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THE CHALLENGE OF SYSTEMIC FOOD CHANGE: INSIGHTS FROM CITIES

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Introduction

One of the most distinctive features of food policy is arguably its fragmentation. Researchers have widely demonstrated that food policies, where they exist, are characterized by a “siloes” (or sector-based) approach that fails to recognize the structural interdependencies between food and other resources (particularly water and energy) and between food and other sectors (e.g., the environment, housing, transportation, waste management, infrastructure, etc.) (Lang and Barling, 2012; Artioli et al., 2017; Mendes and Sonnino, 2018). Part of the problem is that food sits within a global governance context that is also very fragmented, with responsibilities, jurisdictions and priorities often spread across a broad range of organizations and institutions – none of which has the capacity to address problems holistically (von Braun, 2009; Candel, 2014; McKeon, 2015; Moragues-Faus et al., 2017).

The literature has extensively criticized the “inconsistencies, overlaps and gaps” (Slade et al., 2016: 37) produced by fragmented food policies and governance, calling for enhanced coherence and coordination to ensure that food initiatives contribute to shared goals and outcomes (Misselhorn et al., 2012; Pereira and Ruysenaar, 2012). In all, however, this body of research has failed to become transformative; as Candel (2014: 598) explains, scholarship in this area has remained mostly abstract and normative – that is, it focuses on what an ideal food governance context should look like, rather than how it is actually functioning. In addition to being constrained by the paucity of evidence-based studies, academic debates on food policy tend to be framed within specific disciplinary discourses that emphasize very different threats, priorities and scales of intervention. As Eakin et al. (2017: 760) have recently pointed out, “there is relatively little literature that addresses food system sustainability from a truly comprehensive perspective, encompassing the diversity of food system activities, drivers and outcomes”.

Urban areas are emerging as important empirical contexts to progress debates on the nature and functioning of food systems and to understand the scope for a policy engagement with them. As researchers are beginning to note, multi-actor urban governance coalitions are seeking to enroll pre-existing fragmented initiatives by scaling up food-related activities and advocacy to address broader policy concerns (Mansfield and Mendes, 2013; Cretella and Buenger, 2016). Cities, in other words, are becoming strategic transition nodes that can exploit the policy vacuum created by the absence of comprehensive, coherent and integrated national and supra-national food policies to develop more sustainable food systems. Indeed, academic literature suggests that city governments in both the global North and the global South are imposing themselves as the optimal scale for food policy innovation, often through the adoption of an integrated and systemic approach (Rocha and Lessa, 2009; Sonnino, 2016 and 2017; Artioli et al., 2017). To date, however, no research has specifically been conducted on the

meanings and goals attributed to such an approach by actors who are concretely involved in its implementation. How do municipal policy-makers interpret and apply a systemic approach to food? Does food systems thinking hold a real transformative potential? More broadly: is there a gap between food systems theory and practice?

To begin to address these questions, in this paper we present and analyze data collected from 33 cities that are members of EUROCITIES (a network of the local governments of over 140 of Europe's largest cities) and that, in most cases (85 per cent), are formally committed to the Milan Urban Food Policy Pact (MUFPP) – a protocol, launched during the 2015 Expo in Milan, which aims to develop more sustainable urban food systems through city-to-city collaboration and the identification of a broad range of sustainability targets for city governments. Significantly, the MUFPP, which has currently been signed by more than 160 cities across the globe, includes an explicit reference to the importance of adopting a systemic food policy approach. As stated in the preamble of the document, “since food policies are closely related to many other urban challenges and policies, such as poverty, health and social protection, hygiene and sanitation, land use planning, transport and commerce, energy, education and disaster preparedness, it is essential to adopt an approach that is comprehensive, interdisciplinary and inter-institutional”¹.

Based on data collected through a semi-structured questionnaire distributed through EUROCITIES' and the MUFPP's official communication channels and through the organization of a focus group with 25 European city officers and food policy advisors, our analysis of the ways in which food systems are envisioned and addressed on the ground begins to add empirical weight to ongoing theorizations of systemic approaches – especially in relation to their potential for stimulating sustainable food transformations.

