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The Role of Systemic Design in a First Re-Connection of Food Webs and Health Systems

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Abstract:

Nowadays the growing disconnects between food webs and health systems are certainly a complex problem. It is generating a strong perturbation of human and environmental health by destabilizing the balance of territories and communities. Therefore, it is necessary to investigate and describe how the figure of the systemic designer can contribute to a first re-connection between the agri-food and health sectors through a transdisciplinary approach, guaranteeing a greater level of well-being to the food consumer, to the patient and more generally, to the citizen. The final purpose of this paper is the design of a system of relationships among numerous local actors, such as food producers and processors, doctors, associations and the civil community, for the first phase of re-construction of a more healthy and sustainable territorial system.
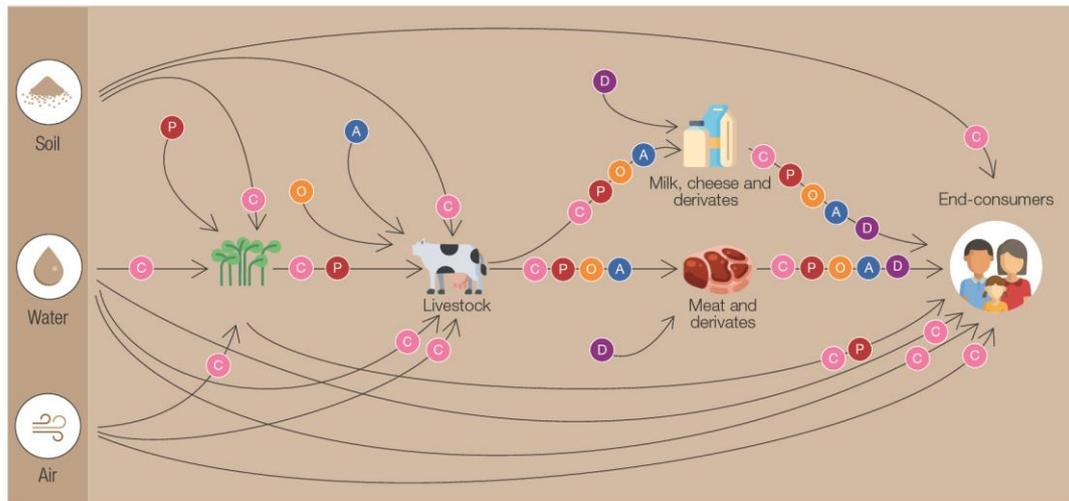
1. Introduction

Nowadays the scientific community and the civil society are called to face a historical moment characterized by continuous perturbations involving different disciplinary fields. The repercussions of environmental transformations on territorial structures and the balance of social and economic systems are leading the human being to reformulate - in terms of greater sustainability and resilience - his ways of acting, working, planning, and living. In this extremely complex scenario, characterized by a process of continuous and not precisely predictable change, the topic of food, as an essential constituent to guarantee life on the planet, as a material for nourishment, but above all as a key element of most economic systems, anthropic and cultural features of a territory, represents a fundamental aspect. In fact, food production is closely linked to the balance of environmental systems and, in turn, is able to strongly disturb the stability, well-being and, relationships of social systems. However, the design and management of agri-food supply chains are moving with

determination towards a high-impact production model, which does not consider the environmental and social cost of the food product, deliberately interpreted as a mere commodity to profit from [1].

In this scenario, industrial agriculture, intensive farming and long-distance distribution systems have allowed the use of harmful substances for human and planetary health [2]. It is possible to categorize these harmful chemical inputs in three large areas, depending on their purpose: a) increase in productivity, it is common to use growth hormones and antibiotics in intensive farms, aimed at increasing the productivity of the animal and at the treatment of diseases related to its wicked living conditions; it is also foreseen the use of fertilizers, pesticides and herbicides in industrial monocultures aimed at obtaining large homogeneous crops, susceptible to the attack of pests; b) food processing, an area that assists in the use of sweeteners, taste extenders, thickeners, etc., aimed at altering the taste, color and consistency of a food product, thus manipulating the perceived quality that stimulates a recurrent purchase; c) conservation of the product, aimed at extending the durability of the food, which must often reach markets far from the production site, without being subject to an organoleptic and formal alteration. For this reason, the use of preservatives, antioxidants and stabilizers is expected.

