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Food, city and territory: some reflections from a socio-spatial point of view

Nunzia Borrelli[1*] and Alfredo Mela[2]

Abstract

The purpose of this article is to highlight the relationship among food, city and space by adopting a social sciences viewpoint. Since the 1990s, not only in sociology but in the social sciences in general, the level of attention given to the role played by space in the production of social phenomena has increased. To describe this trend, certain authors have coined the expression "*spatial turn*", which is analogous to the "*linguistic turn*" that influenced poststructuralist sociology (Warf and Arias 2009; Löw and Steets 2014). The definition of urban food policies, like production of a food product and distribution, the fact that it is more or less accessible and generates surpluses, and its transformation through an industrial process or its use for a domestic recipe, are processes that provide a good example of the interaction among biophysical, economic and socio-cultural aspects, in which all the geographical and climatic characteristics of the places where these processes take place play a role, as do cultural influences, the skills of the actors, and their power relations. In this article, the associations among food, city, and space are shown through the presentation of examples, highlighting certain of the principal topics, and clarifying how the numerous issues relating to food can lead to problems of a micro, mesa or macro nature. In our conclusions, we will stress the value added of the specialist perspective in the study of issues relating to food.

Keywords: Food, City, Space, Governance, Sustainability

Introduction

The topic of food has enjoyed a long history of analysis in the social sciences, especially in anthropology, but also—albeit more occasionally—in sociology, at least since Simmel (1910) work. Its significance has increased in more recent times, however, above all since the 1990s. This is due in the first place to the political importance of the topic: it is no coincidence that the goal of Zero Hunger, the purpose of which is not only to reduce the number of persons suffering from a chronic lack of food but also to improve nutrition and promote sustainable agriculture, is in second place among the 17 Sustainable Development Goals (SDG)[1] approved by the United Nations in 2015.

Issues associated with food—and the sustainability of the entire cycle, from agricultural production to food consumption—have also assumed an unprecedented importance in academe. It should also be stressed that while in past decades these questions were associated above all with problems in less developed countries, they have assumed universal significance in the last 30 years, and have been developed in a wide variety of research objectives, many of which lend themselves to a multidisciplinary treatment in which the social sciences stand alongside agronomic, economic, legal, physical–chemical, engineering, and planning disciplines.

Within this framework, sociology has also seen an increased interest in food, and has been involved in many areas of investigation involving numerous sub-disciplines, from economic to cultural, political, urban, and rural sociology. This article will not deal with any of these areas of study; rather, it will adopt a specific approach to the analysis of food that attributes great significance to the spatial (or spatial–temporal) dimension of the phenomena. As will be seen shortly, however, this is an extremely topical perspective that has not often been used in studies on food systems.

*Correspondence: nunzia.borrelli@unimib.it
[1] Department of Sociology and Social Research, University of Milan Bicocca, Piazza dell'Ateneo 1, Milan, Italy
Full list of author information is available at the end of the article

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[1] Concerning Sustainable development Goals see https://www.un.org/sustainabledevelopment/sustainable-development-goals/.

The purpose of this article is to illustrate the usefulness of a socio-spatialist approach in these studies. First, in "Food from a socio-spatialist perspective" section, we will seek to provide a better definition of the spatialist perspective by way of a brief reference to the literature that theorises it. The two following sections provide examples of food-related issued analysed on the basis of this approach. In particular, in "Localising/placing food at micro, meso, and macro levels" section, three different levels (micro, meso, and macro) will be distinguished, and various topics will be raised in relation to them. In "Concluding remarks" section, we will discuss the sustainability of the food system, showing how this issue traverses all the levels under consideration. Finally, the last section contains a number of conclusions aimed at shedding light on the value-added of the socio-spatialist approach to the analysis of food.

Food from a socio-spatialist perspective

The level of attention being paid in the social sciences to the role that space plays in the production of social phenomena began to increase in the 1990s. In order to describe this trend, certain authors coined the expression "*spatial turn*", which is analogous to the "*linguistic turn*" that influenced post-structuralist sociology (Warf and Arias 2009; Löw and Steets 2014). In the international field, labels such as "sociology of space", which refers to a sociological interpretation of space that sought to go beyond its conception as a pure substrate of social structures, were used during this period. The works of Martina Löw, which were aimed at delineating a relational theory of space in which the social dimension is closely associated with the material and symbolic dimension, are especially important in this regard (Löw 2016; Fuller and Löw 2017). A leading urban sociologist of the stature of Herbert Gans had already written of a sociology of space, focusing above all on the use that social actors make of it through an extremely wide variety of actions (Gans 2002).