Conceptualizing the food system approach: from theory to (urban) policy

Historically, food policy has not been approached systemically. A vast body of literature focused on food security and sustainability, in particular, suggests that the attention of both scholars and policy-makers has tended to focus on *either* the supply *or* the demand side of the food system. Proponents of the first approach, commonly known as “productivism”, are fundamentally concerned with the efficiency of the food production process in a global context of growing population numbers, fast urbanization and increasing competition over resources. From a productivist perspective, scientific and technological innovations are key to achieve the paramount goal of enhancing agricultural productivity while limiting environmental damage (Firbank et al., 2018).

Demand-led approaches, by contrast, emphasize a range of issues that constrain people's ability to access healthy and nutritious food. Under these approaches, the main challenge is not food production, but, rather, the persistence of a

¹ See <https://www.milanurbanfoodpolicypact.org/text/>

complex metabolism of multi-scaled inequitable relations that encompass the entire political ecology of the food system (Garnett, 2013; Sage, 2013).

These two schools of thought have largely failed to extend their views and attention beyond the two extremes of the food system. As Sonnino et al. (2014: 176) summarize, the underlying assumption of productivism is that, once we manage to sustainably produce enough food, the global market will solve the distribution problem. For access-based approaches, in turn, the assumption is that, once we have addressed the distribution challenge, food producers and the industry will adjust to changes in demand.

Over time, a constant increase in numbers of food insecure people, coupled with persistent trends of food price volatility, social unrest and the loss of resources, have demonstrated the inadequacy of confining analytic focus and policy intervention at the two ends of the food system. Scholars have begun to call for a new policy and research agenda that accounts for the “deeply inter-locking nature of economic, social and environmental systems” (Misselhorn et al., 2012: 10; see also Lang and Barling, 2012) – or, more specifically, for the wide range of economic, social and environmental dynamics that interact with each other at various scales, making food part of a complex *system*.

Within this literature, much effort has gone into conceptualizing food systems and demonstrating the theoretical and practical advantages of such conceptualizations. A decade ago, Ericksen (2008a: 234-235) provided one of the earliest (and still most influential) definitions of food systems as comprising “the interactions between and within biogeophysical and human environments, which determine a set of activities; the activities themselves (from production through to consumption); the outcomes of the activities (contributions to food security, environmental security, and social welfare)”. To capture the complexity of food systems and fully understand their vulnerability to environmental change, Ericksen stressed the importance of an inter-disciplinary and inter-scalar focus (see also Ericksen, 2008b) – or what she calls a “systems approach”. In her view, there are two main benefits associated with the adoption of this type of approach: first, it makes it possible to link “food security” outcomes – which she considers “the principal normative objective of food systems” (Ericksen, 2008b: n/a) – to the cross-scale and cross-temporal processes that drive vulnerability. Second, a systemic approach, according to Ericksen, has the capacity to take into account feedbacks and cross-scale interactions that may increase food system vulnerability in the future.

Building on Ericksen’s conceptual framework, Ingram (2011) has also highlighted the potential of a food system approach to uncover and balance synergies and trade-offs across a range of societal goals – and, hence, to facilitate policy discussions about adaptation options all along the food chain. Other scholars have framed this discussion around the concept of “systems thinking” – or the basic idea that “complex issues are linked, there are multiple actors in the system and they are connected, and integrated solutions are required” (MacRae and Donahue, 2013: 5). As an approach, systems thinking suggests that, in complex systems such as food, causality is not necessarily evident, known, stable

and linear; there are “causal loops” between multiple variables (Allen and Prosperi, 2016: 958) that call into question a range of different issues and actors (Misselhorn et al., 2012: 12). By uncovering the “story” told by these causal loops, systems thinking maps the uncertainty that characterizes the structure, conduct and performance of a complex system. In other words, a systemic perspective unveils emerging patterns, relationships and phenomena that would not be visible under a siloed approach. In so doing, it “opens up possibilities for the reconfiguration of existing policies” (Artioli et al., 2017: 219). Indeed, when applied to the framing of problems, systems thinking helps to decompose them and analyze them from different perspectives, capturing differences in viewpoints and roles between stakeholders. In this sense, as Banson et al. (2018: 55) state, systems thinking is “a framework for taming complexity [...] [and] foster[ing] maximum collaboration [amongst] all [...] stakeholders”. As such, it is increasingly seen as an integral dimension of a sustainable global bioeconomy. As El-Chichakli et al. (2016: 35) have recently stated, the consolidation of emerging bio-economic initiatives around the world will depend, amongst other things, on the capacity to devise an “interdisciplinary approach that emphasizes systems thinking, strategic planning and evaluating environmental, social and economic performance, as well as an understanding of technologies and local specifics”.

