

Assembling local, assembling food security

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Accepted: 30 June 2015 / Published online: 14 July 2015
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Abstract The term ‘food security’ has been used in multiple ways and addresses not only issues around availability and accessibility of foods, but also, among others, the sustainability of livelihoods at the local community level—an issue often seen as a basis for the proliferation of local and alternative food networks (AFNs). Accordingly, in this paper we attempt to develop a theoretical re-framing that is able to link food security with AFNs in arguing that the understanding of the two notions is dynamics and contingent upon the elements (actors, practices, geography) that construct them. We use an assemblage approach to analyze a case of Dunedin, a small-size city in New Zealand, in which the community aims to achieve food security through a local food strategy. Through a series of interviews with a group of food activists and academics, public discussions, and two local food forums, we found that food security was understood and performed in its local context through assembling diverse actors and objectives within the AFN. In conclusion, we offer assemblage thinking as an analytical tool to understand how seemingly precarious local food relations are stabilized and assembled so as to open possibilities of achieving food security.

Keywords Food security · Alternative food networks (AFNs) · Local · Assemblage

Abbreviations

AFNs Alternative food networks
DCC Dunedin City Council
FAO Food and Agriculture Organisation

Introduction

The term ‘food security’ can be used, and abused, as a justification for contradictory actions (Carolan 2013). On one hand, the productionist perspective uses food security (or the lack thereof) to produce even more (Godfray et al. 2010). The UN FAO, for instance, in its concern for the 6 billion people to feed and the projection of dramatic population growth in the near future, urges the need to push up agricultural production by 50 % by 2030 and double by 2050. In accordance, terms such as the Gene Revolution (Dibden et al. 2013) and sustainable intensification (Marsden 2010; Godfray et al. 2010) have come into prominence in the last decade as means to achieve this goal.

On the other hand, the term is also used to encourage the growth of local and alternative food movements (Kirwan and Maye 2013). Food security addresses not only issues around availability and accessibility of food but also the sustainability of livelihoods at the local community level. For many, it relates strongly to an active individual and community life. As hinted in the 1996 World Food Summit’s definition of food security, the key point added was that food security should be achieved not only through

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calorie intake and the abolishment of malnutrition, but also through the way local communities are able to engage with one another in an active daily life. In this sense, food security also means community security and wellbeing. Since then, many academics and practitioners alike have been seeking for an alternative concept that could encompass, or at least stress the importance of a more down-to-earth conceptual framework, such as through food sovereignty (Jarosz 2014) and food justice (Gottlieb and Joshi 2010), as being part of a wider understanding of food security.

It is important to note that each of the above understandings results in entirely different actions and strategies. One of the reasons is that food security is socially constructed, while no one has a full claim of it (Maxwell 1996). It is a multiplicity (Mol 2002) and covers a broad range of issues and practices, from yields, calories and poverty to health and the sustainability of livelihoods for communities, for which the term ‘collective action frames’ is coined (Mooney and Hunt 2009). Mooney and Hunt (2009) argue that food security can be seen through three frames: as associated with hunger (caloric perspective), as part of a wider community development strategy, and as associated with risk. While the authors talked about this framing to understand food security through different paradigms and practices (including both productionist and community perspectives as mentioned above), we look into Kirwan and Maye’s (2013, p. 93) argument on how even within a particular collective action (alternative food networks), “boundaries within frames may be firmer”.

Following Kirwan and Maye’s (2013) comprehensive review of food security-local food movement linkages, this paper focuses on how the concept of food security is used, enacted and achieved by local and alternative food networks (AFNs). In this paper we examine a way to link food security with the emerging concept of local and alternative food networks (AFNs). We counter a recently debated argument that local food systems can never help to achieve food security, partly due the way AFNs operate in isolation to one another on small scales (Qazi and Selfa 2005; Mount et al. 2013). Their argument is substantiated by studies in developed and developing countries (Gallaher et al. 2013) that show how local food systems are often too small to even provide sufficient food (hence, food security in terms of metrics and calories) for the local community. However, while Kirwan and Maye focused on the framing of the concept and positioned local food movements within that framing, this paper looks deeper into how the diverse definitions within the collective frames brought about diverse actions of local food movements. In accordance, we also argue that the diverse and evolving actions implicate the continuous construction of the meanings and, consequently, the framings of such.

We use assemblage thinking (Deleuze and Guattari 1983, 1987) to capture this complexity, seeing a connection between the multiplicity of ‘food security’ and the variability and disconnects between actors in AFNs. In order to re-frame food security beyond local–global contestation, we find that post-structuralist approaches to rural sociology (such as actor-network theory, conventions theory and assemblage thinking) are therefore relevant. The divergence in the local food movements (and its consequences on the success and failure of AFNs) compels us to employ assemblage thinking in particular, due to its characteristic of continuous assembling of heterogeneous entities. Using a case of Dunedin, New Zealand, a small-size city (with a population of about 124,000) in which the local community aims to achieve food security through a local food strategy, the paper documents the process by which meanings and actions are articulated around the notion of food and security and argues that a theoretical re-framing is needed to further understand ways in which food security, AFNs and local food are enacted. This paper is presented as follows: the first section of this paper reviews the current literature on food security, AFNs and how assemblage thinking can be used as a conceptual framework to bridge between the two former constructs. The second section offers the case study as a context for the theoretical exploration. The third section discusses how assemblage thinking helps to provide a different understanding of food security and the collective actions associated with it.

Food security: evolving definitions

Food security comes in various, evolving, definitions (Maxwell 1996; Carolan 2013). Smith et al. (1992) have identified close to 200 different ways in which the term is used. Among others, food security can be defined in terms of adequate food supply able to offset the fluctuation of production and prices at the global level (UN 1975), or in terms of a country’s ability to finance needed food imports (Valdes and Konandreas 1981), or in a general term of people’s access to sufficient food on a regular basis (UN World Food Council 1988). The definitions, of course, serve for different purposes and political actions. Maxwell (1996) offers a neat analogy to these definitions, seeing them as a genetic pool in a rain forest, waiting to be expressed as the socio-political context changes over time.

Food security was first coined as something deeper than a mere number of yields or calories. Drawing from President Roosevelt’s address on the ‘four essential freedoms’ (Carolan 2013), food security was first and foremost a goal of societal security and wellbeing. The ‘four freedoms’ (of speech, of worship, from want and from fear) are seen as a whole and cannot stand separately. So for instance,

freedom from food deprivation needs to be seen as a prerequisite for democracy (freedom of speech and worship) and a nurturing social environment (freedom from fear). Carolan (2013) thus offers the understanding that food security ought to be seen not as security *of* food, but security *through* food.

