

Literature Review and Determination of Best Practices: Gleaning and Edible Gardens



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Table of Contents

Summary.....	4
Introduction.....	5
Methodology.....	7
Guiding Framework.....	8
Part 1: Gleaning	
Municipal Considerations.....	12
Governance and Partnerships.....	14
Practical Considerations.....	17
Resources.....	24
Recommendations.....	28
Part 2: Edible Gardens	
Municipal Planning.....	31
Governance and Partnerships.....	36
Resources.....	37
Community Engagement.....	39
Practical Considerations.....	41
Edible Garden Sites.....	46
Recommendations.....	52
Conclusion.....	55
References.....	56
Appendices	
Appendix A.....	65
Appendix B.....	68
Appendix C.....	71
Appendix D.....	74
Appendix E.....	76
Appendix F.....	77

Summary

Food security is a public health issue gaining recognition at local and global levels. In Canada, many individuals are experiencing a lack of food security, which significantly impacts health outcomes (Mikkonen and Raphael, 2010). Challenges to accessing adequate and reliable safe, healthy, fresh and nutritious food can be attributed to challenges within food systems. Production, processing, distribution, waste management, and consumption are all components of the system that present significant opportunities for change. Two approaches to local food systems change include gleaning and edible gardens, which can be implemented by municipalities and communities to address food security issues.

FoodSpokes Strategic Solutions was commissioned by Chatham-Kent's Public Health Unit to conduct a literature review on gleaning and edible gardens. The project aimed to consolidate best and emerging gleaning and edible garden practices; identify resources and activities required for planning, implementation, and evaluating the initiatives; and develop recommendations for the municipality of Chatham-Kent.

Population health and food systems lenses guided the research. The literature revealed that gleaning and edible garden initiatives have been developed and implemented at municipal and community levels in a range of urban and rural contexts. The initiatives can successfully create food systems change to support the health and wellbeing needs of communities that lack food security; however a variety of potential challenges exist that municipalities and communities can address through identified best practices. The recommendations generated for Chatham-Kent include planning municipal approaches, determining governance and partnerships, identifying resources, preparing practical considerations for implementation, and assessing the feasibility of program models or sites.

Key Findings:

1. Define a clear scope and indicators of success to determine project feasibility and sustainability.
2. Outline roles and responsibilities for strong coordination and implementation of initiatives. Partnerships involving multiple stakeholders can strengthen project success, as gleaning and edible garden initiatives typically require cross-sector collaboration.
3. Community organizations receive inconsistent or short-term funding. Multiple funding sources from municipalities, the private sector, foundations, and community partners can reduce resource burdens and sustainably support projects.

Introduction

Food security has been increasingly present in public health discourse around health and wellbeing (PROOF, 2012). The Public Health Agency of Canada (PHAC) defines population health as “an approach that aims to improve the health of the entire population and reduce health inequities among population groups” (PHAC, 2015). To reach these objectives, population health addresses a broad range of factors and conditions that strongly influence health and wellbeing, including food security (PHAC, 2015). A public health approach to food security addresses the underlying factors that contribute to an individual’s or family’s lack of food security and the consequential health outcomes.

Food security has been identified as one of the 14 social determinants of health in Canada (Mikkonen and Raphael, 2010). It is a holistic concept that is understood as adequate and reliable access to safe, healthy, fresh, and nutritious food in culturally appropriate, accessible, and affordable ways (WHO, 2015). In 2012, it was estimated that 12.2% of Canadian households and 1 in 6 children experienced lack of food security (PROOF, 2012). Single parent households and families receiving social assistance are at a greater risk of experiencing a lack of food security (Mikkonen and Raphael, 2010). This is a significant public health issue as inadequate access to healthy foods is a predictor of individuals reporting “poor or fair health compared to good, very good, or excellent health, experiencing poor functional health (e.g., pain, hearing and vision problems, restricted mobility), multiple chronic conditions, and major depression or distress” (Mikkonen and Raphael, 2010, p. 27). Individuals with a lack of food security are also 80% more likely to have diabetes, 60% more likely to have high blood pressure, and 70% more likely to have food allergies than food secure households (Mikkonen and Raphael, 2010).

