Local Food System Planning: The Problem, Conceptual Issues, and Policy Tools for Local Government Planners

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Abstract

Local food system planning was identified in the late 1990s as an emerging and important urban planning object. Since then, little attention has been placed on identifying a robust and comprehensive understanding of the roles and tools local government can use in addressing their local food systems. The emerging literature identifies problems with the dominant productionist agricultural system, addresses conceptual issues and often advances normative arguments in support of developing and supporting local food systems, but attention to the practical actions needed to address this issue on the ground have been limited. This paper provides an overview of the reported risks (such as water shortages, climate change, peak oil) associated with our dominant food systems, addresses the lack of attention to the importance of sub-scales within 'local' and definition of 'local food,' and it identifies the main reasons for considering local food systems as part of addressing the food system risks. Finally, it presents a policy framework along with tools and roles for local government to address local food systems within each of the framework's categories. The principal purpose is to help advance the local food system work of planners in their North American communities.

Keywords: local food systems, local government, urban planning, sustainability, food system policy

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Résumé
La planification locale de système alimentaire a été identifiée dans les années 1990 comme un aspect important en urbanisme. Depuis, peu d'attention a été accordée à l'élaboration d'une meilleure compréhension concernant cette question, et le rôle et les outils que les gouvernements locaux peuvent utiliser pour répondre au besoin de leurs systèmes alimentaires locaux. La récente littérature concernant ce sujet identifie des problèmes avec le système de production agricole dominant, aborde les enjeux conceptuelles et, plus souvent qu'autrement avance des arguments normatifs à l'appui et le soutien soutenable des systèmes alimentaires locaux. Toutefois, l'attention sur les mesures pratiques nécessaires pour répondre à cette question sur le terrain son limités.

Cet article consiste en un aperçu des risques signalés de par les études associés à nos systèmes alimentaires dominants (tels que les pénuries d'eau, les changements climatiques, choc pétrolier). L'étude aborde également le manque d'attention à l'importance des sous-échelles en ce qui a trait au terme 'local' et a la définition de 'nourriture locale' et, identifie les principales raisons de considérer les systèmes alimentaires locaux dans le cadre de lutte contre les risques du système alimentaire. Finalement, l'article présente un cadre politique ainsi que des outils et des stratégies pour les gouvernements locaux pour développer et renforcer le développement de système alimentaire locale. Le but principal est de contribuer à l'avancement des travaux des planificateurs sur les systèmes alimentaires locaux dans les communautés en Amérique du Nord.

Mots clés: système alimentaire locale, administration communale ou locale, aménagement du territoire, planification urbaine, politique des systèmes d'alimentation

Introduction

The study of Local Food Systems and Production (LFS/P) represents a nascent field of geographic study, an emergent focus in urban planning (Granvik 2012) and it is increasingly a key part of sustainable development and the resilient community discourse (Kaufman 2009; Roseland 2012). The convergence of several related food system risks like climate change (Ostry et al. 2011), peak oil (Roberts 2009), productionist agriculture impacts (Tilman et al. 2002), and global demographic trends (Roberts 2009; Peters 2010; The Government Office for Science 2011) highlight the critical role food systems will play in the future at the local level. Research on how local communities and their local governments can support local food systems is essential for responding to this emerging food challenge, and addressing how we grow food is one of the most significant opportunities to become more sustainable (De La Salle 2011).

Since Pothukuchi and Kaufman (1999) placed LFS/P on the planner's table, there has been limited discussion in the academic literature on the role of planners and local governments (Nichol 2003; Werkerle 2003; Roseland 2012; Thibert 2013); however, these works have not attempted to bring together a robust list of the roles and tools. This paper addresses this void by providing a comprehensive list of roles and tools for local government food system planning and placing these within a broad policy framework that local government planners may consider when addressing their local

food system needs. For the latter, however, it is important to understand the problem. We briefly review some the reasons for attention to local food system planning, address the issue of definition for 'local food', identify the importance of addressing local food system sub-scales, and identify arguments in favour of supporting local food systems. With an overview of the problem and a rationale for urban planning strategies to address local food systems and production, it is anticipated that planners will be better positioned to present and advocate for local food system and production initiatives with the tools and roles identified in this paper.

Our approach is sympathetic and supportive of LFS/P, but it asserts the need to retain and improve the sustainability of the global productionist agricultural model. We take a pragmatic view of the problem of sustainably producing enough food globally while respecting the need for local areas to improve food security and their own resiliency. In particular, this paper addresses the importance of LFS/P to the sustainability and resilience of local communities and the role of Local Governments in facilitating LFS/P. The conceptual framework and comprehensive listing of local government food system tools will help local government planners to undertake this important work and develop more detailed policy models within Local Food System Planning.

The Problem

The imperative to sustainably produce food in the global context is presented by the *Foresight* report which used over 100 peer reviewed articles and around 400 leading experts and stakeholders. It suggests that we have about 20 years to provide 40% more food, 30% more fresh water and 50% more energy to meet anticipated needs (Government Office for Science 2011). It argues that the unsustainable global food system needs to be radically redesigned and that food must advance up the political agenda. While other forecasts may reach different conclusions, there is clear growing demand for food, water and energy and serious challenges in meeting them. A current example regarding the water supply challenge, is the state of drought emergency declared in 2014 in the state of California. As of July 29, 2014 the entire state is in the severe, extreme and exceptional state of drought categories and over 58 percent is in the exceptional (highest) drought category (United States Drought Monitor 2014).

Supporters of LFS/P identify a wide range of issues as reasons for serious attention to LFS/P including: diminishing water supplies, environmental degradation from Productionist Agricultural (PA) practices, climate change impacts, rising energy costs, a growing and increasingly prosperous global population, food shortage risks and, more recently, community sustainability and resiliency concerns (Roberts 2009; Roseland 2012; Astyk and Newton 2009). Astyk and Newton (2009) describe the food crisis of 2008 as a result of the increasing global demand for food, cars, and cows and their impact on the price of staple grains. Clapp and Helleiner attribute the crises in part to the "financialization" of the agricultural industry through speculative investment tools like derivatives in agricultural commodities (2012).

Heavy dependence on productionist agriculture is also a common theme in the literature concerning the emerging interest in LFS/P. With PA's heavy reliance on fossil fuels to run machines and transport produce combined with an estimated 23%

of fruits, 17% of vegetables and 68% of fish and shellfish in 2001 being imported into the United States, and with food traveling between 2,170 and 2,400 kilometers to consumers, there are large amounts of embodied energy in food (Frumkin et al. 2007). For example, one pound of lettuce contains 80 calories of food energy, but to grow, wash, package, and transport it from a California field to an East Coast market requires more than 4,600 calories of fossil fuel energy—more than 50 calories of fossil fuel energy in for every calorie of food energy out. For these reasons, PA has been described as eating fossil fuel and its scarcity will result in more expensive and potentially less food (Ibid). The use of synthetic nitrogen has been identified as one of the key reasons why Organic farming produces less GHG emissions and has lower energy requirements (Lynch, MacRae, and Martin 2011).

While local governments have to balance many competing demands for limited resources, planners must be able to make food system planning a priority area for action. This brief overview of food supply risks presents an argument for local communities and their governments to undertake work to improve local food systems as a key strategy to improve local sustainability and resiliency.