Generally, all these chemicals arrive within the consumer's daily meal (as shown in Figure 1). In most cases, he ignores the chronic exposure he undergoes through his diet. Unfortunately, the studies carried out on the interaction between the mentioned chemical inputs are not yet sufficient. However, it is assumed that once ingested, they can enter into synergy and increase their harmful effects [2]. This phenomenon is justified by a capitalist scenario in which the food product must be as captivating as an industrial product. The goal is to achieve a growing profit that will tend to replace the concept of nourishment and protection of the human being. In this way, the natural connection between food webs and health systems weakens, while the contrast between food that feeds and food that gets sick is strengthened. The increase of Non-Communicable Diseases [3] connected to the consumption of industrial food and high-impact food production, testifies to all this. Among these diseases, it is possible to cite cancer, obesity, diabetes, neurodegenerative diseases, cardiovascular and respiratory diseases. Behavioral disorders, increased male infertility, reproductive malfunctions and cases of fetal teratogenesis are also not absent [4]. Overall, the number of annual deaths associated with Non-Communicable Diseases is 40 million [5]. However, it is good to start from an assumption: if on the one hand there are high-impact production models for the human and the environment, on the other there are unsustainable consumption patterns that imply the constant ingestion of industrial food, the predilection of unhealthy foods such as processed meats and soft drinks [6] and the reduction of time spent preparing meals or self-production [7].

Although food plays a fundamental role in the well-being of the community, currently most health systems pay little attention to the impact it has on human health and its strong connection with chronic diseases. Except for small independent companies, the health sector does not dialogue with the food sector and vice versa. In many cases, this factor leads the figure of the doctor to focus on the symptoms of a disorder and not on the cause, leading the patient, therefore the consumer, to pursue an apparently non-dangerous food lifestyle [8]. Therefore, the question to ask is: how the figure of the designer can act on a territorial level, in this dual scenario to initiate a change of paradigm? What strategies should be taken to ensure that humans and the environment are protected by a complex and high-impact production mechanism?

Figure 1. Introduction of chemical contaminants in the agro-food production chain: graphic visualization of the chemical bio-accumulate in plants and animals, food derivatives and humans.

2. Design, Food and Health: a New Scenario to Design

Currently, consumer protection represents a significant multidisciplinary challenge. An enlarged scientific community, able to overcome its disciplinary boundaries and act through shared methodological and operational approaches, is called to respond to it. Returning to consider food as an element belonging to the essential everyday life of every human being, it is possible to see how it has historically conditioned the material culture of different populations [9], permeating objects, spaces, habits, rituals and behaviors. Since the past, the design has tackled the great themes of food and health, yet pursuing two parallel and independent paths. Previous generations of designers have not always used the appropriate tools to fully investigate the intrinsic connections to a complex multi-disciplinary system (Figure 2).
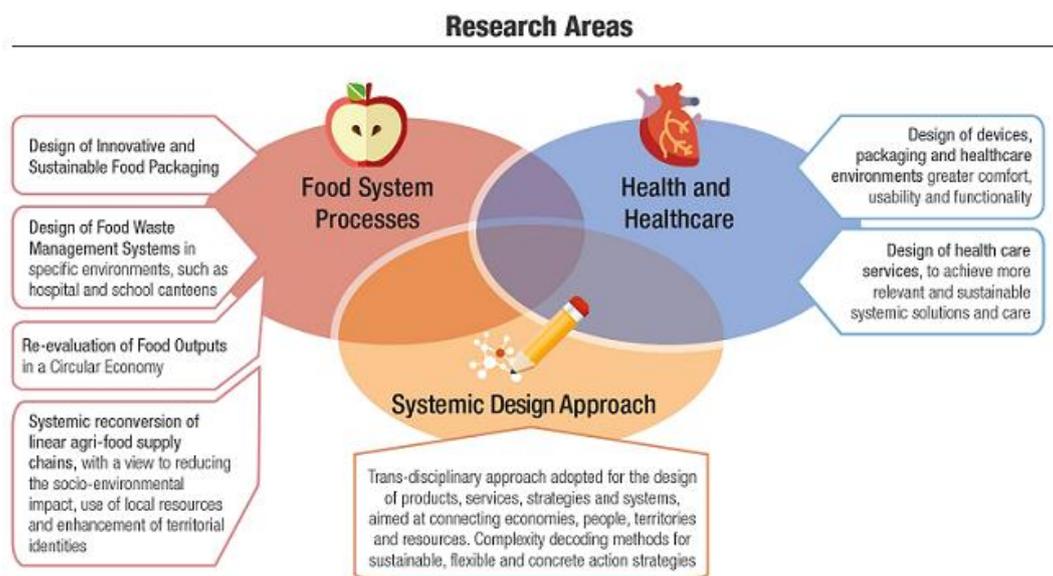
Figure 2. Intersection of the investigation areas and identification of the research focus.

