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The European Fusilli Project In the city of Turin: the Systemic Design of Circular Agri-Food Proposals involving local actors of Mirafiori Sud district

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DESIGN ACROSS BORDERS UNITED IN CREATIVITY

CUMULUS CONFERENCE PROCEEDINGS SERIES

MONTERREY 2024

UDEM | UNIVERSIDAD DE MONTERREY

Tecnológico de Monterrey
Escuela de Arquitectura, Arte y Diseño

DESIGN ACROSS BORDERS
UNITED IN CREATIVITY

Cumulus conference: Design Across Borders - United in Creativity
Co-hosted by the Universidad de Monterrey (UDEM) and the Tecnológico de Monterrey (Tec)
Monterrey, Mexico, on October 16-18, 2024
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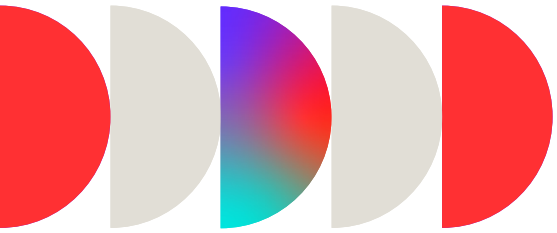


Preface

In a world shaped by constant transformation and global interconnectedness, design emerges as a bridge between people, places, and ideas. Cumulus Monterrey 2024: Design Across Borders – United in Creativity invited the international design community to reflect on the profound potential of design to transcend cultural, geographic, and disciplinary boundaries, uniting us in the shared pursuit of innovation, inclusion, and positive change.

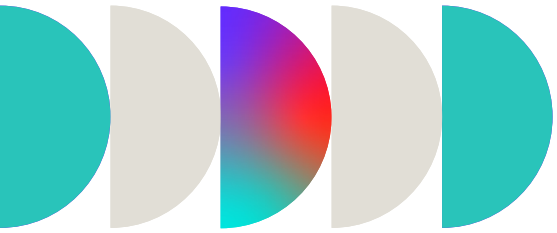
This edition of the Cumulus Proceedings gathers contributions that respond to urgent questions: How can design foster empathy and intercultural understanding? In what ways does it become a catalyst for social transformation in a complex, globalized world? Can design truly become a universal language—and what are the challenges in achieving that ideal?

The richness of perspectives represented in these proceedings speaks to the global nature of the Cumulus network. Authors, researchers, educators, and practitioners from across continents have come together to share insights, experiences, and provocations within four thematic tracks:

- Design for Change explores design's role in social innovation, sustainability, equity, and the circular economy—highlighting projects that place co-creation and inclusion at their core.
- Speculative Futures ventures into emerging territories shaped by technology, artificial intelligence, and immersive experiences, imagining the future of creative practice.
- Education in Art and Design focuses on pedagogical innovation, interdisciplinarity, and the challenges and opportunities of digital transformation in global learning environments.
- Translocality brings critical attention to issues of migration, decolonization, and the Global South, recognizing the importance of diverse voices and perspectives in shaping a more equitable world through design.

Together, these contributions reflect a collective commitment to harnessing creativity as a force that transcends barriers—linguistic, political, cultural—and brings people together around shared values and visions.

We are proud to present this volume as a testament to the power of design to imagine, inspire, and unite. May it serve not only as a record of this important moment in time but also as a spark for continued dialogue, collaboration, and transformation in the global design community.



Design Across Borders: United in Creativity

Lorenzo Imbesi
Full Professor, Sapienza University of Rome
President, Cumulus Association

The Cumulus Monterrey 2024 Conference marked a timely and vital moment in the global conversation about the role of design in shaping a better world. Hosted at the prestigious design institutions of Tecnológico de Monterrey and Universidad de Monterrey (UDEM), the international gathering has been further enhanced by the unique Monterrey's rich heritage and cultural identity, contributing to a thriving ecosystem of creative exchange for scholars, researchers, and practitioners across various design disciplines.

The central theme of the conference, "Design Across Borders: United in Creativity," provided an inspiring gateway for exploring how design holds the possibility to transcend geographical, cultural, and disciplinary boundaries. In particular, the conference was framed by four imperative trajectories: "Design for Change," investigating how design practices can drive social innovation and sustainable development; "Design Futures," exploring the interplay between technology and creativity, immersive experiences, virtual realities, and the implications of artificial intelligence; "Education in Art and Design," investigating pedagogical approaches in the field; and "Translocality," addressing complex issues of migration, decolonisation, and North-South dynamics. Themes highlight the broad scope of contemporary artistic and design pursuits.

At the heart of the conference was a shared recognition that design can be a dynamic force for empathetic understanding and intercultural dialogue. Through a rich program of keynote lectures, panel discussions, workshops, exhibitions, and informal exchanges, the international community demonstrated determination to work collaboratively across geographical and cultural divides, confirming the foundational premises of the conference: that creativity knows no boundaries, and through design, we can forge connections that transcend the limitations of space, time, and cultural difference. In an era of unprecedented global challenges, from climate change to technological acceleration, from cultural conflicts to social inequities, designing without boundaries means identifying areas of commonality, intersection, and convergence, highlighting them in ways that resonate with and reflect the spirit of our transborder region. As traditional confines between nations, disciplines, and cultural contexts become increasingly permeable, the design community must find itself uniquely equipped to harness this fluidity. Rather than resisting uncertainty, design must embrace it, transforming constraints into opportunities for innovative problem-solving and cross-cultural exchange.

The proceedings collected in this edition offer an extensive variety of perspectives on the ideas and projects discussed at the event. They include case studies, speculative work, educational reflections, and practical strategies, all pointing to the evolving role of design to shape societal interactions, encouraging intercultural dialogue, and building a more harmonious and interconnected world. However, these proceedings capture only a portion of the energy and insight shared during the conference, with the remaining impact continuing to reverberate through ongoing collaborations and dialogues within our global community.

As we move forward, the conversations from Cumulus Monterrey 2024 remind us that creativity thrives not in isolation, but in community. And in a time marked by division and uncertainty, design, when practiced with care and intention, can truly serve as a bridge. One that brings us together to learn, to act, and to imagine a positive change.

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Index


PAPERS

“THE EUROPEAN FUSILLI PROJECT IN THE CITY OF TURIN: THE SYSTEMIC DESIGN OF CIRCULAR AGRI-FOOD PROPOSALS INVOLVING LOCAL ACTORS OF MIRAFIORI SUD DISTRICT”.