Definition and Scale Issues

It is important to understand what "local" food means and the subscales in which it can be produced. This is especially true for planning practitioners who will need to analyze local food systems and develop policies that are relevant to each scale of the local food system. There are multiple and varied definitions and practical expressions of 'Local Food Production' in the literature. While this is a point of critique for some, Martinez et al (2010) suggest that it may actually be appropriate to have different definitions. Qazi and Selfa (2005) argue that there are multiple meanings in 'localism' which will depend on the socio-political context and that the fluidic, variable and situated nature of alternative agro-food networks would work against any clarity gained by defining a typology of their forms. Similarly, Fonte (2008) sees local food re-localization strategies stemming from different local (place) contexts and different social networks. Hinrichs (2003) argues that 'local food' is a socially constructed idea that holds multi-faceted and sometimes contradictory meanings and can be an overdrawn and problematic dichotomy.

The United States 2008 Farm Act defines local food as product that is consumed less than 400 miles from its origin or within the state it is produced (Martinez et al. 2010). In comparison, the 100-mile diet popularized by MacKinnon and Smith's year long effort to eat only food produced within 100 miles from where they lived has produced a popular distance-based definition (Ladner 2011). Local food in Sweden is defined as being produced within a 155 mile (250 km) radius from where it is sold (Wallgren. 2006). Further, definitions in the United Kingdom include geographic proximity (ranging from being within 30 miles, a county, a sub-region or to a whole country), a short supply chain or consumers perceptions of 'local' (Pearson et al. 2011). Given the socially constructed, place based nature of 'local food systems', it is not surprising that attempts to arrive at a distance based definition for local has yielded different results.

'Local' is a word that takes its meaning relative to place and is particular to the

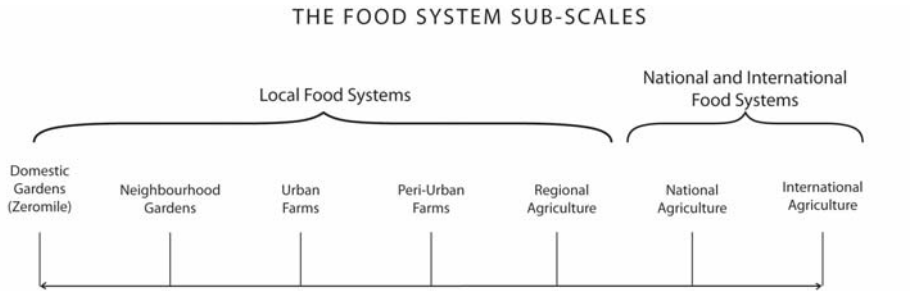
place. Popper (2006) argues that locality is another word for place. If "one thinks of different possible scales, locality is nearby" (Ibid). It is useful, therefore, to understand 'local' as a relativistic term, contingent on place, and in terms of scale it is closer rather than further away. We suggest that attempts to arrive at a standard, quantifiable definition of 'Local Food' will be inherently problematic and unsatisfactory. It is best understood as a socially constructed, relational concept that will vary from place to place (or locality to locality).

Martinez et al (2010) define local food as: "food produced, processed, and distributed within a particular geographic boundary that consumers associate with their own community." This definition speaks to a scale determined by a geographically situated community of consumers. It is silent, however, on the supply chain aspect suggested by several writers as being characteristically short (Renting et al. 2003). By inserting a short supply chain aspect to the definition, LFS/P reflects a smaller (sub-regional) versus a larger (national) geographic area and therefore is more consistent with a community scale. Our working definition is: 'Local Food Production is characterized by a short supply chain between the production of raw food product and the consumers within a geographical area generally understood as a local community by its consumers.' This definition is intentionally silent on any social, political or environmental agenda as well as on a specific geographical distance delimiter. It is intended to be a more neutral definition than would otherwise occur if one or more of these agendas were to be incorporated. Further, it is also less problematic given that there are competing and different views as to what these agendas might be within the LFP discourse and also within communities (Qafi and Selfa 2005).

One of the critiques advanced in the literature on LFS/P is the conflation of 'local' with potential benefits. Several scholars question the uncritical, normative approach to the issue of LFS/P arguing that there is nothing intrinsic in scale and nothing intrinsic in LFP (Mount 2012). Born and Purcell (2006) describe local food as "The '*local trap*' which refers to the tendency of food activists and researchers to assume something inherent about the local scale. The local is assumed to be desirable; it is preferred a priori to larger scales" (Ibid). While they do not argue that local is bad they assert that there is nothing inherently good about any scale. "Local-scale food systems are equally likely to be just or unjust, sustainable or unsustainable, secure or insecure" (Ibid). Scale, they argue, is socially constructed rather than ontologically given and cannot therefore be an end in itself but simply a strategy that leads to wherever "those it empowers want it to lead." They argue that it is the content of the agenda, not the scales themselves, that produces outcomes such as sustainability or justice. We support the importance of content in the local food agenda but suggest that there are differences in scale potentialities which can make for some intrinsic differences. Further, in addition to the perspective that scale is socially constructed, it may also be argued that there are ecological influences on the construction of scale. However, our purpose here is to highlight the importance of scale potentialities and acknowledge that potential for a more sustainable practice does not necessarily deliver better performance. For example, it is easy to imagine unsustainable local food practices. A person could drive long distances in a gas guzzling SUV to buy a few vegetables from a farmer practicing environmentally harmful agriculture. This would seem to be far more unsustainable than simply going to the local grocery store;

however, just as there are criticisms that arguments in favour of local food production may be insufficiently nuanced (Morris and Kirwan 2010 cited in Mount 2012), so too is the argument that there is nothing inherently good or bad in LFS/P. We offer one point to demonstrate this. Some sub-scales of local offer opportunities or potential not available to non-local like, for example, the ability to walk to a private or public garden in a short period of time. There is a range of what might constitute local (see Figure 1) and at the zero-mile (Herriot 2010) end of the scale there is the physical reality that participants merely need to walk into their back yard to farm thus using no fossil fuels, emitting no CO^2 (except through their respiration) and acquiring the freshest possible produce during season.

Figure 1: Local Food Systems



As for the potentialities of sustainable practices, one might also see the possibility of greater opportunities closer to mile zero and conversely increasingly fewer opportunities further away from mile zero (e.g., globally sourced food). The difference in potential makes for inherent differences between local and global. Therefore, there is value in identifying the subscales of LFS/P when discussing potential benefits—something that the literature seems to have missed as an explicit focus thus far. However, it is equally important to be aware of the agenda as suggested by Borne and Purcell (2006). We suggest that it is important to address both in food system policy work. Further, recognizing the different scales within 'Local', planners and researchers can be more transparent about potential benefit from local food production practices.

Arguments in Support of LFS

Given the lack of any efficient and safe fuel alternatives to fossil fuels, combined with the eminent decline, and the associated price increase of fossil fuels, Astyk and Newton (2009) argue that we have to create a food system that is not so dependent on fossil fuels. They see a return to locally produced, small-scale sustainable farming. In terms of organic farming, Lynch, MacRae and Martin report that Organic generally achieves lower GHG emissions and lower energy use compared to conventional operations largely due to lower feed concentrate usage and the non-use of synthetic nitrogen fertilizer. They argue that reducing reliance on fossil fuels should be a critical national strategy in agriculture (2011). Smith (2007) discusses the need and potential to improve the sustainability of the global food chain. She acknowledges

the ability of local food systems to be more sustainable, but also suggests that greater overall sustainability gains could be made by addressing the practices of mainstream agriculture and international food supply chains. Such change, it is argued, will need multi-stake holder initiatives to improve sustainability of conventional food change. This position is generally supported by the *Foresight* report. However, it is not certain that such change will occur and it is also not clear that such changes can address all the elements of sustainability and benefits which local systems can provide. This will require, in our opinion, ongoing academic and government effort to explore, encourage, research and monitor efforts to improve the sustainability of production agriculture.