A similar direction was taken in Italy, too: there, the label more often used is "spatialist sociology", a term that Mela (2006) has taken from Ledrut (1987). Another contribution that has assumed the same concept with a theoretical approach is this by Gardini (2010) while a Manzo (2013) and Borrelli and Mela (2017) adopt a spatialist approach for the analysis of specific fields of study. The relationships between space and society in general are discussed in Bagnasco (1994), Mandich (1996), Gasparini (2000) and Osti (2015) with similar intentions Agustoni et al. (2007) editing a collective book, use the concept of space in comparison to those of environment and territory. The use of the adjective "spatialist" rather than a reference to a sociology "of space" is not without significance, especially when compared with the meaning given

to the latter term in Gans: in his text, in fact, it refers principally to studies of cities and territory, while the intention of the spatialist perspective is to avoid its being identified with a specific field of research or a sub-discipline, let alone creating a new one to be placed alongside the many that already exist. Although urban sociology and works on local societies have played a prevalent role in the exploration of the spatial dimension and the physical form that social phenomena assume, an approach such as this could as a matter of principle be present in the sociological interpretation of any topic, just as considerations of the temporality of phenomena are in relation to other aspects.

Over and above the various positions, it is possible to state that from a socio-spatial perspective, while it is true that the features of places do not uniquely define social processes, it is also the case that they offer a range of limitations and opportunities that contribute to the coevolutionary development of human social systems and the biophysical environment into which they are integrated. The idea of coevolution (Gual and Norgaard 2010) is therefore perhaps the most appropriate for taking account of the active role of spatial features: it recalls the idea of a reciprocal influence between human and non-human factors that "produces" space through their constant interaction, rather than simply "inserting" social systems into it. The term "social systems" is one that might lead us to believe that space operates as a kind of passive frame for human action. In reality, space is not on the edge of social phenomena (like a frame or a container) but is an innate part of them, and the non-human elements—whether they be living or mineral, incapable of being controlled by social actors, or constructed by them—are also endowed with a capacity for action and influence regardless of the fact that human subjects may take account of them in their actions.[2]

A study of this coevolutionary interaction can be undertaken from a variety of standpoints: one of these, for example, stresses the fact that space may be seen as the generative context of social action and the creation of collective structures, social aggregations, and institutions operating on a territory (Mela 2015). Another way of emphasising space as an active actor—which is complementary to the previous one—is to treat it as the product of a social construction developed on elements that cannot always be moulded at the pleasure of human action; this is a product that in turn becomes a pre-requisite for

[2] The idea of coevolution means, however, that social systems and biophysical systems have different and at least partially independent operating methods. Here, even more radical perspectives exist, such as the one represented by Jason Moore (2015) concept of *oikeios*, which refers to the innate unity of human and natural factors, so that no civilization restricts itself to "interacting" with nature, but develops "through nature-as-matrix" (Moore 2015, p. 127).

further processes. A third way consists mainly in emphasising the role of space as a *medium* of social interaction and communication: that is, as a collection of factors that make them possible and classify them. This, therefore, is a *medium* that once again must be understood as an active agent that does not simply submit to the intentions of social actors but, so to speak, adds its own character, just as the acoustics of a concert hall add to, or subtract from, the performance of the musicians.

Above and beyond the aspects mentioned here, however, the most important detail of the spatialist approach is its attempt to provide sociological interpretations that attribute a powerful role to the "situational conditions" concentrated in the territory—in the sense of a system of relations between society and the physical context (natural and constructed)—which makes the emergence of particular phenomena possible. This approach gives a powerful, and to some extent original, meaning to the idea of "situation", and it would therefore be helpful to dwell on this briefly, and to seek to bring the significant features into focus. Reflecting on the conceptual differences between Western and Chinese thought, François Jullien observed that unlike the latter, the former has nearly always devoted very little interest to the concept of "situation", and above all has denied it real autonomy, considering it to be related solely to the point of view of a subject "who situates itself there and sovereignly transcends it" (Jullien 2015, p. 243) of the Italian edition; italics in the original). The potential innate in the situation, as a generator of phenomena, is placed in the background, while evident is its function as an accidental element around the subject, which also provides support for or obstacles to human action.

