

# **A circular collaborative business model for urban food waste management: the case of Milan**

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One of the most urgent worldwide sustainability challenges in the agrifood system is the prevention of food losses and waste (Thyberg & Tonjes, 2016), defined as the decrease in edible food mass at the end of the supply chain (FAO, 2011). In the past decade, diverse public policies and initiatives have been put in place to fight against food waste. The United Nations Sustainable Development Goals target a global 50% reduction of food losses and waste by 2050. Within the European Circular Economy Action Plan, food waste is also defined a priority (EC, 2015). In Italy, the Gadda Law (166/2016) foresees a redistribution of surpluses and unused food products for social solidarity, by donations to people in need. In line with this, one of the five Milan Urban Food Policy priority areas concerns the circular bioeconomy, by recovering and redistributing surpluses and food waste during the different stages of the food chain to reduce socio-economic inequalities and environmental impacts.

Here, the ‘Neighbourhood Hubs Against Food Waste’ project in the city of Milan is presented, consisting of strategic centres where surplus food is collected from supermarkets and redistributed to vulnerable households.<sup>1</sup> The project idea started in 2014 thus one year before the EXPO in Milan, and the first hub has been set up in 2019, based on partnership between the Milan City Hall, the Cariplo Foundation, the Polytechnic University of Milan and the association Assolombarda.

Our study aimed to understand the innovations, governance mechanisms, leverages and barriers, and value co-created by a circular collaborative business model redistributing food surpluses. A circular business model is an innovative management solution for environmental challenges and links circular strategies with resource efficiency while striving for sustainable outcomes (Donner et al., 2020; Nußholz, 2017). A collaborative business model includes joint activities of actors from diverse organizations (public, non-for-profit, industry, research), from different positions of the value chain and from different action levels, who’s common aim is to co-create sustainable value (Rohrbeck et al., 2013; de Vries et al., 2024). Often then, organizational and technological innovations are combined (Donner and de Vries, 2021). If sufficiently large in scale, they can change the ecosystem and induce a transition (Derks et al., 2022).

The Milan case has been studied in the framework of the Horizon Europe project FOODPathS.<sup>2</sup> Data were especially collected via ten qualitative mainly face-to-face interviews, run in June 2023 and lasting between one and two hours each. Interviews were addressing the main stakeholders participating in this co-creation case, i.e., actors from public institutions, the private sector, research institutions, and the civil society. The interview guide covered five main questions concerning the nature and dynamics of the initiative, its governance, leverages and barriers, value creation and distribution.

Results show that the collaborative initiative has allowed for innovations in the food system of Milan, to three extents: organizational-social (previously fragmented various actors cooperate within a newly developed institutional framework and living lab), socio-economic (food for people in need, new ‘zero waste’ label, corporate volunteering), and technical-organizational (logistic operations, monitoring system). Hence, not only combined organizational and technical innovations are observed, but also inter-connected social innovations. Next, the governance of the business model can be considered inclusive as the public sector (Milan City Hall), the private sector (cooperative firms, private firms, the philanthropic organization Cariplo), research (the Politecnico of Milan) and the civil society representatives (NGOs of very different sizes, seniority and socio-ideological background) are all included. These different actors are not just consulted but are active partners of the project,

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<sup>1</sup> [https://www.comune.milano.it/en/aree-tematiche/food\\_policy/contrasto-allo-spreco-e-aiuto-alimentare](https://www.comune.milano.it/en/aree-tematiche/food_policy/contrasto-allo-spreco-e-aiuto-alimentare)

<sup>2</sup> <https://www.foodpaths.eu/>

involved in its implementation and with a considerable capacity of influencing decision-making processes. The distribution of benefits derived by the produced synergies is perceived equitable. Despite some barriers such as identity conflicts or competition dynamics inherent in such an initiative, the Milan circular collaborative business model has brought advantages to the overall system in terms of impact (e.g., quantities of food redistributed), flexibility (in partners and beneficiaries), open innovation (by co-creation), and resilience (e.g., continuity in the delivery of food aid during the COVID crises). In 2021, the City of Milan has won the Earthshot Prize for their innovativeness and contribution to sustainability. In 2023, 615 tons of food have been collected in five hubs and redistributed to vulnerable people.

Our conclusion is that ‘Neighbourhood hubs against food waste’ case can be considered as a collaborative, inclusive as well as a circular business model which can be representative for other cities. Since different actors in Milan share common sustainability objectives, accept (in)formal rules, and are willing to adapt themselves in collaborative actions, five hubs successfully operate and valorise food waste. Their active participation is further enhanced by perceived sustainable value creation, thanks to positive feedbacks of external visitors of their hubs.

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