MDPI

Article

Urban Food Autonomy: The Flourishing of an Ethics of Care for Sustainability

Esteve Giraud

School of Sustainability, Arizona State University, Tempe, AZ 85281, USA; egiraud@asu.edu

Abstract: Urban agriculture is often advanced as a sustainable solution to feed a growing urban population, offering a number of benefits: improved fresh food access, CO_2 absorption, social justice and social cohesion among others. Going beyond these direct tangible/objective benefits from urban agriculture, in this paper we ask: How can growing food in the cities teach us about taking care of each other and the natural environment? We use the example of urban food autonomy movements to discuss the transformative potential of a grassroots-led initiative promoting permaculture, which is anchored in three "ethics": care for the earth, care for the people, and fair share. Through examining the philosophical underpinnings of "autonomy" and "care", we explore how urban food autonomy initiatives can enable the development of an ethics of care, especially using permaculture inspirations. Our theoretical review and case analysis reveal that "autonomy" can never be achieved without "care" and that these are co-dependent outcomes. The urban food autonomy initiatives are directly relevant for the achievement of the three of the UN's 17 Sustainable Development Goals: "Zero Hunger," "Life on Land" and "Climate Action", and contribute to a culture of care. Indeed, urban agriculture can act as a powerful education platform for the engagement of diverse stakeholders while also supporting a collective transformation of values.

Keywords: permaculture; urban agriculture; food autonomy; ethics of care; sustainability; UN Sustainable Development Goals; culture of care

check for updates

1. Introduction

What can growing food teach us about care? In a 2015 interview, UN Secretary General for Economic and Social Affairs Wu Hongbo reminded that, considering the way we currently produce and consume, "The planet's resources will not sustain unless something is done to change the way we treat (it)." (UN DESA 2015) Among the many things humans produce and consume, agriculture and food systems are major sources of environmental destruction (FAO 2011), and their transformation is central to the achievement of many United Nations Sustainable Development Goals (SDGs) (Willett et al. 2019). In a world shaken by COVID-19, the importance of caring for one another and adjusting our productive system for that purpose has moved to the front. Many people have experienced for the first time, with disarray, the sight of empty shelves in the supermarkets of developed countries. Meanwhile, farmers have been forced to throw away million gallons of milk and to euthanize their livestock (Yaffe-Bellany and Corkery 2020), as the number of people relying on food banks to feed themselves sharply increased (Schanzenbach and Pitts 2020). Yet, the novel coronavirus did not create these problems, but instead revealed its long existing vulnerabilities. When an open market stores a large amount of food and living wild animals in anticipation of end of year celebrations—like it happened in Wuhan (China) in December 2019 (Frutos et al. 2020)—the whole world might be affected via a network of social relationships and high mobility. The agro-industrial model is highly sensitive to shocks, and the current crisis urges us to collectively transform our relationship to food: from a commodity to a web that connects us physically and morally to our natural environment and each other.

Food systems are complex and interconnected. They bring together very diverse actors and have strong moral implications. For example, at least 48% of farmworkers in the United States had no legal status in 2014 (USDA ERS 2020), receiving lower pay, and being exposed to higher health related risks. Meanwhile, these workers are necessary for US agriculture to function and for food to reach our pantries (Zahniser et al. 2018). The consequences of our agriculture on the natural environment—soil erosion, extinction of pollinators, water nitrification and greenhouse gases emissions among others—reveal the connection between humans and the natural environment and raise serious ethical questions as they threaten our collective survival. Yet, the web of relationships that constitute our food systems is often reduced to neutral (or amoral) transactional relationships. Before being places of economic transactions, food systems are a web of connectedness, and of diverse relationships that carry responsibilities and ethicality (Puig de la Bellacasa 2017; Whyte and Cuomo 2016). Consequently, we can only transform our relationship to food by casting light on the ethical fabrics of the places we inhabit and from which we eat.

Local foods and urban agriculture benefit from a socially and environmentally conscious image (Low et al. 2015; Grebitus et al. 2020). Within the food system literature, the scholarship on urban agriculture has increased dramatically over the years. It has been discussed with a focus on food security (Eigenbrod and Gruda 2015; Siegner et al. 2018; Sonnino 2016), sustainability (Lovell 2010), social justice (Duchemin et al. 2008; Passidomo 2014; Reynolds et al. 2016), and urban planning (Hara et al. 2018; McClintock et al. 2013). Several research works account for the therapeutical benefits of gardening, both for physical and mental health, such as stress, anxiety, depression and obesity reduction, and with mood and general health improvement (Clatworthy et al. 2013; Soga et al. 2017; Sullivan 1979; Teig et al. 2009). A growing number of studies emphasize how urban agriculture can build relationships and trust among community members, and foster social cohesion (Camps-Calvet et al. 2016; Kingsley and Townsend 2006; Peters et al. 2010; Petit-Boix and Apul 2018). Additionally, it has been argued that urban agriculture gives its participants the opportunity for caring and nurturing life. In doing so, it helps restore their ecological knowledge, which is a critical condition for stronger stewardship of the natural environment (Barthel et al. 2010; Colding and Barthel 2013). It thus seems that care is part of the ethical fabric of urban agriculture, as it offers opportunities to care for one another and the environment. Yet, as far as we are aware, there is currently no study that explores the potentials of urban agriculture practices in relation to the development of an ethics of care, and how they support the achievement of the UN Sustainable Development goals. This is what we propose to do in this article, by reviewing the literature on ethics of care, permaculture and urban food autonomy movement. Our argumentation is also informed by interviews with farmers, permaculture practitioners, food activists and urban food system experts, conducted in the United States, in France and in Cuba. The methodology and analysis of these interviews are excluded from this paper (Giraud 2021).

Following the 2008 economic crisis, a number of initiatives around the world have advocated for urban food self-reliance and autonomy, especially in developed economies. This is the case of the cities of Todmorden in the UK and Albi in France, along with grassroots initiatives in Athens, Rome, Madrid, Morocco, Switzerland, Canada and Puerto Rico, to only name a few. These initiatives encourage urbanites to (learn how to) grow their own food, increase food production areas in the cities and place a preference on local food consumption. Many of these programs have used permaculture principles and philosophy to support their food production efforts. Todmorden (UK) is a well-known example, as it birthed the Incredible Edible movement (Paull 2013). This groundswell encourages free food production by using public spaces to plant herbs and vegetables that are free for everyone to pick. The initiative has been replicated worldwide in around 1000 groups (Incredible Edible Network Organisation Information 2018; Warhurst and Dobson 2015).