Specifically, from the health point of view, the systemic design focused on the one hand on the study of devices, packaging and healthcare settings [10], with a view to greater comfort, usability and functionality, on the other hand on planning of health care services, for the attainment of more relevant systemic care and solutions [11]. On the food front, there may have been a broader field of investigation, which still involves the most classic design of innovative and sustainable food packaging, in the broadest sense [12], but also the complex design of waste management systems in specific environments such as hospital and school dining halls, the re-evaluation of food outputs that are still useful in terms of circular economy [13,14] and the conversion of linear food supply chains, in terms of socio-environmental impact reduction, use of local resources and enhancement of territorial identities [15]. Therefore, we can see that sufficient research has not yet been conducted, addressing the design and joint management of health systems and food webs. Exceptions are rare cases in North America, where the spread of obesity and diabetes linked to high-impact consumption patterns necessarily requires targeted health policies. In fact, in the rest of the world, the development of local policies that address the food-health dichotomy is paradoxically less. The relationship between food and city, therefore between food and community, changes face based on the different territories. If in many regions of Africa, Latin America and Asia the priority is the achievement of a local economic development that guarantees a state of food security for every citizen, the main theme in Europe is that of fair markets and the relationship between producer and consumer [16]. From this overview, the absence of a holistic and unitary design emerges. It is a design that considers the interdependence and the numerous relationships present between the two broad sectors of food and health and that guides the food production/consumption and health sectors towards lasting well-being for the whole community involved.

3. From Food to Health, Systemic Design for Community Well-being

From a scenario that combines design with health and agro-food disciplines, within the Department of Architecture and Design of the Politecnico di Torino (Turin, Italy) is being developed Doctoral Research entitled 'From Food to Health: the Systemic Design for Community Well-being'. The general purpose of the research is the design of a genuine reconnection between the food and health sector through the theoretical and operational approach of Systemic Design, in order to guarantee and protect the wellness of the citizen and the territory in which it is rooted. The aim is the first development of a territorial system of relations, services, strategies and experiences that can contribute to the prevention of chronic diseases connected to current models of food production and consumption, through the diffusion of sustainable individual and collective behaviors, connected to the peculiarities of the territory. It is good to admit that such a complex objective can only be achieved through the design of a network of relationships between the stakeholders involved, therefore between food producers and processors, small restaurateurs and commercial activities, general practitioners, healthcare specialists and many others ho interact with the local community on a daily basis. Therefore, it is a network that, on the one hand, aspires to new and more sustainable ways of producing and curing, on the other, hopes for more virtuous choices and consumption. For this reason the healthy or potentially ill citizen is an integral part of a resilient system that offers and receives. In this way, it is possible to pass from a system where the food is a source of disease, to a reality in which it becomes again a substance that nourishes, sustains and connects until it becomes an integral part of the care processes.

