Urban and peri-urban food systems: exploring proximity and care in alternative food networks

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Abstract: Basing on the European and Milanese context, the paper develops and presents a preliminary reflection on urban food systems, specifically related to local Alternative Food Networks (ANFs) and how their relational and geographical proximity, that might facilitate or prevent forms of care through collaboration. The authors introduce the Food System Matrix that analyses 16 case studies to investigate the main issues connected to the territorial scope and the purpose of the selected cases. Finally, the paper proposes the concepts of 'proximity' and 'care' as a framework for understanding systemic and sustainable change in food-related services, emphasizing relationships, inclusiveness, and resilience. This work lays the foundation for future investigations into AFNs for sustainable food systems, highlighting the role of design and collaboration in promoting positive social impact.

Keywords: service design, alternative food network, proximity, care

1. Introduction

Urbanization has played an important role in shaping food systems. Shifts in consumer habits, rising food demand, the prevalence of highly processed foods, and the centralization of food production in urban areas, along with the effects of the COVID-19 crisis and the Ukraine war, have exacerbated food insecurity in Europe from 2021 to 2022 (FAO et al., 2023). These factors underline the complexity of urban food systems, highlighting the difficulties in sustaining resilient supply chains, addressing the health consequences of urban lifestyles, and managing the cost of food due to centralized production. In this context, consumers are asked to remain informed and proactive about food safety, especially with the additional challenges that climate change poses to logistics and consumer choice.

Alternative food networks (AFNs) emerge in response to these challenges. They create smaller-scale systems that operate within and in contrast to the traditional food system,

providing alternative approaches to food production, distribution, acquisition, and consumption. Even though AFNs function within the global industrialized system, they aim to avoid or reduce environmental and social harm, promoting cleaner, fairer practices and, thus, the sustainability of the whole chain (Bush et al., 2015).

In this context, Milan, Italy stands out as a ground for study. Following the 2015 Expo with the theme 'Feeding the Planet, Energy for Life', the city underwent a significant transformation in its approach to food. After kick-starting the Milan Food Policy Pact, the city's Municipality actively involved local organizations, regional groups, and European partners in discussions around food systems (Scavuzzo et al., 2018). As a result, Milan saw the start of various AFNs focused on managing food surplus and waste and improving food security (*Neighborhood Hubs Against Food Waste*), the development of sustainable food production and distribution centers (*Cascina Nosedo*), and the activation of grassroots food recovery initiatives (such as the *Recup* project) (Corubolo & Meroni, 2023). By leveraging established networks and the existing infrastructure of mainstream systems, these cases of AFNs experiment with innovative approaches to addressing food system challenges by connecting mainstream stakeholders and emerging organizations, linking formal and informal networks in unusual forms of relationships. Consider the example of the *Neighborhood Hubs Against Food Waste*, where multifunctional community centers provide essential services such as food redistribution and support to those in need within their neighbourhood. This initiative operates through a collaborative effort involving governmental entities, market stakeholders, and non-profit organizations. Supermarkets contribute by donating surplus items, and local NGOs facilitate distribution. At the same time, wholesale markets and municipal authorities work with academic institutions to oversee and optimize the system's management and monitoring processes.

As seen in the previous examples, collaboration between multiple actors is strengthened by their relational and geographic closeness. Geographical proximity relates to the physical nearness or distance between individuals or organizations. It considers how physical nearness impacts logistics, accessibility, and, most importantly, how easy it is for actors in the same area to interact or exchange. On the other hand, relational proximity refers to the strength of their relationships and interactions. It relates to collaboration, trust, and communication between actors and to the ways they share resources, power, or information (Manzini, 2022).

By fostering strong local connections and strengthening social ties, proximity empowers actors to create an effective network of collaboration that leads to actions of care (Manzini, 2022). Such an approach to care goes beyond environmental sustainability and considers the community's well-being. Here, the traditional view of care, which focuses on performance and transactions between carer and a cared-for individuals, transforms to align with the ideas of interdependency in an ecosystem and creating a culture of caring communities (Krzywoszynska, 2019; de la Bellacasa, 2017; Care Collective, 2020).

This research is part of OnFoods, a project funded under the National Recovery and Resilience Plan in Italy. Through a selection of case studies, analysed using both field and documentary research, the aim is to investigate the challenges AFNs face by crossing the geographical scale and range of purposes of each case and exploring the role of proximity in facilitating collaboration and sustaining forms of care beyond the environmental one.

Following this introduction, the paper analyses the current urban food system in Milan to visualize the presence of AFNs within it and how these interact with the mainstream food players. The identification of the main food system actors helps to identify local and international case studies for the case analysis. Subsequently, it introduces the Food System Matrix, offering insights into the positioning of the cases and their identified care practices. The discussion concludes with reflections on the role of territorial and relational proximity in the creation of collaborative initiatives around sustainability and care practices.