In this paper, we explore in depth the concept of urban food autonomy by connecting it to the philosophical underpinnings of "autonomy" and "care", and its permaculture inspirations. Permaculture is a regenerative agriculture practice and philosophy that is

anchored in three principles or "ethics": care for the Earth, care for the people and fair share (Holmgren 2002, p. 1). We argue for the development of an urban food autonomy that is regenerative for the environment (starting with the soil) and the human populations, one that is anchored in the practice of care. First, we explore what the concept of urban food autonomy unveils. In the second part, we discuss the potentials of urban food autonomy in fostering food system moral transformation, highlighting the contribution of Care Theory to the food system conversation. Lastly, we make the case that urban food autonomy movements using permaculture support the flourishing of an ethics of care, and contribute directly and indirectly to several Sustainable Development Goals (SDGs) as set by the United Nations.

2. Urban Food Autonomy: Food Self-Sufficiency and Political Empowerment

From its Greek root, the concept of autonomy means "one who gives oneself one's own law". It is used in medicine, politics and moral philosophy in which it conveys different yet similar meanings. In healthcare, personal autonomy refers to the right of the patients to make decisions regarding their own health. It is a key element of informed consent, which applies both to medical research and treatment (Beauchamp and Childress 2013). In moral philosophy, Kant regards autonomy as a condition to the existence of morality (Sensen 2013; Kant 1997). It is because we have the ability to make our own decisions that we can choose to behave morally. Kohlberg develops this idea further in his study of the stages of moral development (Kohlberg 1981). According to Kohlberg, the highest degree of autonomy is reached when moral principles such as justice are internalized, and failure to meet these standards results in guilt and self-condemnation. In political philosophy, the concept of autonomy often refers to self-determination—a principle fundamental to the decolonization process. For urban food movements, the idea of autonomy addresses both the aspiration to local self-sufficiency, and the sense of political transformation toward greater control over food and territories. Embracing the idea of autonomy supports an aspiration to local food self-reliance and the emancipation from a food system thought to be oppressive.

2.1. Urban Food Self-Sufficiency

Throughout history, food was produced in cities or in their close surroundings to feed their respective populations (Imbert 2015). Today, diverse types of urban and peri-urban agriculture within 12 miles of cities account for 60% of all irrigated croplands in the world and supply a large portion of the vegetables consumed in many cities (Tefft et al. 2020). However, it is not the case in industrialized economies that largely rely on modern and longer supply chains. Sanitary regulations, the increase in urban land prices, the development of transportations and storage capacity were all factors that led to the disappearance of farms and gardens in inner cities, and with it, food production knowledge among its inhabitants. Meanwhile, cities became increasingly dependent on food imports, with limited food reserves, and resulting in vulnerabilities to disruptions in production, transformation and distribution channels (Zeuli and Nijhuis 2017). In the early stages of the COVID-19 pandemic, consumers faced empty supermarket shelves, as the system was not able to quickly adjust to the shift in the demand (Yaffe-Bellany and Corkery 2020). Meat processing plants had to close temporarily because of virus outbreaks, driving up the price of meat. Urban food autonomy movements advocate for a re-localization of food production, partly as a way of mitigating such risks. By bringing back the knowledge and practice of food production in cities, these movements seek to reintegrate agriculture at a larger scale in urban spaces and to encourage cities to plan for self-reliance; this is the first part of food autonomy. A study of the city of Cleveland concluded that from 22 to 100% of self-reliance (measured as a function of yield, area and intake) in fresh produces, chicken and honey would be possible to achieve for over 430,000 inhabitants by using vacant lots, residential houses and rooftops, conventional urban gardening and hydroponics (Grewal and Grewal 2012). A study conducted in France for the city of Rennes, with a

population over 220,000, concluded that the urban and peri-urban space could produce 100% of kCal—food calorie—needs per inhabitant by shifting the local production from an intensive animal farming environment (meat, eggs, milk) to the harvesting of grains, vegetables, fruits and oils, and integrating rooftops, forests, private/public gardens and natural areas (Darrot and Boudes 2011). According to these studies, it could be technically possible to feed the entire city population using only the urban and peri-urban spaces, if we use the city space (e.g., rooftops, private yards, vertical gardening, etc.) more efficiently and are willing to transform parts of our diets. However, the urban food autonomy movements argue that the process toward food self-sufficiency is more important than the a priori feasibility of the goal. The steady increase of people's knowledge and practice of food production should support the end goal by unveiling new possibilities.

2.2. Control over Food and Territories

Urban food autonomy seeks to empower people to control their food and their territories by choosing the type of food systems in which they wish to live. It is a direct echo to food sovereignty (The "declaration of Nyéléni" adopted by 80 countries in 2007 proposes the following definition: "*Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.*" (Declaration of Nyéléni 2007)) movements, but it nevertheless covers different political realities, and can support diverse political agendas. Indeed, the local food movements have and still fall under different—and at times opposite—political umbrellas. Some support local production as a matter of local pride and reject the non-local as a potential danger. For instance, traditionalist conservatives prefer localism over the power of a centralizing state. From a different political angle, radical anarchist movements are also supportive of self-sufficiency initiatives. Many "*orti urbani*" (community gardens) in Rome are located in squatted spaces and developed by anarchist groups, promoting horizontal decisionmaking, cooperation, refusal of fascism, racism, patriarchy, labor exploitation and neoliberalism (Mudu and Marini 2018). These gardens are ways for urbanites to reclaim their city and autonomy in opposition to perceived oppressive forces.

In Athens, following the debt crisis, radical movements have been organizing to maintain the life of the cities, developing solidarity networks, often organized around food. The crisis encouraged conversations and dreams of autonomous zones in the city (Newman 2011), and the subsequent "back-to-the-land" migrations from urban centers sparked food solidarity between urban and rural spaces (Morales Bernardos 2017). In Madrid, food movements joined the anti-austerity Indignados movement in response to the 2008 economic crisis, developing community gardens and self-organized food banks for the construction of political alternatives (Simon-Rojo et al. 2018). Originally, it was characterized by a strong anti-capitalistic contestation and slowly evolved to integrate selective private actors through the social economy. It ultimately became active members of city councils working in concert to co-create public policies.

