the disparities in the distribution of climate resilience throughout world cities. This study emphasizes the significance of economic factors in determining how well cities can adapt to climatic effects. It also demonstrates how European cities often show more readiness than African ones. Policy decisions implied to close these gaps and support more inclusive and effective climate adaptation strategies globally are contingent upon the information gathered.

Aleha et al. focused on urban forests and their critical contribution to sustainable urban development, specifically highlighting the case study of Multan, Pakistan. Their study emphasizes the importance of urban green infrastructure in addressing the environmental deterioration resulting from increased urbanization, considering that a substantial proportion of the world's population resides in cities. Furthermore, the research strongly recommends using urban trees as a means to address problems such as urban heat islands and air pollution, by focusing on proactive resilience principles. The initiative seeks to improve urban sustainability by strategically selecting sites and engaging communities, in line with the Sustainable Development Goals (SDGs) and the New Urban Agenda (NUA), devised by the United Nations. The ultimate goal is to provide design recommendations that maximize the exploitation of urban forests for sustainable urban expansion.

The study conducted by Haji et al. explores the entirety of the Energy-Water-Food (EWF) nexus in the realm of sustainability, emphasizing the vital interconnection among energy, water, and food resources. Despite the occurrence of natural disasters and problems arising from human actions, it is essential to employ

integrated analysis in the energy-water-food (EWF) nexus to identify significant connections and potential conflicts. The study highlights the significance of decentralization in enhancing system resilience by giving priority to resilience through effective resource management methods. The research showcases the successful use of a multi-criteria decision-making framework in managing risks and uncertainties in EWF systems. It highlights the correlation between decentralization and resilience principles in the context of sustainable resource management.

In summary the articles submitted provide valuable insights that align with the journal's focus and our Research Topic "Advancing sustainability, battling climate change." Iqbal et al. proposed a passive design solution to improve the energy performance of buildings. Peroni et al. suggested the use and importance of urban riparian ecosystems as a nature-based solution to climate change that can increase carbon sequestration. Haji et al. investigated the intricate connections between energy, water, and food in the EWF nexus, highlighting the significance of integrated analysis in comprehending critical linkages and potential conflicts. Aleha et al., focused on urban forests and how they contribute to sustainable urban development. The study by Yao et al. examined the spatial disparities between urban vulnerability and adaptive readiness. The significance of resilience in addressing environmental issues is emphasized in all five studies. It is advised to employ decentralized methods in resource management, building design and urban planning to increase the resilience of the system. These articles contribute to the overall narrative of combating climate change by emphasizing proactive approaches to resource management, urban green infrastructure, and urban resilience. They are aligned with the objective of advancing sustainability in response to climate disasters.

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WM: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. MK: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. PL: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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