The productionist perspective, however, has reduced the meaning of such a complex construct in the effort to value and measure the extent to which such a state is achieved or achievable. Maxwell (1996) documents the way in which the early shift of meaning relates closely with the post-World War II global context. Food security was centered on world food supply and price stability, and thus defined in terms of world production. From the global context, food security was then framed in a national context, focusing on self-sufficiency programs in many developing countries in relation to the Green Revolution (see for example Herdt and Capule 1983 on rice intensification). Furthermore, Maxwell also notes that the early measurement of food security concentrated much on yields (tons/Ha) and calories intake per capita, seen as more objective indicators by which to compare the state of food security between countries (see e.g. FAOStat 2009).

Critiques of a global food security perspective and objective measurement come against the argument that global food trade is the solution for food insecurity issues. Whereas in some situations market mechanisms might prove to be useful, Whalqvist et al. (2012, p. 658) argue that “in other situations the imposition of market approaches and their extension to wider regions or globally may be part of the problem”. This condition opens up spaces for a more nuanced understanding and analysis of food security that fits into a particular context.

It follows that Maxwell’s post-modern food security conception offers a completely different story; food security is also about what attaches to it, that is, community wellbeing and active life. How can something so abstract be nailed down in order to become operative? How can they be transformed from a merely subjective perception into a collectively shared value? This requires a focus on individual and community (rather than on the nation-state), such as on household income and nutrient intake per capita, as well as subjectivity (rather than objective measurements), such as on the feelings of insecurity and deprivation among the poor. In Maxwell’s (1996, p. 155) words, the post-modern food security framings, therefore, have evolved “from the global and the national to the household and the individual; from a food first perspective to a livelihood perspective; and from objective indicators to subjective perception”.

Partly in response to Maxwell’s post-modern food security, Mooney and Hunt (2009) perceive food security as a “consensus frame”, where framing means a

conceptual tool within which similar understandings of, and actions related to, food security take place. Within a consensus frame, people and organizations acknowledge the values and objectives embedded in the definition, but may work differently in terms of how best achieve the objectives. So, based on Mooney and Hunt’s (2009) thesis, food security can thus be seen in relation to: (1) hunger and malnutrition, in which the collective actions link closely to increase of production of staple foods as well as access to these foods for rural and urban poor; (2) ways to increase community wellbeing (such with Carolan’s argument on security *through* food); and (3) minimizing risks in industrialized agriculture.

The collective actions are not necessarily exclusive to one particular frame. In fact, it is often the case where actions sprout from, or are justified by, two or more consensus frames. For instance, Timmer’s (2005, p. 1) argument on the relation between food security and economic growth might serve as a good example of how food security is seen from the lens of hunger and risks:

That rich countries have little to fear from hunger is a simple consequence of Engel’s Law; consumers have a substantial buffer of non-food expenditures to rely on, even if food prices rise sharply. In a market economy, the rich do not starve. Wars, riots, hurricanes and floods, for example, can disrupt the smooth functioning of markets, and all in their wake can perish. But rich societies usually have the means to prevent or alleviate such catastrophes, social or natural. Food security in rich societies is simply part of a broader net of social securities.

Likewise, the spectacle used in understanding local food movements and AFNs requires a combination of hunger-perspective and community-perspective of food security (see Kirwan and Maye 2013); in another case, local food systems can also be linked to the three frames altogether, where food sharing and community farming, particularly in traditional communities, is used as a means to provide sufficient staple food for the community members, build community strengths, and manage the risk of harvest failure and climate-related disasters (Soemarwoto 2007).

Kirwan and Maye (2013), furthermore, notice the discursive element of the consensus frames, both within and between frames. They use the analogy of ‘flat key’ and ‘sharp key’ to accentuate the reinforcing and critical nature of actions, respectively, toward the dominant definitions of food security. For instance, in the framing of food security as associated with hunger, flat key is used to explore actions that perpetuate the dominant view of global food supply (such as through biotechnology, agricultural intensification or international trade), whilst sharp key is used to question those actions and offer alternative approaches

(such as through local food, food sovereignty and AFNs). This notwithstanding, the different understandings and enactments of food security seem to coalesce in action into a trajectory (or trajectories) of food (and social) relations (Jarosz 2000).

While Kirwan and Maye prefer Mooney and Hunt's (2009) consensus frame over Maxwell's (1996) divergent definitions of food security due to the latter's arguably static characteristics, we instead argue that Maxwell's analogy of a genetic pool helps to understand the diverse actions in achieving food security, particularly in the context of AFNs. Taking the analogy further takes note of how genetic diversity increases through mutation, combination, and environmental changes (Reece et al. 2012). The same holds true to the "conceptual pool" of food security that grows and amalgamates as contexts give rise to new and acceptable definitions. This gives a sense of vibrancy in discourse and praxis of food security. In the context of this paper, although Kirwan and Maye have situated local food and AFNs eloquently with food security framings, we argue that the vibrancy and divergence of AFNs can be understood by this post-modern food security and the continuous construction of meanings through discourse and praxis. It is therefore important to look at the way in which AFNs have also evolved over time.

Alternative food networks (AFNs)

AFNs have been referred to in relation to a wider debate over Conventional and Alternative. Also referred to as 'dominant versus alternative' (McMichael and Friedmann 2007, p. 292), this dichotomization attest conflicts over, and a challenge to, the current configuration of the food system, including both values and practices. The bulk of the studies have investigated AFNs for the challenge they pose to the dominant food system. Some authors prefer to define the alternative side as (food) networks, implying a less structured nature. Networks, in fact, points at a looser configuration, where centrality is given to the relationships occurring and does not assume power relations as the pivot. Alternative food networks (AFNs) refers to forms of food supply (and increasingly also consumption) considered different from the mainstream one in many ways, positing economic viability and ecological perspectives (Feenstra 1997; Morris and Kirwan 2011) and sustainability (Trauger 2007; Maxey 2007) in the bigger frame that vouch for AFN's inherent goodness. Many authors (for instance Maye et al. 2007) agree on placing organic food as the spark of these movements; other authors like Carolan (2012) would include Slow Food and La Via Campesina, pointing at the disruptive modality with which these movements have come to the front. It is undeniable that a

certain environmental concern is central to AFNs, but it would be reductive to limit them to organic practicing, since heterogeneity is one of the main features of AFNs. Sustainability has arguably become a key feature for many practitioners involved in AFNs, but it has to be reframed as environmental *and* social sustainability.

