

Bin2Bean

Practice abstract 22



SCAN ME!

A Scoring System for Circular Management of Urban Biowaste



The **BIN2BEAN project** has developed a comprehensive scoring system to evaluate and rank solutions for improving urban biowaste management, with a strong focus on soil health. The tool acts as a decision-support instrument for city-regions and policymakers, moving beyond technical feasibility to assess "market readiness," defined as the ability of a solution to fit specific regulatory, social, and environmental contexts.

Within this framework, solutions are defined as interventions across **four interdependent stages of the biowaste value chain: (1) source separation, (2) collection, (3) processing, and (4) valorization into organic soil improvers**. This structure enables the model to capture costs, revenues, and performance at each stage, providing a system-wide perspective.

Methodology and Functional Basis

To ensure comparability, solutions are assessed using a common functional unit, such as the total amount of biowaste treated or the quantity and quality of soil improver produced, including attributes like carbon storage potential. The evaluation is based on a **Multi-Criteria Decision Analysis (MCDA) framework**, specifically the PROMETHEE method, selected for its transparency and its capacity to integrate both qualitative (e.g., safety compliance) and quantitative indicators with flexible weighting.

Key Indicators for Holistic Assessment

The system proposed includes four critical dimensions:



Agronomic: potential nitrogen (N) mineralization (indicative of nutrient availability), stability (indicative of carbon storage potential), and organic matter content.



Safety: presence of macroscopic impurities (plastics, metals, glass) and the absolute absence of Salmonella.



Socio-economic: the Net Annual Cost (NAC) is calculated per ton to measure efficiency and per capita to assess the financial impact on citizens.



Environmental: Impacts on species biodiversity using damage models and circularity levels measured through Material Flow Analyses for carbon, nitrogen, and phosphorus.

Project partners

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