

Supporting Just Transitions with Welfare-Based Decision-Making for Nature-Based Solutions: A Participatory Framework

Luca Cetara ⁽¹⁾ - Giada De Angelis ⁽²⁾ - Lorenzo Mucciarelli ⁽¹⁾

⁽¹⁾ Eurac Research, Roma, Italy - ⁽²⁾ Eurac Research, Center for Climate Change and Transformation, Bolzano, Italy

Keywords: Just Transition, Nature-Based Solutions, Welfare Economics, Decision-Making, Equity, Participation

Abstract As urban climate risks escalate, adaptation strategies must prioritize equity and fairness to support just transitions. Nature-Based Solutions (NBS) enhance resilience but require decision-making frameworks that ensure benefits that meet the idea of justice prevailing in the context where they are applied. This study presents a participatory approach to assess and guide NBS implementation, integrating welfare economics with ethical principles such as Rawlsian justice (Rawls, 1971) and Sen-Nussbaum capabilities (Sen, 1999; Nussbaum, 2000), to align with just transition goals. The methodology empowers equitable decision-making through community engagement through participatory techniques and surveys that incorporate diverse voices, ensuring NBS address local priorities, particularly for underserved groups (Arnstein, 1969). Alternative welfare approaches are used to prioritize the least advantaged (Rawlsian), enhance individual freedoms (capabilities-based), maximize total welfare (Utilitarian), or for other ethical purposes, tailoring NBS to ethical and social contexts (Robeyns, 2017). In this line, a multi-objective optimization model can be used to evaluate alternative NBS portfolios, balancing efficiency and equity to inform governance decisions (Pareto, 1906).

In a hypothetical urban case, the framework directs NBS investments to vulnerable areas, improving equity under Rawlsian calibration, while hybrid models optimize trade-offs for broader welfare gains. The proposed method supports inclusive governance by embedding community input and ethical considerations into NBS decision-making, offering policymakers a replicable tool to mitigate climate risks while advancing social justice and empowerment. It aims to ensure that NBS not only bolster resilience but also foster fair transitions in urban planning. We propose a methodology and some preliminary results based on local application to climate strategies framed in Lombardy (Italy) where alternative welfare scenarios are considered.