Tregear (2011, p. 419) defines AFNs as "forms of food provisioning with characteristics deemed to be different from, perhaps counteractive to, mainstream modes which dominate in developed countries". That's why Farmers' Markets, Community Supported Agriculture and Community Gardens—just to name a few—have constituted the bulk of studies on AFNs, because of different provision and fruition modalities. AFNs have offered insights on personal values, beliefs and direct relationships in the construction of market and market-relations; trust and regard seem to be the pivot around which these networks are built as a way to develop new economic forms and relationships. Trust substitutes uncertainty, making certification schemes redundant or relegates their importance to the legal sphere only (Gurviez 1999; Jarosz 2000; Brunori 2007; Campbell and Liepins 2001). In fact the direct relationship mediates between the parts so that consumers find satisfaction and reassurance about production, and producers can explain their practices and position without relying on external agents. Studies have focused also on trust and quality (Prigent-Simonin and Hérault-Fournier 2005), and the great benefits which include a dedicated means to achieve social justice (Macias 2008; Trauger 2007; Allen et al. 2003).

Concern for themselves, members of the family like children, the other in the community and the general 'Other' seem to be main drivers for choosing to engage in AFNs as a producer or as a consumer. The nature of AFNs is extremely contested because of the difficulty in defining precisely what is meant with such a term: one difficulty derives from the fact that many of the constituent features of AFNs can be retrieved in the literature under the name of Short Food Supply Chain; Alternative Food Economy; Alternative Food Initiatives; Sustainable Agriculture Movements; Low Input Sustainable Agriculture. But reasons of contestation lie in: inconsistency of categorization of actors involved; type of relationships occurring (are they mainly economic? capitalistic?); terms of reference; geographic boundaries; supply chain (Tregear 2011) and scale (Mount 2012).

Read as an attempt to re-spatialize and re-socialize food (Jarosz 2008), AFNs have often been identified with local, referred to as an attribute of AFNs (Born and Purcell 2006; Feagan 2007; Hinrichs 2003; Renting et al. 2003; Ilbery and Maye 2005), before deserving to be studied on their own. Roberta Sonnino (2013) has highlighted how local has been deeply analyzed and deconstructed and positives

and negatives have been exposed: at the beginning, local was seen as the panacea to the negative impacts of global food systems (causing scholars to theorize “the local trap”; see Born and Purcell 2006, p. 195); and later as the propeller of inequalities and new structural problems resulting from neoliberal processes. This is argued to be not necessarily true. For instance, Sonnino highlights the extreme fragility of local food networks; instead of being partisan to one or the other, she offers a third point, that is, the need to rescale food policies at the local level instead of rescaling food systems. In exposing how neoliberal processes can enact resilient local food networks, Sonnino argues that food-relationships occurring in a place are fundamental to sustain these networks, beyond a mere reliance on local food, and this drives us again to the importance of relationships. She therefore advocates a reconfiguration of governance since sustainability “is never just a matter of food provenance”. In the same way, and paraphrasing it, we would argue that food security is never just a matter of production-related policies. Such a perspective forces us to ask the overarching question: can the alternatives be formalized in the effort to effectively achieve food security? And what would be the role of local in this formalization?

AFNs and food security through assemblage

In summary, we question the basic premise that there should be one mainstream, one coordinated alternative, one agreeable definition of food security, and one way of achieving it in the context of AFNs. Kirwan and Maye (2013)’s flat and sharp keys serve as a good metaphor to illustrate the continuous and active discourse and praxis around food security—the reinforcing and disrupting nature of collective actions. Food security is better seen as a dynamic construct; it is always in the making. In order to understand this idea of a vibrant food security, we will first explore a different way of thinking about entities, processes, and society. We use assemblage thinking (Deleuze and Guattari 1983, 1987) to articulate the idea of continual emergence of process and structure. Assemblage is used to illustrate how a heterogeneous entity, such as AFNs or the very idea of food security, can “hold together *without* actually ceasing to be heterogeneous” (Allen 2011, p. 154, emphasis in original). It starts from the premise that most of the things we find in life are created through construction and disruption. There is no stability per se; there is instead a continuous process to create a quasi-stable state. Assemblage thinking relies on the argument that collective actions can be understood not through the primacy of action and intention, but through uncertainty, nonlinearity and contingency (Rosin et al. 2013). There is no way to predict the future of a heterogeneous entity.

There is, however, a way to understand the behavior of the actors and entities that form an assemblage. Dewsbury (2011) reiterates a notion in Deleuze-Guattarian assemblage thinking (1987) known as ‘lines of flight’ and ‘lines of articulation’, combined with machinic assemblage and assemblage of enunciation.¹ Lines of flight refer to the nature of entities and assemblages that deconstruct a structure and disrupt a process of formation. It is the ephemeral and precarious characteristics of an assemblage. In contrast, lines of articulation refer to the tendency of the very entities to, at the same time, construct and reinforce an assemblage’s formation. If we then reflect this to Kirwan and Maye’s flat and sharp keys, assemblage thinking can clearly be seen to align with the discursive nature of the collective action frames.

What is yet to be acknowledged in the consensus frames is the role of the entity, human as well as non-human, to equally form (and de-form) an assemblage. Dewsbury refers to this as machinic assemblage and assemblage of enunciation. A machinic assemblage is made out of entities that are physically attached and held together during a process. An operational tractor is a machinic assemblage because it is made from both humans and materials in their material sense. However, a machinic assemblage also calls for an assemblage of enunciation—an expression of meanings through the individuation, or becoming, between a farmer and the tractor s/he uses (Raunig 2010).

The two conceptions of assemblage (machinic and enunciation) form the very basis of the creation of value and meaning within the praxis of food security. As we will show in the case study, food security is constructed not only through expression of values, but also through the interactions between entities, both humans (farmers, social workers, consumers) and non-humans (canned food, vegetables, soil). The interactions influence how intentions are enunciated and how discourses are shaped.

If food security is seen as ephemeral collective actions (due to the combined effect of lines of articulation and flight), then the same must certainly hold true for local and AFNs. In articulating on geographies and places, Rosin et al. (2013) use the idea of *reterritorialization* and *de-territorialization* to explicate the making of boundaries in a given space. Local is socially constructed and cannot be confined to a fixed geographical delineation. It is subject to continuous, diverse actions. Territoriality is not necessarily a spatial construct. In fact, the early use of the concept in Deleuze and Guattari’s *Anti Oedipus* (1983) applies territoriality to the construction (and deconstruction) of social structure and psychological realm. Drawing from this idea, local and AFNs are as much socially constructed

¹ Altogether these four attributes are named the ‘tetravalency’ of assemblage (Dewsbury 2011, p. 148).

heterogeneous assemblages as they are negotiated structures. Boundaries that we make use of to define what local is (distance, administrative region, etc.) are therefore created and re-created on the basis of the relationships between heterogeneous entities (machinic) and the expression that emerges from them (enunciation).

