

MAINSTREAMING NATURE BASED SOLUTIONS IN ADAPTATION PLANS: DESIGNING AND APPLYING AN EVALUATION FRAMEWORK

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Abstract Meeting global sustainability goals requires shifts in the ways societies respond and adapt to climate change. Nature-based Solutions (NbS) are increasingly recognized as a key driver of such transformation, offering integrated benefits for climate resilience, biodiversity, and social well-being. Despite growing recognition, the integration - or mainstreaming - of NbS into local adaptation planning remains uneven and often not sufficiently effective.

The research provides a comprehensive evaluation framework for assessing the degree of NbS mainstreaming in adaptation plans. It is based on 4 dimensions: social challenges, inclusion and equity; governance and participation; economic management; capacity building and implementation infrastructure.

The framework enables systematic assessment, allowing to identify common strengths, recurring gaps, and enabling conditions for better performing comprehensive adaptation plans, moving forwards long-term urban resilience and recognizing cities as complex socio-ecological systems where human and natural components are deeply interdependent.

The methodology developed focuses on the abovementioned dimensions corresponding to a set of indicators that are combined together to compose a representative synthetic index. This reflects the overall performance of each adaptation plan in terms of effectively integrating NbS.

The proposed evaluation framework is then applied to all available Sustainable Energy and Climate Action Plans (SECAPs) from Italian medium-sized cities, chosen for their representativeness within the European urban landscape. Based on these findings, the study highlights best practices and offers targeted key recommendations to guide the development of future local adaptation plans.

The results contribute to a more effective integration of NbS into adaptation processes, paving the way for the pursuit of greater climate resilience in cities.