

Exploring the food-climate nexus through a justice lens: insights from urban experimentations.

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Abstract

Several cities are adopting re-localized food systems as a vehicle to achieve climate mitigation and adaptation objectives, implementing initiatives like productive nature-based solutions, plant-based food procurement, sustainable food environments, net-zero food waste strategies, and more (IPES Food, 2023). However, despite the potential of these urban experimentations to bridge food and climate sustainability, the urban sustainability literature has largely overlooked the food-climate nexus as a critical arena for achieving place-based sustainability, and for addressing socio-ecological justice. Highlighting this gap, this reflective paper examines how cities are experimenting with a new socio-ecological agenda at the cross-roads between food and climate, positioning themselves as potential agents of transformative change within this nexus. Through theoretical discussions and empirical vignettes, the paper particularly highlights key tensions in combining diverse dimensions of justice through the food-climate nexus.

For a time, we had come to believe that civilization moved in the other direction—making the impossible first possible and then stable and routine. With climate change, we are moving instead toward nature, and chaos, into a new realm unbounded by the analogy of any human experience (David Wallace-Wells, 2020, *The Uninhabitable Earth*).

Keywords: Urban food planning, urban climate action, food-climate nexus, governance experimentations, justice

Introduction

Climate change is undoubtedly one of the most pressing challenges of our time. Given the increased frequency and impact of socio-ecological crises – and in light of contested discourses around the adequacy of timeframes, scales, and scopes of action (Scoones et al., 2020) –, a sense of urgency and uncertainty permeates perceptions about the future of society and urban areas (Wallace-Wells, 2020). In this context, scientists and experts have been emphasizing the urgent need to act in order to reduce greenhouse gas emissions, given the already devastating effects caused by global warming to our planet (IPCC, 2023). This call for action demands ‘deep, rapid, and sustained global greenhouse gas emissions reduction (that) can limit future changes’, given that ‘adaptation options that are feasible and effective today will become constrained and less effective with increasing global warming’ (IPCC, 2023, p.18).

The link among diverse (urbanisation-related) socio-ecological systems – such as land-use, transport, energy, housing, building stock etc. –, and the climate emergency is becoming part of common knowledge, at least in the discourse. Within those socio-ecological systems, food systems are increasingly regarded as major contributors to global anthropogenic greenhouse gas emissions, with food production alone responsible for approximately one-third of global emissions (Garnett, 2011; IPES Food, 2016). To this adds the impact of other food chain activities, not least food waste, given that around one-third of all food produced for human consumption (approximately 1,300 million tons per year) goes to waste all along the food supply chain (FAO, 2022).

Acknowledging this reality of crisis and emergency, since at least three decades, literatures on climate urbanism and urban climate planning have started to highlight the role of cities as providing responses to the climate emergency, through diverse modes of urban climate action. Particularly, this literature recognises how urban areas have become pivotal in governance and planning efforts aimed at meeting the Paris Agreement targets of limiting global warming to below 1.5°C or 2°C (Bulkeley et al., 2012; Busch et al., 2018). To stress this aspect, authors such as Bulkeley (2021) have emphasised a shift in urban climate planning and governance approaches occurring over the past three decades. This passage has brought urban climate action from a sporadic type of intervention based on the voluntary or informal engagement of municipal authorities, to an increasingly ‘strategic’ approach, where urban climate planning becomes part of the programmatic agenda of cities with respect to priorities of economic and urban development (Bulkeley, 2021, p. 267). Moreover, what distinguishes contemporary modes of approaching urban climate action, according to the author, is the increased accent on the cli-

mate-connected city. Climate-connected urbanism invites to think urban climate action as intrinsically related to issues such as urban consumption of goods and services, wider sustainable development agendas (biodiversity, energy, water, food systems, ...), and issues of social justice.