4. The Methodology: Desk and Field Research, Case Studies, Guidelines and First Project Development

Asking specific research questions is certainly the first starting point to begin an in-depth analysis of the project context and correct identification of the objectives. It is possible to summarize three fundamental questions that have laid the foundations for the following phases: a) How do current food production chains work and what is their impact on the health of the consumer and the planet? b) How much does the Italian health system consider the food scenario in the process of identifying and eradicating the causes of specific diseases? c) How to trigger an extended systemic territorial re-conversion and encourage a mutual acceptance of responsibility that leads to a first intimate dialogue between food webs and health systems through Design? How to start a lasting territorial involvement? These questions were fundamental for the pursuit of a first review of the scientific literature, not only in the field of Design for Food and Design for Health but also in the specific disciplinary sectors1 of the agri-food, health and anthropological sciences (Figure 3).
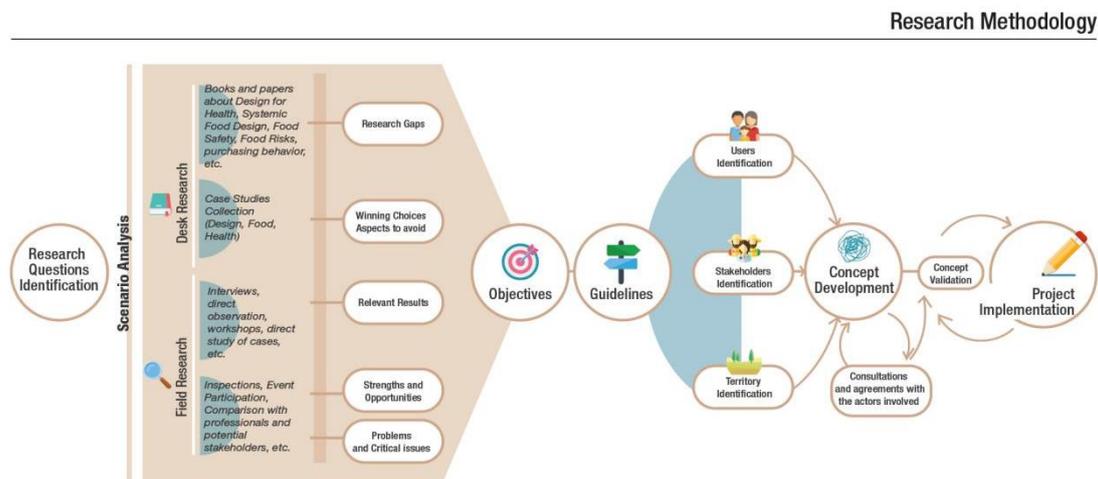
Figure 3. Research methodology for the definition and development of the project.

To support this survey, a collection of about 20 case studies was also carried out (Figure 4) within which four specific categories were differentiated on the basis of their aims: a) platforms designed to generate a direct comparison between local food producers and consumers, therefore to facilitate the purchase of local varieties, to support small territorial activities and to activate a network of relationships based on trust and honest professionalism; b) platforms that lead to a conscious purchase, helping the consumer to identify seasonal products and to understand the meaning of certifications and complex information contained within the labels; c) platforms and realities that allow citizens to organize themselves to self-produce their food at community level, using natural methods, thus becoming virtuous consumer-producers; d) territorial realities that connect patients, medical figures, agro-food producers and chefs in order to improve the health status of groups of people suffering from specific diseases, triggering correct eating habits and generating greater awareness. This collection of cases, included in a first phase of theoretical research, has opened the way for a first field survey, consisting of the direct study of different national and international realities and the participation in thematic events, such as the Food for Health Symposium 2019, promoted by the canadian organization Nourish - The Future of Food in the Healthcare [17] based in Toronto, Ontario, Canada. (Nourish is

currently the most significant case study within the ongoing research. Analyzed through field research, it is based on five fundamental strategic levers: food for health policies; measurement of the patient's eating experience; sustainable food supply; definition of sustainable menus; revaluation of the food of indigenous peoples. Inside it, the contribution of Hayley Lapalme and Cheryl Hsu, systemic designers from the Design for Health Program at the Ontario College of Art and Design University in Toronto, is fundamental.)

Figure 4. Classification of case studies.

Furthermore, in this second phase of direct observation, it was possible to initiate several interviews and workshops with doctors and food producers potentially involved in the project (Figure 5).


Figure 5. Workshop "Food, Community, Health: a first step towars the design of a systemic territorial network" (08.01.2020 – Politecnico di Torino and CioCheVale Association).

This step was significant for a collection of contrasting points of view and relevant experiences, but above all, it represented an excellent opportunity to test the propensity towards a future reconnection project. Following the extensive scenario analysis conducted, five fundamental guidelines were developed, potentially viable directions within the future design phase (Figure 6).

