Development of a multi-criteria-based decision support tool for circular resource recovery and reuse business models

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Abstract

The management of waste has emerged as a crucial issue that concerns both public health and the environment, especially in developing countries, where industrialisation is happening rapidly, the population is growing, and policies are inadequate. To promote sustainable development over a long-time frame, global trends advocate for governments, policymakers, and international organisations to explore ways of moving from linear to circular economy (CE) business models. The aspiration is to shift material flows toward zero waste and pollution, where resources are not consumed and discarded but rather valued and retained for as long as possible. The challenge is that implementing CE innovations is often not straightforward, and decisions to transition are often laden with trade-offs and uncertainties. For many decision-makers and practitioners, CE is viewed as an environmental agenda, and stakeholders' perspectives and priorities on waste management systems are often not considered. This presentation describes the creation of a decision support tool that uses multiple criteria to help decision-makers and practitioners choose suitable and sustainable circular economy business models. It explains the decision analysis methods used to evaluate competing priorities and trade-offs among alternatives. It details how the tool quickly narrows down circular economy business model options for different waste streams and technology alternatives. Finally, it describes a user-friendly interface that allows users to modify inputs, test scenarios, and the operationalisation of the tool in multiple countries and contexts. The target users are public administrators, businesses, and actors involved in recycling food and agricultural waste streams for positive social, economic, and environmental outcomes.

Keywords: sustainable waste management, circular business models, climate mitigation, decision support tool, resource recovery and reuse

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