In this context of enhanced claims for connected action, this paper argues that the food-climate nexus has not received adequate attention. Particularly, urban sustainability scholarship has so far missed to explore the interrelation between food and climate as an arena of urban sustainability governance and planning, and as a testing ground for a connected eco-social justice agenda. Particularly underexplored issues are: a) the key tactics adopted by place-based initiatives to implement and govern sustainability actions at the cross-road of the climate-food domains, and b) the pathways pursued by actors to address different dimensions of justice, including distributive, procedural, recognition and restorative justice (de Bruin et al., 2024). To address these aspects, this paper will draw on insights from literature spanning both the urban food and climate (justice) domains. First, the paper will draw from work on climate urbanism, planning, and mundane innovations (Castán Broto, 2020; Robin and Castán Broto, 2021) to shift the focus from mitigation or adaptation as policy frameworks, to the understanding of the innovative and transformative potential of on-the-ground actions (see section 2). Second, the analysis will argue about the emergence of a recent wave of urban food movements visibly linking food systems to climate action through place-based experiments and higher scale networks (IPES Food, 2023; the Barcelona Climate Challenge) (see section 2.1). Bringing on board critical insights on justice from the urban food and climate literatures (Amorim-Maia et al., 2022; Avelino et al., 2024; de Bruin et al., 2024), the analysis will then shed light on combining diverse dimensions of justice through the food-climate nexus (section 3). Starting to connect theoretical reflections to empirical evidence, this contribution will briefly illustrate few examples of urban (planning) experiments at the food-climate intersection spanning different sections of the urban food system. Particularly, the paper highlights how these initiatives enact sustainability governance strategies and deal with issues of justice as outlined above (section 4). Based on the analysis, the paper will conclude by highlighting the importance of learning from place-based practices, and understanding justice as a dynamic and continuously negotiated nexus (section 5).

2. Experiments in climate urbanism and planning

Climate governance has typically been shaped by international multilateralism and the leadership of nation-states, reflecting the global nature of climate challenges and the need for coordinated response (Bulkeley et al., 2014). Forums like the United Nations Framework Convention on Climate Change (UNFCCC) have been providing platforms for negotiating agreements such as the Kyoto Protocol and the Paris Agreement, which establish emission reduction targets on a country level. In this context, the year 2015 has constituted a pivotal moment, where through the adoption of the Paris Agreement, national states have come together to commit to limiting the rise in global temperatures to well below 2°C above pre-industrial levels, while also striving to restrict the increase to 1.5°C by the end of the century (see for instance, D' Amico, 2024). The year 2015 also marked a symbolic moment for urban climate action. In fact, the Paris Agreement, including in particular the publications and assessment's reports that followed, highlighted the specific role that cities can play in deep decarbonisation strategies, by leveraging key urban infrastructures such as the built environment, energy, as well as land and food systems (Babiker et al., 2022; D' Amico, 2024).

To a good extent, urban climate action and experimentation have also emerged to compensate for the lack of clear leadership, responsibility, and institutional commitment of the national level, ushering urban leaders and actors to stand at the forefront of the 'race' against the catastrophic effects of climate change (Bulkeley and Betsill, 2005).

In tandem with these processes, a critical rethinking of concepts and imaginaries such as 'the sustainable city' – along with the urban sustainability agendas that have been emerging in cities – has stimulated a growing body of research on urban climate governance and planning, signing the establishment of 'climate urbanism' as an emerging field of studies (Bulkeley et al., 2012; Castán Broto et al., 2020). Climate urbanism deals with the uptake of the ecological emergency at the city scale through several critical lenses. Among these lenses are the analysis

of drivers and incentives of cities to engage in urban climate governance and planning, mobilizing policy frameworks such as urban climate adaptation or mitigation plans (Bulkeley et al., 2012). Furthermore, early studies in the field have dealt with the engagement of cities in a multi-level climate governance also by means of city networks allowing to experiment within the urban arena, or transfer lessons learned between cities (Bulkeley and Betsill, 2005; Smeds and Acuto, 2018). Furthermore, critical lenses have analysed the entanglement of (neoliberal) urbanization processes with ecological issues, and the social and environmental externalities produced by those dynamics (Long and Rice, 2019).

Yet, particularly in the aftermath of the 2015 Paris Agreement, the climate urbanism scholarship has begun to analyse climate change governance beyond formal political arenas, looking at 'the multiplicity of urban experiments' happening on the ground and analysing their impact in the socio-material and political makeup of the city (Smeds and Acuto, 2018, p 550). As such, the focus has moved from mitigation or adaptation as policy or planning frameworks towards the understanding of the innovative and transformative potential of on-the-ground actions (Castán Broto and Bulkeley, 2013; Castán Broto et al., 2020). This shift has led to the recognition of how, aside from strategic frameworks and grand narratives, climate action is negotiated through place-based sites of experimentation and innovation, where experiments in climate planning could act as catalysts of social and urban change (Robin and Castán Broto, 2021). In this context, the literature has focused on experimentation as both, a planning tactic and a mode of governance that allows to craft adaptive and context-specific solutions that are targeted to local conditions while taking global objectives into account (Castán Broto and Bulkeley, 2013; Smeds and Acuto, 2018). Contrary to overarching planning strategies or policy framework, experimentations target place-specific infrastructures, such as transport, energy, housing, or food, as vehicles for deep decarbonisation dynamics.