In each of these initiatives, autonomy has a political motive, even though the political ideals they seek to develop and their mode of advocacy can vary greatly. In this paper, we focus on urban food autonomy movements that use permaculture inspirations to invite "care" in their path to political transformation. Together with permaculture, urban food autonomy has potentials to recreate and enrich the relationship urbanites have with their food, their local communities and their natural environment. In doing so, it also directly supports the achievement of multiple UN Sustainable Development Goals. These transformative potentials are worth exploring. The extreme proximity of food production in urban spaces can help reframe the status of food—from a commodity to a catalyst for social and environmental change.

3. The Moral Transformative Potentials of Urban Food Autonomy Movements through the Practice of Care in Permaculture

Urban food autonomy movements that embrace permaculture use the concept of "care", especially to refer to environmental care, social care and, in some cases, self-care. Yet, it is not always very clear what "care" means and how it is compatible with the idea of autonomy. In this section, we first provide an overview of the concept in light of its uses in the ethics of care and ecofeminist traditions. Then, we examine how caring urban spaces can be designed using permaculture techniques.

3.1. The Concept of Care

Ethics of care is rooted in feminist philosophy and political movements that gained voice and momentum in the 1980s and 1990s. In the 1980s, feminist philosophers emphasized the critical importance of "care" in human societies and its exploitation in line with the domination of women and other disenfranchised groups. In his book, *A history of the world in seven cheap things*, Raj Patel describes the work of "caring" and its underpaid commodification as one of the key characteristics of our modern capitalist societies. He writes:

> "The work of caring for, nurturing (. . .) is overwhelmingly unpaid. (. . .) The availability of proletarian labor was possible only because of the transformation of care work into unpaid work, available as one of Nature's "free gifts"—which are neither free nor gifted." (Patel and Moore 2017, p. 133)

This is an echo to ethics of care theorist Joan Tronto's work in *Moral boundaries*:

> "Care is a central but devalued aspect of human life. To care well involves engagement in an ethical practice of complex moral judgments. Because our society does not notice the importance of care and the morality quality of its practice, we devalue the work and contributions of women and other disempowered groups who care in this society. (. . .) (O)nly if we understand care as a political idea will we be able to change its status and the status who do caring work in our culture." (Tronto 1993, p. 157)

Carol Gilligan and Nel Noddings are traditionally considered to be the founders of ethics of care in the 1980s (Gilligan 1982; Noddings 1984). Gilligan is known for opposing her Ph.D. mentor Lawrence Kohlberg and his theory of moral development stages. In response to the Heinz dilemma—one of the stages of Kolhberg's moral development—Gilligan argued that the emotive and context-sensitive "care perspective" is as valid as the liberal tradition of rationalistic and universalistic moral reasoning, not inferior (Gilligan 1982; Kohlberg 1981). According to her and those authors adopting a similar philosophical position, the ethics of care is essentially relational, it accepts the moral validity of emotions in ethical decision-making and is less focused on individual moral reasoning. Caring is essentially relational, it happens "in the relation between the one caring and the one cared for" (Noddings 1984). The feminist movement supported the idea that women were more likely to adopt relational moral positions, and that these were not ethically inferior to Kantian or utilitarian ethics, which focus on individual decisionmaking. It generally endorsed the ethics of care as a valid and valuable moral theory.

Milton Mayeroff defines care as follows: "To care for another person, in the most significant sense, is to help him grow and actualize himself." (Mayeroff 1971, p. 1) However, this definition does not explain "how" to help or what it means in practice, so that the self-actualization can take place. This is an important point since we know that the best of intentions do not always benefit the one being helped. Nel Noddings gives the example of a teacher trying to help someone learn mathematics (Noddings 1984, p. 15). She emphasizes that it might be easier for the helper to take an expert stance and to ensure that she knows better. However, in order to really "help," the helper needs to humble herself and be ready to apprehend the other's reality. This is a critical dimension in growing food. In order to best grow a crop and care for an agricultural space, it is necessary to apprehend the reality

of the plants themselves and to be able to "read the landscape." (Whitefield 2015) Similarly, the advocates of urban food autonomy that rely on permaculture adopt a participatory educational approach to social change, as opposed to top-down policies. For the urban food autonomy activists, care requires genuine attention and collaborative processes.

Tronto emphasizes caring as an ongoing activity and a process. She distinguishes four phases of caring: caring about, taking care of, care-giving and care-receiving. "Caring about involves the recognition in the first place that care is necessary. It involves noting the existence of a need and making an assessment that this need should be met (. . .) Taking care of involves assuming some responsibility for the identified need and determining how to respond to it." (Tronto 1993, p. 106) Additionally, writes Tronto: "Care-giving involves the direct meeting of the needs for care. It involves physical work (. . .) Care-receiving recognizes that the object of care will respond to the care it receives (. . .) for example, the starving children seem healthier after being fed." (ibid, p. 107) For her, ethics of care does not limit caring to human beings, and she and Berenice Fisher "include the possibility that caring occurs for objects and for the environments, as well as for others."(ibid, p. 103) In a note on this comment, she adds: "In general, I believe that ecofeminist concerns form a part of care, but I have not explored these implications here." (ibid, p. 203).

Ecofeminism emerged at the convergence of environmentalism and feminism. Ecofeminists conceptually tie the patriarchal oppression of women to other forms of exploitation, i.e., of nature and "other others" such as racial minorities, indigenous groups and LGBTQ populations (Cuomo 1997). According to Cuomo, ecofeminism must focus on the ways oppression functions so that it can derive alternative anti-oppressive ethical and philosophical insight, committed to the tied-up flourishing of humans and non-humans. Additionally, the practice of care is essential to such flourishing, as it reveals the interdependent nature of autonomy.

Tronto studies the relationship between autonomy and dependence, and writes a response to moral philosophy, for which autonomy presupposes individualism and considers dependence as a form of submission. Her critique highlights that Kantian and consequentialist ethics are anchored in the political climate of the European and North American 17th and 18th centuries, a time when dependence was associated with slavery and serfdom, from which moral philosophers of the Age of Enlightenment wanted to break. These shaped our ideas of freedom and individual rights, and drove aside the intertwined natures of dependence and autonomy. "We start our lives as dependent," writes Tronto, and the role of early care is to foster our autonomy (Tronto 1993, pp. 162–63). Sickness also makes us dependent, and the care received during illness aims to restore our autonomy. In that perspective, care is a response to dependence, in a way that does not abuse it, but instead uses it to promote autonomy.