There is broad support in the literature and some limited evidence that LFS/P plays an important role in developing sustainable communities (Roseland 2012; Astyk and Newton 2009; Smith 2008; Lyson 2004; Feenstra 1997). There is also support for keeping and necessarily overhauling the dominant productionist model within strong sustainability parameters and controls (Government Office for Science 2011; Smith 2007). Pollan's letter (2008) to the President-Elect identified food production as a key issue the President would have to deal with because the era of cheap and abundant food seems to be drawing to a close, and the consequences of the productionist agricultural system are becoming apparent, including its intensive energy consumption, Green House Gas emissions, health impacts, and lack of security. The foundation of Pollan's solution is to replace oil based fertilizer and supports with sunshine. While he acknowledges that a sun-based, decentralized food system may not be as efficient, it will compensate by enhancing resilience in order to resist external shocks or even terrorism.

Kenworthy (2006) identifies several interconnected and essential elements required for achieving sustainable (eco-city) communities. The first of ten critical elements is "the city has a compact, mixed-use urban form that uses land efficiently and protects the natural environment, biodiversity and food producing areas." He argues that if this and the other 9 factors are not effectively addressed, attempts to become sustainable will be severely constrained and possibly thwarted altogether.

The literature highlights many sustainability benefits that more localized and urban based farming could bring to communities. These include: a reduction in the consumption of land for farming (thus conserving open space for natural systems) (Peters 2010); less environmental impact (Haruvy and Shalhevet 2009); greater yields from more intensive urban agriculture methods (up to 13 times more than rural farms) (Brown and Jameton 2000) (although such efficiencies may currently only be applied to a limited number of North American crops and animal sytems in urban settings); urban waste reduction by using urban waste water and urban solid waste inputs (Ibid); more efficient use of underutilized urban lands (Ibid); a reduction in food packaging waste (Smit and Nasr 1992); a strengthening of local economies (Ibid); a healthier population resulting from greater consumption of local fresh fruit and vegetables and associated reduction in high fat and sugar content foods (Hawke's et al. 2012); an increase in carbon sequestration from private lot gardening and on public lands (Astyk and Newton 2009); a reduction in the cost of market externalities (Pretty et al. 2005); a reduction in the use of fossil fuels and their associated GHG emissions, (Pollan 2008; Lynch, MacRae and Martin 2011); and greater biodiversity (Goland and Bauer 2004).

In addition to these benefits, there is considerable evidence that LFS/P can be productive and effective (Lawson 2005; Astyk and Newton 2009; Altieri et al. 1999; Brown and Jameton 2000) and that a local food system can provide greater community resilience to fossil fuel induced food price or supply shocks (Roseland 2012). Smit and Nasr (1992) conclude that Urban Agriculture is a "vast 'opportunity missed' and that without it ecologically sustainable urbanization is inconceivable." Similarly, Astyk and Newton (2009) argue that "growing our own food may be the single most important way any of us can preserve the planet from climate change." We concur with the need for a vastly redesigned and sustainable global food system, and with the value of a global food supply that can address local food crises. However, the role of LFS/P transcends those imperatives when one considers the need to make local communities more resilient and resistant to food supply shocks, in addition to other compelling potential benefits like lowering energy consumption and GHG emissions, improving public health, and supporting local economies.

The potential of Local Food Systems to make significant contributions to the amount of food produced to meet local demands is demonstrated by two historical events: 1) The collapse of the Soviet Union during the US embargo on Cuba and 2) the Victory Gardens during the World Wars. The economic embargo imposed by the US on Cuba in 1960 and the subsequent collapse of the Soviet Union in 1989 [which had until then supplied Cuba with much of its imports] created a devastating impact on Cuban food security. With the reduction in critical imports local food production became Cuba's most important task. Gardens sprang up all over Cuba including its urban areas. Cuban officials regarded urban agriculture as a key component of the national food system and in 1994 a national Urban Agriculture Department was established (Altieri et al. 1999). Prior to this period, urban agriculture was "virtually absent in Cuba and in fact urban gardening was perceived by many as a sign of poverty and underdevelopment" (Ibid). In 1997, it was reported that the City of Havana had 9,998 gardens occupying 15,092 ha of land. Prior to 1989 regulations had only allowed gardening in back yards. As these were relaxed, gardens were developed in all yards, balconies, patios and rooftops (Ibid). One of the national policy goals is to give 3 M^2 of land to each person for farming. This is estimated to produce 60 kg. of fresh produce per plot each year, which is over half the 109.5 kg recommended by the UN Food and Agricultural Organization (Ibid). The gardens also served to replace eyesore land with greenspace and provide a source of leisure, exercise and relaxation.

During World War II, Victory Gardens (vegetable and fruit gardens planted on private residential lands and public spaces) produced 40 to 44% of all the vegetables consumed in the United States in 1943 (Astyk and Newton 2009; Brown and Jameton 2000). The "total quantity of vegetables produced in Victory Gardens was equal to the total output of produce from all US farms combined" (Astyk and Newton 2009). Further, in comparison to production agricultural methods, small scale polyculture that mixes multiple plant crops together is vastly more productive—up to 100 times more productive than industrial farms (Ibid). In terms of the domestic garden scale, "John Jeavons and Ecology Action [a bio-intensive sustainable farming group] have documented that a human being can feed himself for an entire year on as little 700 square feet of land. Most of us would rather use a little more land and eat a more

diverse diet, but we should be aware that the average half-acre suburban lot could fairly easily provide much of what a family eats for a whole year" (Astyk and Newton 2009).

In our view the combination of food system risks associated with Production Agriculture and a growing, increasingly prosperous global population supports the need to support LFS/P and at the same time improve the sustainability of PA. The latter may be unable to actually satisfy the increasing demand for food and without strong local food systems, community sustainability and resilience may diminished. The potential capacity of LFS/P in urban areas to produce significant amounts of food is well demonstrated by the Victory Garden and Cuban experiences. Admittedly the Victory Garden and Cuban experiences were a result of extreme contexts and likely not achievable without similar pressures. However, they demonstrate a potential which would require significant cultural changes or extreme climate, energy or geopolitical induced shocks to the global food supply to be realized to their full potential in the North American context.

More recently, Kortright and Wakefield (2010) conducted an exploratory assessment of the contribution of domestic garden food production to food security in two contrasting neighbourhoods in Toronto with low and middle income residents. Using multiple methods of data collection, the resulting triangulation enabled stronger substantiation of the conclusions. They found that 53% of the respondents grew food almost exclusively in back yards. About a third of them grew a substantial amount of fresh produce such that they were self-sufficient during harvest season for some food types. Kortright and Wakefield argue that informal house-lot food growing is an important element in community food security at all levels of income and it increases the gardener's health and well being. Further, Grewal and Grewal (2012) concluded that significant levels (up to 17.7% by weight) of food and beverage consumption per capita for the City of Cleveland could be produced when only 0.1% is currently achieved. They also noted that this would require an active role of city governments and planners to achieve. The potential for a significant contribution to meeting local food needs demonstrated by the above examples, combined with the potential sustainability benefits, makes a strong argument for continuing research and policy work on LFP/S and the local government role.