2. Research approach

The study adopted a service design perspective to understand the current urban and peri-urban scenario of the Milan food system in relation to the value delivered to all the actors of the chain, from producers to consumers. The research process (Fig. 1) began by analysing existing literature on sustainable urban food systems and Alternative Food Networks (AFNs). From this groundwork, a detailed map emerged outlining Milan's food system (The Milan Food System Map, Fig. 2). This visualization evidenced significant nodes and actors, guiding the selection of representative case studies from Milan. Incorporating international cases broadened the local focus and deepened the case study research scope. Insights from these studies prompted an iteration of the initial map, and the concluding step was the formulation of the Food System Matrix (Fig. 3) to categorize the cases.

Rather than examining each case in isolation, this perspective strives for a systemic understanding: probing into relationships between actors, the services they facilitate, their touchpoints, the engagement of users and stakeholders across various scales, and the outcomes from such collaborations. The following paragraphs outline the various steps of the research, with particular emphasis on the development of the map and matrix as interpretations of the collected data.
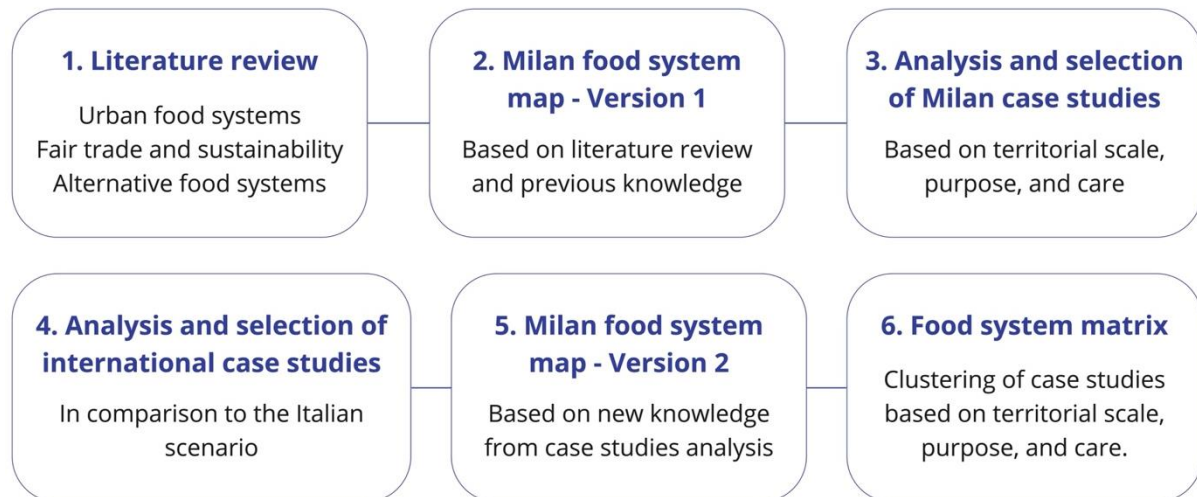
1. Literature review Urban food systems Fair trade and sustainability Alternative food systems	**2. Milan food system map - Version 1** Based on literature review and previous knowledge	**3. Analysis and selection of Milan case studies** Based on territorial scale, purpose, and care
4. Analysis and selection of international case studies In comparison to the Italian scenario	**5. Milan food system map - Version 2** Based on new knowledge from case studies analysis	**6. Food system matrix** Clustering of case studies based on territorial scale, purpose, and care.

Figure 1   Summary of the steps followed during the research process.

2.1 Literature review

Scientific and grey literature on sustainability for both long distance and local food value chains is growing, integrating management with other fields of research, such as innovation studies, service science and design, policy studies, and even urban planning. For this paper, the selected literature investigates food systems and AFNs from a service design perspective focusing on the urban scale and the challenges emerging considering food-related services as forms of socially innovative practices aiming at positively impacting the contexts on which they operate. The analysis took into consideration three main clusters:

- *Urban Food Systems:* Research focusing on food systems in urban contexts, including Komisar and Nasr (2019), Steel (2010), AA VV Milano Food Policy (2018), and FAO (2023).

- *Fair Trade and Sustainability:* Literature examining the intersection of fair-trade practices with sustainability considerations: Bush et al. (2015) and Tansey and Worsley (1995).

- *Alternative Food Networks (AFNs) and Social Innovation:* This theme encapsulates research on AFNs and social value creation: Knorr et al. (2018), Ballantyne-Brodie et al. (2013), Meroni (2013).

2.2 Visualizing the milanese food system

Grounded on the literature review, the authors developed a visual tool to represent the various actors and their interactions within an urban food system. Based on the Milanese context, the map aims to provide a schematic view of the main relationships among the actors involved by drawing attention to the system nodes. The authors refer to "nodes" as the points of the system in which different actors and products inside of a network interact and make exchanges (Aucoin & Fry, 2015).

The process of developing the map moved from the analysis of a "conventional" supply chain of mass market retailers (in opposition to the AFNs) in terms of actors and flows and, subsequently, integrating it with peripheral nodes and connections that have emerged alongside it.