It is argued that, what it may appear as a fragmented and piecemeal approach to urban change, constitutes instead a reality in which change is driven by a diversity of actors, sectors, and scales as catalyst of place-based transformations, leveraging concrete sites and specific infrastructure systems (Kivimaa et al., 2017). In this background, pioneer work on mundane innovations has proposed an approach to urban change which goes beyond a modernist understanding of a homogeneously defined urban future, privileging instead a post-colonial conception of transformative innovations as coming from situated practices of actors and communities, which can inspire other agents and scales (Castán Broto, 2020; Robin and Castán Broto, 2021). Recently, prominent scholars within the climate urbanism debate have highlighted the emergence of a new wave of climate change governance, which is increasingly 'climate connected' (Bulkeley, 2021). This means that the connection of climate with other spheres of urban life, with other policy and planning areas, and with pressing issues of social justice is increasingly relevant, as it would allow place-based experiments to gain traction, expand their focus, and increase their impact across policy domains and spatial-institutional scales. These aspects need to be further explored by the climate urbanism and the urban sustainability scholarship at large.

2.1 Building a food and climate partnership through urban-driven experiments

Not dissimilarly to the climate urbanism debate, over the last few decades, literature on urban food governance and planning has also shed light on the numerous urban food 'experiments' that have spread around the world, ranging from urban food strategies, to food policy councils, to multi-city food policy networks, and the like (Sonnino, 2016; Moragues-Faus, 2021). Overall, literature has regarded urban food as a distinct sphere of action where struggles to accelerate food system change towards greater sustainability and justice are negotiated (Moragues-Faus, 2020; Sonnino and Coulson, 2021). On the one hand, urban food movements and scholarly research have been concerned with the challenge to legitimize local food action as a self-standing area (or arena) of urban sustainability, and as a legitimate urban planning domain (Pothukuchi and Kaufman, 2000). On the other hand, the literature has long argued for overcoming silos thinking and moving beyond compartmentalised approaches to the food question. This means considering how food can work in synergy with other urban planning and policy areas, among the most cited being land use, health, social services, education (HLPE, 2024). In fact, due to the multifunctional and multi-layered nature of food, accent has been given to integrated and systemic approaches that could create bridges between actors, municipal departments, and policy areas (Mansfield and Mendes, 2013;

Sonnino, 2019; Sonnino et al., 2019). This integrated work entails not only embedding a food system lens within municipal jurisdictions, but also showing how working on food can help urban actors to address other transition objectives, not least urban resilience and climate adaptation (Ballamingie et al., 2020).

However, due to the often precarious and voluntary nature of food action in cities, experiments with policy integration are still at their infancy in many contexts. Changes in political cycles or socio-economic downturns are among the factors creating challenges to ensure the continuity and survival of food planning and governance structures (see among others, Manganelli, 2025). Furthermore, despite the numerous studies advocating for nexus approaches between food and other socio-ecological systems (Wahl et al., 2021), empirical evidence is lacking concerning concrete challenges and pathways to enable synergies across domains. As a consequence, there are missing opportunities to learn how 'experiments at the nexus' work in place-specific realities, and, more specifically, how interventions enacted in a crucial planning and governance sphere can foster productive externalities in other domains, helping to strengthen key sustainability agendas in the city (Zerbian, 2024). Such a process passes through the reflexivity of actors involved in concrete 'experiments' concerning challenges to surmount and pathways to pursue in order to engender transformative action 'at the nexus'. In short, in light of claims for the climate-connected city or for 'de-siloed' approaches to food, research is needed that provides a deep understanding of how urban food governance and planning can synergise with other urban transition arenas – climate change being particularly key – and, most of all, how this synergistic action can usher from transformative innovations happening on the ground.