While there are arguments favouring the role of LFS/P it is important to note critical perspectives in the literature. These include concerns regarding a conflation of structural characteristics of alternative food networks with desired outcomes and behaviours as well as insufficient attention to market place problems and the omission of a consumer perspective (Treagear 2011). DuPuis and Goodman (2005) critique the notion that local foods are intrinsically more socially just. A further critical comment addresses the capacity of local food to scale up in production levels (Parrot et al, 2002; Mount, 2012).

A Policy Framework, Roles and Tools for Local Food System Planning

In this section, we present the food system planning roles and tools (instruments, policies and programmes) identified in the literature and found in local government practice (see Table 1). It is important to acknowledge that the tools available in any given local government jurisdiction is to a degree constrained by existing senior

government (provincial or state) legislation. For example, if there is not legislation that allows a local government to use revitalization tax schemes, then that local government will not be able to legally use that tool. However, senior government legislation changes in response to the needs and priorities of the communities and the governments. An example is the Local Food Act adopted in 2013 by the Province of Ontario. Local Governments can and do lobby and advocate for enabling legislation to allow new tools that could be used for local objectives. In this context, while the tools and roles identified in this paper may not be currently enabled throughout North America, there is opportunity to see enabling legislation brought in. Awareness of the range of tools and roles for local governments in supporting local food systems can help bring about such senior government legislation.

Working from a broad policy framework may aid in understanding the range of tools that have been used or considered in order to facilitate local food policy initiatives and may also help in planners to develop and structure a specific local food plan or strategy by prompting planners and their community participants to specifically think about local opportunities from a broad and comprehensive view. Roseland, for example, (2012) offers a four category framework of tools: voluntary (initiatives done without local government involvement), financial (funding provided to others), expenditure (funds spent on local government programs) and regulatory (bylaws). The difference between financial and expenditure is unclear and the voluntary categories do not include the advocacy and facilitation role local government can adopt. While Roseland's framework is useful, we suggest that local government actions are perhaps better cast in the four categories identified in the District of North Saanich Whole Community Agricultural Strategy (2010): 1) ***provide resources*** [information, in-kind, land and financial resources to facilitate others to act], 2) ***undertake projects and programs*** [such as community gardens, demonstration gardens, local procurement, and partnerships with others], 3) ***advocate (encourage) and facilitate***, and 4) ***regulate and establish policy*** [this includes preparing the plans, strategies and studies that inform policy and regulations and support local food initiatives]. Of these four categories, enabling legislation from senior governments is most relevant to categories 2 and 4.

Some tools or roles are simple while others may be more complex requiring a set of preceding actions or collection of other tools or instruments in a strategic policy. In some cases, the specific tool is mentioned (or could be mentioned) in more than one of the categories because it lends itself to more than one type of action. For example, a local government may wish to advocate for a community group to develop a food hub. It may also decide to support this effort by providing land or even providing a tax break through a revitalization bylaw and partnering agreement (available under British Columbia legislation). This policy framework explicitly includes actors other than local government in the policy process in recognition that food systems involve and are influenced by other groups and stakeholders. For example, in British Columbia, agriculture is regulated in part by the Ministry of Agriculture and in both North America and Europe community groups and advocates have been pioneers in advancing and supporting local food systems as a critical community development need (Mason and Knowd 2010; Granvik 2012).

Table 1: Local Food Production Tools and Roles

Tool Category	Local Government Tools and Roles for supporting Local Food Production
1. Provide Resources (Funds, land, facilities and support staff)	• Food Policy Council • Rent subsidies [for land or facilities] • Provide land for community gardens and other urban agriculture • Food Hubs • Farmers Markets • Farmer Forums • Farmland Trust
2. Undertake Projects and Programs	• Community Gardens • Agricultural Development Commissions • Food Waste recovery and composting • Demonstration Gardens • Food Mapping/Community Food Assessments • Farmland Trust • Food/agricultural festivals • Agricultural extension (for conventional and urban farming) • Wildlife management
3. Advocate and facilitate	• Roof top gardens • Education and Promotion • Municipal Agricultural web site • Development of a Local Food market • Agri-tourism development • Food access considerations • Good Food Box programs • Community Supported Agriculture • Edible School Gardens • Vertical Gardening • Back Yard Aquaculture • Farmers Markets • Senior Government funding
4. Regulate and establish policy	• Zoning/land use Bylaws (urban agriculture) • Progressive agricultural zoning (value added farm activities) • Animal Control Bylaws • Density Bonus Bylaws • Development Permit Areas and Guidelines • Food Security Bylaw • Right to farm legislation • Food Security Assessments and Strategies • Food and Agriculture Strategies Agricultural Economic Development Strategies • Food Procurement Policies • Business License Bylaws [for selling produce] • Farm friendly sign Bylaws • Consult with knowledgeable people during plan and policy research • Farmland Preservation • Comprehensive Plans [Official Plans, Agricultural Area Plans, Neighbourhood Plans] • Agricultural Economic Development Strategies • Tax Break/Incentive Bylaws • Food Charters

For the remainder of this section, we will briefly discuss each of the tools and roles contained in each of the four categories.

Provide Resources

In general, the resource category enables local government to support other bodies or groups to undertake programs and initiatives it deems to be important without having to directly undertake the initiative. It utilizes the capacity, skills and knowledge of non-local government people to undertake work in a limited partnership with the local government by providing resources which can be in the form of funds, land, staff support or facilities. Following are examples of food initiatives that can be supported by local government resources.

Food policy councils are advisory and advocacy bodies comprised of volunteers and stakeholders which focus on policies, goals and actions to support and enhance food related issues (Roseland 2012). They may or may not have status or support by the local government(s) in which they operate. A local government can support food policy councils with funding, facilities in which to meet, and support staff.

Rent subsidies for land or facilities can be provided by local government to community groups wanting to undertake not-for-profit food related initiatives (Wegener 2009). The resource contribution would be multiplied by the value of the knowledge, skills and time each group would bring to the initiative. Further, this approach limits future resource liability. A local government would not necessarily be compelled to contribute to future costs or closure costs should the initiative be terminated.

Local governments can provide land for community gardens or other urban agriculture. This may be an attractive option when land is available but providing funds for other actions like rent subsidies is not a priority for the local government. If there is land available that is not currently in any other productive or valued use, it would be making better, more efficient use of the local government asset.

Local governments can provide resources (land, staff, funds, facilities) for specific initiatives like food hubs. Food hubs can generally be described as places that integrates a spectrum of land uses, strategies, and food programs in order to increase access, visibility and the experience of growing food in urban areas (De La Salle 2011). Some elements of food hubs can include: aggregation, distribution and storage; processing and commercial kitchens; teaching and learning spaces; community gathering spaces; direct marketing; community outreach services; food retail; green design and providing a quality public realm; office space; focus on local food business; community food access; pedestrian access to neighbourhood food hubs; support of agribusiness; and food warehousing.

Farmer markets can be supported by funds, land or facilities. They have been associated with a number of benefits (Gillespie et al 2007) including: 1) making local food more visible, 2) encouraging local economic diversification by providing niche market opportunities and more profitable alternatives to specialized commodity farming, 3) supporting business incubation because entry into business has comparatively fewer barriers and less competition, and 4) facilitating social and economic interaction in the civic space they operate, bringing together the broad spectrum of community

members for a fundamental need, food. Lapping (2004) suggests that the rebirth of farmer markets is reflective of the interest in alternative food systems. Farmer markets benefit communities by assisting needy families (25% participation), providing a major source of income for many farm families, providing a multiplier effect to the local economy, becoming economic engines for local communities, and contributing to food access programs.