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ABSTRACT | The topic of enhancing food waste and preventing wastefulness in all phases of the food value chain is nowadays increasingly prevalent to respond to some complex contemporary challenges. When the food issue is treated outside the industrial context, covering the urban scenarios, it also involves the dimension of neighborhoods and micro-communities. In this background, transdisciplinary Systemic Design projects originate which aim to plan and implement Circular Economy for Food activities in the catering, agricultural, and domestic sectors, aimed at inclusively involving the diversified communities of local citizens. The objective of this contribution is to illustrate the results that the European H2020 FUSILLI project is bringing within the city of Turin (Piedmont, Italy), in particular in the peripheral neighborhood of Mirafiori Sud, where different migratory flows have stratified over the years. Specifically, through the Systemic Design methodology, a circular restaurant and a circular kiosk were developed through co-creation processes within a Sustainable FoodLivingLab, based on the valorization of the less noble parts of food. In particular, the aim is to increase levels of food awareness in terms of recovery and valorization of food, still characterized by sensorial and nutritional properties, respecting the gastronomic cultures of the different ethnic groups of the neighborhood and triggering virtuous behavioral change. The project was supported by the collaboration of the University of Gastronomic Sciences of Pollenzo, the Fonda azione Comunità di Mirafiori, Orti Generali, the University of Turin and, obviously, the City of Turin, and required the trans-disciplinary collaboration of designers, gastronomes and local administrators.

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KEYWORDS | SYSTEMIC DESIGN, CIRCULAR ECONOMY FOR FOOD, FOOD LIVING LAB, FOOD WASTE, H2020 EUROPEAN PROJECT

1. Introduction
1.1 Food Waste in the Catering and Household Sectors

Our economy exceeds the planet's limits (Rockström et al., 2009) and social limits (Raworth, 2017), adopting unrestrained predatory behavior without limits on a planet that, instead, is limited. It is a parasitic symbiosis that damages our common house (Pope Francis, 2015). However, the greatest crises often mark decisive transitions between epochs, destabilizing the categories of thought with which human beings interpret life. The erosion of natural capital accelerated in recent decades mainly due to food production, has already partly compromised the stability of cultural capital (Bourdieu, 1980). At a time when social inequality is widening more and more, dividing those who have access to quality food and those who do not, acting and designing for change, in collaboration with others, can restore hope in the community, moving away from linear, high-impact models of production and consumption. Environmental and social degradation are the main consequences of these models, in which food waste, in its broadest sense, plays a significant role, resulting in a loss of the nutritional, social, and educational value of food (Kowalewska et al., 2018; Niaki et al., 2017), as well as of the resources used in its production. There are two broad definitions of food waste: the first distinguishes between loss and waste throughout the food supply chain, while the second focuses on the difference between loss and waste of edible and inedible food.

According to the FAO (Food and Agriculture Organization), food waste refers to food suitable for human consumption that is discarded, lost or wasted along the entire food chain, from operators in the sector to final consumers (FAO, 2019). Food is discarded even when it is still edible and safe for human consumption. This definition includes waste in both domestic and industrial settings (restaurants, hospital and school canteens, supermarkets, farms, etc.) and is broader than the definition of the Environmental Protection Agency of the United States (EPA, 1997), considering advances in food logistics and

increased environmental awareness. Concretely, food waste includes discarded, overproduced, unsold, and leftover food (CalRecycle, 2009). Furthermore, according to the Waste & Resources Action Programme (WRAP, 2009), food waste can be divided into three categories: avoidable, possibly avoidable, and unavoidable. The first two categories include 'edible waste', i.e. food that is discarded while still being eatable, or food that some people eat and others do not (e.g. bread crusts, apple peels, etc.). The third category, on the other hand, concerns 'inedible food waste', which includes waste from food preparation (such as bones, eggshells, etc.). This last concept, however, may vary considerably depending on the gastronomic culture of the territory analyzed. In fact, the "maximum efficiency" of an agro-food product cannot be achieved if the raw material is considered inedible. In this sense, the boundaries of defining what is considered inedible should be re-evaluated.
In the catering sector, between 4% and 10% of the food purchased is wasted in kitchens before reaching the consumer (LeanPath, 2008). Another significant portion is served but not consumed. The main causes of this wastage include the size of the portions prepared and served, the quality standards required by specific restaurant chains, the need to maintain large stocks in order to constantly offer a wide choice of offerings (Kantor, 1997), the difficulty in planning food purchases, and the lack of widespread practices in which unconsumed food is taken home by customers (Barilla, 2012). The behavior and culture of kitchen staff also significantly influence the generation of food waste. In the United States, for example, plate waste accounts for the largest fraction of food losses. On average, customers left over 17% of their meals, and 55% of these potential leftovers are not taken home (Buzby, 2011). In particular restaurant scenarios, centralized management may make waste prevention more difficult, due to the lack of flexibility at the local level that prevents the creative valorisation of food and leftovers. However, household food waste is also a major critical issue, as much food that is still edible ends up directly in municipal solid waste (Gaiani, 2013). For example, in Italy, it is estimated that each citizen wastes about 566g of food weekly (Waste Watcher Report, 2024). In this scenario, the main cause of waste is not only the perishability of food, but also an increasingly robust relationship between the food sector and hyper-consumerism, which includes growing overproduction, excessive food shopping (with an increase in the selection of products on promotion or close to expiry), limited knowledge of how to preserve food, the tendency to prepare and serve excessive quantities of food, and frenetic lifestyles that are less and less inclined to autonomy in preparing daily meals.

1.2 The Circular Economy Lever for Food

Food consumption and management habits can change considerably according to historical and geographical contexts. Globally, developing countries show significantly lower levels of household food waste than developed countries. For example, in the

United States, the amount of food wasted at the household level is ten times higher than in Southeast Asian countries, highlighting significant differences in consumption habits and food management policies between different regions of the world (FAO, 2011). In this regard, in the context of the Circular Economy applied to food, there is a growing interest in the anthropological theme of "agricultural bricolage" (Lévi-Strauss, 1962). This concept refers to the ability of traditional societies to operate on material and immaterial knowledge by creatively recombining it, to enhance it to the maximum and avoid the generation of waste. Historically, this mode of operation was typical of women, who with few resources were able to feed an extended family, composed of people from different generations with different nutritional needs. Thanks to this mentality, traditional dishes were born that today represent the history of Italian gastronomy, such as the more international meatballs, invented in Roman times (between 25 and 35 B.C.) as a good practice to utilize leftover cooked meat. Today, these processes can be described as a true "short cycle" typical of "biological metabolism" in the kitchen, using the conceptualisations of the Circular Economy found in the "Butterfly Diagram" developed by the Ellen MacArthur Foundation (Ellen MacArthur Foundation, 2015) to describe the essence of the new economic paradigm.

Reference is made to the 'cascade cycle' when the food chain does not end with human consumption, but supports the needs of animals or agriculture, in line with the most recent European directives on the "Food Waste Hierarchy" (European Commission, 2018). So, the circular economy applied to food is not a new concept, but it is rooted in the domestic economy and reminds us that underlying this constant action-research, besides economic scarcity, there is exploratory thinking and a deep dialogue with ecosystems.