In the next section, we present a case of Dunedin's AFNs, which helps to illustrate a theoretical re-framing for the dichotomies between local and global (Hinrichs 2003). We put a particular emphasis on the types of relationships that shape the meaning of local and food security, along with the context in which the assemblage takes place. Here, we attempt to see how the food network is not always constructed through intentional negotiations, but also through somewhat unintentional, collective actions—just like how we see an assemblage. This, of course, brings an implication on the way different actions, as opposed to a single coordinated action, might in fact help to shape local movements, as well as re-define what local is in the context of food security.

Presenting the case: Dunedin's local food economy

The data reported here were collected as part of a project we pursued in order to map the local food system of Dunedin, a small size city in the South Island of New Zealand. Our interest lay in being able to identify the major actors of such a food system and understanding the relationships occurring between them. In our attempt to constrain the scope of study, we found defining community boundaries to be difficult. Therefore, geographically speaking, we decided to also include people and activities from the hinterland, following their orientation to understand Dunedin's boundaries more loosely. Participants were selected based upon their involvement within the production end of the food system (e.g. farmers participating in the local Farmers' Market). Through a snowball sampling technique (Goodman 1961), the discussion processes expanded to include other groups that were of significance to the development, and people who had some interest in the functioning, of the local food system (e.g. activists, faith-based groups running a food bank, policy makers).

Focusing on a qualitative research approach (Denzin and Lincoln 2011), the study was conducted using informal, conversation-style interviews and participatory action research in which we were directly involved in informal gatherings, local food meetings, focus group discussions and community forums. We particularly co-organized two local food fora (in 2012 and 2013), from which insights on different understandings of local food and food security were captured. Some additional information was gathered

through document analysis (Yin 1994) of public documents, groups' web profiles, reports and other relevant academic and popular publications.

This paper places Dunedin as a particular case in regard to local food system. On one hand, Dunedin accounts as the second largest city in New Zealand, to which massive peri-urban agriculture surrounds the urban area (Statistics New Zealand 2006). Beyond the city limits, Otago region is also one of the largest regions in New Zealand. On the other hand, in terms of population, Dunedin only contributes to 2 % of the total population of the country (of about 6 million people; Statistics New Zealand 2006), which also shows a very sparse population per area (DCC 2011). The fact lends to a huge potential for providing local food to the city population.

Despite this fact, the entirety of New Zealand's agricultural policy is orientated towards export market (Le Heron and Pawson 1996). Some of the most prominent agricultural products in the Otago region—summer fruits, dairy, sheep and wine—are above all else considered world commodities, catering to the growing demands of European, American and Asian markets (FreshFacts 2011). FAO (2009) also illustrates that more than 70 % of the agricultural products produced in the country are marketed overseas, which brings a consequence to increasing reliance on imported goods. This, of course, is not necessarily bad, as it is well-accepted that industrialized countries are basing their food security on international trade (Timmer 2005). However, with ever-increasing economic and food crises (Rosin et al. 2012), this situation challenges the city's population to raise the importance of a resilient local food system.

Another factor that contributes to the vibrancy of Dunedin is its designation as a city of students and academic life. We see this as bringing at least two consequences to the dynamics of food activities in the city. Firstly, with a growing numbers of students, both domestic and international, the students' life has contributed significantly to the economy of the city. In accordance, there are also increasing numbers of restaurants, cafes, amount of goods circulated through the supermarket chains, and smaller grocery stores and vegetable retailers filling in the niche market (DCC 2011). However, we argue that another advantage of being a student (and academic) city has lent Dunedin a vibrant flow of new information, culture and lifestyle brought along by students and researchers. This vibrancy becomes one of the drivers for the growth of local food initiatives in Dunedin.

Furthermore, as a small city located at the corner of the world, people in Dunedin also share a strong sense of community. Immigrants from different parts of the world looking to start a new life together in the city have thus strengthened the solidarity and attachment to the land and

community. We have also identified some faith- and community-based organizations that grew strong over the past century, supported a sense of community and provided help for food insecure individuals. This sense of belonging has, to some extent, driven a more active engagement with food and farming, such that was also demonstrated by Hinrichs in the case of AFNs in Iowa (2003).

We observed, among others, clustered community gardens, urban gardens and backyard producers, not only as a way to support their economic activities or to provide healthy and safe food, but also to build a sense of community and shared experiences, and show a different understanding of relationship with nature and the environment and the food we eat. There were also clusters of community support organizations relying and building upon different access to food and the sense of relatedness to other people. This allowed us to chart actors rendered invisible in a society where the only common factor is the economic functioning of the system, but also about a redistribution of food surplus and a deep inter-relatedness. These simple aspects speak loudly about our understanding of food security as a matter that cannot be dealt only with an increase in production.

This paper thus argues that all of these factors that build upon the peculiarity of Dunedin have also opened a way for the growing interest on local food provisioning and acted as the foundation on which a local food network is built. One thing to note here is that mapping and identifying these actors requires a measure of inclusivity. In fact, the main issue in trying to represent graphically such a network was on how to cluster them (see Fig. 1).