With regard to food, systems thinking can be defined as a multi-disciplinary and multi-actor approach that aims to demonstrate that the multi-scaled challenges of the current configuration of global food systems are not isolated issues, but indicative of underlying systemic socio-ecological problems. Under a systems thinking approach, for example, food consumption issues would not be framed as a matter of individual access or choice; rather, they would be seen as the result of the interplay between a range of different factors -- including, for example, cultural trends, education and the physical food environment. Likewise, food production problems would not be addressed purely through technological intervention (‘sustainable intensification’), which, on its own, could not eliminate the socio-ecological harms that are embedded within a spatially uneven political and economic landscape that too often precludes small farmers from adopting technological innovations.

In sum, a review of existing literature shows that thinking of food systemically entails two main things: first, a consideration for the global environmental and socio-economic dynamics that affect (and are affected by) all activities involved with the production and consumption of food; second, and partly related to this, a focus on the relations and connections (or lack of) between all actors involved with those activities at different stages of the food system (not just production and consumption but also processing, packaging, retailing, distribution, transportation, storage and waste management). In theory at least, systems thinking gives analytic and practical emphasis to interactions, integrations and relationalities between actors and activities within the food system and between food and other relevant systems.

So far, the debate on food systems has not gone much beyond the abstract level. As discussed earlier, theorists have provided detailed and often sophisticated

descriptions of the nature and functioning of food as a system, highlighting its potential to contribute to achieve a range of societal goals in the socio-economic, cultural and environmental domains. Little effort has been made to test the perceived benefits of a systemic approach to food against the goals and objectives of actors who are attempting to apply it in practice².

Cities provide an excellent context to begin to fill this gap and add an empirical dimension to the debate on food systems. Planners, architects and urban designers have long been exploring the intimate intersection between urbanism and food. In her seminal book, Steel (2009) analyzes the complex co-evolution between food system practices and urban development and the ways in which this reflects in the design of a city, its economy and its private and public spaces. Using a similar approach, Parham (2015) examines food's historic relationship with spatial design and the ways in which this shapes the city as a more or less sustainable and convivial place. There are also specific conceptual frameworks offered by urban designers to illustrate the contribution of food to place-making through a systemic approach. One important example in this sense is the concept of Continuous Productive Urban Landscapes (Viljoen et al., 2005), intended as "a coherent strategy for the introduction of interlinked productive landscapes into cities thereby creating a new sustainable urban infrastructure and supporting a redefinition of open urban space usages" (Bohn and Viljoen 2010: 149). An important implication of this concept has been a new emphasis on the potential of urban agriculture as a structural and structuring urban asset (Ilieva, 2016), which, over time, has been further explored by practitioners through, for example, the analysis of Troy Gardens in Madison (Wisconsin), often considered to be a quintessential example of successful integration of multiple land uses and functions such as food production, commerce and housing (Gorgolewski et al., 2011; Timber 2012; Ilieva, 2016).

