

URBAN AND REGIONAL DEVELOPMENT

Eurac/CNR/DIST/Centro interdip - Planning and Design based on Nature-based Solutions (NbS) for Climate- Resilient Cities

Funded By	EURAC RESEARCH [Piva/CF:01659400210] C.N.R. - CONSIGLIO NAZIONALE DELLE RICERCHE [Piva/CF:02118311006] Dipartimento DIST Centro Interdipartimentale R3C
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Context of the research activity	The proposed PhD research focuses on advancing the integration of NbS into urban environments to enhance climate resilience, energy efficiency, and environmental quality. This study will develop a multi-scalar modeling framework to evaluate the effectiveness of green roofs, living walls, and urban vegetation in mitigating urban heat island, improving building energy performance, and enhancing ecosystem services for the definition of planning and design.
Objectives	The proposed PhD research focuses on advancing the integration of NbS into urban environments to enhance climate resilience, energy efficiency, and environmental quality. This study will develop a multi-scalar modeling framework to evaluate the effectiveness of green roofs, living walls, and urban vegetation in mitigating urban heat island, improving building energy performance, and enhancing ecosystem services for the definition of planning and design. By leveraging advanced computational tools, including Computational Fluid Dynamics (CFD) and energy balance models, the research will assess microclimatic interactions, thermal comfort improvements, and energy-saving potential of NbS at both the building and urban scales. Beyond the technical aspects, the study will integrate frameworks to analyze the long-term socio-environmental impacts of NbS, considering trade-offs, uncertainties, and governance challenges, and testing the effective benefits in planning and design. A stakeholder-driven approach through a living lab will help identify perspectives, needs, and potential conflicts among key actors and citizens, ensuring that NbS strategies align with urban design and planning priorities. A strong focus will be placed on justice and equity, ensuring that NbS foster inclusive climate adaptation, prevent green gentrification, and enhance access to environmental benefits for all. By integrating insights from bioclimatic design, this research will generate evidence-based design

	solutions and develop an interactive 3D City Practice Lab to support participatory urban planning and design. This digital platform will enable stakeholders, policymakers, and communities to visualize NbS interventions, engage in scenario-based decision-making, and co-develop strategic climate adaptation and energy efficiency plans.
Skills and competencies for the development of the activity	Urban and Regional Planning - GIS