Bringing the active character of space in relation to the subject of food to light is not an arbitrary procedure: the production of a food product and its distribution, the fact that it is more or less accessible and generates surpluses, and its transformation through an industrial process or its use for a domestic recipe are processes that offer a good example of the interaction among biophysical, economic and socio-cultural aspects, in which all the geographical and climatic characteristics of the places where these processes take place play a role, as do cultural influences, the skills of the actors, and their power relations.

In this brief text, our attempt to demonstrate the active nature of space with reference to the subject of food is developed by proposing two lines of reasoning. The first, which refers back to the traditional micro-meso-macro scheme, clarifies the forms of spatial relationship that they offer for each of these levels, using examples. The second, on the other hand, discusses certain questions that traverse the above-mentioned three levels, and which are significant for the debate on food and

regulation of the food system, and illustrate the role of their situational conditions.

Localising/placing food at micro, meso, and macro levels

At a micro level, the reference is to social interactions in the places where food is consumed, produced, and distributed (restaurants, bars, street food sellers, markets, vegetable gardens, etc.). Food can be an important occasion or means for strengthening social relations, creating social cohesion, and consolidating forms of cultural and social capital, because it generates conviviality and the art of living together.

In our modern cities, food's capacity to generate conviviality has changed, and its areas of expression can be found not only in the ever more diverse consumption practices—which have been investigated in more detail by food sociologists (see also Sassatelli 2004)—but also in food production and distribution.

The consumption of food in modern metropolises includes certain distinctive elements relating to the levels of publicness, mobility, and encounters with diversity. One interesting example, which combines the aspects of movement and diversity, is street food in the city of Portland, Oregon. Here, the city council has decided to use certain empty spaces to sell ethnic food to be eaten on the street, with the aim of offering a diversified culinary experience, creating employment opportunities for immigrants, and finding a new use for empty spaces (Borrelli 2018). In the production domain, community gardens (whether they be urban, for teaching purposes, or otherwise), which encourage practices that can generate a sense of community and social interaction, offer a good example: it is no coincidence that they are known as community gardens in the United States.

Finally, the distribution of food creates the bases for the construction of new forms of social interaction, above all if one considers the role of farmers' markets, ethical purchasing groups, and everything around the so-called short supply chain: that is, the tendency to "skip" commercial intermediation stages and connect agricultural producers with consumers directly (Belletti et al. 2002).

In all the cases presented so far, the functional relations among producers, consumers and sellers are driven by forms of trust, and by the prior mutual presence or absence of connections.

In other words, practices are influenced by the territory in which they are carried out, and contribute to creating territoriality (Raffestin 2012, 2015).

Food consumption practices and the social interactions associated with them play a role in giving new meaning to places, and are in turn influenced and conditioned by local specificities and the local culture. Frequenting pubs

and bars is a very different in Asian cities from what it is in European or American cities. The same applies to the consumption of street food (in Italy alone, we can think about the differences between the southern cities of Naples and Palermo and the northern cities of Turin and Milan), which is affected by local ways of acting and thinking, but which may also contribute to the development of new ones. Similarly, food production practices and the social interactions associated with them are also affected by the characteristics of both physical locations (it is not possible to create urban kitchen gardens or kitchen gardens for teaching purposes everywhere) and cultural ones (individuals' predispositions for looking after a common asset, or the desire to create relationships to encourage exchanges and distribution).

At a meso level, the focus of attention is on the study of urban food policies, which enables us to verify how food (and the food system) can contribute towards the creation of local societies, and, vice versa, how situational conditions can influence the development of urban food policies. The expression "urban food policy" refers to interventions planned and implemented by local governments to encourage the development of a sustainable urban food system from an economic, social, and environmental standpoint (Moragues-Faus and Morgan 2015).

Urban policies, which are developing in Global South as well as in Global North (Morgan 2015; Van Veenhuizen 2014), are especially affected by the specificities of the locations, and contribute towards capitalising a territory (Fourcade 2008). Urban policies begin with acknowledgment of local resources, and have the aim of creating local development processes. In other words, by making use of the recognition of endogenous resources, they construct networks of actors who affect the development and enhancement of these same resources. In other words, urban food policies seek to consolidate the relationships among actors in a certain territory, and to strengthen relations between the territory and social action in order to contribute to the development of internally cohesive local societies, characterized by a high degree of equity (Allen 2010) and resilience (King 2008), capable to establish fruitful interrelations with higher spatial levels. There are a number of cities having already implemented food policies. An interesting case study is Portland (Borrelli 2018) where the cooperation among different actors, belonging to different spatial levels (urban, national, county), and an in-depth analysis of the local resources are triggering discourse, practices and policies on the local food consumption and distribution.