With the majority of the world's population now living in urban areas, the role of cities in both perpetuating and addressing interconnected social, environmental and economic crises has heightened. As places in which "poverty, food insecurity, diet-related health inequalities and retail food restructuring are perhaps most visible" (Bedore 2010: 1418), urban areas are increasingly recognised as strategic sites to begin to address complex socio-ecological issues that have disrupted the internal metabolism of the food system. Indeed, researchers and policy-makers alike are beginning to focus on cities not just as the spatial dynamic through which the interdependent pressures that shape food insecurity converge (Morgan and Sonnino, 2010), but also as places where new food "politics of the possible" are being created (Blay-Palmer et al., 2016). An emerging but still very fragmented literature is extolling the potential of more place-based urban food governance approaches that are attempting to counteract the regressive impacts of neoliberalism by nurturing civic engagement and supporting collective action. Urban food policies are often seen

² Important exceptions in this regard are provided by recent efforts to analyze concrete food system interactions (Kopainski et al., 2018) and develop metrics that can capture them (Allen et al., 2018). Also relevant is Kopainski et al.'s (2017) work with small farmers in Zambia to adapt participatory system dynamics modeling at the community level and support local capacity-building and decision-making in relation to food security.

as tangible efforts to develop synergies between diverse stakeholders and traditionally disjointed policy domains (Wiskerke, 2009) that can bolster urban and regional development (Sonnino, 2009; Mah and Thang, 2012).

In sum, as several scholars have pointed out, through a range of practices that promote joined-up food policies (Mansfield and Mendes, 2013), enhance civil society participation in the governance of food (Hassanein, 2003; Levkoe, 2011; Morgan, 2015) and incentivize trans-local collaborations and knowledge-exchange (Sonnino et al., 2016), cities are recasting themselves as food system innovators. For pioneering city governments, “viewing food systemically serves as a lens for analyzing food as part of the urban metabolism, with flows between components and interfaces with other relevant thematic fields of urban planning” (Kasper et al., 2017: 1011). As identified by Doshi (2017), urban metabolism here is more than just a conceptual metaphor. It is an embodied process that links health, consumption, waste and resource distribution in deeply intimate and political ways. In other words, when translated into practice, urban metabolism entails, first and foremost, the capacity of viewing food as a multifunctional public good that, by its very nature, raises the need for a systemic, integrated and cross-sectoral policy approach (Morgan, 2015; Sonnino, 2016 and 2017; IPES-FOOD, 2017).

Food Systems Thinking in Cities: The Research Approach

Our research aimed to understand the practical dimension of a systemic approach to food and identify interactions and nodal points in the food system that tend to be emphasized or neglected by key players in charge of implementing this kind of approach. Methodologically, our project was designed around a two-stage process. Following an extensive review of both academic and “grey” literature on urban food, during the initial phase we designed a large questionnaire, semi-structured around 62 questions, which was distributed online to all members of EUROCITIES and all signatory cities of the MUFPP. Through these two communication channels, we reached more than 150 cities all over the world, and all those that responded to the questionnaire were included in our sample – that is, 28 European cities (in Italy, Sweden, France, the UK, Romania, Albania, Latvia, Ireland, Spain, Slovenia, Croatia, Portugal, the Netherlands, Greece, Belgium and Germany³) and 9 extra-European cities from Africa (Antananarivo, Douala and Dakar), Australia (Melbourne), the Middle-East (Tel-Aviv), China (Shanghai), Latin America (Quito and Mexico City) and Canada (Toronto). In all, this research sample is well representative of the diversity of the urban world, given not just the location of participant cities in different regions, but also their enormous variation in terms of size, geography and socio-economic context.

³ These include: Cork (Ireland), Rome, Genoa, Milan, Modena, Bari and Parma (Italy), Paris and Lyon (France), Mollet Del Valles, Vitoria-Gasteiz, Bilbao, Mieres, Zaragoza and Barcelona (Spain), Ljubjanja (Slovenia), s’Hertogenbosch and Amsterdam (Netherlands), Zagreb (Croatia), Porto (Portugal), Brussels and Bruges (Belgium), Tirana (Albania), Gothenburg (Sweden), Riga (Latvia), Preston (UK), Athens (Greece) and Bucharest (Romania).

In addition to including some generic questions that aimed to contextualize ongoing food initiatives in relation to the size and morphology of the city, its climatic conditions and its development and governance context, the questionnaire asked specific questions on the nature and extent of city governments' systemic engagement with food. Organized around the six categories of the MUFPP Framework of Action (i.e., Governance; Sustainable Diets and Nutrition; Social and Economic Equity; Food Production; Food Supply and Distribution; and Food Waste), such questions elicited information about key actors and stakeholders involved with the different food initiatives, the policy instruments utilized for their implementation, the replicability and adaptability of existing food policies, the budget allocated to them and the presence or absence of collaborative relations between different governance levels and city departments – what the questionnaire defined as a “multi-level and cross-sectoral effort”. In all sections, city officers were also asked to identify emerging research and policy needs and were provided with an opportunity to add free-text comments to their answers.

