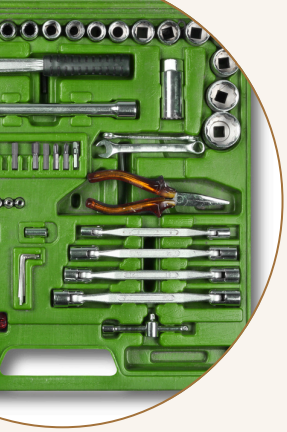

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Practice abstract 23

A Decision-Support Toolbox for Sustainable Biowaste Management

Background & Tool Overview

Effective biowaste management is key to advancing circular economy strategies and sustainable soil restoration. To support evidence-based decision-making, Wageningen University and Research group, in collaboration with DTU, developed an interactive toolbox that links Life Cycle Assessment (LCA), nutrient flow analysis (C, N, P, K), and socio-economic indicators. The tool integrates data from the EUSO Health Dashboard to assess the environmental and agronomic performance of biowaste-derived soil improvers.

Scope and Functionality

The toolbox enables users to define and compare multiple biowaste management solutions (BMS), including composting, anaerobic digestion, and collection systems. Pre-configured baselines can be modified with user-defined inputs such as population, waste generation, transport distances, and processing technologies. Key outputs include environmental impacts (e.g., biodiversity indicators), nutrient recovery efficiency, and economic performance.

Methodology and Analytical Framework

The tool combines LCA-based indicators with nutrient mass flow modelling and multi-criteria decision analysis (MCDA) using the PROMETHEE method. This integrated approach allows for transparent comparison of alternative scenarios, highlighting trade-offs between environmental performance, soil quality, and costs. The inclusion of standardized indicators ensures comparability across different regional contexts.

Key Insights and Relevance

By linking soil health indicators with system-level sustainability metrics, the toolbox supports the design of optimized biowaste valorisation strategies. It enables stakeholders to identify robust and scalable solutions that enhance nutrient recycling, reduce environmental impacts, and improve data-driven policy development.

Find the toolbox here: https://b2b-score-sys-frontend.containers.wur.nl/cnpk-tracker

Project partners

Consorzio Italbiotec · Wageningen University & Research · N3 Nachhaltigkeitsberatung Dr. Friege & Partner · Ruokavirasto Livsmedelsverket Finnish Food Authority · euroquality A Warrant Hub Company · HIGE Shaping the Circular Economy · Stadtreinigung Hamburg · etaflorence renewableenergies · AMS Amsterdam Institute for Advanced Metropolitan Solutions

Get in touch

bin2bean.eu · info@bin2bean.eu · Bin2Bean

originally published on

Co-funded by the European Union

EU CAP NETWORK

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