Finally, the macro level looks at those practices associated with food that enable territories in which forms of internal and external integration are created and consolidated by utilising its attractiveness to be connected (Le Gales 1997, 1998).

In recent years, the debate on "global food systems" has raised the issue of the need to avoid treating them as totally despatialised, and to focus attention more on the social relationships that define the system. In this raged, numerous questions have been considered that have a powerful spatial value, and which lead food systems to be treated as being made up of situated elements. These situated elements are first of all the places where food is produced, but they are also the complex transformation and distribution chain (Holloway et al. 2007). This is also true for the mainstream food system: as Whatmore and Thorne (1997) have observed referring to the ANT (Actor Network Theory) paradigms, the global nature of the food system is not an intrinsic requirement; rather, it derives from an interconnection of actors, artefacts, living beings, and situated codes that define particular patterns at a global level. This is even more the case of alternative food systems, which are not necessarily of a solely local character, but sometimes create wide-scale networks.

In this context, the example of networks to enhance local products in order to enhance the attractiveness of a city is an especially apt example. The typical products that are associated with the agro alimentary sector have specific local features that play a role in defining the particular aspects of territories and their qualities, and cause them to become significantly noteworthy and attractive in the eyes of outside consumers. In addition to the product itself, the specificity and attractiveness of an agro alimentary product is also expressed through the process that leads to its creation. The entire production process therefore takes on a certain relevance to the specificity of each product, because the production techniques used are part of the tradition, and at the same time adapt to changes in the environmental and social context of the place.

Some transcalar issues: first observations on food sustainability and food accessibility

Concerning the issues that transverse the above mentioned three levels, one of the first questions to be considered is the sustainability of regulation of the food system, and the sustainability of urban, metropolitan, and regional food policies.

Sustainability as it applies to the food system involves both questions such as the use of land and the protection of agro alimentary biodiversity and energy consumption and the price of food products, and the right to nutrition and the value of gastronomic diversity and local identities (Salomone 2009).

Developments towards sustainability of the food system are quite complicated for many reasons. Generally speaking, the sustainable transition of regulation of the food system underwent a significant acceleration around 2007/2008, when in the middle of the economic crisis, the characteristics of what was later defined by Morgan and by Sonnino (2010) and Marsden and Morley (2014) as the "new food equation" were specified. The principal elements of the new food equation can be summarised as follows:

- The price increases in the period between 2007 and 2008, which were stimulated by the outbreak of the global financial crisis: this resulted in over two billion people, many of whom were concentrated in urban areas, falling into a situation of food insecurity;
- The importance of issues around healthy food: the focus on this question was increased above all by food scandals in the past 15 years (such as mad cow disease and bird flu);
- The effects of the food system on climate change: there has been an increase in awareness of the effects of the food system on air and water pollution;
- Conflicts over the use of land: the question of competition for spaces leads to a gradual loss of agricultural land, above all in urban and metropolitan areas.

According to the literature cited above, the combination of all these factors has required confirmation of place-based food system policy models: that is, policies that can use knowledge and the enhancement of local resources (both tangible and intangible) and the implementation of a local network of actors as their starting point. The purpose of these policies is to check food quality, encourage local production in order to reduce transport costs (and thereby affect carbon dioxide emissions), implement awareness campaigns to encourage the consumption of healthy food with a low environmental impact, and regulate the use of land. What emerged at the same time as the 2008 crisis is that problems relating to malnutrition on the one hand, and issues regarding food surpluses and waste on the other, have contributed to the birth of a new equation in the regulation of the food system that has the aim of addressing the problems of food insecurity (healthy food for all) and sustainability (respect for the environment, positive economic impact, and enhancement of the condition of individuals). This new equation must be place-based, and has the ability to redefine the nature of the relationship between urban and rural, and between developing and developed countries. In other words, it means abandoning a hierarchical logic, and imagining these two "worlds" as if they were involved in a continuing dialogue (the term

translocalist-distributed is used here) through the construction of alliances and relational networks.