In conclusion, the Circular Economy for food identifies itself as a sustainable practice aimed at addressing urgent contemporary issues, such as the inefficient use of resources and their consequent waste, the impacts of human actions in terms of climate change and soil and ocean pollution (Esposito et al., 2020; Jurgilevich et al., 2016). However, when analyzing in depth many case studies that claim to adopt circular economy practices, risks emerge related to an approach that could encourage manipulative design for waste, which paradoxically could accelerate planned obsolescence (Fassio & Tecco, 2019). The complexity of the food system therefore requires the adoption of a long-term holistic perspective, typical of Systemic Design and Gastronomic Sciences, based on a new knowledge paradigm that can trigger a virtuous change in current design and action models. With this awareness, the H2020 FUSILLI project was developed at European level.

[1] The priorities of the European Food 2030 policy are the development of sustainable and healthy diets and that of smart and sustainable food systems, the pursuit of circularity and waste reduction, and finally, innovation and community empowerment)

1.3 The European project H2020 FUSILLI in the city of Turin

FUSILLI is a project funded in 2021 by the European Horizon 2020 programme, which aims to transform the urban food system through the implementation of Innovative Living Labs (FUSILLI Project, n.d.). In detail, the acronym FUSILLI literally means 'Fostering the Urban Food System Transformation through Innovative Living Labs Implementation'. In fact, the project intends to trigger an integrated holistic transition towards sustainable, healthy and inclusive food systems in urban, peri-urban and rural areas, through innovative and replicable urban policies, leading to the implementation of improvement actions at all stages of the food value chain, consistent with the priorities of the European FOOD 030 Policy[1] (European Commission, 2021). In order to achieve this objective, a real network has been developed between 12 different European cities[2], which, through the development and implementation of Living Labs of various natures and identities, are launching concrete actions in the diverse European scenarios. Specifically, a Living Lab is a place, but more than that, it is a real-life context characterized by a deep-rooted social dimension, supported by the involvement of several stakeholders through inclusive and participative methods. Collaboration between citizens and stakeholders is defined as fundamental in order to give rise to experimentation processes aimed at achieving innovative objectives. In the case of the FUSILLI project, the aim is to start a sustainable transition of the urban food system by involving the multifaceted dimension of food. Living Labs are characterized by extreme dynamism, as they necessarily adapt to the urban environment within which they develop. Moreover, they are strongly based on the legitimate inclusion of different groups of citizens, sometimes suffering from a state of even acute vulnerability. Generally, where possible, in such contexts, the domination of a few actors is avoided and the broad participation of local communities is favored, encouraging a participatory continuity in the project paths undertaken. Indeed, it is not uncommon for a cohesive and thriving community to develop around a Living Lab, characterized by the sharing of common values, through which co-design and innovation processes can be facilitated (Bason at al., 2017). In the last decade, more and more Living Labs have been dedicated to the topic of sustainable food systems, with a particular focus on urban food production (Dell'Era & Landoni, 2014; Blay-Palmer et al, 2016; Balzan et al., 2020). In this, in Europe, the FUSILLI project has been a substantial encouragement (Wilde, 2022). The discipline of Design is well suited to act in such open contexts that welcome innovative transdisciplinary approaches.

[2] The cities involved in the project are Athens (Greece), Castelo Branco (Portugal), Differdange (Luxembourg), Kharkiv

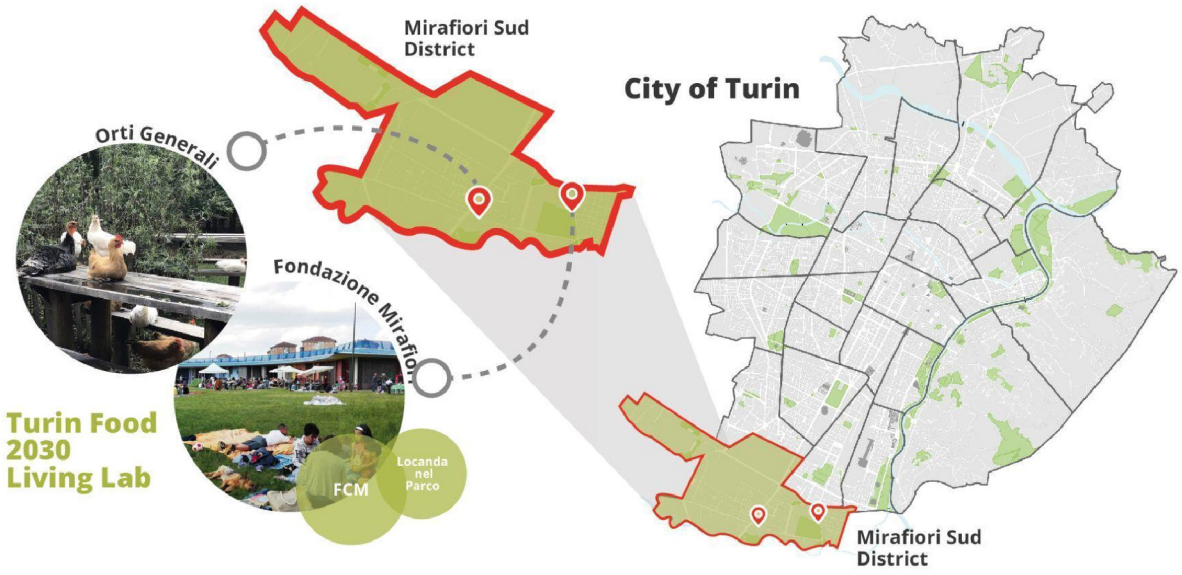

Figure 1. The suburban district of Mirafiori SUD (Turin, Piedmont, Italy) involved in the European Project H2020 FUSILLI

Among the cities involved in the project, which will still be ongoing until the end of 2024, the City of Turin (Piedmont, Italy) stands out for its achievements. Many partners are involved in it, including the Municipality of Turin, the University of Gastronomic Sciences of Pollenzo (UNISG, Cuneo, Piedmont, Italy), the University of Turin (UNITO), the Mirafiori Community Foundation (FCM) (Mirafiori Foundation, n.d.) - within which the Locanda nel Parco social restaurant is also located - and, finally, the suggestive urban agriculture community, Orti Generali (Orti Generali, n.d). The latter are located in Mirafiori SUD, a suburban district of Turin, primarily involved in the FUSILLI project (Figure 1) and they represent the roots of Turin's first Food Living Lab.

