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Environmental Impacts of Surplus Food Redistribution: A Life Cycle Assessment of Urban Food Hubs in Milan

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Abstract. Urban food hubs dedicated to surplus food redistribution represent a promising strategy to reduce food waste and its associated environmental impacts. However, their environmental performance has been only partially explored. This study presents a life cycle impact assessment of two urban food hubs operating in Milan, a city recognized for its innovative food policies.

The results show that a single food hub can generate substantial environmental benefits, including net annual savings of approximately 107 t CO₂-eq and the recovery of around 140,000 meals per year. By preventing surplus food from entering waste streams, these initiatives reduce environmental burdens associated with excess food production and disposal, such as greenhouse gas emissions, resource depletion, biodiversity loss, and pollution.

Surplus food redistribution through urban food hubs contributes to the achievement of global sustainability objectives, particularly SDG 12 (Responsible Consumption and Production) and Target 12.3, which aims to halve global food waste by 2030. The findings also highlight the role of food hubs as effective components of broader urban sustainability strategies.

Overall, the study strengthens the evidence supporting food hubs as strategic instruments for climate change mitigation, resource conservation, and the transition toward more sustainable urban food systems.

Keywords: Surplus food redistribution; Food waste mitigation; Environmental sustainability; Life cycle assessment.