The significance of the Milan Food System Map lies in its ability to offer a holistic view of its food scenario, making it easier to identify interconnected case studies for subsequent analysis. While diagrams simplify complexities, a comprehensive map detailing the main actors in today's intricate food systems —characteristic of a European region—can aid in visualizing the various nodes within different food chains and systems. Drawing inspiration from the service design toolset (Morelli et al., 2021), this map can help quickly identify the interconnectedness of the different chains and how AFNs operate at different scales (spatial, social, and economic) within the conventional industrial system of production, distribution, acquisition, consumption, and disposal of food.

The map also worked as a reference system to select a first set of cases. From the analysis of these first initiatives, the map has then been refined and improved in terms of completeness and used again to integrate the selection of cases.

2.3 Selecting, analysing, and clustering case studies

A qualitative outline of a selection of case studies helped understand the main issues, predominantly at the urban and peri-urban scale, connected to how AFNs and food chain governance structures tackle sustainability in the triple bottom line accounting of people, planet, and profit.

Some of the selected cases run parallel to the conventional industrial food system, while others intertwine with it. While most cases serve as examples of AFNs, some have been included for their strategic or centralized role in shaping food systems and influencing the emergence of AFNs (e.g.: food policies, wholesale markets). Partnerships within AFN initiatives involve multiple stakeholders and environmental, social, or economic concerns influence the products and their production processes.

We selected and analysed the cases based on their geographical scale, purpose, and care-related actions. We considered the geographical scale from two complementary perspectives. The first one relates to the actual scale of the considered region, spanning from the neighborhood scale (hyper-local distances) to the broader peri-urban region, as defined by the European Union: "the space around urban areas which merges into the rural landscape (the area between urban settlements) and their rural hinterland" (EC, 2012). This perspective emerged as crucial when examining food-related cases, particularly in Milanese areas, where system nodes and their actors exist in a transitional space between city and rural areas, continuously activating relationships to and from these contexts. The second perspective emphasizes "territory" in its capacity to facilitate relationships through proximity, understood here in both its geographical and relational dimensions (Manzini, 2022). Moreover, as

suggested by Felici & Mazzocchi (2022), territory is defined as the space where "different actors, with different levels of power, interact". Here, the space of interaction occasionally involves various numbers and typologies of stakeholders and forms of relationships that can be ascribed to the concept of networks (Felici & Mazzocchi, 2022).

The range of purpose relates to the objectives or goals each case targets while deploying its strategy, ranging from single-purpose initiatives to multi-purpose ones. It is important to highlight that the scope of an initiative needs to be differentiated from the actions designed to reach such purposes. Single-purpose projects might focus on one initiative or a variety of initiatives, all oriented to address one specific purpose as priority goal of the project strategy (e.g., food aid). In contrast, multiple-purpose cases combine different practices and initiatives to address jointly distinctive but interconnected purposes outlined in their strategies (e.g., food policies' priorities). The analysis of the purposes of each case study contributes to set the forms of collaborations required in each case, assuming that multi-purpose projects usually require the involvement of multiple actors from different sectors, thus increasing both the complexity of the network and the relationships, as well as the management of the value production and distribution among the stakeholders.

Finally, building on the existing reflection on the relationship between food and care and on the extension of this concept beyond traditional realm (Corubolo & Meroni, 2023), we examined the specific care actions in each case. We adopt the conceptual framework that identifies 4 care-related actions based on: care for diversity and inclusion, for quality of work, for the neighborhood, and for the environment (see Table 1). By placing care at the core of the design process, initiatives belonging to the 4 clusters are pursuing and proposing alternative and more sustainable ways of consuming, producing, and living. Although each case shows a primary care theme, these often overlap, illustrating how AFNs embrace a broader, more systemic understanding of care. Here, care may prioritize one area, such as the environment, but it also engages other forms of care, such as diversity and inclusion.

Table 1   Care actions from food-related services adapted from Corubolo and Meroni (2023)

Care action	Definition
Caring for diversity and inclusion	This care action moves from the willingness of actors to leverage food to establish connections and links between cultures to designing inclusive and participatory processes of learning and exchange and involving beneficiaries in food production.
Caring for the quality of work	This care action aims to support actors across the entire food supply chain in regenerating the socio-environmental landscape through forms of work that prioritize the well-being of people, communities, and lands.
Caring for the neighbourhood	This care action focuses on service models that activate local production chains and transform food into new products that multifunctional spaces and informal networks distribute.
Caring for the environment	This care action relates to participatory projects for the renewal of urban spaces with productive and non-productive vocations, the reduction of the use of materials and the disintermediation between producers and consumers.

After selecting and analysing these cases, we refined the Food System Map and expanded the case selection to an international level. These international counterparts provide a comparative perspective to the Italian state of the art and contribute to highlight commonalities in the organization of food-related AFNs.