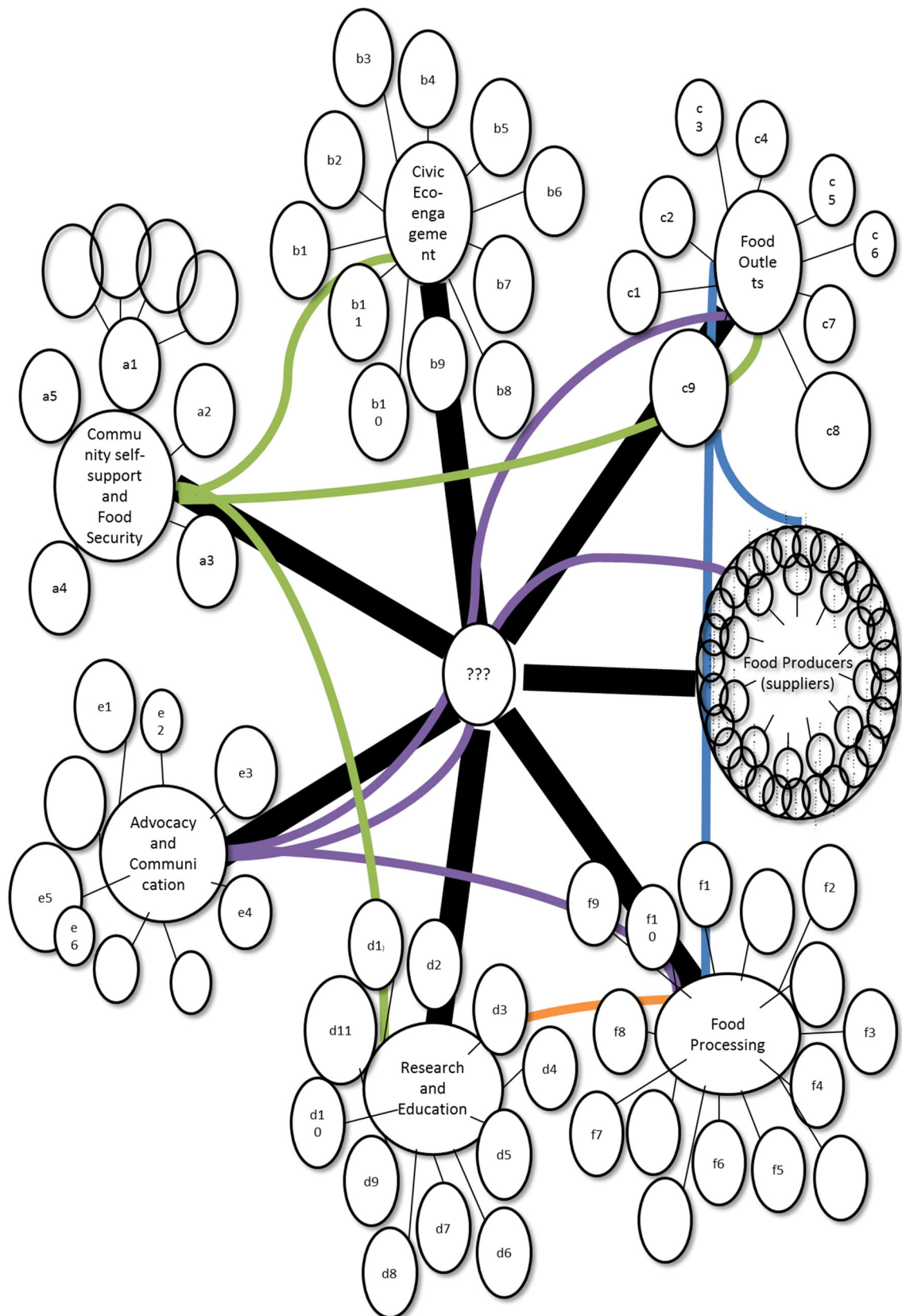
Looking at the resultant chart in Fig. 1, the only clear thing was that we put on one side actors and activities we could label as ‘production’ and on the other side a loose assemblage of the rest. The heterogeneity of this last group of actors made it difficult to conceive them as a whole entity—are they the consumption side? The civic engagement? How do we understand and theorize them? What is their role? We started questioning what their contribution is and whether we could measure it on the sole basis of production. In addition, relationships occurring among them were not emerging clearly, and we thus offer a new framework in terms of assemblage instead of a systematic representation. The actors, and groups of actors, seem to hold together through different manners (the question mark in Fig. 1), while at the same time still being heterogeneous and ephemeral, just like what Allen (2011) neatly describes as assemblages.

We also show in Fig. 1 that a thin boundary is made on the basis of the actors’ commitment and good-will to promote local food and/or nurture community development. As discussed earlier, most actors are included solely on the basis of their geographical locations. Yet, we

sometimes have to cross those boundaries when we encounter actors that operate beyond the spatial scale. For examples, most of the prominent faith-based organizations are nationwide, but operating in a particular locality for the sake of the local community. The same thing applies to organic support organizations. Some conventional supermarkets and processing factories are part of multinational corporations and trans-Tasman food networks, but have the flexibility to source their goods locally or engage personally with local communities and, by doing so, promote the growth of the local food system. In our analysis, we went beyond ‘the local trap’ and sought for a local inclusiveness on the premise that even the ‘conventional’, often considered as bad (Lang 1999; Hinrichs 2003), can have a significant role in shaping the local food system. We thus posit that local needs to be seen in its widest conception.

We then challenged this argument by seeing empirically how instances like community events and public discussions on local food considerably attracted these various groups. As it turned out, meetings like the local food forum on developing local food policy (attended by a range of audiences including food activists, organic practitioners, community groups, academics, restaurant associations, and large corporations) shows how local has become both inclusive and alluring. The emerging prominence of local food within the public interest has, to some extent, attracted involvement of a wide spectrum of actors to the system for their own interests. It is thus important for us to acknowledge that these actors, from the conventional to the alternatives and from private to community-based, are playing a particular role in the construction of a local food system in Dunedin. Even if these actors are working independently to pursue their own interests, they share a collective sense manifested in the way they are connected with each other. Such a collective nature has been expressed during the two public fora we have helped organize and run and constitutes the basic assumption around AFNs, that is, the contestation of the current global organization of food provision. The market with its particular rules and assumptions is not the only way to allocate resources and achieve food security; a global dimension denies local people and practices as contributors to food security. To put production on one side, as we have shown graphically in Fig. 1, evidences the pressure put on some actors considered in charge of food provision and neglects the role of local and non-mainstream activities. Actors and activities need to be integrated and move beyond a very basic assumption of food security as ‘being free from hunger’.

Nonetheless, we have noticed something more, relevant to the argument in this paper; that such a collective action has already taken place despite being uncoordinated. Our findings lead to an understanding that engagements between actors take place in various times and places,



◀**Fig. 1** Mapping Dunedin's local food network. *Notes* a1 Christian Helping Agency (Food Bank); a2 The Methodist Mission; a3 Pacific Representatives & Groups; a4 Local Iwi; a5 Local churches, mosque and temple; b1 South Dunedin Community Garden; b2 Waitaki Community Garden; b3 Dunedin's Vegetable Growers' Club; b4 Broad Bay Community Garden; b5 Transition Valley 473; b6 Pine Hill Community Garden; b7 Waitati Edible Gardeners' Group; b8 NEV Community Garden; b9 Kaikorai Valley Community Garden; b10 Brockville Community Development Project; b11 Dunedin Botanical Garden & Horticultural Society; c1 Circadian Rhythms; c2 The Good Earth Café; c3 The Joyful Vegan; c4 Potpourri Natural Food; c5 Taste Nature; c6 Lievito Bakery; c7 Who Ate All the Pies?; c8 Conventional Supermarkets and restaurants; c9 Otago Farmers' Market; d1 Students for Environmental Actions (SEA); d2 OUSA's Food Bank; d3 Dunedin's Food Not Bombs; d4 University's Dept. of Food Science; d5 Dept. of Botany; d6 Dept. of Geography; d7 Dept. of Sociology, Gender & Social Work; d8 Dept. of Marine Science; d9 Centre for Sustainability; d10 Centre for Theology & Public Issues; d11 Polytech's Sustainable Living Campus & Food Prep Program; e1 Local newspapers; e2 Enviro-Schools; e3 Food festivals & events; e4 Food Share Dunedin; e5 Soil and Health Association; e6 NZ Organic Magazine; f1 Marlow Pies; f2 Whitestone Cheese; f3 Church Road Industries Ltd.; f4 Haraways Oats; f5 Cadbury Chocolates; f6 Fisher Meats; f7 Evansdale Cheese; f8 Wests Cordial; f9 Cottage Bakery; f10 Gourmet Ice Cream