It is possible to summarize them in the following points:

A) Giving back value, or bringing back natural food to be a key element in the process of preventing chronic diseases and maintaining an optimal state of health; B) Reconnecting, or lead health professionals to tackle with greater vigor the importance

of food production and natural nutrition, drawing strength from a transdisciplinary and systemic approach; C) Generating awareness, disseminating a basic knowledge about the health risks / costs associated with low quality food, produced with intensive and high impact methods, increasing the perception of chemical risk, on a par with microbiological risk [18] through the dissemination of information and direct experiences within the communities; D) Creating relationship and mutual responsibility, connecting actors belonging to scenarios that today are difficult to talk to each other. Create an exchange of skills and a community action that has the protection of the individual and his territory as its ultimate goal; E) Producing a positive long-term impact, socially, environmentally and economically, therefore an increase in the well-being of a community that can perpetuate virtuous and sustainable behaviors over time. These guidelines reflect the design objective set out above.
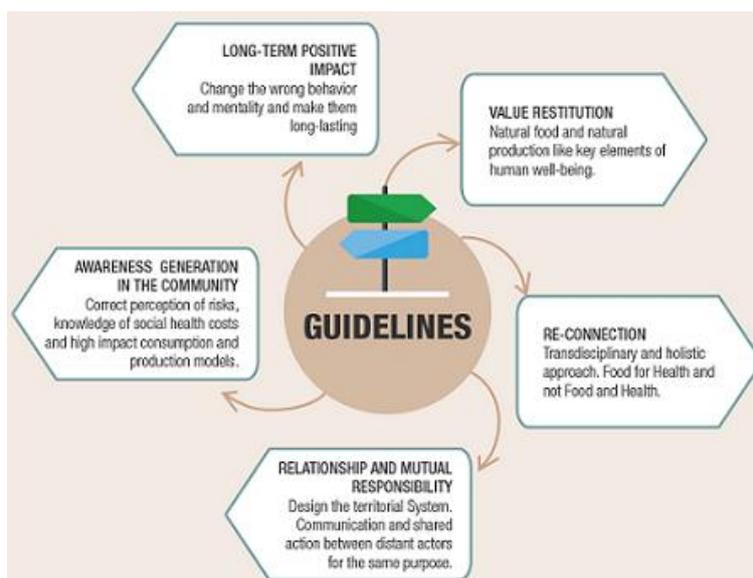

Figure 6. Design Guidelines.

5. The Design of a Territorial Relationship System

Through these first directions, the design of a multi-functional platform was launched for: food purchasing, medical consultation, exchange, information and dissemination. It wants to generate and perpetuate over time the relationship between users, organic producers, virtuous physicians, cooks and social and environmental promotion organizations (Figure 7). This platform intends to be a reference point for all healthy citizens, but also for those who are sick, who need support in their healing or cohabitation process with the disease. Through the platform, the health figures involved will be able to develop healthy and sustainable menus or suitable menus for specific pathologies, report harmful food products and processes or, on the contrary, foods and processes with particularly beneficial properties, disseminate suggestions on more healthy cooking methods, publish articles and accept booking of visits, checks and medical consultations. Local food producers will be able to sell their seasonal products, on condition that they have been generated using natural methods, publish the scenario of food arriving in the following weeks, distribute product kits for specific needs, recipes, occasions and finally, deliver them at home, in the site of the platform and in specific collection points in the territory. In this way, participating chefs and cooks will be able to consult the food products offered by the platform, elaborate and disseminate seasonal healthy recipes and design a progressive cookbook

that is always accessible to the user. Finally, through social and environmental promotion organizations it will be possible to organize events, workshops and cooking, self-production and permaculture courses, also involving schools and universities.
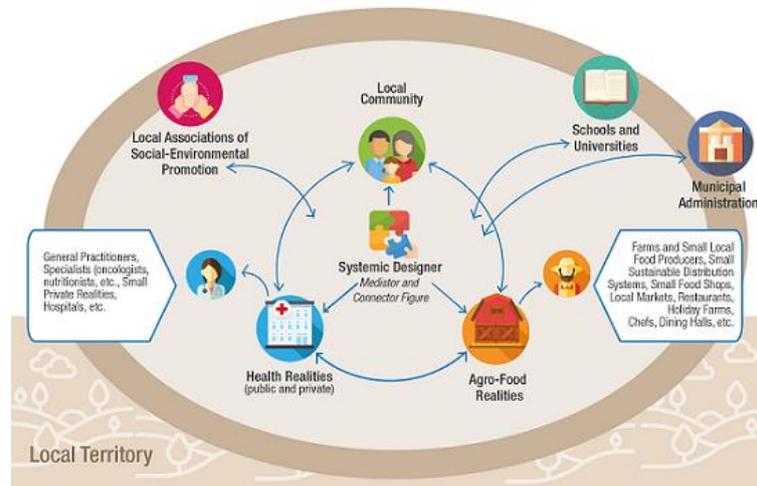
Figure 7. Territorial system of relations among health and food realities, citizens, associations and schools.