Our modern societies have been strongly inspired by the idea that autonomy is a condition for moral judgment, hence, we defend the freedom and autonomy of individuals and states, but we discard the critical importance of caring to achieve such autonomy. There is no autonomy without the consistent work of caring, which itself is a central element to environmental sustainability. Albeit, care promotes autonomy of the care-receivers, and conversely, autonomy is a testimony to a skilled practice of care.

To summarize, ethics of care insists on the relational nature of individuals and situations, and values emotions and affects as part of moral decisionmaking. It pursues the self-actualization and autonomy of the caregiver and the care-receiver. Along with ecofeminism, it seeks to understand and oppose the constructed oppression of nature, women and other dominated groups, by putting the practice of care at the center of moral action and as key to political transformation.

3.2. Designing Caring Spaces with Permaculture

Caring for plants, soil and spaces defines the core of permaculture, and is a good exercise of care habit formation. By reintegrating these caring practices into our urban spaces, urban food autonomy movements provide a catalyst for social change. Permaculture and

ethics of care emerged as different disciplines: the former as a branch of moral philosophy, and the latter as a set of design principles to mimic and work with natural ecosystems. In spite of coming from different traditions, we argue in this section that permaculture is an ethics of care, and that it supports societal change by designing caring spaces.

First, permaculture relies on three core principles or "three ethics": (1) care for the earth (the living soil, the forests, the oceans and the freshwater), (2) care for the people (compassion for and simplicity toward human needs, self-reliance and personal responsibility), and (3) fair share (sharing abundance and setting limits to personal consumption) (Holmgren 2002, p. 1). The goal of permaculture is to create self-reliant and autonomous communities through the practice of these three ethics, each centered on the practice of caring. It represents what Janel Curry called "caring agricultural practices" (Curry 2002, p. 129) that seek to address and transform the mechanisms of oppression in our agricultural system.

Second, permaculture values emotions and affectivity in moral decisionmaking. Maria Puig de la Bellacasa studies permaculture as the practice of an ethics of care, i.e., a practice that is less focused on traditional morality in terms of abstract universal principles, and more on how to "make and live with everyday systems and techniques that embody and embed care for the earth." (Puig de la Bellacasa 2017, p. 126) Permaculture is essentially embedded in relationships inherent in a collective of humans and non-humans. It fosters durability and renewal. Puig de la Bellacasa develops the example of caring for the soil in agriculture. In modern agriculture, the soil is already "taken care of" she says, for instance, through tilling and chemical fertilizers that put the farmer into a managerial role rather than into a tending one. When relying on permaculture, the farmer needs primarily to invest emotionally in their relationship to the soil. "The point is (. . .) to alter existing relations of taking care through alternative modes of affectivity." (Puig de la Bellacasa 2017, p. 199) Taking care of the soil in permaculture requires taking the time, a time that respects the biological time and cycles of the soil, but which also includes the emotional time of creating attachment to the life in the soil.

Third, permaculture practitioners use their understanding of system design to foster plants and systems autonomy by enhancing cooperation between elements. These practitioners primarily rely on natural synergies between ecosystems, encouraging plant growth and yields. In the words of Patrick Whitefield, author of *The Earthcare Manual*, it is the art of designing "beneficial relationships." (Whitefield 2015) Permaculture provides ways of designing food production systems that fosters nature's independence, while relying on biological cooperation to do so. This is a good example of relational autonomy in practice. For instance, companion planting (Holmgren 2002, p. 165; Parker et al. 2013) is one of the many ways permaculture uses design to enhance plant health by relying on cooperation.

Says environmental designer, and co-founder of the permaculture concept, David Holmgren:

> "The emphasis on building more mutual and co-operative relationships while reducing the impact of predatory and competitive relationships is a key permaculture strategy for more effective integration within and between systems. Companion planting of vegetables and herbs, originally based on observations of mutualistic effects by biodynamic researchers, has popularized the idea that plants do not necessarily compete and may have beneficial effects on one another." (Holmgren 2002, p. 165)

Lastly, permaculture also takes part in fighting the very mechanisms of oppression in our agricultural system that lead to environmental destruction and social exploitation. Bill Mollison, considered to be the father of permaculture, defines it as:

> "a philosophy of working with, rather than against nature; of protracted and thoughtful observation rather than protracted and thoughtless labor; and of looking at plants and animals in all their functions, rather than treating any area as a single product system." (Mollison 1997, p. 10)

Indeed, permaculture offers principles that allow humans to grow food in a way that can regenerate soils, depollute waters and reverse deforestation. For example, a team of permaculture designers lead a Greening the Desert project in the Dead Sea region in Jordan, where they have been able to grow trees and food by using a system of swales and mulch to harvest the water and desalinate the ground (Geoff Lawton 2016). Similarly, many permaculture practitioners oppose the exploitation of farmworkers by industrial agriculture, and develop alternative projects that emancipate producers and consumers. They recognize that social and environmental issues, along with "care for the earth," "care for the people" and "fair-share" are inextricably interlinked. In Arizona's capital city of Phoenix, the nonprofit Tiger Mountain Foundation uses urban farming and permaculture knowledge to help community members come together, access food, learn new skills and support the reinsertion of young adults who have been behind bars (Tiger Mountain Foundation 2020). The foundation manages three urban gardens located in communities with few supermarkets and high incarceration rates. For the community members and the volunteers that work in these gardens, the collective participation in growing food provides them a place to grow roots, learn about healthy foods and—for some—to break free from the prison cycle.

By putting "care" at the core of its practice and moral principles, by including emotions and attachment in decisionmaking, by recognizing that humans and ecosystems are primarily relational, and by offering alternatives to an oppressive agricultural system, permaculture is an ethics of care. As such, permaculture allows urban food autonomy movements to design caring landscapes that enhance human and environmentally beneficial relationships and transform the moral fabric of our agricultural systems.

4. Urban Food Autonomy Supports the SDGs

Some research work has already discussed how permaculture design principles can address air pollution in urban areas (SDG #11—Sustainable Cities and Communities), and increase universal access to renewable energy (SDG #7—"Affordable and Clean Energy") (Moran 2019; Moran and Mempouo 2019). Here, we argue that by promoting food self-reliance and using permaculture principles, urban food autonomy movements directly contributes to three of the UN's Sustainable Development Goals: "Zero Hunger," "Life on Land" and "Climate Action." Additionally, these movements support the moral transformation in our societies that is critical to address these goals. Indeed, placing "care" at the center of our public lives is necessary for the achievement of the SDGs. The quality of caring expresses the conscious commitment to support others and the natural environment and to extend one's own responsibility toward them (Biesecker et al. 2014). Without such quality, the SDGs cannot be achieved.