During the second stage of the research, insights obtained through the analysis of the responses to the questionnaire provided the basis for the structuring of a focus group (held in Birmingham, UK, in 2017) with 25 representatives (from municipal departments of health, environment and planning, in addition to a few food policy advisors) from 22 European cities that were contacted through EUROCIITIES' official communication channels. A few signatory cities of the MUFPP volunteered to join the focus group once they informally heard about it from members of EUROCIITIES. In the end, our sample for the focus group included both cities that had responded to the questionnaire (i.e., Gent, Lyon, Porto, Milan, Preston, Athens and Gothenburg) and cities that had not been involved with the first stage of the research (i.e., Utrecht, Birmingham, Turin, Venice, Almere and Sandwell). Detailed notes were taken by the researchers during the focus group (which, like the questionnaire, concentrated on cities' engagement with the six thematic areas of the MUFPP) and later triangulated with data collected through the semi-structured questionnaire. Based on our research questions, the analysis focused in particular on the ways in which a food system approach is interpreted, characterized and ultimately implemented by key food policy actors operating within very different urban contexts.

Embedding systemic thinking into urban food policies

Comprehensive food policies, strategies or plans are currently under implementation in 29 per cent of cities in our sample. Another 31 per cent is working in this direction, while 34 per cent of sampled cities only have some food-related projects in place.

Despite this diversity of food policy approaches and development stages, there are important commonalities in the narratives utilized to describe municipal intervention on food systems, namely: a tendency to recognize the complex interconnections between food and other policy priorities and areas; an emphasis on the creation of an inclusive food governance context; but also, as we

will show, a low level of engagement with food system actors operating outside of the production and consumption spheres and at higher governance scales.

Connecting urban food with other complex systems

Virtually all city representatives highlighted the role of food within broader socio-economic and environmental policies. For some, the recognition that “food can tackle multifaceted issues”, as stated by a city officer from Preston, is the main innovation that urban governments have introduced in the food policy arena. As described by a representative from Quito, at the heart of this innovation is the acknowledgment that an urban food policy

solves [...] several problems. It is an idea that generates value for others, replicable, sustainable, and [it] generates new relationships of collaboration.

Although specific motivations behind the political decision to engage with food vary significantly from city to city, there is substantial overlap in terms of goals and priorities, which are often discussed in association with three main policy domains: health and well being; the environment; and economic and community development.

Health and well being are especially prominent themes in the narratives surrounding urban food policy. The city of Porto, for example, identified as its main ambition “the integration of *all* policies related to food and health”. For cities as diverse as Toronto, Gothenburg, Edinburgh and Ljubljana the overarching policy goal is the provision of “healthy” food. Mexico City referred to its efforts to coordinate all food and nutrition initiatives emerged at the urban level as the main policy innovation introduced by the city government in recent years.

Significantly, discussions about policy integration around food, health and well being often evoke another pressing policy issue: the fight against poverty. Representatives from cities in the global North (e.g., Preston, Birmingham and Mieres), in particular, often referred to the vicious cycle (or ‘causal loop’, in systems theory language) between socio-economic deprivation, access to healthy food and obesity as one of their main policy concerns. Interestingly, though, our data highlight a notable gap in the framing of the problem, which was never discussed in relation to questions we asked about the role of the physical food environment (i.e., the distance or density of fresh food stores) in perpetuating the problem of access to healthy food (especially in disadvantaged neighbourhoods).