depending on which aspects of the food system they touch. For example, the Otago Farmers' Market facilitates interactions between local food producers, processing entities, food distribution and consumers at large on a weekly basis. This occasion provides not only market activities, but also, as we witnessed directly, a place to engage deeper with the local food in which people discuss future plans ahead and is based on inclusivity. Similar things happen during a regular working bee in community gardens or permaculture gardeners' meeting where they often invite experts from the university or practitioners alike. During certain periods of the year, the faith-based organizations coordinate a food bank program that occasionally involves community gardens, students' groups and supermarkets to donate their produces and goods. Lastly, events like food forums and public talks facilitate a wider engagement of these actors within the local food system.

It has to be noted that the people we interviewed are extremely knowledgeable on food and food provision, are concerned about food security and committed to the creation of a local, coordinated network. In such a restructuring process, where positions and relationships have been questioned, conflicts and frictions over 'local' or 'food security' were the essence of debates:

We must be inclusive. Local food is actually a very broad constituency, ranging from [...] our local area, to large commercial producers who are working, producing food, generating income within the existing food system. Most people here I suspect will believe that there are some things wrong with that

system and that things should change, but I think we need to look at ways so that we can include as many people as possibly can. And certainly I think what we will find is that even within the group there are people who have got quite different takes on what local food means for them and what they see as the opportunities. (A, Farmer, 2nd local food forum)

You know, the Otago Farmers' Market has chosen to define local as within the Otago region. But that doesn't necessarily make sense. It makes sense for us in Dunedin because we are in the center of the area but what if you live near borders and your neighbor is technically in the other region? So it's a bit of multi-scale kind of thing ... When we talk about localizing food I don't really think about that as... like a brick wall, we don't want to build a brick wall around the target and say 'we don't allow anything from outside of this wall. We must be self-sufficient', that's a little bit unrealistic. (B., Food Activist, 1st Local Food Forum)

The different understandings of local and food security had never influenced them in engaging with one another prior to the Local Food Forum, because the assemblage has already taken place long before. However, although the discussion in the food forum seemed to perpetuate the idea, it also had the risk of attracting conflicts. Two participants noticed this:

There were some people who wanted to go to supermarket and encourage them to have labeling and stuff like that, and to really make an emphasis on growing locally and having that less than 200 km distance, or whatever. But on the other side, some other people thought that supermarkets really are part of the problem. (M, Journalist, 2nd Local Food Forum)

All foods we gave out are donated, and we'll just take whatever's going, from firms, from individuals [...] we'd like to do better than tins of spaghetti and pasta and rice. If we can get fresh produce, that's great, although it has to be given out as soon as we get it. (N, Food Bank Manager, 1st Local Food Forum)

The first quote talks almost entirely on ways to achieve food security through local produce. Supermarkets, in this sense, can be seen as either the problem (in such a way that it sells imported food and does not give a contribution to a stronger local economy) but, as other participants also noticed, supermarkets do provide food and have started offering local products more frequently, and thus helps to strengthen food security (at least under the hunger frame, not so much under the community frame). In a similar way,

the second quote shows a sense of pragmatism, depicting how food security for urban poor is best seen as any food that can be distributed easily and stored over longer periods (answering to the hunger frame and risk frame). What is interesting is that it is implied in both cases that there are spaces for negotiation and actions to cross boundaries of the given frames (Mooney and Hunt 2009; Kirwan and Maye 2013). Boundaries, in this sense, are fluid and go beyond geographic limitation. This fluidity is thus important to understanding relationships between actors and things that ‘glue’ others together.

Discussion

The experience of Dunedin partly presents similarities with other AFNs around the world that contest the global food system through activities such as farmers’ markets, urban gardens and community gardens (Hinrichs 2003; Kirwan and Maye 2013). However, it also presents differences because of the relationships occurring among actors and in the way the system is perceived, showing the need to understand the system using different tools.

Dunedin’s local food system is shaped by multiple entities in such a way that assemblages work, from the economic and agricultural orientation of the country, a growing organic market, the geography of the region, as well as the structure of the population. With a sparse population and massive agricultural land in the peri-urban area, an increasing number of lifestyle farmers (who produce food for their own, local, need) vis-a-vis the large scale export oriented agriculture offer a space for the growth (and contestation) of different food systems. And its citizens, coming from different backgrounds and social strata, bring along their lifestyle, culture and knowledge into the local food practices. Here, these entities contribute to a vibrant local food system that seems to be always in the making.

Understanding Dunedin’s local food system through the lens of assemblage, it is clear that the first instance of AFNs shaped in Dunedin was in fact through individual actions that coalesced into collective ones. Machinic assemblage, shaped by the materiality of humans (students, farmers, social workers and migrants) as well as non-humans (climate, geography, and food), also brought about an assemblage of enunciation, where goals and objectives met, contested and merged, either intentionally or unintentionally. We have found that a formal entity of a local food network was only recently established, and even then it had not held together as it was expected.

Using lines of articulation and lines of flight, we sought to explain these processes of stabilizing and de-stabilizing the local food network. In the local food forum that we co-

organized, where most participants agreed to come up with a coordinated, rigorous network, the different (and conflicting) conceptions of local that they bring along seem to de-stabilize the process. On one hand, local is about being inclusive, but on the other hand, exclusion is also needed so that the integrity of the network is not lost. A similar contradiction also appears when the city council attempts to create formal food governance, and some worry that it might end up limiting the already engaging group of local food initiatives (and for the record, the city council involvement in this project ended here for this reason, but it is still active for other initiatives). In this sense, in articulating the local (i.e., giving ‘local’ a shape), the ‘flight’ comes from the blurred dichotomies between local and global, urban and rural, inclusion and exclusion, or robust and fluid.

The blurred boundaries also came between rural and urban, about different worlds and provision systems, about geography, and most importantly about social and cognitive aspects, which means the way in which we perceive and understand the system. We noticed an increased awareness of the complexity of the food system, and this awareness appears to be a major drive for engagement, what in the literature has been properly defined as reflexivity (Beck 1994). Awareness also defines the modern setting: unlike the past, engagement is possible at different levels, in different ways and this shapes the relationships between actors.