The reference to a *distributed translocalist place-based system* demonstrates how the operation—and above all the management—of the food system can influence the city-country/urban–rural relationship by contributing to resolving the dichotomy in favour of an integrated approach based on connections that treat the creation of partnerships (whether they be political, economic, or social) is an especially significant aspect. The city-country relationship has seen a quite particular history and development that have followed the evolution of spatial and social transformations. Before the Industrial Revolution, cities arose close to agricultural areas; urban populations were "fed" by the surrounding countryside; the consumption of food followed the cycle of the seasons; and surplus food was as far as possible conserved by means of natural techniques. In the nineteenth century, the transport revolution contributed to the creation of a distance between the city and the countryside, and therefore significantly reduced cities' dependence on natural cycles of food production. At the same time, industrialisation affected productive processes, recognising and specialising them, and ending up by "severing the ties between product and territory, and disconnecting food from its more immediate environmental and cultural milieu" (Sassatelli 2004). Finally, the growth in employment in the industrial and service sectors meant that city-dwellers had greater financial resources with which to purchase the food that they needed, buying it without having to produce it themselves, thereby contributing to making food habits uniform.

Industrial development was therefore the time when the city/country relationship became conflictual, and generally speaking, we can refer to a contrast between city and countryside in which the latter is the weak link in the chain from the point of view of both the functional division of labour and the use of resources. As Steel (2008) reminds us, the cause of this contrast was the spread of artificial fertilisers, means of transport, and railways. By enabling large quantities of food products that could be transported into city centres to be produced far from inhabited areas, the countryside was inevitably made weaker (Steel 2008). In other words, cities became independent from nearby rural areas because they could also "nourish" themselves with products made elsewhere, and this independence translated into greater power for cities compared with the countryside.

Another topic often raised in the socio-spatial debate on food concerns accessibility to food. This is the ability to obtain healthy food at affordable prices. This is influenced by factors relating to supply and demand. From the demand standpoint, the dimensions to be taken into

consideration are economic accessibility and the level of awareness of which foodstuffs are healthier and which are less healthy. From the supply standpoint, attention is on physical accessibility, and therefore on food distribution outlets and the quality of the food on offer.

The subject of accessibility to food is a part of the debate on food security, which must be distinguished from that on food safety. The purpose of food safety is to guarantee that food is safe from a health point of view: i.e., that it does not have side effects, and corresponds to the description on product labels.[3] Food security, on the other hand, is concerned with the certainty of food supplies; it therefore pays greater attention to issues relating to individuals' physical and economic ability to procure healthy food that has been subject to controls.

When we refer to accessibility to food, we therefore mean both the opportunity to physically access food thanks to the presence or absence of infrastructures and the relative proximity of locations where it is possible to find healthy food, and the economic opportunity to access healthy food, in that the conditions exist to be able to do so.

The question of food waste, which also has powerful spatial implications, is complementary and contiguous to the topic of accessibility: while eight hundred million human beings do not have enough food, one-third of global food production is lost or wasted along the chain that takes food from the field to the table; 1.3 billion tons of food for human consumption, with an economic value of approximately 1000 billion dollars a year, never reach the table (Segrè and e Azzurro 2016, p. 14). In order to explain what food waste is, many domestic organisations and institutions, including the SIK (the Swedish Institute for Food), WRAP (the Waste and Resources Action Program), BCFN (the Barilla Center for Food and Nutrition), and the EPA (the Environmental Protection Agency), among others, which have been protecting the environment and consumers for years, have provided a number of very similar definitions. The position that might provide a point of reference has been expressed by the FAO (the United Nations Food and Agriculture Organization), which has offered two definitions of "food waste". The first relates to the principle of so-called "food loss", which is "food losses occurring during the agricultural production, post-harvest and transformation phases of food products". These losses principally relate to the sowing,

cultivation, harvesting, handling, conservation and initial agricultural transformation phases. The second refers to food waste in the strict sense, which is defined as "food waste occurring in the final part of the food chain (distribution, sale, and final consumption)". This is waste that occurs during industrial transformation, distribution, and final consumption (FAO 2011).

Concluding remarks

Before we conclude, it may be helpful to add a few more thoughts in order to underline the value-added deriving from studies on food that adopt a spatialist perspective. To this end, it might be useful to briefly refer back to the distinction between the three levels—micro, meso, and macro—while at the same time emphasising the fact that, as has already been shown in our analysis on sustainability and regulation, many issues associated with food systems must be faced at all levels, and therefore require a trans-scalar approach.