Our process resulted in the selection and analysis of sixteen cases. The depth and methods of analysis varied across the explored case studies. While we investigated some through desk research, others involved field visits and unstructured interviews with key stakeholders. Predominantly, we evaluated cases outside Italy via desk research alone.

Table 2 organizes the sixteen case studies into categories, spanning from the macro territorial scale of the peri-urban region (with a focus on food policies) to the micro scale of neighborhood areas (emphasizing on food recovery and distribution initiatives), detailing the predominant care action identified for each case.

Table 2   The selected case studies

Category	Title	Location	Start year	Description	Form of care
Policy	Milan Food Policy	Milan, Italy	2014	First food policy in Italy, working on five priorities around health, sustainability, education, food waste and research.	Environment

Policy	Copenhagen Food Strategy	Copenhagen, Denmark	2019	Food strategy that aims for all citizens to access healthy and sustainable food, based on tasty and high-quality meals. Recognized for organic public procurement meals.	Environment
Green Belt	Parco Agricolo Sud	Milan, Italy	1990	Metropolitan green belt that protects the environment and the agricultural practices in the southern region of Milan, while providing a green area for citizens to connect with nature.	Environment
Green Belt	Agrarian Park El Baix Llobregat	Barcelona, Spains	1998	Green area around Barcelona with the goal of restraining urban expansion and safeguarding agricultural traditions and value.	Environment
Wholesale market	SogeMi	Milan, Italy	1979	Italy's largest wholesale market providing food to Italy and Europe. During the last year SOGEMI started an ideation process around actions towards food recovery, food transportation and healthy diets.	Environment
Agricultural associations	Milan Agricultural Districts	Milan's metropolitan area	2011	Associations of farmers working to safeguard the cultural, architectural, and agricultural heritage of their territory and to support the production of high-quality products.	Quality of work
Agricultural associations	Agri-environmental cooperatives	Netherlands	2016	Farmers' cooperatives working together towards agri-environmental targets and actions.	Quality of work
Farmers' markets	Earth Markets Slow Food	Worldwide	2003	Farmers' markets guided by Slow Food's vision of local, seasonal, and fair products,	Diversity and inclusion

				that foster producer-con-sumer dialogue and commu-nity development.	
Farmers' markets	Mercato della Terra, Milan	Milan, Italy	2009	Milan's Earth Market reu-nites every week producers from 40km around the city who sell their products and support the creation of a community around fair food and education.	Diversity and inclusion
Food re-covery & distribu-tion	Neighbor-hood Hubs Against Food Waste	Milan, Italy	2019	Project part of the Milan Food Policy, aiming to re-duce urban food insecurity and food waste. Actions are connected to other welfare services, based on local hubs operating at neighborhood level.	Diversity and inclusion
Food re-covery & distribu-tion	FoodCloud	Dublin, Ire-land	2013	Platform connecting busi-nesses with surplus food and charities that need it. It mixes a digital app with physical storage hubs to al-low the redistribution of both small and big quantities of food.	Neighbour-hood
Food re-covery & distribu-tion	Sospesa	Milan, Italy	2020	Initiative born during the COVID-19 pandemic. It pro-vides food to vulnerable citi-zens, by recovering or pur-chasing it at controlled prices. The project reunites local businesses, associa-tions, and restaurants from the area.	Neighbour-hood
Food re-covery & distribu-tion	La Rotonda	Baranzate (Milan Metropolitan City), Italy	2017	Initiative that provides food assistance, educational initi-atives, labor consultancy and training to vulnerable citi-zens and families.	Diversity and inclusion
Food re-covery & distribu-tion	Ricibo	Genoa, Italy	2017	Initiative that connects non-profit organizations through	Neighbour-hood

| Food re-covery & distribu-tion | RepoPp & Caravana Salvacibo | Turin, Italy | 2016 | Partnership that employs young vulnerable people to recover and redistribute surplus food from market-sellers and non-profit organi-zations. | Neighbour-hood |
| Food re-covery & distribu-tion | ReFoodGees | Rome, Italy | 2017 | A group of volunteers recov-ering surplus food from ur-ban markets and redistrib-uting it to people in need to-gether with other welfare services. | Diversity and inclusion |

This work led to the creation of the Food System Matrix (Fig. 3), which clusters case studies by geographical scale and purpose, thereby outlining the main care action in the four result-ing quadrants.

3. Discussion

The Milan Food System Map (Fig.2) and the Food System Matrix (Fig. 3) were instrumental in analysing the case studies; however, they also stand out as research outputs. Both provide a visual synthesis of the data collected across various research phases while highlighting po-tential areas for future exploration.

3.1 The Milan Food System Map

The service design-led analysis of Milan's food system, its cases, and complementary inter-national ones supported the creation of a map (Fig. 2) that illustrates the meeting nodes of long-distance and local value chains. This map can be seen as a representation of the Milan-ese food system and, to a certain extent, mirrors similar urban food systems across Euro-pean regions.

