Politecnico di Torino

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Honors Thesis

Master's degree Science in Architecture Construction City

Abstract

Microclima Mitigazione: Analisi e Progettazione di un Mercato All'aperto a Porta Palazzo, Torino

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The impact of urban design on microclimate conditions has long been a topic of interest to the scientific community. This thesis presents an analysis of the microclimate of Porta Palazzo Market in Turin, with the aim of proposing strategies for the area that mitigate Urban Heat Island (UHI) effects at the neighborhood scale. The study incorporates an analysis of the market's architectural and historical aspects, examining the market's timeline and heritage to integrate these elements with urban design principles. Specific software was used to analyze how the microclimate around the market is influenced by UHI and other factors, identifying the areas most impacted.

The thesis is structured into three main phases. The first phase provides a historical and theoretical foundation, covering microclimate concepts, mitigation and adaptation strategies, and relevant analytical software. The second phase includes case studies that illustrate these concepts and enhance the understanding of the thesis scope. In the final phase, a detailed microclimate analysis using ENVI-met software is conducted, focusing on four main parameters: potential air temperature, surface temperature, wind speed, and Physiological Equivalent Temperature (PET). Based on this methodology, strategies for microclimate mitigation and adaptation in the area are suggested. The effectiveness of the proposed design is evaluated using the same software, demonstrating promising results in improving thermal comfort and positively impacting the climate conditions in the market.

The findings of this research underscore the importance of targeted microclimate interventions in enhancing urban resilience and sustainability

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