In a context that is increasingly characterised by global urbanisation processes, and which transcends the distinction between city and country, in which processes of explosion and implosion overlap (Brenner 2014), by a growing interdependence between the phenomena at a planetary level, and by fragmentation at a local scale, food is an especially appropriate topic for contributing to an explanation of both aspects of these processes.

At a micro level, the most interesting aspect is the study of spatialist practices generated on the ground and the socio-spatial spheres that they help generate. The places where particular production, distribution, and food consumption practices prevail (from the various types of urban kitchen gardens to places where specialised food products are sold, to restaurants, bars, fair trade dining halls, gastronomic events, cookery competitions, etc.) are urban spaces where specific forms of conduct and social relations, and symbolic references and the way in which relations with natural and manufactured elements are concentrated. These are places where various factors that have some kind of connection within food implode. Each is a bubble with spatial and temporal confines that sometimes resemble one another and are sometimes incompatible. Overall, however, they form a foam, to use Sloterdijk (2004) metaphor, which spreads over the territory and diversifies it.

At a meso level, the main problem that arises is the question of the governance of food and the related policies, which occur at the level of particular urban—or better, metropolitan—agglomerates. The issue here is that of opening channels of communication among the various bubbles in such a way that forms of complementarity are established among them that guarantee greater sustainability of the food system in a part of the territory,

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[3] Food Sovereignty—a form of sovereignty that supports principles of self-determination by populations in the production, distribution, and consumption of food assets, and opposes the homologation of the agri-industrial complex by affirming the diversity of production methods and respect for individual forms of farming (Cavazzani 2009)—is quite different from food security and food safety.

accessibility to nutritional resources—or at least to the basic ones—by all social groups, and reinforcement of the resilience of the territorial system in the face of crises or other unforeseen events. This food governance also enables the relations among the various social groups to be strengthened, the more destructive conflicts to be prevented or mediated, and the level of cohesion among the parties, and between the parties and the environment, to be increased. One effect of this policy is also how it contributes to the identification of areas of the territory, which gives them a distinct identity compared with other areas, and ensures that they conform as urban systems (albeit open and mobile) that can be recognised both by those who are part of them and from the outside. Today, in fact, it is difficult to be able to recognise "natural" or historic borders that render the individuality of cities and territories incontrovertible and irreversible, but it is also true that this individuality, which is constantly being constructed and reconstructed, remains a factor of internal cohesion and advantage in global competition.

At a macro level, the nutrition question refers above all to global food systems and the effects their consolidation, which has been encouraged by neoliberal policies in many countries, has had on the redefinition and nearly always on the increase of the social and spatial inequalities in the various contexts. These inequalities manifest themselves both within the country itself—for example, in the crisis suffered by small rural producers due to competition from the large multinational distribution chains—and among different countries, with the establishment of relationships of domination and dependence due to international commerce in food products or to phenomena such as land grabbing. Substantially, therefore, the food system contributes to shaping the geography of international imbalances and the positions of advantage or disadvantage of the various social groups. Alongside the dominant system, however, alternative food systems are emerging, also at a global level, based on a direct relationship (or at least one with few intermediaries) between producers and consumers, and on the fact that attention is being paid to product quality, the sustainability of productive processes, and the fairness of the compensation paid to producers. Although these alternative systems are limited compared with the mainstream model, they contribute to the design of a diverse food geography and open up the potential for developments that will have the capacity to act more profoundly in the future.

In this article, we have focused above all on the distinction between the micro, meso, and macro levels. In conclusion, however, we should also repeat that many of the questions associated with food require a trans-scalar view, because they raise aspects that involve more than one level at the same time. This is the case, for example, of the issue of sustainability, to which we have briefly referred, and with many other problems, such as those of food surpluses and waste, the relationship between the nutrition cycle and the exploitation of workers, and the relationship among food, migration, and urbanisation. All these topics could benefit from more in-depth study from a spatialist perspective, although this is of course not the only possible approach. In any event, a good deal of work in the area of theoretical refinement, and above all empirical research, still remains to be done.

Authors' contribution
NB and AM worked jointly on this publication. Both authors read and approved the final manuscript.

Author details
[1] Department of Sociology and Social Research, University of Milan Bicocca, Piazza dell'Ateneo 1, Milan, Italy. [2] DIST Interuniversity Department of Regional and Urban Studies and Planning, Polytechnic of Turin, Viale Mattioli 39, Turin, Italy.

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