The central part of the map represents the conventional food chain: the large-scale retail trade that involves national and international providers, logistic and processing platforms, and reaches final users through supermarket chains. This central line is out of the scope of the research, even though some of the steps within it connect to alternative food systems in their search for sustainability, for example, when tackling food surplus and waste.

The representative cases from the research are positioned both below and above this cen-tral line. These cases, whether directly linked to the line or interconnected among them-selves, establish varied networks of actors. These networks address social, environmental,

and/or economic aspects within their production processes. The lower section of the map showcases initiatives incorporating the wholesale market, processing, and distribution companies, along with local entities like neighborhood shops, markets, restaurants, and canteens. These entities are supported by collaborations and services dedicated to redistributing surplus or near-expiration food to vulnerable citizens. In contrast, the upper section of the map highlights realities seeking the de-mediation of the food supply chain. They aim to connect producers and consumers directly, both physically and digitally, requiring the formation of alternative networks distinct from the conventional system.

Lastly, actors and steps on the right side of the map align with local food policies, which promote the creation of synergies between public, private and civil stakeholders.

While the map's objective wasn't to simplify the intricate food ecosystem, it served to easily discern actors and their interconnections, spanning both traditional chains and alternative food systems. Using this map, the research team was able to:

1. Recognize the scale of action of food systems. This visual representation helps in pinpointing potential areas for future work and provides a visual comparison between the current state and possible future scenarios. It also allows the Milan food system to envision new internal connections.

2. Identify and analyse the main nodes at urban and peri-urban areas. The process has been useful as a starting point to update research around these spaces of encounter. They have been active for several years now and will constantly need revisions of their purposes, strategies, and resiliency plans.

3. Identify and analyse the hybrid nature of the nodes in terms of variety and often complementarity of skills, service offerings, locations and actors involved, ranging from producers to processors, traders, retailers, and consumers.
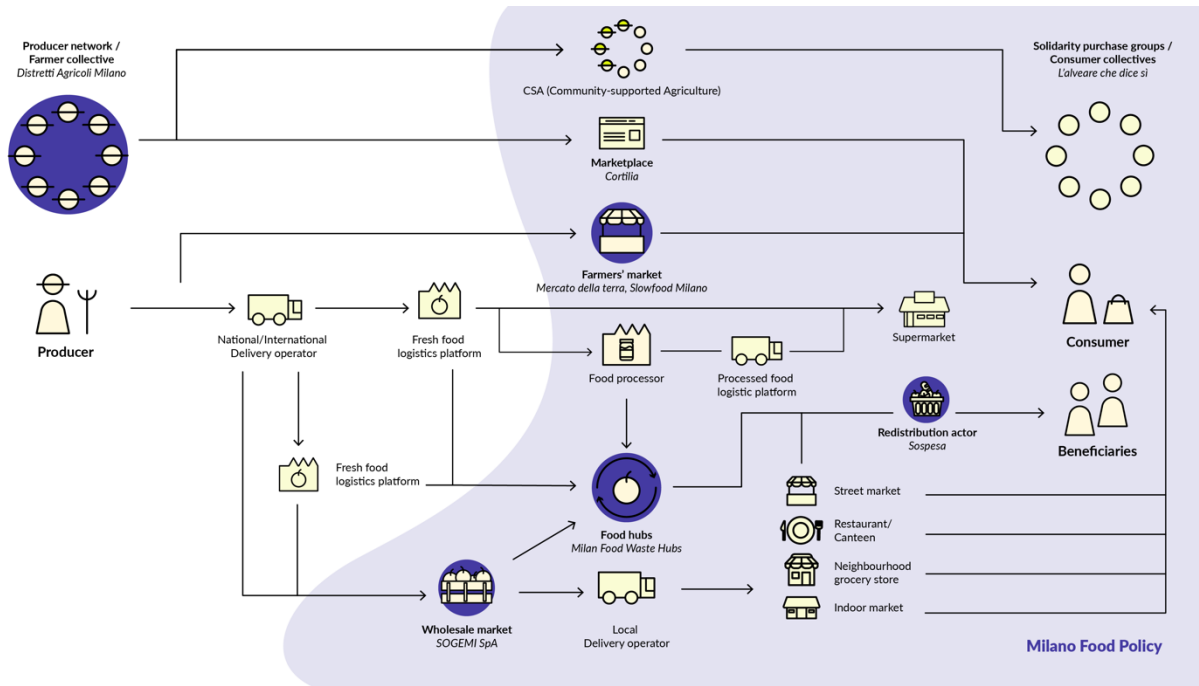
Figure 2   The Milan Food System Map. The nodes highlighted in blue were the ones prioritized for the analysis of the case studies.

3.2 The Food System Matrix and cluster analysis

The reflections on the local systems highlighted through the Food System Map led to developing the Food System Matrix (Fig. 3), which clusters case studies according to the two axes of geographical scale and purpose, highlighting the main care action present in each quadrant. The geographical axis ranges from the neighborhood to the peri-urban scale, while the purpose axis spans from single-purpose to multi-purpose projects.