Community dialogue and learning about farming can be supported by local governments. For example, Farmer to Farmer forums have been partially financed by the District of North Saanich since 2010. These forums are open to conventional and urban farmers and local food advocates and provide an opportunity for participants to discuss and learn about farming challenges and opportunities from each other.

Undertake Projects and Programs:

Rather than supporting Local Food Systems and Production indirectly through the provision of resources, local governments can directly undertake projects and programs. In such cases the local government is either the principal operator or is an active partner in providing programs or undertaking the projects. This could include the initiatives identified in the *provide resources* category (community gardens, food hubs, farmer markets) and others like establishing an agricultural development commission (Katz 1986) or an agricultural advisory commission (District of North Saanich 2011), and running a food waste recovery and composting service (Kaufman 2009; Metrovancouver 2010). Local governments can use demonstration gardens (Pollan 2008; District of North Saanich 2011) to highlight growing opportunities and techniques. The District of North Saanich, for example, has five demonstration gardens on its municipal hall lands demonstrating for example a back yard orchard, vegetable gardens and a hedgerow incorporating edible plants.

A local government could undertake the preparation of a local food map. This was done by the City of Campbell River in 2014 in partnership with the local Chamber of Commerce. The interactive map includes a wide range of local retailers, restaurants, cafes and farms and lists hundreds of locally grown and processed products which uses can search for based on location, seasonal availability, organic certification, and pesticide use (Campbell River 2014).

Pothukuchi and Kaufman (1998) suggested the establishment of a municipal food department as a local government approach for undertaking comprehensive food system actions. While they acknowledge that the latter does not exist anywhere in the United States (and we are not aware of any Canadian local government with a municipal food department), it is interesting to note that a 1918 article published in the American Journal of Public Health contemplated the establishment of a New York City Department of Food as a means to manage food during World War 1 (Salthe 1918).

A local government can establish a Farmland Trust or participate in regional farmland trusts. These trusts can be financed with development approval community contributions, tax funds or supported with municipal lands. The District of North Saanich is currently negotiating receipt of about 83 acres of agricultural land as part of a rezoning of lands formerly part of a horse racing track. These lands may be put into

a farmland trust for future and ongoing agricultural use including allotment gardens, community gardens, orchards and market gardens (A. Finall, personal communication, July 25, 2014).

Food and agriculture festivals could be initiated by local governments as a way to support and encourage LFS/P. The Capital Region Food and Agricultural Initiatives Roundtable partnered with the District of North Saanich to operate and further develop agricultural fairs and celebrations on the peninsula of the Capital Regional District (2014). These events showcase local farmers and their products in on farm locations and celebrate local cuisine.

The provision of agricultural extension services used to be provided by the British Columbia provincial government as a way to provide farmers with information regarding farming techniques and crop challenges (A. Finall, personal communication, July 25, 2014). While this service is no longer provided by the province, a local government might consider providing this service to help conventional and urban farmers.

Wildlife can cause significant damage to crops and has been identified as an area local government can help in the viability of LFS/P (District of North Saanich 2011). The Capital Region District in British Columbia, for example, has completed a Deer Management Strategy in response to this issue (2012).

Advocate and Facilitate

Local governments face many competing demands for their attention and resources. Providing resources and undertaking food initiatives may have a hard time competing with demands for infrastructure improvements, recreation services and other municipal services especially under constrained fiscal conditions and/or with unsupportive Councils. Ideally local governments would undertake comprehensive food system actions including providing resources, undertaking projects and programmes, regulating and establishing food policy and undertaking effective advocacy and facilitation initiatives. However, when the local context would prevent such a comprehensive approach, advocacy and facilitation may be a supportable approach until priorities and conditions permit greater investment in food system planning initiatives. While this still takes staff time to undertake, it may result in community and private actions supporting local food systems. Such involvement may also support future direct initiatives by keeping the interest in LFS/P alive at the local government and by developing relationships within the community. Following are some examples of advocacy and facilitation. Roof top gardens (Kaufman 2009) can be encouraged by the local government. If these are built and maintained by private interests, there is no cost to the local government. A local government can provide educational and promotional material on its website as well as agricultural information and resource links (District of North Saanich 2011). It can encourage the development of a local food market (Hammer 2004). Good food box programs (Connelly et al 2011) and farmer markets (Pollan 2008; Morales 2009), and backyard aquaculture can be encouraged by indicating local government support, providing resource links and information.

If local regulations permit, agri-tourism (Hammer 2004) can be encouraged and if the regulations are not permissive, they can be changed. Similarly, with appropriate

regulations in place, local government staff can encourage vertical gardening as a voluntary use and facilitate it with a density bonussing bylaw (Friedman 2007; Roseland 2012).

A local government can provide information about Community Supported Agriculture (CSA) and encourage community participation in a local CSA. The CSA concept originated in the 1960s "when Japanese women, concerned with the increase in imported food and the loss of farmers and farmland, asked local farmers to grow vegetables and fruits for them. The farmers agreed, on the condition that a number of families commit to supporting the farmers" (Wells et al 1999 p. 39). They are essentially a subscription service with consumers prepaying for shares in the produce and in doing so, consumers take on a portion of the harvest risk. As of 2012, there were over 4,000 CSAs listed in the United States (localharvest 2012).

Planners can encourage better food access by incorporating food access considerations into community plans (Hammer 2004). This could identify the need and suitable locations for food stores (Roseland 2012), food hubs, community gardens, and farmer markets. Edible gardens on schools could be encouraged by local governments (District of North Saanich 2011; Roseland 2012). This would introduce students to the process of growing food and would be a healthy outdoor activity.

Senior governments in Canada fund the Investment Agriculture Foundation in British Columbia in support of innovative projects benefitting the agri-food industry. Local governments can lobby their respective senior governments for programs like the Investment Agriculture Foundation for local funding, both for conventional and urban agricultural initiatives.

Regulate and Establish Policy

The fourth category, regulate and establish policy is the final and largest list of potential tools and roles a local government can consider. It is also involved in the other categories. A local government that wants to advocate and facilitate, for example, back yard aquaculture, farm gate sales, roof top gardens, food stores in underserved areas, farmers markets, etc., needs to ensure that its zoning and business regulation bylaws and policies allow those activities (District of North Saanich 2011). The City of Kelowna adopted an 'urban agriculture' bylaw which was written to specifically permit greenhouses as a primary (stand alone) use on urban residential lots in the City. Prior to that bylaw, such urban agricultural uses were not permitted and therefore could not be encouraged by city staff. The City of Vancouver provides another example of an urban agriculture bylaw (Roseland 2012) which permits residents to keep beehives and chickens in backyards. Essentially an urban agriculture bylaw is an amendment to a local government zoning bylaw and is intended to permit agriculture activities in urban areas.

In addition to enabling urban agriculture through zoning bylaws, local governments can include the provision in the zoning bylaw for value added farm operations. This would enable farms to process their raw products into other, more valuable products like, for example, yarn from sheep, ice cream from milk, pies from berries and, of course, wine from grapes.

