



NBS efficiency-informed urban upscaling methodology: the euPOLIS approach

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Nature-Based Solutions (NBS) offer multiple and diverse benefits for both nature and society as they could simultaneously address a spectrum of environmental, social, and economic aspects. The need to upscale urban environments via NBS has resulted in an ever-increasing demand for structured methodologies and easy-to-implement urban design tools to facilitate their adaptation in standard urban policies and modern practices. Within this context, an innovative multi-dimensional, indicator-based NBS assessment framework for enabling a first-order site-specific selection of NBS has been developed herein. The proposed two-step simple, yet systematic, methodological framework enables urban planners to rank a set of candidate NBS, considered for a site of interest, on the basis of multi-dimensional measurable criteria, instead of founding their decision on a purely subjective interpretation of the potential NBS benefits in view of past good practices.

The first step of the proposed methodology exploits readily available data and expert knowledge to eventually deliver an initial site screening through estimating appropriate indicators that monitor site performance in a set of concerns associated with the following categories: (a) Public Health and Well Being, (b) Urban, (c) Environment, (d) Social, and (e) Economic. In particular, urban planners initially perform a qualitative site assessment to evaluate site performance across a list of concerns, representing critical issues identified within each of the aforementioned categories, that could potentially be mitigated via NBS interventions. Although the severity assessment of a particular concern (e.g. air quality, overweight population) is offered in a descriptive form (i.e. High/Moderate/Low/Not a problem/Not a concern), specific thresholds are recommended for each concern to guide stakeholders' decisions with regards to the transition from one severity state to the other. The second step involves assessing the capacity for each of the NBS identified for the site of interest to mitigate the most pressing site-specific concerns. This NBS impact assessment, likewise the site screening, is performed in a qualitative manner. Hence, based on available literature, past experience and expert opinion, urban planners specify whether a specific NBS could have a Direct/Indirect/No mitigating impact on a particular site concern.

Following the input phase, the information related to the severity of the concerns (step 1) is convolved with the ability of an NBS to impact them (step 2) to produce a ranked list of the site-

specific candidate NBS on the basis of their efficiency to address the most pressing site concerns. To facilitate this, a score is assigned to each of the qualitative descriptions in both steps. Through multiplying the two step scores per concern and then summing them, a total score per NBS is computed reflecting the overall NBS site-specific score. Supplementary factors could be accommodated by the proposed framework, to account for other aspects that are likely to affect NBS selection, e.g. budget or other constraints.

The proposed innovative methodology is also offered in the form of an online application, to serve as a decision-assisting tool for undertaking a first-order NBS selection and consequently prioritising further investigation and detailed modelling to appropriate interventions prior to their implementation.