The matrix helped the research team unveil common characteristics between case studies placed in each quadrant. It also highlighted points of discussion, like the dominance of certain governance models at specific territorial levels or the necessity to establish multi-level networks when addressing multiple purposes. Finally, it serves as an initial tool to study how different contexts—with varying territorial scales, purposes, and actor proximities—develop different care models and initiatives.
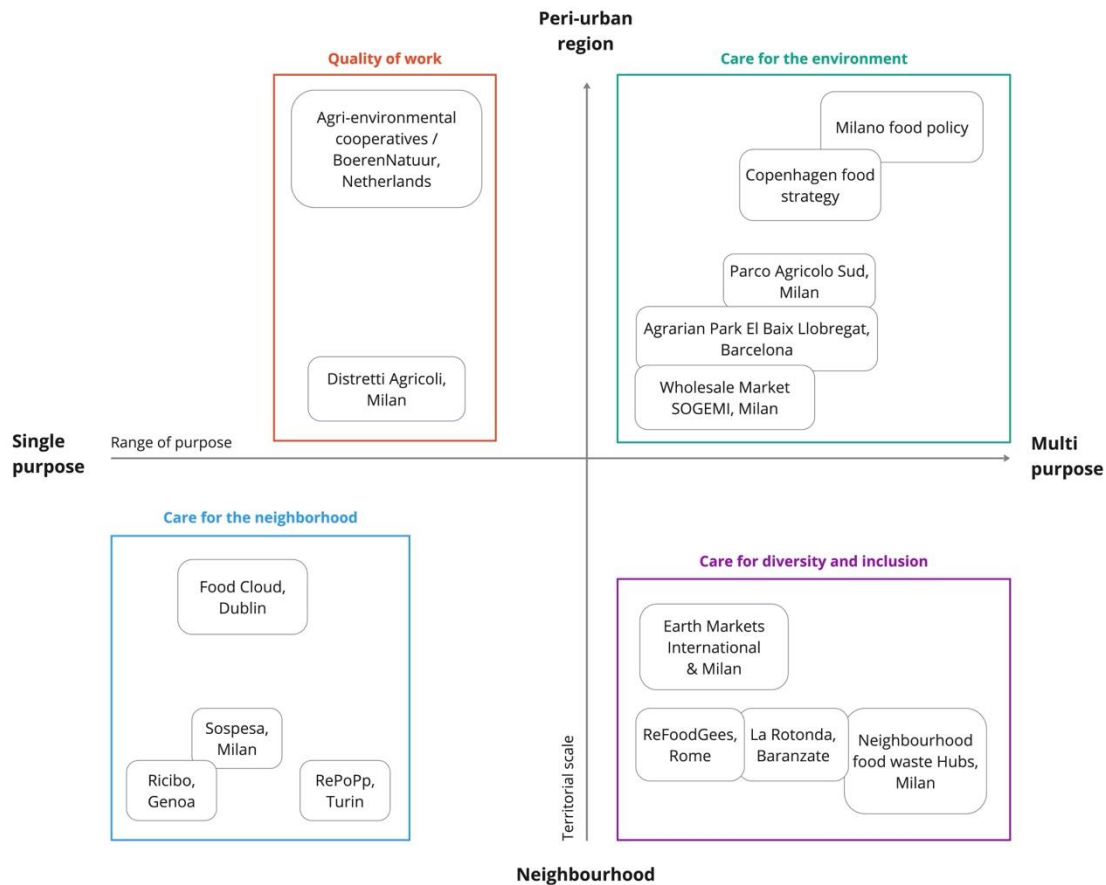
Figure 3 The Food System Matrix. Four quadrants emerge from crossing the polarities of territorial scale and range of purpose, highlighting the prevailing dimension of care.

From crossing the polarities of territorial scale and range of purposes, four quadrants emerge. Looking at the cases, a specific dimension of care can be described as predominant, but not exclusive of each quadrant.

Peri-urban & multi-purpose quadrant: Caring for the environment

This quadrant includes case studies with several purposes that have an impact on peri-urban regions. The initiatives in this quadrant give an answer to this complexity by following a top-down strategy that orchestrates specific actions through different entities in smaller territories. Examples of initiatives with these characteristics are the Milano Food Policy, aiming at providing guidance and supporting local actions within a common strategy, and the city green belts such as *Parco Agricolo Sud Milano*, which promotes a series of objectives such as local food chains, environmental protection, and dissemination of practices.

In this quadrant, we find two types of exemplary cases: Food policies and *Greenbelt Parks*. Urban food policies considered for the study, Milan and Copenhagen, are leading examples of the strategies that can make a difference in the transition towards environmentally and socially sustainable food systems. In this sense, food policies, moving from care towards the environment, expand their actions towards inclusion, health, and wellbeing.