The project assumes the identification and study of a series of physical spaces in which the actors can play their role, but also of a virtual reality where they can perpetuate the type of relationship and exchange created, without space-time limits. Although it is still in the definition phase, a first development was conducted within the territory of Chieri (Chieri, Piedmont, Italy), in which a close collaboration was born with CioCheVale, an Association of Social and Environmental Promotion, which became the reality of connection with the territory and the local community. For the realization of this platform, being expanded program was drawn up (Figure 8). As a starting point, it presumes the drafting of a manifesto of intent and values and the mapping of the virtuous realities in the selected territory (The adjective 'virtuous' refers to those activities that act in respect of the human being and the environment. In the case of agri-food activities, a production free of chemical contaminants, a correct management of resources and waste are required. Instead, in the case of healthcare realities, a holistic approach to care is required, which includes the evaluation of eating habits and the environmental factors to which the patient is exposed). The next phase will be the collection of the subscription of the local actors who share the principles, values and objectives of the initial manifesto, in order to develop a collective of food producers, doctors and organizations that will constitute the central body of the platform at the service of the citizen. Therefore, the shared definition of roles, activities and services will be necessary, through a participatory planning process. The final phase will see the design of physical space, a point of reference for stakeholders and citizens and that of a virtual platform that could facilitate access to the services offered and the exchange of information. The potential of this reconnection project was presented to the citizens and municipal administrations of about twenty-three municipalities of Piedmont, on 21 September 2019, at the Municipal Library of Cambiano (Turin, Italy), which proved extremely favorable to being involved in the inside the program. About a year after the launch of the initiative, 45 municipalities are involved. Verification of the validity of the results will only be possible after the concrete development of the platform. However, due to the Covid-19 emergency, but at the same time, the ferment of ideas and creativity

connected to the greater free time available in the months of quarantine and social distancing, there was the possibility of a first virtual development of connections between food producers, doctors, cooks and citizens, who are waiting to be operational as soon as possible. Furthermore, since this is a project based on real connections between daily activities of different professions, the time required for the validation phase could be prolonged. The dissemination of the detailed characteristics of the platform and the results obtained is expected in a subsequent publication.
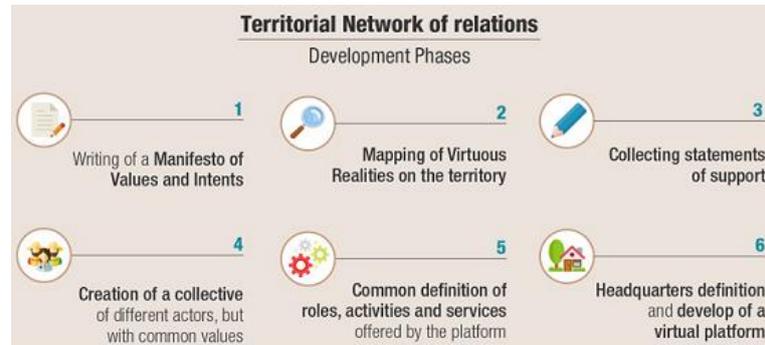

Figure 8. Main development phases of the territorial system.

6. The Roles of Systemic Designer

This research represents only one of the many projects within which the discipline of Systemic Design plays a key role. However, it is good to reflect on what the role of the designer is in a multidisciplinary scenario, where different professional figures interact, all extremely important for the success of the project. Defining one's role is never easy, especially if the development of the disciplinary field in which one acts is still in progress. For this reason, it is extremely important to trace a tangible definition of one's duties, so that the civil community and those of the professionals involved can have a correct understanding of the figure covered and subsequent approval of it, indispensable for generating a trust relationship. Through the research undertaken, it was possible to define the systemic designer through three different but closely related labels (Figure 9). It plays the role of reader and decoder of complex realities, for the resolution of the so-called wicked problems [19], of multi-disciplinary challenges that cannot be faced through a reductionist approach. Therefore, reading the complexity means to decipher the components belonging to it, the relationships between them and the properties emerging from these connections [20].