4.1. "Zero Hunger"

There are many ways in which urban agriculture can contribute to food access (Poulsen et al. 2015), even if it rarely fully removes the households' pressure for food availability (Badami and Ramankutty 2015). First, urban agriculture (and especially direct household food production) can improve access to diverse and nutritionally rich fresh foods. Second, urban agriculture can free up some money by reducing food expenditures, taking into account the initial cost of setting up the garden. Urban agriculture can also protect families from food-price volatility. It is not always clear if urban agriculture efforts improve food access for low-income urban consumers, especially in developing countries (Gudzune et al. 2015; Lucan et al. 2015; Misyak et al. 2014; Siegner et al. 2018; Badami and Ramankutty 2015). Moreover, urban agriculture presents the risk of neighborhood gentrification by beautifying spaces and attracting consumers willing to pay a higher price for locally grown food (Tornaghi 2014).

However, many successful examples of urban agriculture have led to improved food security, especially for nutrition, diets and calorie intake (Poulsen et al. 2015). In Todmorden, urban agriculture was very efficient in improving food security (Paull 2013).

The same phenomenon happened in Brachoua in Morocco, where the inhabitants came out of deep poverty, thanks to permaculture design and agroecology (France 24 2016). In these two examples, urban agriculture increased food availability, thanks to the geographic proximity of the production, but it also increased food access and utilization. Indeed, in Todmorden, the food grown in urban spaces was either offered to the population for free or sold in a local currency at a preferential rate. As a consequence, people had access to the food, regardless of their socio-economic status. Additionally, raised bed included cooking instructions and anecdotes to educate the population on how to cook the different vegetable, which improved food utilization. When implemented properly, urban food autonomy initiatives have the potential to contribute directly to reducing hunger and enhancing food security (SDG #2—"Zero Hunger").

4.2. "Climate Action" and "Life on Land"

The concept of food miles is often the first argument used to claim the environmental benefits of urban food production (Food miles is the distance food is transported from the time of its production until it reaches the consumer, and is measured in GHG emissions as a proxy to climate change contribution (Engelhaupt 2008)). Food produced locally requires less transportation; hence the easy claim that it is more environmentally friendly. However, transport is not the only contributor to greenhouse gas (GHG) emissions. Christopher Weber and H. Scott Matthews conducted a life cycle assessment (LCA) of GHG emissions during all stages of food production and transport, and concluded that transport accounts for only 11% of these emissions (Weber and Matthews 2008). Production and harvesting methods account for 83% of GHGs in this sector. The "where" food is produced does not matter as much as the "how" when we consider GHG emissions. Urban food autonomy movements that embrace regenerative agriculture and permaculture principles reject the use of chemical pesticides and fertilizers. Instead, they promote soil restoration in reclaimed concrete spaces (Rouillay and Becker 2020, p. 12), and biological intensification for pest management. These largely reduce emissions traditionally associated with non-organic agricultural production and promote soil carbon sequestration that contribute to Climate Action (SDG #13). Additionally, these food production techniques support biodiversity (SDG #15—"Life on Land") by relying on the soil microbiome to enhance crop fertility, and by reintroducing a variety of plants and insects in urban spaces.

4.3. A Culture of Care

Beyond the three goals already mentioned, the development of urban food autonomy can support the achievement of several Sustainable Development Goals. When it uses permaculture, and especially centers its actions in the regular practice of "care", we argue that urban food autonomy participates in the moral transformation of our food systems, and the flourishing of a culture of care. Care is essential to autonomy, but in many cases, it is not recognized as such. It largely falls under the radar of policy making, and is performed by unpaid workers and women. The United Nations Research Institute for Social Development (UNRISD) identifies six policy areas for transformative change, and connects these areas to the 17 SDGs. Care is one of these policies areas, and according to the UNRISD, it contributes to seven of the stated SDGs: "No Poverty", "Good Health and Well-being", "Quality Education", "Gender Equality", "Clean Water and Sanitation", "Decent Work and Economic Growth" and "Reduced Inequalities".

Notes UNRISD:

> "Care policies serve a range of different objectives, including poverty reduction, enhanced women's labor force participation, employment creation and the expansion of future generations' human capabilities. Because care policies mold the ways in which care is provided and funded, and can determine who provides and receives care, they have the potential to contribute to gender equality and mitigate other dimensions of inequality such as class, caste, ethnicity or sexual orientation." (UNRISD 2016)

Indeed, care policies allocate money, services or time to caregivers and to people who need care. The current unequal distribution of care and domestic work between men and women is a driver of gender inequality, that contributes to poverty, reduced employment opportunities, lower education levels and their consequences on sanitation. Care policy recommendations stipulate that unpaid care and domestic work must be recognized to support the achievement of the SDGs. Caring for the natural environment and for the people by practicing permaculture and regenerative agriculture is also a form of unpaid care work. Their recognition as such would directly contribute to sustainable development. The development of urban food autonomy with permaculture is much more than simply growing food. It can bring "care" to the center of our ethical fabric and support the development of a more sustainable world.

5. Conclusions

The concept of urban food autonomy brings together the ideas of local food self-sufficiency and the empowerment of local communities over their foods and territories. Many movements aim to build such urban food autonomy by encouraging food self-reliance and self-transformation. They directly contribute to several Sustainable Development Goals, namely "Zero Hunger", "Climate Action" and "Life on Land". In spite of different uses and political tones of the concept of food autonomy, we focus here on urban food autonomy as a grassroots movement that seeks to tackle the commodification of food by using and teaching permaculture principles to produce food, regenerate soil in the urban space and encourage self-transformation. These movements contribute to food security by increasing food availability, as well as food access and food utilization. They also have climate mitigation potential, such as contributing to a reduction of GHG emissions and an increasing soil carbon sequestration. Additionally, these movements promote biodiversity by relying on biological intensification and supporting healthy soil microbiome.