On the other hand, we have *Greenbelt Parks*, initiatives focused mainly on safeguarding green areas around cities from urban expansion. These areas facilitate citizens' access to natural spaces, and in the case of Milan and Barcelona, they have become agricultural areas that provide fresh and local food for citizens. In both these cases, an initial focus on the environment leads to social activities and citizens' wellness.

The collaborations that manifest within this quadrant are usually top-down driven and frequently of a public nature, working within a complex system of priorities, actors, resources, and impacts. While this approach encourages and establishes the prerequisites for cross-sector partnerships and AFNs to materialize, it also confronts challenges when attempting to align a systemic vision with the localized needs articulated by the various levels of expertise, interests, and types of actors involved. Moreover, it requires capacity of adapting tools, visions, and relationships to reach the specificities on the micro level, while preserving a horizontal relation in terms of power distribution and independence (Felici & Mazzocchi, 2022). Proximity is here emerging in its relational dimension more than in the geographical one, indeed, the cross-sector partnerships are built from and, at the same time, contribute to build a system of interaction that constitutes the infrastructure for collaboration.

Here, care is represented in the form of common strategies and practices that consider an interdependent relationship between humans and the environment; thus, the cases promote alternative solutions to the mainstream food system integrating these two spheres.

Neighborhood & multi-purpose quadrant: *Caring for diversity and inclusion*
Inside this quadrant, we find collaborations mainly rising from civil society, looking for answers to their daily challenges. The impact is primarily local but, given the dimension of their partnerships and the extension of their scope, it might as well have a spread impact. Given the bottom-up nature of these initiatives, it is difficult to govern them with the increasing number of partners and strategies and it might become a challenge when the power is decentralized among the different actors. Network creation emerges to be crucial alongside the increase in goals and as a precondition for achieving greater levels of vertical integration with government. Taking the example of the *Neighborhood Hubs Against Food Waste*, an agreement with the municipality was set up to incentivize the process of replicability and allowed the project to open 4 new hubs. Here, the geographical and relational proximity coexist and are mutually benefiting one from the other.

Starting from tackling environmental and social issues, such as food waste and food insecurity, the solutions in this quadrant propose a different form of care from the donation model (*caring for*), moving toward a collaborative model of co-responsibility and co-production of the service *with* the community. For these projects, food is the entryway to developing community ties and designing processes that involve beneficiaries and local stakeholders, thus proposing more inclusive and participative service models, both in their governance and delivery dimension.

ReFoodGees has a clear intention of utilizing food to integrate and connect migrant populations into their new cities and neighbourhoods and vice versa. This case collects surplus food from street markets in Rome and redistributes it to people in need. The project started in 2017 with food distribution as the main activity, adding later spaces for books, toys and clothes collection, and cultural events. Food has become the bridge towards a more inclusive city, that provides nourishment, conviviality and social spaces by valuing diversity.

La Rotonda is an association born in the outskirts of Milan that works with vulnerable citizens and families. The activities offered by them range from food distribution to educational paths, labor consultancy and social housing. Care in this case is intended as providing the skills set to vulnerable citizens in peripheral areas, ensuring the capabilities and resources needed to actively participate in and contribute to the life of the city.

Peri-urban & single-purpose quadrant*: Caring for the quality of work*
In this quadrant, we find networks that, by connecting different local actors, work towards applying a regional strategy to a local territory. This is done through an association or a cooperative system that connects individuals with the same purpose from different areas. The focus of the collaboration is placed on impacting a broader territory, rather than on pursuing several priorities. One example from this quadrant is the *Dutch Agri-environmental Cooperatives system*. In this case, Dutch farmers joined into cooperatives covering a region of the country and each cooperative agreed on some environmental targets for their region. The government gives subsidies to the cooperatives for achieving these targets and each farmer contributes by individually achieving the targets in its farm. These initiatives provide an example of how bottom-up initiatives can have a vertical integration with regional regulations, having as a result an impact both at the local level and regional level. The fact that these initiatives focus on a single purpose makes it easier to monitor, replicate them and iterate their models from a governance and services point of view. The regional proximity here works as a catalyzer of interests and partnerships, facilitating collaboration and alignment toward the purpose.

Care in this case is related to the respect translated from these cooperative models into people, communities and land. Sustainable agriculture must change current practices while ensuring a fair transition and learning process for producers.

In the case of *Dutch Agri-environmental cooperatives* and *Milan agricultural districts*, the motivation to take care of the environment in agricultural areas has been a process in which farmers were actively involved. The result are associations and cooperative systems where groups of farmers have a voice that facilitates their communication with regional and national policies, leading to practices that consider both farmers' working conditions and clear environmental targets.