It follows another decisive role, such as that of the communicator. In fact, generally, it develops systemic maps, graphs and images that make comprehensible notions and complex data, often not easily accessible, except for professionals in the sector. After this first role of communicator-reader, therefore of the researcher, a fundamental turning point develops, that precedes the project act, or rather the transition of the focus from profit to human and the environment. It is a salient element that frees the designer from design for big companies, connecting him to the territories, communities, and diversified work teams. This is a salient element that frees the designer from designing for big companies, connecting him to territories, communities, diversified work teams and leading him to adopt a transdisciplinary approach. Thus, in the act of designing, it becomes a connector of different realities, a mediator of distinct cultural and disciplinary languages and backgrounds, a mitigator of conceptual and communicative obstacles. Through interaction with other branches of knowledge, he broadens his field of action, but above all he lays the foundations for

a complete, realistic design, with a greater level of feasibility. Finally, a design guided by honest intellectual, professional ethics and the willpower to protect humans and the environment, makes the systemic designer an educational and persuasive figure. In fact, through the design of spaces, objects and experiences, he can achieve a positive, sustainable and lasting behavioral change, increasing the qualitative level of daily actions and choices and contributing concretely to the collective well-being of the community [21].
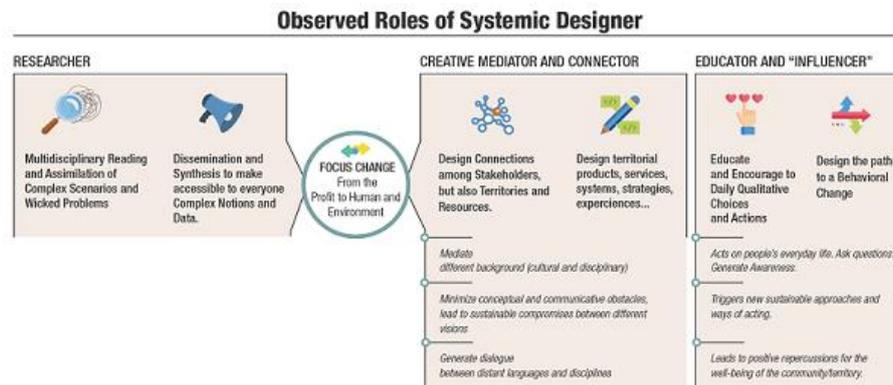
Figure 9. The current roles of the systemic designer.

7. Conclusion

The project is currently under development: after the fundamental territorial definition, the mapping of the local actors involved within the platform is finalized. This is an extremely delicate phase, since the identification of virtuous activities requires the verification of the values declared by them, which are not always present in reality. Furthermore, it is very complex to be able to obtain full availability from the selected figures, especially in the medical field. Due to the unexpected historical period underway, marked by an unexpected pandemic scenario, the priorities of health professionals have changed. This re-positioning of priorities has therefore been added to a frequent skepticism in the face of the possibility of integrating the food scenario within their daily working life. This factor represents one of the greatest limitations of the research in progress: it is in fact very difficult to modify a system if it does not change the awareness and mentality of the people who work within it [22]. Therefore, it is necessary to lead stakeholders to a shared understanding of the problem [23], which precedes the definition of a range of viable routes for its resolution. In fact, it is fundamental to start a path aimed at a socio-ecological transition, to lead to the change of visions, behaviors and attitudes, interactions, practices and methods. Although it may seem pretentious to trace a definite direction in an extremely wide scenario, it is necessary to start from the assumption that planning for territorial well-being does not mean perceiving itself as architects of the destiny of a community, but contributing to creating a more sustainable territorial balance through collaboration with the actors local and with citizenship. The starting point of this project is the healthy and sustainable food. A food that is not only the way to reach psycho-physical well-being, but also an educational tool, a means of connection with the territory and with local realities, therefore with an anthropological system made up of people and resources that can support a clean, low impact, but above all, identity economy. In this way, food becomes a vehicle and rediscovery of local material culture, but above all an instrument of defense against consumption and production models that today threaten the health and balance of communities, their identity and their territories.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Acknowledgments

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