Mirafiori Sud was originally a historical center, but it underwent rapid expansion between 1960 and 1970 to accommodate mainly migratory flows from southern Italy, attracted by the jobs available in the FIAT factories, a major Italian automobile company. Thus, the district embraced the critical issues typical of fast-growing neighborhoods: housing challenges, distance from essential services, and a concentration of complex social and economic problems. However, towards the end of the 1990s, a long process of redevelopment began, which involved significant project interventions to improve the area and support the communities. Among these, the various European projects activated stand out, such as the H2020 ProGireg Project, which designed, tested,

(Ukraine), Kolding (Denmark), Nilufer (Turkey), Oslo (Norway), Rijeka (Croatia), Rome (Italy), Turin (Italy), San Sebastián (Spain), Tampere (Finland).

[3] The Food Council is a set of governance tools that create and support the network of parties involved in all urban and peri-urban food-related issues, defining the spheres of action, the objectives and processes necessary to elaborate, implement, and measure the policies of a territory.

and implemented different nature-based solutions to activate an urban regeneration of post-industrial areas in Europe and China, based also and above all on the design of new behavioral models (Nohra, 2019).

All of the partners in the FUSILLI project are working together on many goals, including:

- the definition of a system of sustainable food policies, which will generate a real Food Council[3] for the city of Turin, as already exists in other cities around the world, Toronto (Ontario, Canada), Milan (Italy), etc. (Calori & Magarini, 2015);
- the design of educational and awareness-raising activities on the food topic;
- the pursuit of projects related to the Food Atlas of Metropolitan Turin (Atlante del Cibo, nd; Calori et al, 2017);
- the development of concrete actions on the Food Hub concept, thus on the recovery, management and redistribution of food surpluses to the most vulnerable segments of the Turin population.

Specifically, the University of Gastronomic Sciences of Pollenzo, in collaboration with the above-mentioned partners, is acting concretely within the Circular Economy for Food dimension. It has worked on the design of a circular restaurant and a circular bar, an integral part of the Food Living Lab (at the Locanda nel Parco social restaurant and at the Orti Generali kiosk, respectively). These concepts may be able to reduce and prevent the generation of food waste, creating community co-evolution processes and preserving the natural and cultural capital.

2. Methodology

2.1 Approach and Design Phases

In order to design the circular restaurant and circular bar, belonging to a broader Circular Business Model project applied to the Food Living Lab in Mirafiori Sud, the typical methodology of systemic design was adopted (according to the Italian view of the Politecnico di Torino). By definition, systemic design is a design approach, adapted to the design of products, services, processes, strategies, experiences, and in particular, production chains and complex systems, aimed at connecting economies, people, territories and resources, with a view to environmental, social and economic sustainability (Celaschi et al., 2016, Jones, 2014; Bistagnino, 2011). Moreover, it can be defined as a suitable tool to define and implement circular economy projects in different scenarios, such as agrifood, urban or industrial waste, social, etc. However, before being defined as such, it is a tool for decoding complexity to design flexible, virtuous and sustainable strategies and action plans. Adopting the Systemic Design approach not only attempts to reduce the ecological footprint and social repercussions of a project. In fact, it also lends itself to finding creative and coherent methods to enhance local culture, strengthening the identity of communities and territories (Barbero et al, 2022; Parente

& Sedini, 2019). The development of systemic business models thus makes it possible to generate sustainable economic flows, avoiding situations of imbalance, in terms of impacts and benefits, among the actors involved.

Following this methodology (Figure 2), the first step was the realization of a holistic diagnosis (Tamborrini & Stabellini, 2018) of Locanda nel Parco and Orti Generali, i.e. a capillary survey of the case studies that would respectively host the future circular

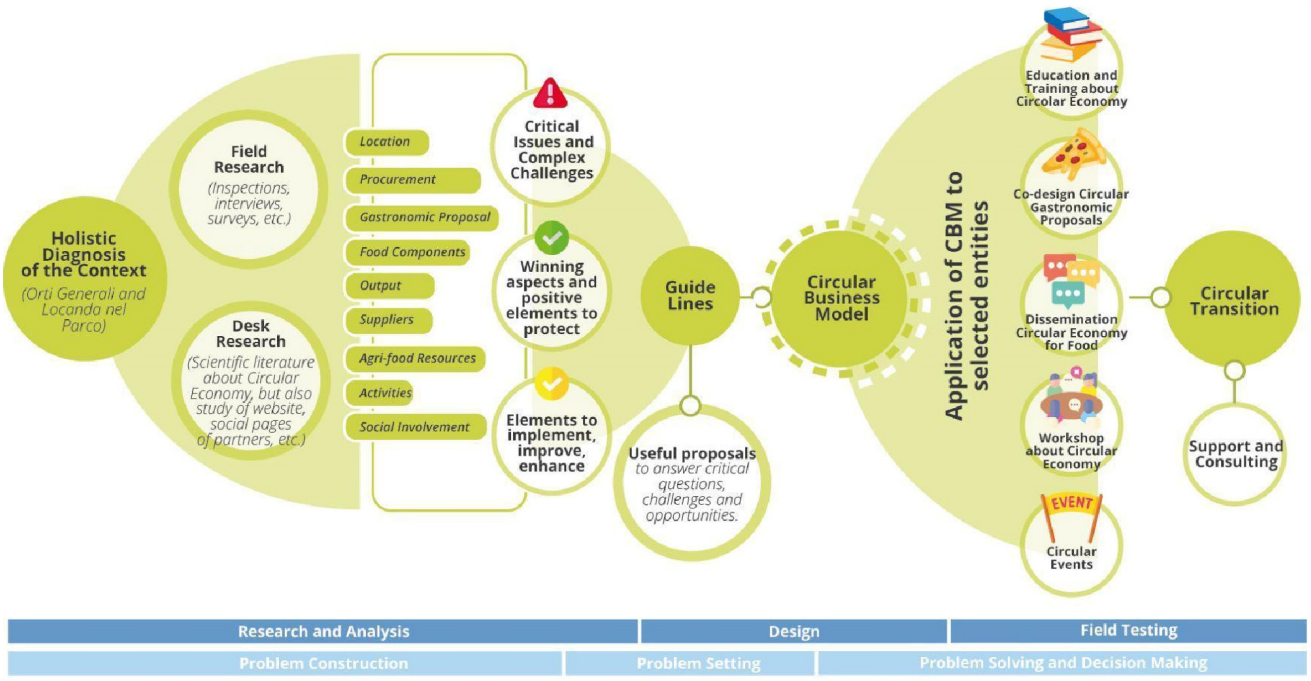

Figure 2. The systemic methodology adopted within the design path undertaken in the H2020 FUSILLI European Project by the University of Gastronomic Sciences of Pollenzo

restaurant and circular bar. This step was carried out starting from the analysis of the territorial context of the urban district of Mirafiori Sud, in which, as already mentioned, different migratory flows have stratified over the years, bringing to the Piedmontese city, the most diversified cultures from the regions of Southern Italy and those from the Middle-East. Through an initial field research, several visits were carried out through which it was possible to interview the actors active in these places, very often represented by citizens belonging to the local community.