Indeed, municipal food policy-makers tend to associate the term “environment” with the global, rather than the urban, scale. When describing initiatives introduced to enhance the production of organic food in the peri-urban area (Zagreb) or its consumption in the city (Toronto and Paris) and to promote the recycling of food waste (Gent, Almere and Birmingham), city officers do not give much emphasis to their local environmental benefits. There was some mention of the need to enhance the quality of water and air in urban areas, but what

emerged in this discussion is primarily a sense of global environmental responsibility – i.e., the unique contribution that cities can make to the fight against climate change and, more broadly, to the challenge of meeting “new environmental needs”, as stated by Toronto.

Spatial proximity (the local scale) becomes a prominent theme in relation to the third policy area that cities associate with food: economic and community development. Significantly, spatial proximity was never discussed as an urban design or place-making principle. For city officers, the kind of proximity that seems to matter in development terms is the one between urban and rural areas, given the alleged potential of food re-localization strategies (and, specifically, short supply chains) to generate employment (Zagreb and Edinburgh). The narrative changed, however, when cities (such as Zaragoza and Dakar) explicitly framed their objectives for economic and community development in terms of urban “food sovereignty”. The emphasis in this case is on the socio-material relations that need to be created or strengthened *within* urban areas. Indeed, as deployed by city representatives in our sample, the concept of “food sovereignty” entails guaranteeing the “right to food” for every citizen through initiatives such as “social kitchens” for the homeless (Birmingham and Porto), projects that involve refugees and unemployed citizens in the collection or recycling of food waste (Turin, Venice and Gent), school meal initiatives to enhance the inclusion of immigrant children (Modena) and neighborhood-based initiatives, such as WhatsApp groups and “solidarity fridges” (Gothenburg, Bologna and Brussels), to incentivize citizens to donate unutilized foods to the poor. In contrast with mainstream interpretations of the concept (see Sonnino et al., 2016), as an urban policy goal food sovereignty is not about self-sufficiency in food production; it is about social justice and the designing of more inclusive urban foodscapes.

Creating multi-actor urban food governance contexts

The tendency to see food as a tool for social inclusion translates into a pervasive emphasis on citizen participation and active involvement in the formulation and implementation of urban food policies. In some cases, this is accompanied by an explicit effort to downplay the role of the State in the food governance arena, as explained by a city officer from Utrecht:

The government facilitates and connects, but doesn't take the lead by developing a policy; civil society and the private sector should spur innovation, with the government providing institutional support and political backing.

This is indeed the approach behind Vitoria-Gasteiz’s urban food strategy, which, for several years, was co-produced by civil society organizations and private sector actors – with the city government joining in at a later stage. Other examples include the city of Milan, which involved more than 1,000 representatives from academia and civil society in the consultation process that preceded the designing of their urban food policy, and Mexico City’s *Comedores Comunitarios* (community canteens), one of the most compelling examples of

collaborative food governance. Established in 2009 with the aim of feeding the urban poor, Mexico City's "community canteens" (106 in 2016, serving more than 8,000 meals per day in the most deprived areas of the city) are governed through a partnership that involves the city government (which provides technical, administrative and financial support, as well as non-perishable food donations from the central wholesale market and water donations from the central municipal system), local citizens (who run the canteens) and the private sector, which collaborates through donations and maintenance services.

Confirming the findings of existing research in this area, some cities (especially in the global North) stated that they have developed specific governance arrangements to sustain citizen participation in the implementation of their food policies. These arrangements often take the form of a food policy council (Gent, Melbourne and Bruges) or other types of multi-stakeholder platforms such as the "Food Commission" in Turin, which involves as many as 45 food system actors (from both the public and the private sectors) and researchers in the implementation of the city's strategic plan.

In all, however, less than half of cities in our sample (43 per cent) have established formal and inclusive food governance mechanisms. In some cities (e.g., Barcelona and Milan) food policy is a responsibility of a single designated officer, whereas in others it falls under the remit of a specific municipal department (e.g., social health in Birmingham and Mexico City, environment in Brussels and Tel Aviv). A smaller number of cities in our sample have established formal steering groups of representatives from different departments (e.g., Preston and Melbourne) or more informal working groups that operate on a case-to-case basis (Mollet des Valles and Ljubljana).