The flight and articulation also speaks clearly about what food security means for the society, and how it is enacted differently. Consensus frames, in this sense, are only useful as an analytical and theoretical framework rather than collective and individual actions. Many food activists and community members in the local food forum willingly participated in a way that could benefit their values and objectives, despite the seemingly existing framing boundaries. Praxis, in the end, equally shapes meanings and framings.

We argue that the most important thing for local AFNs to succeed is creating as much space as possible for the engagement process and relationships to occur. In seeing this, the potential and challenges of creating such spaces come with the fact that relationships are always contingent and also transformative. This brings at least three consequences.

Firstly, it transforms our understanding and practices of markets. It de-territorializes the classic neoliberal market where people meet for economic transactions, and re-embeds the market to its geographical locality, as also a place for a community engagement and the marginal economies. Secondly, it also pushes us to re-consider the practices of governance. It de-centralizes the power and opens new forms of governance that go beyond the formal structure. In

this understanding, food policy might become redundant, or at least, to be addressed, rather than seen as a real necessity.

Finally, it re-defines what local means. Through assemblage thinking, we see local shifts from something that is static and well-defined, into something that is dynamic, unstable and ephemeral. It is the subject of ongoing negotiation between actors, a form of de- and re-territorialization. It is contingent on the people, as well as on the geography, food, land, communication channel and infrastructure.

Conclusions

A deeper understanding is needed about food security and how it is related to local and alternative. In this article we have shown how food security is understood and performed in its local context through assembling of diverse actors and objectives within the AFN. This practice of assemblages compels us to revisit notions such as local food, market, governance and inclusivity. We have also argued that assemblage thinking offers an understanding of the way in which seemingly unstable local food relations are assembled so as to open possibilities of achieving food security.

It is important for us to note that assemblage is not a fatalist worldview, as many critics have posed (Allen 2011). There is, after all, a space for actions and changes. In fact, our finding in the case shows that fora and public discussions should never be intended as a means to bind the divergent actors. Instead, it is better to use these events to create spaces of engagement and contestation, or in other words, space of assemblage. However, it is also important to pinpoint that along the process, meanings change, and what we fight for (or against) may no longer be the same. The notion of food security evolves, but so do the actions that make it meaningful (or meaningless). When we assemble local food networks, we may not necessarily fight to re-claim food security (Carolan 2013); we are assembling a new idea of food security that would fit into the growing and changing society.

Acknowledgments This article was inspired by moments of discussions among members of Dunedin's local food network, to whom the authors share their utmost gratitude. An earlier version of this article was presented in a lively discussion at a working group during the 20th Australasia Agrifood Conference in Melbourne, 2013. The authors would like to thank all of the participants of the group for their inputs. The authors also thank Chris Rosin, Hugh Campbell, Dave McKay, Alaric McCarthy, and two anonymous reviewers for their insightful comments on earlier drafts of this article.

References

Allen, J. 2011. Powerful assemblages? *Area* 43(2): 154–157.

- Allen, P., M. FitzSimmons, M. Goodman, and K. Warner. 2003. Shifting places in the agrifood landscape: the tectonics of alternative agrifood initiatives in California. *Journal of Rural Studies* 19: 61–75.
- Beck, U. 1994. *Reflexive modernization: politics, tradition and aesthetics in the modern social order*. Redwood City, CA: Stanford University Press.
- Born, B., and M. Purcell. 2006. Avoiding the local trap scale and food systems in planning research. *Journal of Planning Education and Research* 26(2): 195–207.
- Brunori, G. 2007. Local food and alternative food networks: a communication perspective. *Anthropology of food* 2:1–20.
- Campbell, H., and R. Liepins. 2001. Naming organics: understanding organic standards in New Zealand as a discursive field. *Sociologia Ruralis* 41(1): 22–39.
- Carolan, M. 2012. *The sociology of food and agriculture*. New York, NY; London, UK: Routledge.
- Carolan, M. 2013. *Reclaiming food security*. New York, NY; London, UK: Routledge.
- Deleuze, G., and P.F. Guattari. 1987. *Thousand plateaus: capitalism and schizophrenia*, vol. 2. Minneapolis, MN: University of Minnesota Press.
- Deleuze, G., and P.F. Guattari. 1983. *Anti-oedipus: capitalism and schizophrenia*, vol. 1. Minneapolis, MN: University of Minnesota Press.
- Denzin, K., and Y.S. Lincoln (eds.). 2011. *The SAGE handbook of qualitative research*, 4th ed. Thousand Oaks, CA: SAGE Publishing.
- Dewsbury, J.D. 2011. The Deleuze-Guattarian assemblage: plastic habits. *Area* 43(2): 148–153.
- Dibden, J., D. Gibbs, and C. Cocklin. 2013. Framing GM crops as a food security solution. *Journal of Rural Studies* 29: 59–70.
- Dunedin City Council (DCC). 2011. Residential Research Report 2011. http://www.dunedin.govt.nz/data/assets/pdf_file/0018/233235/Residential-Research-Report-October-2011-Final.pdf. Accessed 26 June 2013.
- FAO stat. 2009. Food balance sheet: New Zealand 2009. statistical database. Retrieved 27 June 2013 from <http://faostat.fao.org/>.
- Feagan, R. 2007. The place of food: mapping out the 'local' in local food systems. *Progress in Human Geography* 31(1): 23–42.
- Feenstra, G. 1997. Local food systems and sustainable communities. *American Journal of Alternative Agriculture* 12(1): 28–36.
- FreshFacts. 2011. *New Zealand Horticulture 2011*. Auckland, NZ: New Zealand Institute for Plant & Food Research Ltd.
- Gallaher, C.M., J.M. Kerr, M. Njenga, N.K. Karanja, and A.M. WinklerPrins. 2013. Urban agriculture, social capital, and food security in the Kibera slums of Nairobi, Kenya. *Agriculture and Human Values* 30(3): 389–404.
- Godfray, H.C.J., J.R. Beddington, I.R. Crute, L. Haddad, D. Lawrence, J.F. Muir, J. Pretty, S. Robinson, S.M. Thomas, and C. Toulmin. 2010. Food security: the challenge of feeding 9 billion people. *Science* 327(5967): 812–818.
- Goodman, L.A. 1961. Snowball sampling. *The Annals of Mathematical Statistics* 32(1): 148–170.
- Gottlieb, R., and A. Joshi. 2010. *Food justice*. Cambridge, MA: The MIT Press.
- Gurvitz, P. 1999. Le rôle de la confiance dans la perception des risques alimentaires par les consommateurs. *Revue Française de Marketing* 183(184): 87–98.
- Herd, R.W., and C. Capule. 1983. *Adoption, spread, and production impact of modern rice varieties in Asia*. Los Banos, Laguna, Philippines: International Rice Research Institute.
- Hinrichs, C. 2003. The practice and politics of food system localisation. *Journal of Rural Studies* 19: 33–45.
- Ilbery, B., and D. Maye. 2005. Alternative (shorter) food supply chains and specialist livestock products in the Scottish-English borders. *Environment and Planning A* 37: 823–844.