Subsequently, the analysis was extended to the food dimension of these locations. The type of food supply, the gastronomic offer, the typology and materials of the components used for the consumption of food, the partnerships with suppliers and their location, as well as that of the resources used, the output produced in terms of waste and by-products in the food processing and consumption phases, and finally, the activities of social involvement of the most marginalized segments of the population, such as families with insufficient income

to lead a decent life, people with motor or cognitive disabilities, people who have come out of crime, etc., through collaboration with non-profit organizations and associations, were all investigated. through cooperation with non-profit organizations and associations.
Considering the purpose of the project, this field research phase was supported by a desk research phase, in which the scientific literature relating to the Circular Economy for Food was analysed, in which other national and international circular food case studies were traced and explored in depth (from which to take inspiration). The product of the holistic diagnosis finally allowed the design of a systemic graphic map for each place analyzed which linked suppliers, food resources, the type of output produced, and the consequent management and disposal (Figure 3). This first methodological phase allowed a simpler identification of the critical aspects to work on, the most complex challenges to address, as well as, the dormant assets and, equally, the winning sides to protect, emphasize, or implement. Therefore, some useful guidelines for the design process were drawn up.

In order to respond to the critical elements, as well as to the need to implement the intrinsic opportunities of such contexts, approximately 100 students from the Gastronomic Design Course (Bachelor's Degree in Gastronomic Sciences and Cultures, UNISG, Pollenzo, Italy) were involved, who developed a panel of circular proposals applicable within the scenario of the future Turin Living Lab 2030. They acted within four specific themes:

- the development of partially or totally circular menus (circular and symbiotic gastronomic proposals such as genuine local products, or alternative formats such as circular picnics and aperitifs);
- the definition of systems for the valorisation of food and inorganic outputs currently not re-inserted into the system;
- the design of laboratories, events, cooking courses and workshops related to the Circular Economy for Food theme;
- the experimentation of tools for the widespread dissemination of circularity.

The best proposals were presented to the managers of Orti Generali and Locanda nel Parco to adapt them appropriately to their needs and begin the first design steps towards a sustainable circular transition of the food system they support. In this process, the transdisciplinary approach of Systemic Design was fundamental. In fact, a close collaboration between eco-designers, gastronomes, food geographers and, more generally, catering professionals was activated. In particular, the support of the Pollenzo FoodLab (UNISG, n.d), an experimentation and training laboratory for innovation in the kitchen, run by chefs and gastronomes specialized in circular agrifood processes, was essential.

In general, the role of the gastronome is to spread the culture and good practices of food sustainability and sovereignty, to develop and share new perspectives on the agri-food

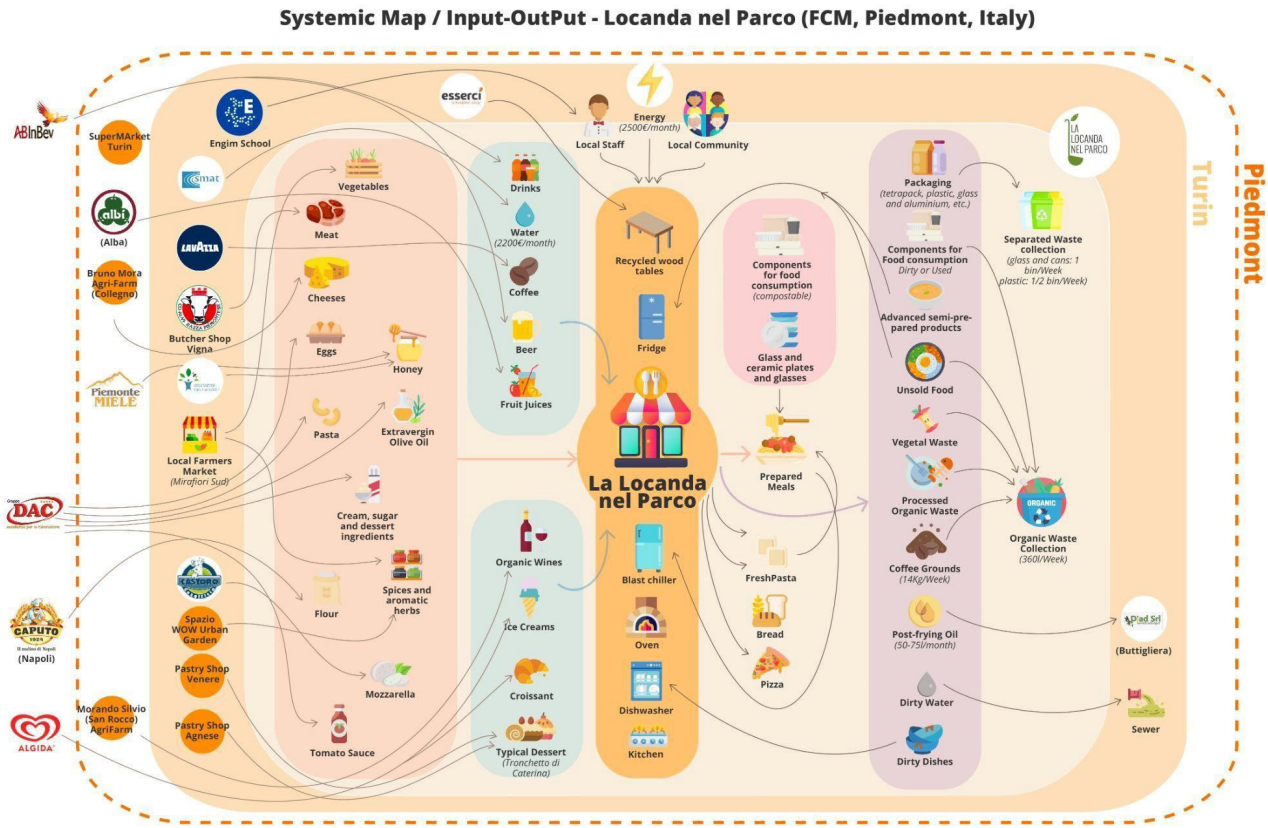

Figure 3. An example of a Systemic Map designed for the Holistic Diagnosis of the Locanda nel Parco Social Restaurant. In particular, graphical representation of the input and output analysis.

system with a holistic view of food production, processing and consumption, and finally, to design possible future food scenarios. In this framework, systemic designers guided and supported co-creation processes, but above all, worked as mediators of different backgrounds, minimizing conceptual and communicative obstacles and working out compromises between different visions. In this sense, they facilitated dialogue between different disciplines and professions in order to achieve high project standards. This specific role of creative connector is extremely favorable to co-design processes with different communities and teams (Celaschi, 2008, Savina & Peruccio, 2020).