Our paper contributes to the literature on Care Theory and develops examples of urban food autonomy movements to show how their embeddedness within care practices directly support the achievement of the SDGs. The direct implications of Care Theory for policy change are still marginally studied, and we hope that this article encourages more researchers to explore that connection. Especially, the relevance of Care Theory for food systems transformation could benefit from more exploration, considering that "care" for the land and for their communities is a direct preoccupation of the farmers who feed us. Our review of the literature reveals that "autonomy" and "care" are co-dependent outcomes that can be jointly advanced within urban food systems, especially through permaculture. Their advancement within food systems contributes to their advancement within our larger societies as well. We argue that urban food autonomy holds the transformative potential to restore the value and practice of "care" in our modern societies. Indeed, the revalorization of care is essential to break the boundary between the political and the moral sphere (Tronto 1993), and to transform our relationship to food, to each other, and to the natural environment. The very idea of an achievement of the UN Sustainable Development Goals cannot come to fruition without such transformation. Permaculture stands on the pillars of its three "care" ethics, and it provides powerful principles of change in that direction.

References

Badami, Madhav G., and Navin Ramankutty. 2015. Urban Agriculture and Food Security: A Critique Based on an Assessment of Urban Land Constraints. *Global Food Security* 4: 8–15. [CrossRef]

Barthel, Stephan, Carl Folke, and Johan Colding. 2010. Social–Ecological Memory in Urban Gardens—Retaining the Capacity for Management of Ecosystem Services. *Global Environmental Change* 20: 255–65. [CrossRef]

Beauchamp, Tom L., and James F. Childress. 2013. *Principles of Biomedical Ethics*, 7th ed. New York: Oxford University Press.

Biesecker, Adelheid, Priti Darooka, Daniela Gottschlich, Ulrike Röhr, Marcela Tovar-Restrepo, and Vivianne Ventura Dias. 2014. A Caring and Sustainable Economy: A Concept Note from a Feminist Perspective. In *International Policy Analysis*. Edited by Cäcilie Schildberg. Berlin: Friedrich Ebert Stiftung, Available online: https://library.fes.de/pdf-files/iez/10809.pdf (accessed on 31 July 2019).

Camps-Calvet, Marta, Johannes Langemeyer, Laura Calvet-Mir, and Erik Gómez-Baggethun. 2016. Ecosystem Services Provided by Urban Gardens in Barcelona, Spain: Insights for Policy and Planning. Advancing urban environmental governance: Understanding theories, practices and processes shaping urban sustainability and resilience. *Environmental Science & Policy* 62: 14–23. [CrossRef]

Clatworthy, Jane, Joe Hinds, and Paul M. Camic. 2013. Gardening as a Mental Health Intervention: A Review. *Mental Health Review Journal* 18: 214–25. [CrossRef]

Colding, Johan, and Stephan Barthel. 2013. The Potential of 'Urban Green Commons' in the Resilience Building of Cities. *Ecological Economics* 86: 156–66. [CrossRef]

Cuomo, Chris J. 1997. *Feminism and Ecological Communities: An Ethic of Flourishing*. London: Routledge.

Curry, Janel M. 2002. Care Theory and "caring" Systems of Agriculture. *Agriculture and Human Values* 19: 119–31. [CrossRef]

Darrot, Catherine, and Philippe Boudes. 2011. Toward a Self-Feeding City? Rennes Ville Vivrière: Scenarios of Food Autonomy for Rennes Metropole (France). Paper presented at Agro Campus Ouest, Angers, France, August 22.

Declaration of Nyéléni. 2007. Paper presented at the Forum for Food Sovereignty, Nyéléni Village, Sélingué, Mali, February 27. Available online: https://nyeleni.org/spip.php?article290 (accessed on 2 May 2018).

Duchemin, Eric, Fabien Wegmuller, and A.-M. Legault. 2008. Urban Agriculture: Multi-Dimensional Tools for Social Development in Poor Neighbourhoods. *Field Actions Science Reports. The Journal of Field Actions* 1. Available online: http://journals.openedition.org/factsreports/113 (accessed on 3 December 2018). [CrossRef]

Eigenbrod, Christine, and Nazim Gruda. 2015. Urban Vegetable for Food Security in Cities. A Review. *Agronomy for Sustainable Development* 35: 483–98. [CrossRef]

Engelhaupt, Erika. 2008. Do Food Miles Matter? In *Environmental Science & Technology*. Washington, DC: American Chemical Society, vol. 42, p. 3482. [CrossRef]

FAO. 2011. *The State of the World's Land and Water Resources for Food and Agriculture: Managing Systems at Risk*. Rome and London: Food and Agriculture Organization of the United Nations and Earthscan.

France 24. 2016. Avec ses jardins écolos, un village marocain sinistré revit et fait des émules [Media]. Les Observateurs de France 24. Available online: https://observers.france24.com/fr/20160712-jardins-potagers-agro-ecologique-permaculture-local-revenus-brachoua-village-maroca (accessed on 30 November 2018).

Frutos, Roger, Marc Lopez Roig, Jordi Serra-Cobo, and Christian A. Devaux. 2020. COVID-19: The Conjunction of Events Leading to the Coronavirus Pandemic and Lessons to Learn for Future Threats. *Frontiers in Medicine* 7. [CrossRef]

Geoff Lawton. 2016. Greening the Desert Project. Available online: https://www.youtube.com/watch?v=xgF9BU4uYMU (accessed on 15 December 2020).

Gilligan, Carol. 1982. *In a Different Voice: Psychological Theory and Women's Development*. Cambridge: Harvard University Press, Available online: https://www.fulcrum.org/concern/monographs/gb19f658d (accessed on 15 December 2020).

Giraud, Esteve. 2021. Permaculture, ethics of care, and urban food system resilience. Unpublished Ph.D. dissertation, Arizona State University, Tempe, AZ, USA.

Grebitus, Carola, Lauren Chenarides, Rebecca Muenich, and Alex Mahalov. 2020. Consumers' Perception of Urban Farming—An Exploratory Study. *Frontiers in Sustainable Food Systems* 4. [CrossRef]

Grewal, Sharanbir S., and Parwinder S. Grewal. 2012. Can Cities Become Self-Reliant in Food? *Cities* 29: 1–11. [CrossRef]

Gudzune, Kimberly A., Claire Welsh, Elisa Lane, Zach Chissell, Elizabeth Anderson Steeves, and Joel Gittelsohn. 2015. Increasing Access to Fresh Produce by Pairing Urban Farms with Corner Stores: A Case Study in a Low-Income Urban Setting. *Public Health Nutrition* 18: 2770–74. [CrossRef]

Hara, Yuji, Timon McPhearson, Yuki Sampei, and Brian McGrath. 2018. Assessing Urban Agriculture Potential: A Comparative Study of Osaka, Japan and New York City, United States. *Sustainability Science* 13: 937–52. [CrossRef]

Holmgren, David. 2002. *Permaculture: Principles and Pathways beyond Sustainability*. Victoria: Holmgren Design Services.