I argue that opportunities to make advancements in this direction are already there, emerging, among others, from a recent wave of urban food movements visibly linking food systems to climate action and planetary health objectives. Despite being under-researched in their transformative potential, these movements encompass a diversity of local initiatives, but also scalar processes that, while stemming from food system's activities, are inherently at the intersection of food and climate, also including interconnected issues of planetary justice and human health (IPES-Food, 2023). Emerging experiments are diverse and involve different activities and areas of the food and urban systems. They range from experiments in using land for agroecological food production, to the scaling out of productive nature-based solutions and biophilic urbanism initiatives, to the movement on plant-based food procurement, work on sustainable food environments and the last food mile, to net-zero food waste strategies, among others. Some of these experiments are enabled by institutionalised planning frameworks at the local level – such as urban food strategies, or urban climate plans (Mahmoud, 2025) – while other initiatives emerge from the outside with the potential to influence institutional frameworks.

In particular, some of the urban areas where these movements occur have joined city networks intersecting both areas: food and climate. These networks include the Milan Urban Food Policy Pact (MUFPP), the Barcelona Challenge for Good Food and Climate, and the latest C40 Network's 'Good Food Cities Declaration', urging city partners to 'deliver sustainable food policies in order to achieve a Planetary Health Diet'. The years 2020-2021 have been particularly crucial in pushing these networks and movements to build coalitions. At that time, around 120 local and regional governments created an alliance in order to shape a common agenda for climate-oriented food system transformation. In 2021 this agenda was officially launched at the global climate conference COP26 in Glasgow (UK). Named as 'the Glasgow Food and Climate Declaration' (GlasgowDeclaration.org), this multi-city pact calls for responsibility in 'reducing greenhouse gas emissions from urban and regional food systems in accordance with the Paris Agreement and the Sustainable Development Goals' (see IPES-Food, 2023, p.10) and invites to shape policy frameworks, governance mechanisms and coordinated action to that purpose. Following the COP26, the 7th Global Forum of the Milan Urban Food Policy Pact was held in Barcelona in 2021, giving place to the so-called 'Barcelona Climate Challenge' (thebcnchallenge.org). The latter is regarded as a step to implement the objectives of the Glasgow declaration. It provides local authorities with support to calibrate and measure their actions at intersection of food and climate. Several actors and networks support the Challenge, including the Barcelona City Council, the Spanish municipal agro-ecology network 'Red de Municipios por la Agroecología', the Milan Urban Food Policy Pact, C40, the French network 'Terres en villes' and the UK multi-city food policy network 'Sustainable Food Places'.

We could advance the hypothesis that the emergence of these movements – including initiatives such as actors' coalitions, pacts, and declarations around the food-climate nexus – indicates a growing momentum and multi-actor engagement aimed at advancing the climate-food agenda. To build on this momentum, what is needed is a systematic and up-to-date understanding of how these and other initiatives work to overcome siloed actions, create bridges between the sustainability spheres of food and climate, and practically operationalize a multidimensional justice agenda.

3. Informing the food-climate nexus through a justice lens

Socio-ecological theories including work on urban political ecology, environmental justice, but also literature on justice in planning (Fanstein, 2017), have taught us how any initiative seeking to engender meaningful socio-ecological change in complex social and urban settings, has to deal with issues of justice (Manganelli, 2024). Thus, deepening the understanding of the transformative role of on-the-ground 'experiments', work on justice has advanced, intersecting with both, the food and the climate debates (Avelino et al., 2024; de Bruin et al., 2024).

Inspired by civil rights movements and struggles for racial justice in the US, pioneer studies on environmental justice have mainly focused on the analysis of **distributive justice** issues, namely the (un)fair distribution of the effects of environmental actions across communities (Schlosberg and Collins, 2014). Early contributions on food justice have advanced a similar focus, understanding justice mostly in terms of 'ensuring that the benefits and risks of where, what, and how food is grown and produced, transported and distributed, and accessed and eaten are shared fairly' (Gottlieb and Joshi, 2010:6). After all, when considering food chains, questions such as how communities get access to food, who is exposed to the greatest disadvantages in access, what are the distributional effects of given food policies, and so on, acquire preeminent attention.

Yet, from the early focus on distribution, the environmental justice debate has over time moved in the direction of embedding multiple dimensions of justice, englobing in particular **procedural and recognition justice** (Fraser, 2008; Schlosberg, 2013; Schlosberg et al., 2025), the other two pillars of the environmental justice framework. As scholarly contributions highlight, procedural justice has notoriously been a rather underplayed dimension in the food debate that has long overlooked the importance of politicising decision-making processes (Duncan and Claeys, 2018). Procedural justice, indeed, focuses on how decisions are made and who is included or excluded in decision-making arenas regarding food or climate actions. Recognition justice involves acknowledging who is the real subject of injustices and tackling structural determinants of those actors in disadvantaged positions (De Bruin et al., 2024).