Neighborhood & single-purpose quadrant*: Caring for the neighbourhood*
Within this quadrant, we find civil society initiatives with single priorities that pursue collaborations with other local actors to reach economic, material, or cognitive resources. Given

the bottom-up nature of these realities there is the need to collaborate and to receive support from different actors to accomplish their purpose. These realities usually lack direct collaboration with the government and in many cases with the private sector as well. For networks in this quadrant, the necessity to work with different actors that can help them to scale or to replicate is a matter of survival, rather than of achieving more purposes. In this quadrant, we can find initiatives such as *Sospesa*, a reality whose main purpose is the recovery and redistribution of surplus food for citizens in condition of need. *Sospesa* has created a network of local partners across the neighborhood (local shops, restaurants, and volunteers) in its way to increase its economic streams and food donors. Without the support of this network the initiative would not have the capacity to keep working. Scaling up and replicating a model is a difficult step for initiatives that are born inside of a context and that have created partnerships corresponding to their territory, where proximity is the main driver of collaboration. Geographical proximity is crucial in determining relevance and trust (Morelli, 2015) which supports the replicability and diffusion of a practice.

These initiatives are born from the needs of vulnerable individuals and the bottom-up activation of alternative food chains. They are typically informal, fostering unique connections among community members. This informality enhances neighborhood care by activating local food distribution chains *by* and *for* the community. Initiatives like *Sospesa*, *RePoop*, and *Ricibo* operate locally, collecting food from wholesale markets and local shops to distribute to those in need within specific neighborhoods. *Food Cloud* expands this network, sourcing from food processing companies to serve broader areas. An important feature in this quadrant is that most of the projects work with the support of volunteers from the same neighborhood, creating a common space that facilitates collaboration and inclusion.

4. Conclusions

This research is an initial approach to examining how proximity in Alternative Food Networks (AFNs) promotes collaboration and sustains forms of care. By analyzing various case studies, the research highlights the crucial role of geographical and relational proximity in delivering services to local communities and in facilitating partnerships between diverse sectors, even when the partners have distinct objectives and characteristics.

When viewed through a care lens, Alternative Food Networks (AFNs) unveil social innovations that transform care into a relational action of shared responsibility, shifting traditional service models towards collaborative and coproduction ones. Here, every participant contributes their competencies, resources, and knowledge, moving away from traditional care models that focus on transactions and performance towards a cooperative framework of care based on mutual contributions. The concept of care is broadened and takes on a systemic value, in a process that allows several dimensions of the same concept to coexist, be integrated and mutually reinforce each other.

These initiatives, indeed, address complex food chain challenges by shifting from a narrow, sector-specific focus to a systemic view that recognizes the intricate web of relationships and dependencies in play, opening to codesign and participative processes.

To promote care and support a more equitable transition towards sustainable food systems, design can leverage these relationships:

- *Bridging strategies with localized needs:* In the peri-urban and multi-purpose quadrant, proximity fosters collaboration and a broader spectrum of care through relational closeness among diverse stakeholders. This quadrant shows how initiatives such as the *Milano Food Policy* and *Greenbelt Parks* extend environmental care to encompass social well-being, inclusion, and health. On the other hand, in the peri-urban and single-purpose quadrant, geographical proximity unites local actors in networks, like the *Dutch Agri-environmental Cooperatives*, facilitating their collaboration to implement regional strategies locally. In this case, care manifests in work that respects people and their lands. The primary challenge in both quadrants lies in harmonizing overarching strategies with localized needs. Here, design can help tailor visions and relationships to meet the nuances of local contexts, ensuring equal power distribution and autonomy.

- *Fostering co-responsibility in care delivery:* In the neighborhood and multi-purpose quadrant, relational and geographical proximity drive collaboration and expand care towards diversity and inclusion. This dual proximity enables projects like the *Neighborhood Hubs Against Food Waste* and associations like *La Rotonda* to create networks supporting more inclusive and participatory service models. Challenges include managing decentralized power and scaling while still maintaining the community focus. Here, design can help actors create scalable and localized solutions that foster co-responsibility and integration in care delivery. Since design encourages the adoption of a continuous prototyping mode, solutions can be quickly implemented, tested, monitored, and improved contributing to shape resilient models.

- *Cultivating collaborative networks:* In the neighborhood and single-purpose quadrant, geographical proximity drives collaboration among local civil society initiatives focused on specific goals, such as food redistribution. Initiatives like *Sospesa* rely on a network of local shops, restaurants, and volunteers to meet community needs, caring for the neighborhood by activating local food distribution chains that are by and for the community. Challenges include a lack of direct collaboration with the government and private sectors and difficulty finding actors to collaborate with for scaling and replication. Here, design can help identify new collaborations and create spaces to initiate or rejuvenate stalled partnerships. Adopting open and participative processes that involve unusual partners, design can enable the exploration of innovative forms of relationships.

This work contributes to the understanding of the dynamics of Alternative Food Networks (AFNs) and their implications for fostering collaborative care in sustainable food systems. By highlighting the significance of proximity, collaboration, and shared responsibility within AFNs, this work lays the groundwork for further exploration and for the development of design orienting scenarios that envision food as a catalyst for the development of broader and more comprehensive solutions and service offerings aimed at achieving sustainable futures.

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