In the municipality of Chatham-Kent, Ontario, 8% of the population is considered to lack food security (Zettler and Maaten, 2011). The municipality and community are engaging in a number of interventions to address the issue in both rural and urban areas (Chatham Kent municipal staff, personal communication, January 23, 2015). At the municipal level, initiatives include the development of a Food Policy Council, incorporation of food security into the Official Plan and zoning bylaws, and provision of resources to establish and run community gardens. Community stakeholders have also been taking a lead to address lack of food security by providing edible planters to businesses and non-profits, investing in growing produce by planting a forest garden, and establishing a strong volunteer base to support community gardens. It is clear that the municipality is taking a

multi-stakeholder approach to implement a wide range of initiatives focused on improving local food security. (Chatham-Kent municipal staff, personal communication, January 23, 2015)

Gleaning and edible gardens are two initiatives that aim to increase food security, a concept based on the three pillars of food availability, food access, and food use (WHO, 2015). Specifically, gleaning is a step towards increasing food access, and edible gardens works to increase both food availability and food access (WHO, 2015). *Gleaning* is commonly understood as the act of collecting leftover crops from farmers' fields after they have been commercially harvested or on fields where it is not economically profitable to harvest. *Edible gardens* offer an alternative to conventional residential landscapes that are designed solely for ornamental purposes. Edible gardens can still be used for beautification, but also capable of producing fruits and vegetables.

On a broader scale, these two food security initiatives can be understood as drivers of food system change. The food system includes activities related to food production, processing, distribution, waste management, and consumption (Agriculture Sustainability Institute, 2015; Oxford Martin School, 2015). From a population health perspective, the current food system is failing to meet the health and wellbeing needs of community members that lack food security. When thinking about gleaning and edible gardens as approaches to creating food system change, opportunities for intervention arise at the food production, distribution, and waste management levels. With a growing awareness of the harmful impacts of a lack of food security on health and wellbeing, it is clear that food system change is needed. Although the nature of food security issues varies between urban, peri-urban, and rural environments, sustainable and localized gleaning and edible garden interventions are steps towards food security that can subsequently improve overall health and wellbeing.

The following report identifies best and emerging practices related to gleaning and edible gardens in Canada, the US, and internationally. The literature review aims to answer the following research questions:

- What are the current best and emerging practices related to gleaning and edible gardens in Ontario, Canada, the United States, and internationally that are either municipally directed or community led?
- What activities or resources are needed to support gleaning and edible garden projects?
- What are recommended next steps for the municipality and community of Chatham-Kent?

Methodology

Early 2015, consultants conducted a literature review that surveyed information pertaining to existing gleaning and edible gardening practices, policies, and research relevant to the municipality of Chatham-Kent, Ontario, Canada. The body of the document includes two major sections: 1) gleaning, including a literature review and recommendations for Chatham-Kent; and 2) edible gardens, including a literature review and recommendations for Chatham-Kent. Secondary information was sources and analyzed, and primary data was collected through key informant interviews.

Secondary information was gathered from academic sources, including peer reviewed articles and interviews with academics and experts in the field, as well as grey literature, books, publicly available protocols, and manuals. Search channels included the University of Toronto's online database, Directory of Open Access, Google Scholar, JURN, Journal Storage (JSTOR), Mendeley, OVID, Pub Med, Project Muse, ProQuest, Scopus, SpringerLink, and Web of Science. Google was also used a search channel. Search results yielded organization's websites, which were utilized to assess current trends and themes made available through publicly accessible communications.

After conducting a preliminary scan of the literature, a concept matrix was created and used to determine relevant references and keywords pertaining to field gleaning and edible gardens. Research was also expanded to include literature pertaining to urban agriculture, zoning, food deserts, food surplus, food recovery, food waste, emergency food provision, hunger relief, guidelines, manuals, and case studies. Sources that were published and produced in the last five years was prioritized, however, no cut-off date was put into practice to restrict older literature from being examined.

Keywords and research topics that were excluded in the literature review included: private landscaping, bioengineering, retail food redistribution, retail food recovery, and non-perishable food donations. Literature characterized as blogs, needs assessments, environmental scans, and action plans were also excluded. Research included examples from Canada, the United States, and internationally.

Primary information was collected through key informant interviews. The interviews were conducted with representatives from various sectors, including non-profit and community groups, an advocacy group, an emergency food relief organization, academic experts, and municipal staff from Chatham-Kent. A total

of seven individual and two group interviews were conducted with representatives from the previously mentioned sectors. Each interview was approximately 90 minutes in length. The interviewees were selected based on the relevance of their work of the topics of gleaning and edible gardens and their knowledge of practices based in Ontario, and in some cases Chatham-Kent. The interviews consisted of qualitative questions related to motivations behind each initiative, reasons for success, and barriers or challenges faced in the field. The interview guides were similar for both edible gardens and gleaning (see Appendices A to D).

Gleaning and edible gardens were separately researched because of key themes that differentiate the subjects. Gleaning literature highlights the challenges around the food charity model and the need for greater participation from various community stakeholders, while research on edible gardens predominantly focuses on issues relating to public land use and planning. Although the subjects' content differs, there were also clear overlapping areas of challenge and opportunity.