Imbert, Dorothée, ed. 2015. *Food and the City: Histories of Culture and Cultivation (Dumbarton Oaks Colloquium on the History of Landscape Architecture)*. Washington, DC: Dumbarton Oaks Research Library and Collection.

Incredible Edible Network Organisation Information. 2018. Incredible Edible. Available online: https://www.incredibleedible.org.uk/organisation-information/ (accessed on 10 January 2020).

Kant, Immanuel. 1997. *Practical Philosophy*. Translated by Mary J. Gregor. Cambridge: Cambridge University Press.

Kingsley, Jonathan 'Yotti', and Mardie Townsend. 2006. 'Dig In' to Social Capital: Community Gardens as Mechanisms for Growing Urban Social Connectedness. *Urban Policy and Research* 24: 525–37. [CrossRef]

Kohlberg, Lawrence. 1981. *Essays on Moral Development*, 1st ed. San Francisco: Harper & Row.

Lovell, Sarah Taylor. 2010. Multifunctional Urban Agriculture for Sustainable Land Use Planning in the United States. *Sustainability* 2: 2499–522. [CrossRef]

Low, Sarah A., Aaron Adalja, Elizabeth Beaulieu, Nigel Key, Steve Martinez, Alex Melton, Agnes Perez, Katherine Ralston, Hayden Stewart, Shellye Suttles, and et al. 2015. *Trends in U.S. Local and Regional Food Systems: A Report to Congress*. AP-068. Washington, DC: USDA, ERS.

Lucan, Sean C., Andrew R. Maroko, Omar Sanon, Rafael Frias, and Clyde B. Schechter. 2015. Urban Farmers' Markets: Accessibility, Offerings, and Produce Variety, Quality, and Price Compared to Nearby Stores. *Appetite* 90: 23–30. [CrossRef]

Mayeroff, Milton. 1971. *On Caring*, 1st U.S. ed. World Perspectives v. 43. New York: Harper & Row.

McClintock, Nathan, Jenny Cooper, and Snehee Khandeshi. 2013. Assessing the Potential Contribution of Vacant Land to Urban Vegetable Production and Consumption in Oakland, California. *Landscape and Urban Planning* 111: 46–58. [CrossRef]

Misyak, Sarah, Meredith Ledlie Johnson, Mary Mcferren, and Elena Serrano. 2014. Family Nutrition Program Assistants' Perception of Farmers' Markets, Alternative Agricultural Practices, and Diet Quality. *Journal of Nutrition Education and Behavior* 46: 434–39. [CrossRef]

Mollison, Bill. 1997. *Introduction to Permaculture*, Revised ed. Sisters Creek: Ten Speed Pr.

Morales Bernardos, Ines. 2017. Building New Solidarities between Movements: Insurrectionary Politics of Food Autonomy in the City of Athens. *Transnational Institute of Social Ecology*. Available online: https://trise.org/2017/05/07/building-new-solidarities-between-movements-insurrectionary-politics-of-food-autonomy-in-the-city-of-athens/ (accessed on 30 November 2018).

Moran, Cora, and Blaise Mempouo. 2019. Using Permaculture Design Principles to Provide an Accessible Design Toolkit for the Installation of Offgrid Microgeneration Renewables. Paper presented at the SECAM, Yaoundé, Cameroon, October 22–25.

Moran, Cora. 2019. Using Plants in Conjunction with Permaculture Design Principles to Provide an Effective and Affordable Way to Address Air Pollution in Urban Areas. Paper presented at the SECAM, Yaoundé, Cameroon, October 22–25.

Mudu, Pierpaolo, and Alessia Marini. 2018. Radical Urban Horticulture for Food Autonomy: Beyond the Community Gardens Experience. *Antipode* 50: 549–73. [CrossRef]

Newman, Saul. 2011. Postanarchism and Space: Revolutionary Fantasies and Autonomous Zones. *Planning Theory* 10: 344–65. [CrossRef]

Noddings, Nel. 1984. *Caring, a Feminine Approach to Ethics & Moral Education*. Berkeley: University of California Press.

Parker, Joyce, William Snyder, George Hamilton, and Cesar Rodriguez-Saona. 2013. Companion Planting and Insect Pest Control. In *Weed and Pest Control—Conventional and New Challenges*. Edited by Sonia Soloneski. London: IntechOpen, Available online: https://www.intechopen.com/books/weed-and-pest-control-conventional-and-new-challenges/companion-planting-and-insect-pest-control (accessed on 3 December 2018). [CrossRef]

Passidomo, Catarina. 2014. Whose Right to (Farm) the City? Race and Food Justice Activism in Post-Katrina New Orleans. *Agriculture and Human Values* 31: 385–96. [CrossRef]

Patel, Raj, and Jason Moore. 2017. Cheap Care. In *A History of the World in Seven Cheap Things*. Berkeley: University of California Press.

Paull, John. 2013. 'Please Pick Me': How Incredible Edible Todmorden Is Repurposing the Commons for Open Source Food and Agricultural Biodiversity. In *Diversifying Foods and Diets: Using Agricultural Biodiversity to Improve Nutrition and Health*. Edited by Jessica Franzo, Danny Hunter, Teresa Borelli and Federico Mattei. Oxford: Earthscan from Routledge, pp. 336–45.

Peters, Karin, Birgit Elands, and Arjen Buijs. 2010. Social Interactions in Urban Parks: Stimulating Social Cohesion? *Urban Forestry & Urban Greening* 9: 93–100. [CrossRef]

Petit-Boix, Anna, and Defne Apul. 2018. From Cascade to Bottom-Up Ecosystem Services Model: How Does Social Cohesion Emerge from Urban Agriculture? *Sustainability* 10: 998. [CrossRef]

Poulsen, Melissa N., Philip R. McNab, Megan L. Clayton, and Roni A. Neff. 2015. A Systematic Review of Urban Agriculture and Food Security Impacts in Low-Income Countries. *Food Policy* 55: 131–46. [CrossRef]

Puig de la Bellacasa, Maria. 2017. *Matters of Care: Speculative Ethics in More than Human Worlds*. Posthumanities 41. Minneapolis: University of Minnesota Press.