Oswald (2009) identifies density bonus bylaws as a tool to encourage a local food service in exchange for additional density in a development. The additional density provides the funds for a developer to include a food system support as part of the development approval. Development Permit Areas and Guidelines are a level of regulation over the land use regulation in zoning bylaws. They address the design elements of a development including form, character, siting, and landscaping. With this regulatory tool, a local government can establish the requirement for edible landscaping in development proposals (District of North Saanich 2011).

Roseland (2012) uses Belo Horizonte in Brazil as an example of a local government using a food security bylaw to address local food security. The bylaw enables citizens to define their own food and agricultural policies. One percent of the budget is dedicated to innovated food progammes. In his relatively early work on sustainable cities, Katz (1986) suggested right to farm legislation as a local government tool but this is not limited to local government legislation. In 1996, the Province of British Columbia established right to farm legislation for specific areas of the Agricultural Land Reserve in British Columbia.

In addition to zoning bylaws, some local governments may also use business license bylaws to regulate certain business activities. The District of North Saanich (2011) identified the need to ensure that business bylaws and zoning bylaws be aligned. For example, if selling domestically produced vegetables on a residential lot is not allowed by the business bylaw but growing the vegetables for commercial sale is permitted, the urban farmer will be constrained in their marketing activities. Similarly, sign bylaws may not be written with sufficiently supportive language. Improving farm sign bylaw provisions was identified as a priority in North Saanich (2011). Tax break/incentive bylaws to specifically encourage the provision of critical food system infrastructure (e.g., abattoirs, food storage and processing facilities, food hubs, etc.) can also be used (District of North Saanich 2011; Oswald 2009; Wegener 2009 and Roseland 2012). This type of bylaw would enable a local government to reduce property taxes for a desired food system infrastructure for a specific period of time. Such support may make a food enterprise economically viable during its early years of operation.

In a similar vein, a local government can ensure that its animal control bylaws are aligned with new zoning amendments to allow urban farming. For example, while amending the zoning bylaw for chickens in North Saanich, collateral changes to the animal control bylaw were also adopted. This enabled certain animal management provisions to be implemented e.g., a requirement for the animals to be contained in enclosures (A. Finall, personal communication, July 25, 2014).

In addition to bylaws, local governments can employ a variety of policy documents like food security assessments and strategies (City of Vancouver 2013; Metrovancouver 2010), food and agricultural strategies (District of North Saanich 2011; Metrovancouver 2010) and other comprehensive plans like official plans, neigbourhood plans (Hammer 2004) and Agriculture Area Plans (District of North Saanich 2010). These documents are more comprehensive in nature, often identifying a collection of several actions and initiatives (like those identified in this paper) as a road map to improving local food systems. They may have incorporated specific instruments like food system mapping (Campbell River 2014) and community food

assessments (Hammer 2004; Pothekuchi 2004).

Other more focused policy instruments can include agriculture economic development strategies (District of North Saanich 2013) and food procurement policies (Lyson 2004, Public Health Services Authority 2008). These are policies focused on specific aspects or weaknesses of the local food system as opposed to more foundational policy documents like food charters (District of North Saanich 2011) that establish a more general policy platform from which to develop more specific and targeted programs and policies.

We have listed several regulatory tools that a local government can use to improve local food systems. Underlying those efforts, it should be argued is the need to look after the existing stock of farmable land. Farmland preservation bylaws and policies (Lyson 2004; Hammer 2004; Hall 2009; Turvey and Konyi 2009) should perhaps be considered a fundamental tool to employ in order to prevent the erosion of the capacity of communities to supply at least some of their own food and achieve a measure of resilience to food supply shocks.

Finally, consulting with knowledgeable people during plan and policy research is an important role for local governments (Thibert 2012). It enables plans, policies and bylaws to incorporate informal knowledge from the community, stakeholders and experts and should make the documents more effective.

Conclusion

Early in the history of the literature, authors such as Katz (1986), Kloppenburg et al. (1996), and Lyson (2004) identified a role for local government in supporting LFP. The list of tools identified in the preceding section is significant but not exhaustive. Further, because the four categories of roles capture the broad range of roles and tools that local governments can undertake and use, including working with non-local government actors, we suggest this is a conceptual framework that will facilitate effective policy work in supporting their local food systems. We anticipate that as local governments increasingly address this important topic, this chest of tools will greatly expand and evolve. However, there are barriers to LFS planning including planners themselves and planning regulations. In the UK, for example, the changes in farming activities associated with re-localization have resulted in planners having to be involved in planning approvals when they previously had no mandate. This has created a view that planners are obstacles more than enablers (Nichol 2003). Saha and Paterson (2008) found in a survey of local government representatives that the biggest barriers to promoting sustainability initiatives, including local food production, were lack of adequate funding, elected officials' apathy, and the lack of knowledgeable staff. Illustrating this epistemic divide between current regulatory practice/culture and the local food movement is the report of a Michigan woman living in Oak Park who was facing up to 93 days of jail time for refusing to remove a vegetable crop from her front yard. The planner involved is reported as advising that the City does not want to see vegetable gardens, only lawn, shrubs and flowers (Naylor 2012).

It is fair to say that there are limits to which a city can become food secure and produce its own food, but to move in that direction, we will need to rethink the separation of food systems from cities (Angotti 2009) and reintegrate food production with

[the social and physical fabric of] communities (Lyson 2004). There is, however, good evidence of the capacity of the different LFS/P models to collectively provide a significant portion of local consumer's needs and in the process build community resilience, mitigate climate change effects, and move towards local and global sustainability.

In addition to the role of LFS/P in achieving this goal, a growing and increasingly prosperous global population, along with the capacity of globalized production agriculture, and with real limits to LFS/P, there is a need to continue with the former, though in a reformed, more sustainable manner. In this regard, LFS/P also offers value. While some researchers (Feagan 2007) have described the appropriability of LFS/P as a problem, we see it to be a means by which to help reform PA. If consumers want Local Food because of perceived environmental benefits, then the large PA commercial agents may respond with amended practices as they have done with organic farming (Feagan 2007). Surely this is a potentially positive outcome given the need to improve the sustainability of PA (Government Office for Science 2011). In this way LFS/P is both an alternative to PA and a change agent for PA.

For communities that want to improve their sustainability and resilience, LFS/P offers a compelling opportunity with multiple potential benefits. Given that the risks to the global (and by extension to the local) food supply are numerous, serious and already manifesting, not working to strengthen LFS/P would be more than just a 'vast opportunity missed' (Smit and Nasr 1992). The consequences could be dire. We argue that not only is LFS/P an important sustainability opportunity, it is an essential part of any community's sustainability and resiliency strategy.

The broad policy framework along with a listing of the roles and tools that can be considered by local government planners may assist communities in these efforts. The list of tools identified here will be subject to the legal framework in each jurisdiction but most of the tools identified should be relevant to most North American communities. Supporting LFS/P successfully will necessarily involve a broad range of actors. A policy framework that explicitly calls for the involvement of key actors (farmers, food processors, community groups, provincial and federal agencies) is more likely to be effective. Further, we recognize that the list of roles and tools is neither exhaustive nor static. In fact, we anticipate that it will grow and evolve rapidly as local governments apply their own thinking and problem solving for making our local food systems viable, healthy and productive. In particular, to move beyond this relatively simple conceptual framework and listing of roles and tools, we see a need for more detailed policy models and ongoing theoretical and empirical research to support their development.

References

Abate, G. 2008. Local Food Economies: Driving Forces, Challenges, and Future Prospects. *Journal of Hunger & Environmental Nutrition* 3(4) (October 2012): 384–398.