- Jarosz, L. 2000. Understanding agri-food networks as social relations. *Agriculture and Human Values* 17(3): 279–283.
- Jarosz, L. 2008. The city in the country: growing alternative food networks in Metropolitan areas. *Journal of Rural Studies* 24(3): 231–244.
- Jarosz, L. 2014. Comparing food security and food sovereignty discourses. *Dialogues in Human Geography* 4(2): 168–181.
- Kirwan, J., and D. Maye. 2013. Food security framings within the UK and the integration of local food systems. *Journal of Rural Studies* 29: 91–100.
- Lang, T. 1999. The complexities of globalization: the UK as a case study of tensions within the food system and the challenge to food policy. *Agriculture and Human Values* 16(2): 169–185.
- Le Heron, R., and E. Pawson (eds.). 1996. *Changing places: New Zealand in the nineties*. Auckland, NZ: Longman Paul.
- Macias, T. 2008. Working towards a just, equitable, and local food system: the social impact of community-based agriculture. *Social Science Quarterly* 89(5): 1087–1101.
- Maye, D., L. Holloway, and M. Kneafsey. 2007. *Alternative food geographies: representation and practice*. Oxford, UK: Elsevier.
- Marsden, T. 2010. Food 2030: towards a redefinition of food? A commentary on the new United Kingdom government food strategy. *The Political Quarterly* 81(3): 443–446.
- Maxey, L. 2007. From “alternative” to “sustainable” food. In *Alternative food geographies*, ed. D. Maye, L. Holloway, and M. Kneafsey, 55–76. Oxford, UK: Elsevier.
- Maxwell, S. 1996. Food security: a post-modern perspective. *Food Policy* 21(2): 155–170.
- McMichael, P., and H. Friedmann. 2007. Situating the ‘Retailing Revolution’. In *Supermarkets and agri-food supply chains: transformations in the production and consumption of foods*, ed. D. Burch, and G. Lawrence, 291–319. Cheltenham, UK: Edward Elgar Publishing.
- Mol, A. 2002. *The body multiple: ontology in medical practice*. Durham, NC: Duke University Press Books.
- Mooney, P.H., and S.A. Hunt. 2009. Food security: the elaboration of contested claims to a consensus frame. *Rural Sociology* 74(4): 469–497.
- Morris, C., and J. Kirwan. 2011. Ecological embeddedness: an interrogation and refinement of the concept within the context of alternative food networks in the UK. *Journal of Rural Studies* 27(3): 322–330.
- Mount, P. 2012. Growing local food: scale and local food systems governance. *Agriculture and Human Values* 29: 107–121.
- Mount, P., S. Hazen, S. Holmes, E. Fraser, A. Winson, I. Knezevic, and K. Landman. 2013. Barriers to the local food movement: Ontario’s community food projects and the capacity for convergence. *Local Environment* 18(5): 592–605.
- Prigent-Simonin, A.H., and C. Hérault-Fournier. 2005. The role of trust in the perception of the quality of local food products: with particular reference to direct relationships between producer and consumer. *Anthropology of food* 4:1–19.
- Qazi, J.A., and T.L. Selfa. 2005. The politics of building alternative agro-food networks in the belly of agro-industry. *Food, Culture and Society: An International Journal of Multidisciplinary Research* 8(1): 45–72.
- Raunig, G. 2010. *A thousand machines: a concise philosophy of the machine as social movement*. Cambridge, MA: The MIT Press.
- Reece, J.B., M.R. Taylor, E.J. Simon, and J.L. Dickey. 2012. *Campbell’s biology: concepts and connections*, 7th ed. San Francisco, CA: Pearson Benjamin Cummings.
- Renting, H., T. Marsden, and J. Banks. 2003. Understanding alternative food networks: exploring the role of short food supply chains in rural development. *Environment and Planning* 35: 393–411.
- Rosin, C., A. Dwiartama, D. Grant, and D. Hopkins. 2013. Using provenance to create stability: state-led territorialisation of Central Otago as assemblage. *New Zealand Geographer* 69: 235–248.
- Rosin, C., P. Stock, and H. Campbell (eds.). 2012. *Food systems failure: the global food crisis and the future of agriculture*. New York, NY; London, UK: Earthscan.
- Smith, M., J. Pointing, and S. Maxwell. 1992. Household food security, concepts and definitions: an annotated bibliography. *Development Bibliography No. 8*. Brighton, UK: Institute of Development Studies, University of Sussex.
- Soemarwoto, R. 2007. Kasepuhan rice landrace diversity, risk management, and agricultural modernization. In *Modern crises and traditional strategies: local ecological knowledge in island South-east Asia*, vol. 6, ed. R. Ellen. New York, NY: Berghahn Books.
- Sonnino, R. 2013. Local foodscapes: place and power in the agri-food system. *Acta Agriculturae Scandinavica Section B-Soil & Plant Science* 63(sup1): 2–7.
- Statistics New Zealand. 2006. *Quick stats about Dunedin City*. <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/>. Accessed 26 June 2013.
- Timmer, C.P. 2005. Food security and economic growth: an Asian perspective. *Asian-Pacific Economic Literature* 19(1): 1–17.
- Trauger, A. 2007. Connecting social justice to sustainability: discourses and practice in sustainable agriculture in Pennsylvania. In *Alternative food geographies: representation and practice*, ed. D. Maye, L. Holloway, and M. Kneafsey. Oxford, UK: Elsevier.
- Tregear, A. 2011. Progressing knowledge in alternative and local food networks: critical reflections and a research agenda. *Journal of Rural Studies* 27(4): 419–430.
- United Nations. 1988. *Towards sustainable food security: critical issues*. Nicosia, Cyprus: Report by the Secretariat, World Food Council, Fourteenth Ministerial Session, 23–26 May.
- United Nations. 1975. *Report of the world food conference*, Rome, NY: 5–16 November 1974.
- Yin, R.K. 1994. *Case study research: design and methods*, 2nd ed. London, UK: Sage Publications Ltd.
- Valdes, A., and P. Konandreas. 1981. Assessing food insecurity based on national aggregates in developing countries. In *Food security in developing countries*, ed. A. Valdes. Boulder, CO: Westview Press.
- Wahlqvist, M.L., J. McKay, Y.C. Chang, and Y.W. Chiu. 2012. Rethinking the food security debate in Asia: some missing ecological and health dimensions and solutions. *Food Security* 4(4): 657–670.

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