URBAN AND REGIONAL DEVELOPMENT

DM 630/Fondazione LINKS - Supporting decision-making processes for effective and equitable nature-based solutions

Funded By	FONDAZIONE LINKS - LEADING INNOVATION & KNOWLEDGE FOR SOCIETY [P.iva/CF:11904960017] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584]
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Context of the research activity	Nature-based Solutions (NbS) offer various benefits but may exacerbate urban inequalities. The research project will systematically evaluate NbS in European cities, each facing distinct climate impacts and governed by different planning systems. Using a comparative case study approach across four disciplines, the project will identify conditions and design principles for effective NbS. These principles will be validated in European cities through the use of digital twin technology, promoting equitable NbS implementation and fostering an integrated approach to urban regeneration. Progetto finanziato dal PNRR a valere sul DM 630/2024 - CUP E14D24002480004
	The recent extreme weather events across Europe underscore the impact of climate emergency on urban areas. As a way forward, Nature-based Solutions (NbS) – such as green roofs, rain gardens, and constructed wetlands – are essential for creating circular urban economies by integrating nature and natural features into cities and landscapes (EC, 2015). NbS contribute to climate mitigation and adaptation efforts while providing wider ecological, social, cultural, and economic functions and benefits (Lafortezza et al., 2018; Goodwin et al., 2023). Yet, the exposure to climate risks and NbS benefits is unevenly distributed among urban residents (Cousins, 2021). In the worst-case scenario, the local implementation of NbS can acquire an exclusionary character (Berrang-Ford et al., 2021; Anguelovski & Connolly, 2022) or result in the destruction and degradation of ecosystems elsewhere (Seddon, 2022). This challenges the "win-win-win" proposition of NbS, which claims that NbS contribute to a socially inclusive, economically vibrant, and ecologically resilient society. It is crucial to address existing and future urban inequalities and injustices when creating NbS to enhance the transition

Objectives	towards climate-proof and climate-zero cities. To realize the EU ambition of becoming an international frontrunner in NbS, both theory and practice have turned to Inclusive Climate Actions (ICAs) that simultaneously tackle climate change and inequalities (C40, 2019a; Cousins, 2021). ICAs are tools that enable a structural and systemic implementation of NbS for equal benefits to communities and ecosystems. This is achieved by engaging diverse communities, incorporating fairness and accessibility in the design of NbS, and equitably distributing NbS impacts from neighborhood to urban level (C40, 2019a). Although several European cities have gained first experiences with ICAs (C40, 2019b), there has been no systematic evaluation of Nature-based Solutions (NbS) to date. This lack of evaluation hinders a wider, more effective implementation. The project aims to contribute to the UN Sustainable Development Goals 11 and 13. The project pursues four main objectives: (OB1) mapping NbSs for the city of Turin, identifying and cataloging existing NbS in the city, (OB2) defining an interdisciplinary theoretical framework through literature review and best practices analysis for developing a comprehensive theoretical framework, (OB3) proposing an evaluation and monitoring framework based on Key Performance Indicators (KPIs) to measure the social, health, economic, environmental, and circular impact of NbSs through analysis and participatory workshops, (OB4) digitalization and visualization of results, comparing scenarios, and proposing guidelines through an interactive digital platform to guide policy-makers and public administration activities. The project defines ICAs as tools for implementing public policies on NbSs, contributing to the "Climate and Green Transition." The research includes pilot cases in the city of Turin to empirically validate the framework, providing replicable tools at an international level. This results in, amongst others, innovative sustainability and circularity assessments, hotspots of intersecting urban vulnerabilities and reducing urban inequalities, and digital twins of NbS that facilitate co-creation. This PhD research will be partially conducted in the context of GREEN-INC DUT EU project and in the collaboration of Links Foundation, City, Climate & Environment FUTURE CITIES & COMMUNITIES (https://linksfoundation.com/), specifically within the projects Interreg EU Re-Public Spaces and the and Clima, co-benefici di salute ed equità (PNC). The data collected from its relative pilot cities will be the basis of the research analysis. Therefore, the PhD activities will be joint research activities between Politecnico di Torino (POLITO) (https://www.dist.polito.it/) and Links Foundation. The activity will mostly take place in the (S3+Lab) “Urban Sustainability & Security Laboratory for Social Challenges” laboratory which is part of the SDG11Lab of the Interuniversity Department of Regional and Urban Studies and Planning, Politecnico di Torino, which integrates all existing relevant platforms and operating solutions for providing an infrastructure with a horizontal component, able to guarantee efficient access to general and reference data sources, and to host a variable number of vertical domains that require specific data and dedicated analysis tools. Being also a part of a Links Foundation project, the Ph.D. candidate will spend 12 months at this research center in Turin (Italy) and 6 months abroad. The Ph.D.'s daily activities will be supervised by the main tutors with the contribution of the full environment of the laboratory and Dr. Sara Torabi (POLITO) and Dr. Stefano Pensa (Links Foundation).

Skills and competencies for the development of the activity	PhD candidate to be involved in this project is expected to be interested in the theoretical perspective on climate adaptation, NbS, urban planning, and the evaluation and assessment of Key Performance Indicators (KPIs). The candidate should possess skills in spatial analytical tools for sustainable urban planning and be proficient in GIS mapping for sustainable evaluation. Additionally, the candidate should be familiar with social and inclusive research methodologies such as questionnaires, surveys, and participatory approaches, to effectively engage stakeholders in the planning process. Confidence in extracting, manipulating, and analysing data and scripting capabilities in common computer languages are also highly desirable.