Essentially, the consolidated literature on environmental justice has shown how justice is played out at the intersection of different dimensions. Focusing on the triad distribution, procedural and recognition justice has the value to highlight how actors need to mediate among these different aspects (Schlosberg et al., 2025). Specifically, focusing on distributive issues alone without considering who is included and who is excluded in the first place, risks to induce a reductionist consideration of justice. In the same vein, focusing mainly on establishing procedural arrangements, such as mechanisms for civil society participation, politicisation and control, without attention to how this leads to fairer outcomes, would be a missed opportunity to substantiate justice.

While this literature on justice has put preeminent focus on social aspects, one of the key contributions of the climate urbanism and climate justice debate is to bring to the fore a relational perspective that encompasses **the ecological** dimension of justice as linked to the social, but also in possible tension with it (Pineda-Pinto et al., 2021). Based on a relational approach encompassing nature and earth, 'just sustainabilities' perspectives, for instance, have highlighted the need 'to ensure a better quality of life for all, now, and into the future, in a just and equitable manner, while living within the limits of supporting ecosystems' (Agyeman et al., 2016: p. 28). Going deep into diverse relational and ecological perspectives on justice would over-exceed the scope of this paper. However, it is important to highlighting how sub-literatures within environmental justice – such as materialist-feminist perspectives on justice – have acknowledged that, in a world of deep planetary relations and inter-dependencies, theories of justice should be grounded in situated knowledge and practices (Olazabal et al. 2021), specifically ac-

knowledging the place that humans inhabit in the world together with other human and non-human elements. **Ecological justice** then indicates a process of establishing relationships of care with nature and 'the environment', avoiding exclusively anthropocentric perspectives on justice.

These insights could be developed further into an approach to justice at the nexus, nurtured by theories that avoid both dichotomic and universalistic understandings of justice. Nexus justice draws attention to the inter-connections between various dimensions of justice and how these unfold within place-specific initiatives. This perspective allows to examine not only how different types of experiments emerge and scale at the intersection of food and climate, but also how, driven by ecological ambitions and environmental targets, they attempt to implement a nexus justice lens. Such a lens connects different policy spheres and multiple dimensions of justice - particularly linking ecological (planetary) justice with social (human) justice.

4. Some empirical examples emerging from cities

What follows constitutes a very explorative illustration of how some of the above insights and concepts can be applied to the analysis of emerging food-climate experiments at the nexus. Without any ambition to provide an exhaustive picture, this section illustrates examples of experiments emerging in different city contexts - i.e. Brussels, New York, and Milan, - and in different sections of the food system, including in particular food production, food procurement, and waste recovery-redistribution.

Data on experiments in these city contexts are mainly retrieved by means of desk research, secondary literature review, personal knowledge networks and, in the case of Brussels, by means of primary research conducted in that context up to the year 2022. These cities were chosen as they belong to some of multi-city networks on food and climate highlighted in section 2.1 (MUFPP, C40, ICLEI.). Furthermore, these cities demonstrate engagement in both climate and food justice action. They show a diversity of food-climate experiments and engage with social and ecological justice dimensions. Each of the following sub-sections illustrates with one city context and experiment.

Vignette 1. The Brussels' Capital-Region: creating an agroecological food hub

The context of Brussels is a rather instructive one from a perspective of food planning innovations and their connection to ecological and climate agendas. Being for several time relatively understudied by the urban food planning scholarship, the Brussels' Region has instead demonstrated a rather good degree of institutional leadership in food issues, combined with a rather dynamic bottom-up engagement in alternative food initiatives (Manganelli, 2020). Particularly, since the official approval of a food strategy in 2015, key institutional actors in the Brussels' Region have been providing steady support for food system's re-localisation. Ecological considerations have been a foundational element in the development of Brussels' food movement. The initial wave of bottom-up mobilization in the early 2000s was largely driven by agroecologically engaged citizens and farmers, as well as by participants in alternative food consumption networks who laid the groundwork for the broader movement (Manganelli, 2020). The key institutional leader of the Brussels' food movement has been the agency of Environment (Bruxelles Environnement), at the forefront of actions related to greening, biodiversity, waste management, public procurement, and responsible consumption in the Region. Several local experiments can be identified in Brussels that connect food and climate agendas, including studies producing evidence on the environmental impact of the food chain in terms of greenhouse gas emissions (see studies connected to the Brussels' Strategie GoodFood). This section, in particular, illustrates an experiment promoting agroecological peri-urban food production and food system re-localisation, called the Boeren Brussel Paysans (see Manganelli and Moulaert, 2019). Activated in 2015 thanks to funding received from the European Regional Development Funds, this 'experiment' is a pilot project that involves practices of land restoration and re-conversion to promote agroecological farming activities. It also involves the creation of a re-localised hub for food processing and transformation, refurbishing pre-existing infrastructures. Agroecological farming activities have been implemented in two plots of publicly owned land in the Municipality of Anderlecht, at the outskirts of the Brussels-Capital Region. Since the genesis of the project, the ecological argument related to food system re-localisation, and to the promotion of more resilient and sustainable farming practices, has been rather strong. In this background, the genuine will of public land