3. Discussion and Results

3.1 The Circular Valorisation of the Less Noble Parts of Food

On the basis of the methodology described in the previous section, through the collaboration of the actors introduced, symbiotic circular menus were designed that could be included in the circular restaurant and circular kiosk's agri-food offer.The holistic analysis undertaken has thus allowed the coherent and virtuous planning of the agri-food proposals. These menus were developed following the cycles of the Circular Economy (Ellen MacArthur Foundation, 2012)

and the fundamental principles of Systemic Design, based primarily on the valorisation of outputs, the creation of relationships between the parties, local action, with a strong focus to the protection of the environment and communities (Barbero & Tamborrini, 2015). However, the key principle that guided the development of the menus is not only an integral part of the systemic approach, but is also a key rule of ecology, according to which all waste matter can become a form of nourishment for other systems (Commoner, 1971).

Each circular agri-food proposal has been designed, experimented and preliminarily tested within the Pollenzo FoodLab, under the guidance of cooks, chefs and researchers.

Figure 4. Local citizens involved in the circular gastronomic events organized in the Mirafiori Sud district (Turin, Italy)

The citizens of Mirafiori Sud, already actively involved in Orti Generali and Locanda nel Parco, took part in the co-creation process, which was able to enhance ancient knowledge and traditions of cultures and peoples even far from the Piedmontese territory (Figure 4). In this, the value of the elderly emerged, i.e. citizens of senile age (from 65 years onwards) who in most cases preserve food and agricultural rituals and traditions, to be handed down to younger generations. Citizens from Southern Italy, although grafted into Piedmont for social and work related reasons, have in fact often shown themselves to be very close to the riches of rural settings, often forgotten in more developed urban areas.

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areas.

Among the activities designed and implemented in the Food Living Lab it is possible to mention the Circular Cooking Course, (from which the Participated Circular Aperitif format originated) and the Symbiotic Circular Pizza. In both cases, the direction was to valorise the less noble parts of the agri-food products used and that of the by-products of the food transformation processes.

Generally, food waste is that food, or those parts of food, which in the common perception are not useful for human consumption or which, more simply, were not valorised before they became inedible (e.g. food defined as not suitable for consumption , spoiled, expired, advanced, manipulated food, etc.). Changing terminology, however, the perception of food waste changes. In fact, talking about “less noble parts of food”, rather than food waste, has made it possible to refer to those parts/elements of agri-food products that are usually discarded, which however are still perfectly useful for human consumption and, on the contrary, still have good organoleptic/sensorial properties, so much so that they can be fully exploited in the kitchen, following appropriate gastronomic transformations. These are edible components of food, such as fruit peels and leaves, greens, basal/apical parts, seeds and, again, food processing by-products, such as the cooking water of a product. In circular menus, the potential of all the parts of an ingredient are studied and analyzed (Whole Ingredient concept), so that they can be enhanced in the different agri-food courses and in some cases, increase the nutritional intake of a meal.

The target of the circular actions undertaken is primarily the citizens of the Mirafiori district of the city of Turin. However, it extends to all urban citizens, as well as to all urban gastronomic scenarios, as one of the objectives of the project is precisely to increase food awareness at a territorial level. In order to reach such a wide audience, for each of the gastronomic experiences, and specifically, for each menu designed, simplified systemic maps were created (Figure 5 - Figure 8), which, through the use of visual communication, represented a useful tool for communicating the effective circularity of food proposals to an average user, therefore to a mixed audience, characterised by different cultural levels, as well as different disciplinary languages. In some cases, these easy-to-use maps were printed on the placemats inserted inside the aperitif boxes or for the administering of the Circular Pizza during the dissemination events of the project and the official launch of the proposals. This graphic-visual tool generally allows for an easier metabolization of concepts aimed at changing

the user's behavioral habits.

3.2 The Circular Cooking Course and the Participatory Circular Aperitif

Within the evocative natural spaces of Orti Generali, which host 178 urban gardens, a synergistic vegetable garden and an didactic farm with animals such as chickens, bees, hares and Irish cows, a participatory, zero-waste circular aperitif format open to all local citizens has been designed every year, since 2022, in the summer season.
This format included a preliminary circular cooking course, through which to collectively cook the agri-food proposals, under the expert guidance of the pollentine chefs. Around 20 chefs from the Turin restaurant sector were involved annually, mostly belonging to Turin's neighborhood houses, and around 100 citizens, reaching a broader social dimension. The objective of the event was to spread the principles of the Circular Economy for Food in the restaurant sector and among local citizens, so that the urban food transition could take place both in restaurant and domestic environments, involving the dimension of daily life. The course led cooks and chefs to experiment with the preparation of vegetable and circular proposals based on the integral use of seasonal and local vegetables (such as tomatoes and courgettes, wild vegetables and legumes), creating a concrete menu of sustainable circular proposals, in mutual symbiotic connection, through the complete valorization of the less noble parts of the ingredients and preparation waste. The citizens who attended the circular agri-food training actively contributed to the cooking course, while the other citizens were the users of a broader dissemination process, which concluded with the tasting of the circular aperitif (Figure 5).

Considering the multiple geographical identities of the local community involved, the menus were designed by revisiting international gastronomic elements. In the systemic map representing the circular menu of the participatory aperitif designed in 2023 (Figure 6), it is possible to see how, starting from the integral valorisation of three ingredients (beetroot, radish, red onion), some typical recipes of Argentina, Greece, America, but in particular the Middle East (as well as those of other regions of Italy) have been revisited. These recipes belonging to different geographical contexts (such as chimichurri sauce, tzatziki sauce, hummus, ketchup) have been re-designed following the concept of mutualistic symbiosis (Bronstein, 2001). In the preparation of each of them the process output of further gastronomic preparations is present. The format of this circular aperitif demonstrates how the concept of Circular Cuisine, already partially anticipated by the Italian chef Massimo Bottura (Italia Circolare, 2020), does not undertake to exclusively valorise what is commonly treated