Altieri, M., N. Companioni, K. Cañizares, C.Murphy, P. Rosset, M. Bourque, and C. Nicholls. 1999. The Greening of the 'Barrios': Urban Agriculture for Food Security in Cuba. *Agriculture and Human Values* 16: 131–140. http://web.nmsu.edu/~bikerac/Articles/The greening of the barrios-Urban agriculture for food

security in Cuba.pdf.
Angottie, T. 2009. Urban Planning for Food Security: Reinventing City and Countryside with Jane Jacobs. *Plan Canada* Vol 49 No 2.
Astyk, S., and A. Newton. 2009. *A Nation of Farmers: Defeating the Food Crisis on American Soil*, New Society Publishers.
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) (December 1): 195–207. doi:10.1177/0739456X06291389. http://jpe.sagepub.com/cgi/doi/10.1177/0739456X06291389.
Brown, K. H., and L. Jameton. 2000. Public Health Implications or Urban Agriculture. *Journal of Public Health Policy* 21 (1) (January): 20–39. http://www.ncbi.nlm.nih.gov/pubmed/10754796.
Capital Regional District. 2012. *Regional Deer Management Strategy,* Capital Regional District, www.crd.bc.ca
Capital Region Food and Agriculture Initiatives Roundtable. 2014. www.flavourtrails.com
City of Vancouver. 2013. *What Feeds us: Vancouver Food Strategy,* City of Vancouver.
City of Campbell River 2014. Think Local and Eat Local with the Campbell River Food Map. www.campbellriver.ca
Clapp, J., and E. Helleiner. 2012. Troubled Futures? The Global Food Crisis and the Politics of Agricultural Derivatives Regulation. *Review of International Political Economy* 19 (2): 37–41. doi:10.1080/09692290.2010.514528.
Connelly, S., S. Markey, and M. Roseland. 2011. Bridging Sustainability and the Social Economy: Achieving Community Transformation Through Local Food Initiatives. *Critical Social Policy* 31 (2) (February 9): 308–324. doi:10.1177/0261018310396040. http://csp.sagepub.com/cgi/doi/10.1177/0261018310396040.
District of North Saanich. 2010. *Agricultural Area Plan.* District of North Saanich.
District of North Saanich. 2011. *Growing Towards Food Self Reliance: A Whole Community Agricultural Strategy*, District of North Saanich.
District of North Saanich. 2013. *Agricultural Economic Development Strategy*, District of North Saanich
De La Salle, J. 2011. Local Food Hubs, A new Strategy in the Field of Food System Planning. *Plan Canada* Vol. 51 No. 3.
DuPuis, E. and D. Goodman. 2005. Should we go "home" to eat?: toward a reflexive politics of localism. *Journal of Rural Studies 21*(3): 359–371. doi:10.1016/j.jrurstud.2005.05.01
Feagan, R. 2007. The Place of Food: Mapping Out the 'Local' in Local Food Systems. *Progress in Human Geography* 31 (1): 23–42. doi:10.1177/0309132507073527.
Feenstra, G. 1997. Local Food Systems and sustainable communities. *American Journal of Alternative Agriculture.* Cambridge Univ. Press.
Fonte, M. 2008. Knowledge, Food and Place. A Way of Producing, a Way of Knowing. *Sociologia Ruralis* 48 (3) (July): 200–222. doi:10.1111/j.1467-9523.2008.00462.x. http://doi.wiley.com/10.1111/j.1467-9523.2008.00462.x.
Friedman, A. 2007. Farming in Suburbia. *Open House International* 32 (1): 7-15.
Frumkin, H., J. Hess, and S. Vindigni. 2007. Peak Petroleum and Public Health. *JAMA :*

the Journal of the American Medical Association 298 (14) (October 10): 1688–90. doi:10.1001/jama.298.14.1688. http://www.ncbi.nlm.nih.gov/pubmed/17925522.

Goland, C. and S. Bauer. 2007. When the Apple Falls Close to the Tree: Local Food Systems and the Preservation of Diversity. *Renewable Agriculture and Food Systems* 19 (04) (February 12): 228–236. doi:10.1079/RAFS200487. http://www.journals.cambridge.org/abstract_S1742170504000298.

Government Office for Science. 2011. *Foresight, The Future of Food and Farming: Challenges and choices for global sustainability*, London, Government Office for Science.

Granvik, M. 2012. The Localization of Food Systems—An Emerging Issue for Swedish Municipal Authorities The Localization of Food Systems—An Emerging Issue for Swedish Municipal Authorities (October): 37–41.

Grewal, S. and P. Grewal. 2012. Can cities become self-reliant in food? *Cities 29*(1): 1–11. doi:10.1016/j.cities.2011.06.003

Hall, G. 2009. Securing British Columbia's Agricultural Land through Effective Growth Management: The Fourth Decade of the Agricultural Land Reserve, *Plan Canada*, Vol 49 No 2.

Hammer, J. 2004. "Community Food Systems and Planning Curricula. *Journal of Planning Education and Research* 23 (4) (June 1): 424–434. doi:10.1177/0739456X04264907. http://jpe.sagepub.com/cgi/doi/10.1177/0739456X04264907.

Haruvy, N., and S. Shalhevet. 2009. Assessing the Impacts of Local and Imported Produce on the Public and the Environment. *International Journal of Agricultural Resources, Governance and Ecology* 8 (2-4): 242–257.

Hawkes, C., S. Friel, T. Lobstein and T. Lang. 2012. Linking Agricultural Policies with Obesity and Noncommunicable Diseases: A New Perspective for a Globalising World. *Food Policy* 37 (3) (June): 343–353. doi:10.1016/j.foodpol.2012.02.011. http://linkinghub.elsevier.com/retrieve/pii/S0306919212000152.

Herriot, C. 2010. *The Zero Mile Diet: a year-round guide to growing organic food*, Harbour Publications.

Hinrichs, C. 2003. The Practice and Politics of Food System Localization. *Journal of Rural Studies* 19 (1) (January): 33–45. doi:10.1016/S0743-0167(02)00040-2. http://linkinghub.elsevier.com/retrieve/pii/S0743016702000402.

Katz, D. 1986. Metropolitan Food Systems and the Sustainable City. In *Sustainable Communties: A New Design Synthesis for Cities, Suburbs, and Towns,* ed. S. Van de Ryn & P. Calthorpe. San Francisco, Sierra Club Books.

Kaufman, J. 2009. Food System Planning: Moving Up the Planner's Ladder. *Plan Canada* 49 (2).

Kenworthy, J. 2006. The Eco-city: Ten Key Transport and Planning Dimensions for Sustainable City Development. *Environment and Urbanization* 18 (1) (April 1): 67–85. doi:10.1177/0956247806063947. http://eau.sagepub.com/cgi/doi/10.1177/0956247806063947.

Kloppenburg, J., J. Hendrickson, and G. Stevenson. 1996. Coming in to the Foodshed. *Agriculture and Human Values* 13 (3) (June): 33–42. doi:10.1007/BF01538225. http://www.springerlink.com/index/10.1007/BF01538225.

Kortright, R., and D. Wakefield. 2010. Edible backyards: a qualitative study of

household food growing and its contributions to food security. *Agriculture and Human Values 28*(1): 39–53. doi:10.1007/s10460-009-9254-1

Ladner, P. 2011. *The Urban Food Revolution*, New Society Publishers.