Where they exist, multi-stakeholder partnerships do not have a significant representation of actors from higher governance scales. In no case we found the presence of national government representatives in the urban food governance structure, and only four cities in our sample (Barcelona, Paris, Bruges and Modena) have formally involved representatives from their regional government in the governance arena. As explained by a city officer from Mieres, cities find it easier to collaborate with one another through participation in trans-local networks such as the MUFPP, EUROCITIES and C40 (which brings together more than 90 megacities committed to addressing climate change) than to involve higher levels of governance.

Developing urban food systems: the "missing middle"

Data collected about the implementation stage confirm a widespread effort by cities to progress what Ljubljana defined as a "holistic" approach to food that reconnects the urban and the rural domains. According to a representative from Antananarivo, such an approach entails the formulation of a food policy that "embraces connected issues, such as urban agriculture, [...] reducing food waste, food sharing, and strengthening [...] food production and food value chains".

In practice, however, this aspiration does not translate into the adoption of a fully integrated and systemic approach to food provisioning. In general, cities' attention remains largely focused on the two ends of the food system, with a range of initiatives in place to strengthen their connections (or, at least, "make them visible", as stated by a city officer from Gent). These include, for example, the introduction of local box schemes (Almere), support for the development of urban gardens (Venice), initiatives designed to promote the online marketing of products from farmers' markets (Lyon) and investment in the creation of urban food markets (Barcelona and Tirana). When city officers mentioned initiatives that engage with multiple stages and actors of the food system they made reference to national projects such as the "Right Price Menu" in Portugal, where restaurants have been encouraged to reduce their portion sizes and prices to achieve the dual goals of reducing food waste and making their meals more accessible to the poor. By and large, however, specific questions about food supply and distribution remained unanswered, nor is there much reference in our data to initiatives taken to address 'causal loops' that embrace food system activities other than production and consumption – e.g., processing, packaging, storing, transportation.

There may be a correlation between this gap in food systems thinking and the absence of multi-level governance arrangements. Indeed, in many countries infrastructural development issues are a responsibility of regional or national authorities, which often play a substantial role also in relation to other policy areas that our research identified as significantly underdeveloped at the urban level. One notable example is public procurement, a multi-level policy tool that, as demonstrated in the literature (see, for example Morgan and Sonnino, 2013), holds significant integrative potential for the food system, embracing as it does multiple objectives, stages and actors. In the absence of cross-scale collaboration, it is probably not surprising that only 37 per cent of cities in our sample have introduced procurement guidelines to incentivize the provision of local, seasonal, organic and Fair Trade products or the use of recyclable packaging in their public canteens (i.e., schools, hospitals and care homes).

The lack of a multi-level and enabling food governance context may not be the only factor responsible for cities' lack of emphasis on the "missing middle" – that is, the various stages in the food system that connect production with consumption. Our research also uncovered substantial knowledge gaps that are bound to stymie systemic policy intervention by city governments. For instance, 80 per cent of cities in our sample stated that they do not know where their food comes from and that they would not be able to quantify what percentage of food they import and export, and only 40 per cent of all cities involved in our study could estimate their financial investment on food. Notable exceptions here include Paris and Barcelona, which have collected data about the provenance of their food, and, outside of Europe, Shanghai and Quito, which demonstrated an awareness of the percentage of food they produce and consume locally.

TABLE 1 HERE

Addressing the Challenges of Systemic Food Change: Some Conclusions

Based on existing scholarship, embedding a systemic approach to food into policy entails two fundamental changes: cross-sectoral integration, or the recognition that food systems are inextricably linked with other complex systems, sectors and policy priorities; and what Eakin et al. (2017) have recently called “modularity”, or a practical consideration of the ways in which the different components of a food system are interconnected.

Findings from our research indicate that city governments often emphasize the contribution of food to other policy priorities – especially health and well being, the environment and socio-economic development. In this context, reference to concepts such as “food sovereignty” and the “right to food” may signal an effort by city governments to ensure that access to healthy food for the urban population is not threatened or diminished by other policies. Our data also suggest that, in some cases, policy integration efforts go hand in hand with an important re-organization of the food governance context, which is indeed experiencing a significant shift from top-down government to more collaborative governance. In this sense, our study confirms arguments already made in the literature about the relevance of urban-based governance innovations in enhancing multi-actor participation in food policy.

