

Social tipping points for a circular food system transition in cities– The case of urban organic waste

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Cities as central collection points for organic waste offer great opportunities to valorize it into higher-value products than compost or bioenergy. However, urban organic waste currently mainly ends up in landfills, incinerators, or open dumps. As sociotechnical systems, cities are stabilized by regimes that coordinate the activities of actors and social groups creating inertia, lock-ins, and path dependencies in existing systems. It is, therefore, important to understand how transitions to a new more circular system occur and how socio-cultural, economic, ecological, and institutional changes react to each other and result social tipping points. The aims of this study are twofold. First, the relevant factors influencing organic waste valorization in cities and their interaction are identified and, second, the impact of changes in these factors contributing to tipping points for circularity are explored. Using Amsterdam as a case study, this study uses a fuzzy cognitive mapping approach to explore stakeholders' opinions about relevant system elements that drive a transition of the urban organic waste system towards circularity. In addition, the multi-level perspective (MLP) is used as a guiding theory of sustainability transitions to analyze the transition pathway and cluster the driving factors. For example, expert perspectives suggest that engagement in innovative waste valorization activities will remain in niches without industrial and political engagement. The financial returns from such technologies can only be achieved with large-scale production and waste homogeneity. The municipality of Amsterdam needs to take a leadership role in organizing a circular waste system and should promote exchanges between stakeholders and provide supporting data on waste composition and volumes. There is a particular need for industrial investors to integrate high-value technologies into circular business models. Regulatory or economic adjustments at national and EU levels can significantly impact this industrial engagement. The analysis of the expert opinions revealed ten different tipping points driving the circular organic waste system and showed that the transition process requires a change of attitude towards waste in all societal groups in order for the majority of society to support the shared vision of circularity.