Lawson, L. 2005. *City Bountiful*. Oakland, CA: University of California Press.

Lynch, D., H, MacRae, R. and R. Martin. 2011. The Carbon and Global Warming Potential Impacts of Organic Farming: Does It Have a Significant Role in an Energy Constrained World? *Sustainability* 3: 322–362. doi:10.3390/su3020322.

Lyson, T. 2004. *Civic Agriculture: Reconnecting Farm, Food, and Community*. Medford, Massachusetts: Tufts Univ. Press.

Martinez, S., M. Hand, M.Da Pra, S. Pollack, K. Ralston, T. Smith, and S. Vogel. 2010. *Local Food Systems: Concepts, Impacts, and Issues*. United States Department of Agriculture, Economic Research Report 97, May 2010.

Mason, D. and I. Knowd. 2010. The Emergence of Urban Agriculture: Sydney, Australia. *International Journal of Agricultural Sustainability* 8 (1) (February 1): 62–71. doi:10.3763/ijas.2009.0474. http://www.tandfonline.com/doi/abs/10.3763/ijas.2009.0474.

Metrovancouver. 2010. *Regional Food System Strategy*. http://www.metrovancouver.org/services/regional-planning/PlanningPublications/RegionalFoodSystemStrategy.pdf

Morales, A. 2009. Public Markets as Community Development Tools. *Journal of Planning Education and Research* 28 (4) (February 25): 426–440. doi:10.1177/0739456X08329471. http://jpe.sagepub.com/cgi/doi/10.1177/0739456X08329471.

Mount, P. 2012. Growing Local Food : Scale and Local Food Systems Governance. *Agriculture and Human Values* 29: 107–121. doi:10.1007/s10460-011-9331-0.

Naylor, L. 2012. Hired gardens and the question of transgression: lawns, food gardens and the business of 'alternative' food practice. *Cultural Geographies* 19: 483. doi: 10.1177/1474474012451543

Nichol, L. 2003. Planning Local Food Production: Some Implications for Planning. *Planning Theory & Practice* 4 (4): 409–427. doi:10.1080/1464935032000146264.

Oswald, J. 2009. Planning for Urban Agriculture. *Plan Canada* Vol 49 No 2.

Ostry, A., C. Miewald and R. Beveridge 2011. *Climate Change and Food Security in British Columbia*, Pacific Institute for Climate Solutions, University of Victoria.

Parrott, N., Wilson, N., and J. Murdoch. 2002. Spatializing Quality: Regional Protection and the Alternative Geography of Food. *European Urban and Regional Studies*, *9*(3): 241–261. doi:10.1177/096977640200900304

Pearson, D., J. Henryks, A. Trott, P. Jones, G. Parker, D. Dumaresq and R. Dyball. 2011. Local Food: Understanding Consumer Motivations in Innovative Retail Formats. *British Food Journal* 113 (7): 886–899. doi:10.1108/00070701111148414.

Peters, K. A. 2010. Creating a Sustainable Urban Agriculture Revolution. *Journal of Environmental Law and Litigation,* v. 25 (1): 203-247. University of Oregon.

Pollan, M. 2008. An open letter to the next farmer in chief. In *The New York Times.*

Popper, D. 2006. Locality. In *Encyclopedia of Human Geography*, Warf B. (ed), Thousand Oaks, California: Sage Publications Inc.

Pothukuchi, K., and P. Kameshwari. 2004. Community Food Assessment: A First Step in Planning for Community Food Security. *Journal of Planning Education and Research* 23 (4) (June 1): 356–377. doi:10.1177/0739456X04264908. http://jpe.

sagepub.com/cgi/doi/10.1177/0739456X04264908.

Pothukuchi, K., P. Kameshwari, and J.L. Kaufman. 1999a. Placing the Food System on the Urban Agenda: The Role of Municipal Institutions in Food Systems Planning. *Agriculture and Human Values* 16: 213–224. http://www.springerlink.com/index/h7h924u505252477.pdf.

Pretty, J.N., S. Ball, T. Lang, and J.I.L. Morison. 2005. Farm Costs and Food Miles: An Assessment of the Full Cost of the UK Weekly Food Basket. *Food Policy* 30 (1) (February): 1–19. doi:10.1016/j.foodpol.2005.02.001. http://linkinghub.elsevier.com/retrieve/pii/S0306919205000059.

Provincial Health Services Authority. 2008. *A Seat at the Table: Resource Guide for Local Governments to Promote Food Secure Communities*.

Qazi, J. 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) (March 1): 45–72. doi:10.2752/155280105778055416. http://openurl.ingenta.com/content/xref?genre=article&issn=1552-8014&volume=8&issue=1&spage=45.

Renting, H., T. K. Marsden, and J. Banks. 2003. Understanding Alternative Food Networks: Exploring the Role of Short Food Supply Chains in Rural Development. *Environment and Planning A* 35 (3): 393–411. doi:10.1068/a3510. http://www.envplan.com/abstract.cgi?id=a3510.

Roberts, P. 2008. *The End of Food*. New York: First Mariner Books.

Roseland, M. 2012. *Towards Sustainable Communities: Solutions for Citizens and their Governments*, New Society Publishers.

Saha, D., and R. G. Paterson. 2008. Local Government Efforts to Promote the 'Three Es' of Sustainable Development: Survey in Medium to Large Cities in the United States. *Journal of Planning Education and Research* 28 (1) (May 12): 21–37. doi:10.1177/0739456X08321803. http://jpe.sagepub.com/cgi/doi/10.1177/0739456X08321803.

Salthe, O. 1918. Municipal Food Departments in Modern War. *American Journal of Public Health* Vol. 8, No. 3 (March): 197-201

Smit, J., and J. Nasr. 1992. Urban Agriculture for Sustainable Cities: Using Wastes and Idle Land and Water Bodies as Resources. *Environment and Urbanization* 4 (2) (October 1): 141–152. doi:10.1177/095624789200400214. http://eau.sagepub.com/cgi/doi/10.1177/095624789200400214.

Thibert, J. 2012. Making Local Planning Work for Urban Agriculture in the North American Context: A View from the Ground. *Journal of Planning Education and Research* 32 (3) (January 19): 349–357. http://jpe.sagepub.com/cgi/doi/10.1177/0739456X11431692.

Tilman, D., K. Cassman, P. Matson, R. Naylor and S. Polasky. 2002. Agricultural Sustainability and Intensive Production Practices. *Nature* 418 (6898) (August 8): 671–7. doi:10.1038/nature01014. http://www.ncbi.nlm.nih.gov/pubmed/12167873.

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. doi:10.1016/j.jrurstud.2011.06.003

Turvey, J., and B. Konyi. 2009. Farmland Protection and Sustainable Urban Communities in Ontario. *Plan Canada* 49 (2).

United States Drought Monitor, July 24, 2014, http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?CA

Wallgren, C. 2006. Local or Global Food Markets: A Comparison of Energy Use for Transport Local or Global Food Markets: A Comparison of Energy Use for Transport. *Local Environment: The International Journal of Justice and Sustainability* 11 (April): 233–251.

Wegener, J. 2009. Alternative' Food Outlets and Their Relevance to Policy and Planning Decisions. *Plan Canada* 49 (2).

Wekerle, G. R. 2004. Food Justice Movements: Policy, Planning, and Networks. *Journal of Planning Education and Research 23*(4): 378–386. doi:10.1177/0739456X04264886