owners (i.e. the Municipality of Anderlecht) to use available public land in a different way than urbanisation and soil consumption, was also pivotal to enable the project. Further actors involved in the experiment, including in particular the organisation Terre en Vue, were essential to provide evidence about further accessible and available land for local agroecological producers in the Region.

More than just a project, or experiment, we could argue that through time the Boeren Brussel Paysans has constituted an advocacy platform around access to land, agroecological farming practices, and the provision of shorter supply chains. At present, this experiment counts 10,57 hectares of land mobilised for local agriculture; 30 agro-ecological farmers and 25 small processors that were involved in training activities (see Boeren Brussel Paysans' documentation). Overall, this coalition of actors has undoubtedly played a role in influencing regional discussions around access to land, and, potentially, in showing a different model of land use and land development for Brussels and its outskirts. One of the key processes initiated by this project is the development of the Municipality of Anderlecht's Climate Action Plan 2023-2030, with a particular focus on reducing greenhouse gas emissions through the promotion and production of low-carbon food.

In summary, this initiative shows how ecological justice arguments related to soil restoration and land reconversion in urban-peri-urban areas, together with the social challenge of supporting small producers, provided a strong narrative to motivate the genesis and role of this experiment. Far from constituting an isolated case, the Boeren Brussel Paysans should be regarded in conjunction with similar dynamics going on in Brussels and in other contexts. Given the growing number of urban greening plans and nature-based solutions emerging in response to climate adaptation targets (Mahmoud et al., 2025), there is an opportunity to explore how experiments in re-localized food production can leverage the broader set of frameworks and windows of opportunity created by this expanded climate agenda.

Vignette 2. New York City: combining ecological and social justice objectives through Good Food Purchasing

New York City (NYC) is considered as pioneer in urban food planning, embracing a progressive and systemic vision around food system transformation (Cohen and Ilieva, 2021). Issued in 2010, comprehensive visions and reports such as FoodNYC and FoodWorks show a clear orientation towards a food system approach. Such an approach argues for an integrated food policy that considers the different stages of the food system and examines the ways in which NYC is actually fed (Morgan, 2025). In 2021, the mayor's Office of Food Policy – i.e. the office responsible for food policy-making and for the orchestration of different agencies in the city – launched a food plan called 'Food Forward NYC'. This plan designs a ten-year roadmap aiming 'to reach a more equitable, sustainable, and healthy food system by 2031' (see the Food Forward NYC's plan). In 2023, Mayor Adams also launched the city's climate plan – called PlaNYC, showcasing political engagement in climate action. New York City's leadership has clearly demonstrated its commitment to food and climate goals, notably by joining the Cool Food Pledge in 2021. This global initiative, launched by the World Resources Institute, invites cities and institutions to reduce greenhouse gas emissions from the food they serve by 25% by 2030, using 2015 as the baseline year (Cohen, 2023). This commitment is reinforced in the PlaNYC, which raises the target to 30% emissions reductions by 2030, engaging relevant city agencies such as schools, hospitals, jails, social centres, etc. (IPES-Food 2023, p. 23).