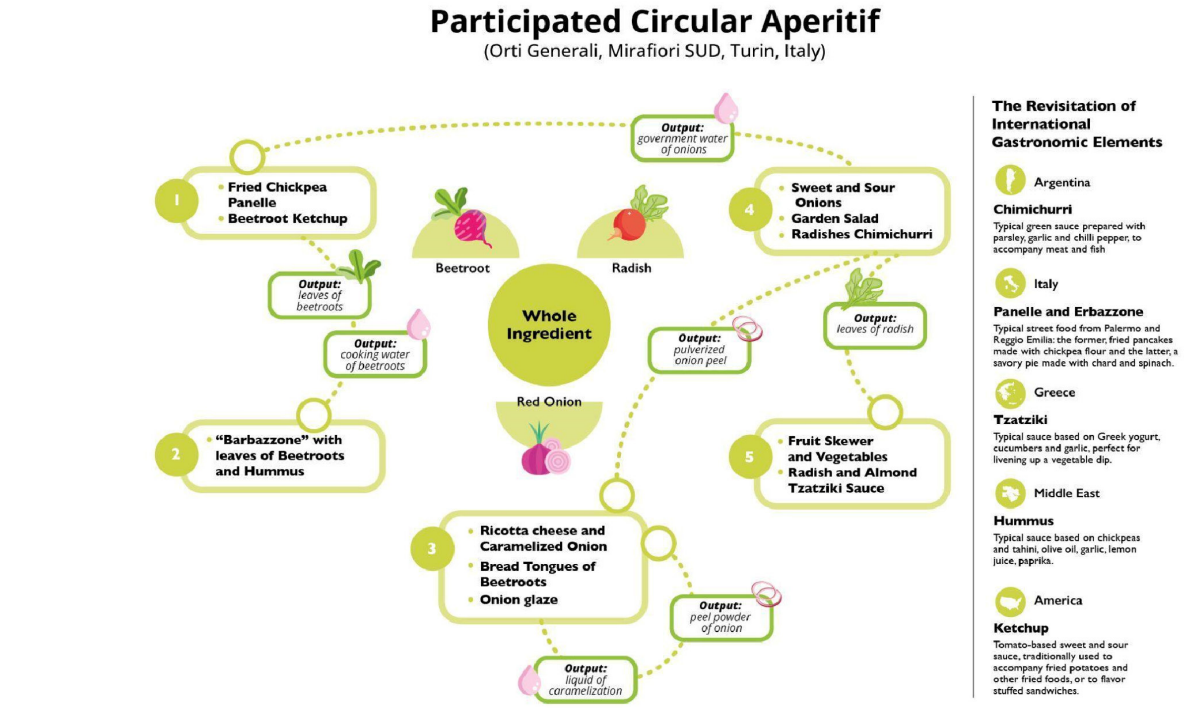

Figure 5. The Systemic Map of the gastronomic proposals of the Participated Circular Aperitif (Orti Generali, 2022)

Figure 6. The Participated Circular Aperitif, with the Preliminary Circular Cooking Course (Orti Generali

as waste, but also the resources and the communities of a specific territory.

3.3 The Symbiotic Circular Pizza

Following the same methodological process, the Symbiotic Circular Pizza was designed at the Locanda nel Parco social restaurant (Figure 7). This is not a static recipe, but an iconic Italian product, which, following the 3Cs of the Circular Economy for Food (synthesized as Capital, Cyclicality, and Coevolution) (Fassio et al., 2020), enhances the ingredients in their wholeness, avoiding the generation of waste, enhancing the natural and cultural biodiversity typical of the territory and involving the local community with a nutritious and healthy product.
Its recipe, extremely versatile depending on the annual periods and geographical areas, proposes the use of vegetables that are a seasonal expression of the Piedmontese territory and that of typical local products, coming from sustainable production processes. The broader ambition was to circularly revisit some great classics of Italian cuisine. In the circular restaurant project, the Circular Pizza changes seasonally. Furthermore, it was designed in a symbiotic relationship with a circular starter. In the following image (Figure 8) it is possible to analyze, as in the same way as the circular aperitif, also in the case of this food combo, the elements of products and preparations that are not enhanced within the pizza, with appropriate transformations, represent the main ingredients of the appetizer and vice versa.

Figure 7. The Circular Combo (Circular Aperitif and Circular Pizza) of the Locanda nel Parco social restaurant (FCM, 2023)

Although these projects are located in a micro-local dimension (in this case purely urban), the strategic choice of some agri-food products, such as pizza, known internationally, has made

it possible to make the new agri-food proposals vehicles of circular innovation and information in different international contexts, not just Italian ones, overcoming every cultural and geographical barrier[4]. In this sense, the objective of contributing to the sustainability of the food sector has been achieved in a much broader way. In fact, these are Italian food rituals that lend themselves well to adoption by other territories and cultures, albeit with appropriate variations. The prevention of food waste and the valorisation of the less noble parts of food are in fact activities and values that can be communicated and learned in any kitchen in the world, where the Circular Economy is often already intrinsically present.

It is important to point out that the development of circular menus is not enough for the design and subsequent construction of a circular restaurant and a circular kiosk. In order to complete these concepts, further fundamental points have been adopted, such as:

- the use of energy-saving technologies, such as ovens made of refractory materials to maintain temperature and reduce consumption;
- the use of renewable energy, through the installation of solar panels;
- self-production, where possible, of vegetables, fruits, herbs and other food products, in compliance with current Italian food safety regulations;
- the use of agro-ecological cultivation practices, without the use of chemical herbicides, within urban agriculture activities;
- the facilitation of on-site separate waste collection by all the actors involved,
- the supply of drinkable water in pitcher, to avoid the over-production of plastic waste;
- the production of common goods useful to the community starting from food waste that cannot be exploited in the kitchen, such as the artisanal production of soaps starting from the used oil resulting from the frying process;
- the supply of doggy bags to avoid wasting leftover food, encouraging the domestic consumption of what is not consumed in the catering sector.

The development of the aforementioned activities, connected to the designed circular gastronomic experiences, adapt well to the concept of Food Living Lab, already widely rooted in the Mirafiori Sud district of the City

[4] In 2023, the Circular Pizza concept was presented at the Karlín Forum in Prague, Czech Republic,during the international catering event organized by Fany, major food retailer, and at the World Pizza Championship 2023 (Parma Exhibition Centre, Italy).