Reynolds, Kristin, Nevin Cohen, Nik Heynen, Mathew Coleman, and Sapana Doshi. 2016. *Beyond the Kale: Urban Agriculture and Social Justice Activism in New York City*, Reprint ed. Athens: University of Georgia Press.

Rouillay, François, and Sabine Becker. 2020. *En Route Pour l'autonomie Alimentaire: Guide Pratique à l'usage Des Familles, Villes et Territoires*. Mens: Terre Vivante.

Schanzenbach, Diane, and Abigail Pitts. 2020. How Much Has Food Insecurity Risen? Evidence from the Census Household Pulse Survey. Institute for Policy Research Rapid Research. Available online: https://www.ipr.northwestern.edu/documents/reports/ipr-rapid-research-reports-pulse-hh-data-10-june-2020.pdf (accessed on 15 December 2020).

Sensen, Oliver. 2013. *Kant on Moral Autonomy*. Cambridge and New York: Cambridge University Press.

Siegner, Alana, Jennifer Sowerwine, Charisma Acey, Alana Siegner, Jennifer Sowerwine, and Charisma Acey. 2018. Does Urban Agriculture Improve Food Security? Examining the Nexus of Food Access and Distribution of Urban Produced Foods in the United States: A Systematic Review. *Sustainability* 10: 2988. [CrossRef]

Simon-Rojo, Marian, Inés Morales Bernardos, and Jon Sanz Landaluze. 2018. Food Movements Oscillating Between Autonomy and Co-Production of Public Policies in the City of Madrid. *Nature and Culture* 13: 47–68. [CrossRef]

Soga, Masashi, Kevin J. Gaston, and Yuichi Yamaura. 2017. Gardening Is Beneficial for Health: A Meta-Analysis. *Preventive Medicine Reports* 5: 92–99. [CrossRef]

Sonnino, Roberta. 2016. The New Geography of Food Security: Exploring the Potential of Urban Food Strategies. *The Geographical Journal* 182: 190–200. [CrossRef]

Sullivan, Mary E. 1979. Horticultural Therapy—The Role Gardening Plays in Healing. *Journal—American Health Care Association* 5: 3, 5–6, 8. Available online: https://europepmc.org/article/med/10316809 (accessed on 19 September 2020). [PubMed]

Tefft, James, Marketa Jonasova, Fang Zhang, and Yixin Zhang. 2020. *Urban Food Systems Governance—Current Context and Future Opportunities*. Rome: FAO and The World Bank. [CrossRef]

Teig, Ellen, Joy Amulya, Lisa Bardwell, Michael Buchenau, Julie A. Marshall, and Jill S. Litt. 2009. Collective Efficacy in Denver, Colorado: Strengthening Neighborhoods and Health through Community Gardens. *Health & Place* 15: 1115–22. [CrossRef]

Tiger Mountain Foundation. 2020. Phoenix Community Garden. Tiger Mountain Foundation. 2020. Available online: https://tigermountainfoundation.org/non-profit-community-garden/ (accessed on 15 December 2020).

Tornaghi, Chiara. 2014. Critical Geography of Urban Agriculture. *Progress in Human Geography* 38: 551–67. [CrossRef]

Tronto, Joan C. 1993. *Moral Boundaries: A Political Argument for an Ethic of Care*. London: Routledge.

UN DESA. 2015. Why Should You Care about the SDGs? *United Nations Department of Economic and Social Affairs*. September 22. Available online: https://www.un.org/development/desa/en/news/sustainable/why-care-about-sdgs-html.html (accessed on 3 December 2020).

UNRISD. 2016. *Policy Innovations for Transformative Change: Implementing the 2030 Agenda for Sustainable Development*. UNRISD Flagship Report. Geneva: United Nations Research Institute for Social Development.

USDA ERS. 2020. Farm Labor. U.S. Department of Agriculture Economic Research Services. Available online: https://www.ers.usda.gov/topics/farm-economy/farm-labor/ (accessed on 15 December 2020).

Warhurst, Pam, and Joanna Dobson. 2015. *Les Incroyables Comestibles: Plantez Des Légumes, Faites Éclore Une Révolution*. Domaines Du Possible. Arles: Actes Sud.

Weber, Christopher L., and H. Scott Matthews. 2008. Food-Miles and the Relative Climate Impacts of Food Choices in the United States. *Environmental Science & Technology* 42: 3508–13. [CrossRef]

Whitefield, Patrick. 2015. *How to Read the Landscape?* East Meon: Permanent Publications.

Whyte, Kyle Powys, and Chris Cuomo. 2016. Ethics of Caring in Environmental Ethics: Indigenous and Feminist Philosophies. In *The Oxford Handbook of Environmental Ethics*. Oxford: Oxford University Press, p. 624. Available online: https://kylewhyte.marcom.cal.msu.edu/wp-content/uploads/sites/12/2018/07/Ethics_of_Caring_in_Environmental_Ethics.pdf (accessed on 31 January 2019).

Willett, Walter, Johan Rockström, Brent Loken, Marco Springmann, Tim Lang, Sonja Vermeulen, Tara Garnett, David Tilman, Fabrice DeClerck, Amanda Wood, and et al. 2019. Food in the Anthropocene: The EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems. *The Lancet* 393: 447–92. [CrossRef]

Yaffe-Bellany, David, and Michael Corkery. 2020. Dumped Milk, Smashed Eggs, Plowed Vegetables: Food Waste of the Pandemic. *The New York Times*. April 11 Sec. Business. Available online: https://www.nytimes.com/2020/04/11/business/coronavirus-destroying-food.html (accessed on 14 December 2020).

Zahniser, Steven, Edward J. Taylor, Thomas Hertz, and Diane Charlton. 2018. *Farm Labor Markets in the United States and Mexico Pose Challenges for U.S. Agriculture*; Economic Information Bulletin 201. Washington, DC: U.S. Department of Agriculture Economic Research Services.

Zeuli, Kimberly, and Austin Nijhuis. 2017. *The Resilience of America's Urban Food Systems: Evidence from Five Cities*. Roxbury: The Rockefeller Foundation and ICIC.