Within this background, City's decision-makers have become conscious about the transformative power that the public sector can leverage thorough sustainable food purchasing (Morgan, 2025). Particularly, this vignette briefly elaborates on the NYC's Good Food Purchasing program as a vehicle for combined food and climate action. The Good Food Purchasing is a public procurement program launched at the local level but responding to a wider national public procurement framework (Morgan, 2025). NYC initially joined the program in 2018, with two agencies participating – the Department of Education and NYC Health and Hospitals. The initiative later expanded to include seven city agencies (Morgan, 2025). In 2022, Mayor Adams reinforced this commitment by signing Executive Order 8, which formally institutionalized the Good Food Purchasing Program (see NYC Food Policy's web sources). Kate MacKenzie, the executive director of the mayor's Office of Food Policy, refers to the food purchasing program as 'an enormous lever for change and critical tool for equity', able to 'deliver higher-quality food and make progress on climate, animal welfare, workers' rights and supporting minority and women owned business'

(Mayor's Office of Food Policy, 2021).

In fact, what is interesting about the Good Food Purchasing program, is the clear orientation towards climate mitigation while also keeping attention to social justice objectives. This is achieved by the set-up of clear ecological and social values, or principles, on which basis establishing a methodology that allows to evaluate the program and track progress through time (Cohen, 2023). Those values and principles draw inspiration from the nationally networked Good Food Purchasing Program. First, the principle of environmental sustainability, which implies establishing a metrics to monitor which food is supplied by public caterers and what is environmental impact of different food types in terms of greenhouse gas emissions. As highlighted by various sources, longitudinal monitoring of this metric enables an assessment of how well food purchasing aligns with climate objectives, and serves to incentivize the adoption of lower-emission, climate-conscious choices (Cohen, 2023; IPES-Food, 2023). Second, the value of supporting local economies while fostering inclusivity. This is achieved by privileging food that is 'grown, processes, manufactured, or distributed' by businesses or enterprises located in the City or in the State of New York (see NYC Food Policy's web sources), while also keeping attention to gender and cultural aspects (by for instance privileging businesses run by women, or people self-identified as indigenous, or minorities). Third, setting quality standards regarding nutrition (e.g. minimum requirements in terms of fruits, vegetables, low-processed plant-based proteins, etc.). Fourth and fifth, the attention to animal welfare (e.g. reporting purchases of animal proteins) and worker's rights (raising transparency and monitoring conditions of food workers and laborers, in all parts of the food chain, in accordance to national laws on labour standards) (see NYC Food Policy's web sources). Finally, a further overarching principle is the one of transparency, i.e. the provision of publicly accessible data concerning monitoring and progress.

The above is a short overview of an 'experiment' whose impact certainly needs deeper evaluation and research. Yet, this experiment provides an inspiring practice of a publicly led program which clearly stands at the nexus of climate and food justice objectives. What needs further deepening are aspects such as the capacity and impact of such a program through time, the challenge of running a clear monitoring framework, and the ways in which this experiment can be further empowered thanks to the connection with the program at the national level. Rather than considered in isolation, this experiment should be regarded within a wider set of practices and movements towards universal and climate-conscious public procurement (Morgan, 2025).

Vignette 3. Milan: achieving climate and social targets through the Food Waste Hubs

Having examined experiments in land use and public procurement, this vignette turns to another strategic dimension of the food system with potential to advance both climate and food security objectives: the recovery and redistribution of food waste. Specifically, it focuses on initiatives developed in the context of Milan as illustrative examples. Milan is considered as a further 'best practice' when it comes to leadership in food policy and food governance (Calori et al., 2015). Key institutional steps in food policy development occurred around the year 2014, when the Milan Municipality and the Cariplo Foundation (a key private foundation in the city), launched a study about the Milan urban food system. On this basis, in 2015 actors' consultations led to the development and approval of a food policy for Milan (Food Policy di Milano). In a move comparable to New York City's approach, 2017 saw the establishment of a Food Policy Office (Ufficio Food Policy) within the Deputy Mayor's cabinet, tasked with coordinating and implementing food policy across municipal departments. Among the priority axes of the Food Policy are: ensuring healthy food and sufficient drinking water for all; promoting the sustainability of the food system; Promoting food literacy; tackling food waste; and promoting scientific research in the agro-food sector (see Food Policy's documentation).