The novelty of this approach should not be underestimated, given its potential to overcome the unwarranted fragmentation that has historically characterized the food governance context and to enhance coherence, efficiency and transparency in the policy-making process. However, our research has also identified important gaps and weaknesses that counterbalance the optimistic stance of most urban food scholarship literature. In the latter, emerging governance arrangements (such as food partnerships and food policy councils) tend to be depicted as “spaces of possibility” where multiple actors envisage, develop and seek to enact “place-based” solutions to complex socio-economic challenges. Our data, however, show that city governments are failing to engage with the relational nature of place – the fact that, as human geographers have long been arguing (in relation to food, see, for example, Jackson et al., 2008), all processes of place-making are produced by forces that are, at the same time, local and global.

As described earlier, in the narratives of municipal food policy-makers different scales evoke different problems and different levels of responsibility. Economic development issues, for example, are almost invariably connected with the urban/local scale; the environment, in turn, is framed as a global problem and intervention context. Clearly, scale is interpreted as ontologically fixed, rather than as an outcome of contested and power-laden processes that co-constitute (and constantly re-configure) the social and the natural.

From a practical perspective, there are important implications of a too rigid understanding of scale and place-making processes. In terms of governance, participation, for example, is indeed horizontally wide, embracing as it does multiple organizations and actors from civil society, but it does not extend as

widely to the “vertical” governance axis – as evidenced by the absence in the emerging urban food governance arena of key actors operating at higher scales (i.e., representatives from regional and especially national governments).

In addition to creating the danger that urban food innovations remain spatially isolated and politically fragile, the lack of engagement with the vertical governance axis maybe an important factor behind the striking knowledge gaps that our research has identified. According to Caraher and Coveney (2004), a policy approach that is capable of embracing the many complex (and often unsustainable) linkages between different stages of the food system must be, at the same time, “downstream” and “upstream”. There are important feedback loops that need to be created within the multi-level governance context to ensure that food policy remains responsive to emerging needs and external drivers of change.

In reality, however, our research shows that most city representatives lack any understanding of food flows and modularity – that is, the relations (or lack of) between different food systems (e.g., local and global, urban and rural) and between stages within such systems (from production all the way through to post-consumption). As a result, key strategies that could play a vital role in realizing the potential of a systemic approach to food remain largely unutilized. This applies not just to policy instruments that intervene on the physical infrastructure of the food system (e.g., food hubs, markets, landscape continuity, etc.). Tools that engage with the more “invisible” infrastructure of the food system (such as public procurement) and that could be instrumental to establish tighter physical, economic and socio-cultural connections between food system actors are also widely neglected.

Our research also highlights the existence of significant knowledge gaps, which confirms the need for evidence-based sustainability metrics and standards that uncover the tangible linkages (or lack of) between food security, nutrition, diets, health, agricultural productivity, resource use and environmental costs and benefits (Beddington et al., 2012; Tilman & Clark, 2014). Urban communities would benefit from comprehensive assessments that examine the local connections between food production, distribution, consumption and waste disposal and measure their impacts on the environment, human health and livelihoods. An appropriate set of indicators would enhance understanding by city governments of trends and relationships between elements within the food system, thereby helping them to detect gaps that need to be addressed, to monitor their progress and to identify investment needs (Prosperi et al., 2015).

Both theoretically and practically, this research then raises the need for a cultural change. Thinking of (and acting on) food systemically entails, first and foremost, the capacity to overcome pervasive fixities, rigidities and ontological divides, including those between different disciplines. Our research findings highlight the importance of developing new interdisciplinary collaborations between urban designers, planners and social scientists to enhance understanding of the ways in which changes that occur at the micro-level of ordinary food practices (e.g., shopping, eating out, disposing of waste, etc.) in

both the private and the public spaces of a city bring about larger infrastructural transformations – and how the latter, in turn, may affect food-related social practices. Without this kind of relational approach to the analysis of the role of food in place-making processes, it will not be possible to identify the socio-ecological and political reconfigurations that are really needed, across places and scales, to meet the challenges of systemic food change.

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