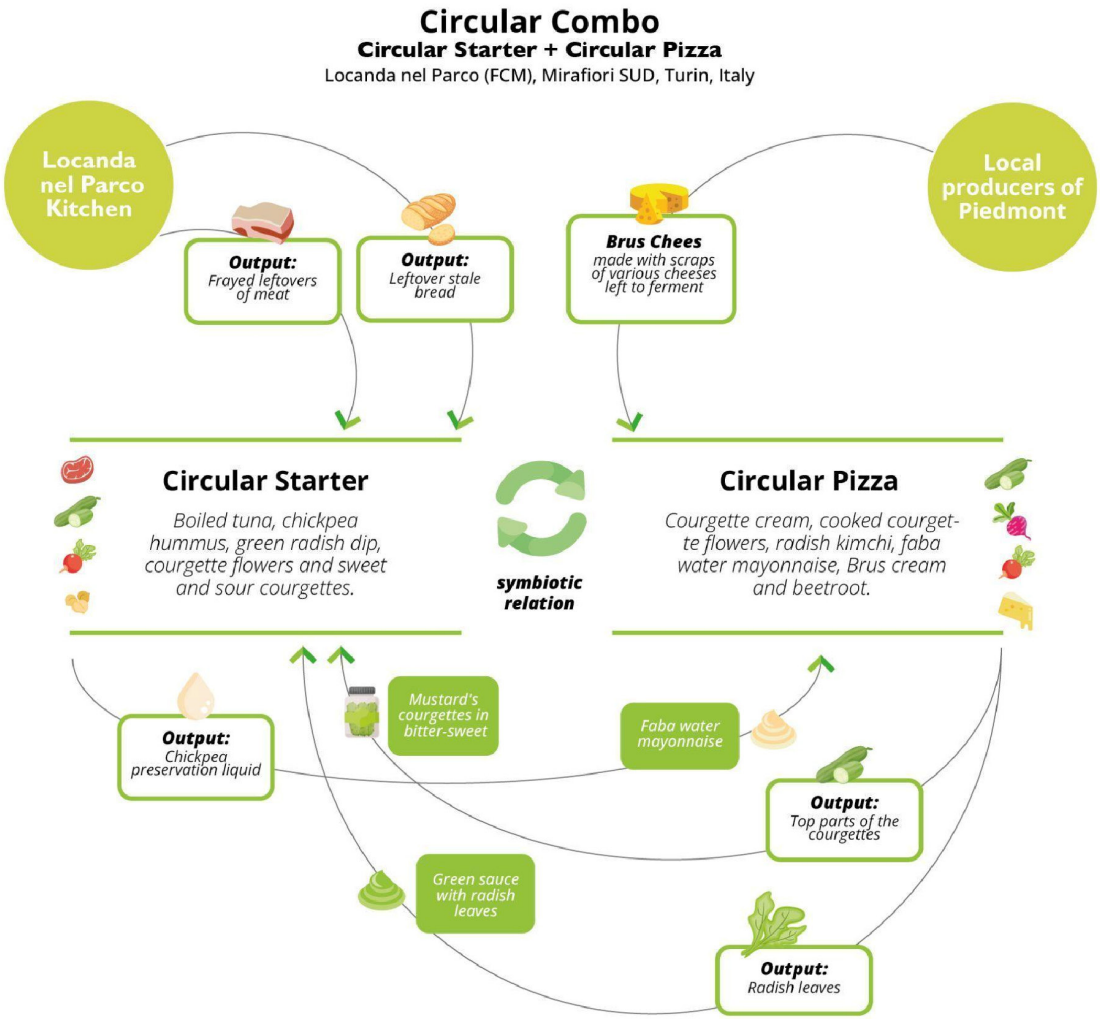

Figure 8. The Systemic Map of the Circular Combo (Circular Aperitif and Circular Pizza) designed for the Locanda nel Parco social restaurant (FCM, 2023)

of Turin. The local community welcomed the initiatives undertaken, demonstrating a growing interest which allowed the rapid metabolization of the circular experiments and effective autonomy in the reproduction of the developed model.

Furthermore, the project demonstrated how design is an effective tool in supporting "wicked interactions" (Buchanan, 1992; Granovetter, 1973), and in creating local informal networks, contributing to territorial social capital. In this sense, design manifests itself as a discipline extremely suitable for the coordination of multidisciplinary groups and the management of 'community-centered' projects (Manzini and Meroni, 2014), i.e. initiatives in which local communities (stakeholders and citizens) actively participate in the design path, leading to the achievement of a holistic result and a collective virtuous behavioral change (Wendel, 2013). In many cases, such as the one presented in this article, such projects can become versatile models that can be replicated in different territories.

4. Conclusion

Through the circular agri-food experiments launched through the European H2020 FUSILLI project within the city of Turin, it was possible to act on several elements of the urban food system. Although the starting point was, for obvious reasons, a supply of seasonal local resources, favoring sustainable production processes, the main focus was directed more concretely on the food handling and transformation phases, in particular to prevent the generation of waste in the pre-consumption phase. Working with food catering, in fact, allows us to act in the phase preceding the meeting with the final consumer. Working with food catering makes it possible to take action in the phase before meeting the end consumer. In addition, applying circularity in the kitchen for the elaboration of gastronomic catering proposals makes it possible to indirectly contribute to increasing the food awareness of the public reached, initiating processes of ecological literacy (Sterling, 2012), which facilitate the arrival of the Circular Economy also in the domestic sphere, triggering a change in people's daily habits. In this sense, food, and more specifically, design for gastronomic sciences, becomes a vehicle for sustainable virtuous principles.

Although local citizens were defined as the primary target of the project, the activities carried out also significantly involved several catering professionals. In turn, they will be able to replicate the good practices learned within their food business, also adopting a sustainable change in the systemic design of menus, with a broader vision of the different food formats, which, on the contrary, often embody formulas that involve massive consumption at low cost, to the detriment of the quality and sustainability of the products and working conditions. In this sense, the ecological transition path initiated wants and must also consider the social dimension of the designed system.

Currently, the FUSILLI project is still ongoing at European and Italian level and it will end in December 2024. The real challenge will be to preserve the results achieved at the Food Living Lab in Mirafiori Sud, progressively expanding them and maintaining the active participation of the community and stakeholders involved. The limits of the project are in fact in some cases to be found in the lack of continuity, which is predominantly the most critical element, not only in associationism, but also in forms of citizen self-organization. European projects make it possible to direct substantial funding towards the exploration of specific topics and the development of joint activities related to them, which can lead to tangible impacts on territories and communities in different European nations. This allows the realization of individual local programmes characterized by concreteness, capable of generating employment over time, also thanks to the structuring of expected periodic results, verified by international managers. Nevertheless, it is not uncommon that there are inconsistencies between the peculiarities

of each territory and the standard requirements dictated by specific KPIs (key performance indicators), the same for all cities in their diversity, Political involvement supports and nurtures the life of such projects, and vice versa, such projects help political administrators in the development of targeted innovative activities. One of the most decisive strengths has been the structuring of a heterogeneous local partnership of which the research organizations are part, which has made it possible to combine different competences and approaches to achieve extensive results in terms of food awareness and new sustainable good practices.
The downside, however, is the risk that the activities undertaken will be suspended at the end of the funding period, not allowing the final achievement of results or their maintenance over time. This means that in the event that the project has not generated structured activities on the ground capable of self-management and self-financing, the impact on communities risks fading over time, unless the arrival of new funding allows for investment in the continuation of the results achieved.

As regards the fruits of the FUSILLI project in the city of Turin, the greatest legacy is undoubtedly the development of an Interdepartmental Group of Food Policies (GIPA), capable of making departments and local authorities discuss the topic of food, with a shared effort and with different points of view. This discussion will establish a real Food Council, which can develop healthy and sustainable food policies for all citizens and the environment, educating on more virtuous food consumption and production behaviors, in line with the Sustainable Development Goals of Agenda 2030. To conclude, in 2024, through the activities developed in Turin, the University of Gastronomic Sciences of Pollenzo won the prestigious CEFoodCycle AWARD (Lamoro, 2024) which recognized the most innovative circular economy initiatives in the food sector, and identifying some circular

pioneers on the European scenario.

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