In this background, this vignette deals with experiments in food waste as a testing ground for the food-climate nexus, particularly focusing on emerging social and ecological justice aspects. An illustrative case in point is the so called 'Food Waste Hubs' pilot project, activated in Milan a few years ago. Food Waste Hubs is a network of neighbourhood spaces and infrastructures for the collection and storage of surplus food from various retail outlets, including in particular large-scale retail (information retrieved from the Municipality of Milan). Specifically, each hub sources surplus food primarily from supermarkets and workplace canteens, providing it to local NGOs,

community initiatives, and food security organisations that support the neediest members of the community. This experiment started in 2017 as a pilot project, product of the collaboration between the Municipality of Milan, the Cariplo Foundation, the organisation 'Assolombarda' (a consortium of enterprises operating in the Milan Metropolitan area and its province) and the Politecnico University of Milan. The first hub was implemented in 2019 in the 'Isola' district of Milan. In 2021, another hub was established as a sort of consolidation of the experimental phase. From that year on, a further expansion phase occurred, with the creation of other hubs, up to the most recent phase that integrates new actors such as municipal markets (information retrieved from the Municipality of Milan and Polytechnic University of Milan's website sources about the experiment).

The year 2021 was a key moment in the young trajectory of the Food Hubs' experiment. In that year, the city of Milan obtained a reward of 1 million pound (1.17 million euros) in the first edition of the Earthshot prize, a global environmental award established in the UK. The Food Hub's project was awarded within the category 'Build a Waste Free World' (see earthshotprize.org). The award could channel further resources that allowed to amplify and further integrate the experiment. In particular, the key actors participating in the project sought not only to create new food hubs and involve more actors; they also pursued the creation of stronger networks among the different actors involved in various food waste hubs, aligning them towards shared ecological and social objectives.

The Food Waste Hubs is one among the several examples of initiatives at the food-climate nexus addressing complex challenge of food sustainability and fight against food waste as an ecological target, while also promoting food equity. Aspects of social justice are addressed by tackling distributive and procedural issues such as improving fragile people's access to dignified food; scaling out the approach socially and spatially in the city; and by using food as a vehicle for sociability and dignity, by shaping community food infrastructures. At the same time, the experiment could serve as a demonstration platform that put accent on the ecological impact produced by food waste and thus, on the opportunity to take action in this direction. A short account of the impact of this experiment in the year of 2021 tells that across all active Food Hubs at that time, 1,386 tonnes of food waste were recovered, thereby preventing an estimated 3,188 tonnes of CO₂e emissions. According to these data, these efforts facilitated the redistribution of several hundred thousand surplus food items to approximately 27,000 individuals experiencing vulnerability, corresponding to an estimated 1.23 million meals (source: earthprice.org).

There are of course critical questions that can be posed to this experiment. On the one hand, as the NYC's vignette suggests, measuring the impact of this kind of initiative in terms of emissions' savings would require a systematic tracking which measures progress through time. Furthermore, there are questions related to the resourcefulness of this project and its capacity to last in time so as to exercise an impact. Finally, a deeper engagement with the challenge of social justice raises the critical question of the extent to which emerging experiments work in address the underlying determinants that shape access to good and healthy food for individuals in vulnerable situations (HLPE, 2024). Taking these issues into account, one could argue that an experiment of this kind serves to highlight food waste as a critical arena for aligning food and climate objectives, with the potential to synergize with broader urban initiatives such as circular economy strategies and climate action plans.

5. Conclusions: ways forward

This reflective paper has claimed for a deeper account of the interrelation between food and climate as a critical arena for urban sustainability governance and planning. Taking inspiration from the climate urbanism, food governance, food and climate justice debates – but also from real-life movements and practices emerging from cities –, this paper has shown how the climate-food nexus serves as a site for situated experimentations and place-based innovations emerging from the ground-up (Castán Broto, 2020). In this background, this paper has also suggested integrating a nexus-justice approach where aspects of ecological justice could be regarded in synergy (or, sometimes, tension) with social justice dimensions, providing potential arguments for the out-scaling or up-scaling of experiments at the food-climate nexus.

While this contribution has only provided a brief illustration of initiatives in different city contexts and in diverse areas of the food system, there is surely scope for wider theoretical and empirical research. Indeed, further lines

of research could go in the direction of identifying various typologies of food-climate experiments in different contexts, looking at the challenges to connect these sustainability fields and engender systemic and transformative action in both domains. Further research could also explore how city actors and other players are trying to build methodologies in order to track progress and measure achievements in terms of climate objectives and ecological justice targets. Moreover, other studies could mobilise critical lenses that explore the challenges to attend different dimensions of social and ecological justice, and how this justice nexus could create potential contradictions in situated experiments. In conclusion, this paper invites to explore the potential of food as a testing ground for the climate-connected city (Bulkeley, 2021), and of climate as a fertile terrain in which transformative food system goals can be further advanced.

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