Guiding Framework

Food systems change and population health lenses guided the research. A food systems change approach highlighted food production, distribution, and waste management are the primary areas addressed by the interventions of gleaning and edible gardens. Building on this foundation, a population health perspective offered a clear outcome for these two food security initiatives, specifically the improve health and wellbeing of the community. Framed in this manner, the processes and outcomes desired for gleaning and edible gardens are clear.

Food production encompasses the growing of food, and the governance and economics behind it (Oxford Martin School, 2015). The current Canadian food system is situated within a web of policies and processes that regulate production. The Agriculture Sustainability Institute (ASI) states “community food systems are gaining attention... as an important way to create links between farmers, consumers, and communities” (ASI, 2015). Taken a step further when looking at community food systems through a population health lens, gaps or challenges in food access become apparent. These gaps can lead to a lack of food security for low-income communities. Edible gardens are being considered as an intervention to meet local needs by shifting the current food production system towards publically grown and distributed fruits and vegetables.

Food distribution and waste management links producers to processors and consumers (Agriculture and Agri-Food Canada, 2015). It is a large and complex sector, including supermarkets, grocery stores, restaurants, wholesalers, distributors, and the brokers that supply them (Agriculture and Agri-Food Canada, 2015). It is also well known that there is a significant need for better waste management practices to manage excess or “unacceptable” foods along the conventional food system. Food assistance programs, including food banks and soup kitchens, emerged as a response to manage unequal food distribution (Coleman and Ganong, 2014). However, today these programs are often regarded as having limited quantity, and questionable and unpredictable quality of food (PROOF, 2015). Gleaning is an avenue to re-distribute fresh fruits and vegetables to individuals with food access challenges.

A population health and food systems change framework offers:

- Structure to identify goals and outcomes of initiatives.
- Flexibility to determine localized solutions to lack of food security.
- Communicability to demonstrate key ideas to stakeholders. (Davidson, 2011)

PART 1:

GLEANING

Gleaning harvest-ready fruits and vegetables is a strategy for addressing food system challenges related to food distribution and waste management at the community level. It can also be defined as an “act where foods that cannot be sold in retail are shared as a donation and in charity” (Hoisington et al., 2001; Tarasuk and Eakin, 2005; Badio, 2009). Gleaning exposes the dissonant reality

where North American societies are faced with excess or surplus foods, but have individuals who have challenges accessing adequate and appropriate foods.

Limited academic and grey literature documents the effectiveness of gleaning initiatives on addressing food security and its subsequent health outcomes. The following literature review uses both environmental and public health perspectives to explore the roles of public and private sectors in the planning and implementation of gleaning programs. The gleaning section aims to:

- a) Define relevant keywords and concepts;
- b) Outline a framework towards understanding gleaning as a potential food security practice;
- c) Describe current challenges and benefits in order to synthesize best practices and possible next steps.

A review of best and emerging practices around planning and implementation of gleaning is provided, as well as recommendations that were synthesized based on best practices and categorized into municipal considerations, governance and partnerships, practical considerations, and resources.

Gleaning is a historically documented social practice. There is evidence of gleaning in the Bible, as well as English and French history (King, 1992; Vardi 1993; Hoisington et al., 2001; Badio, 2009). Historical information suggests that the English and French feudal systems constructed legal structures to sanction gleaning. Farmers were legally obligated to allow individuals holding low socioeconomic status to glean foods that were not needed from harvest (Vardi, 1993). However, legal reforms began to curtail the practice in support of emerging economic pressures and priorities (King, 1992). Public and private authorities began disregarding gleaning as an accepted practice. Michelle Coyne, an urban gleaning expert, discussed how the reformed practice, or lack thereof, was carried over into British colonies (personal communication, February 4th, 2015).

The new British settled colonies in Canada neglected the charitable practice leading to an institutional legacy that pushed food growing and production outside city limits (Coyne, personal communication, February 4, 2015). Other forms of food assistance developed during recessions and economic restructuring during the 1980's. Contemporary food assistance programs target hunger relief to lessen the impacts of social service cuts (Husbands, 1999). However, in recent decades the need for emergency food has increased (Wakefield et al., 2012). While gleaning has a long history, levels of Canadian government have not institutionalized it as a solution to address food security issues. Gleaning is re-emerging as a way of meeting the needs of low-income communities that lack food security. In addition, gleaning can be understood as more than charity because it is a practice located at the intersection of

environmental, agricultural, social service, and social justice work (Wakefield et al., 2012).

Contemporary gleaning practices include “dumpster-diving”, i.e. recovering food restaurants, farmers’ markets and retail stores; harvesting edibles from public and private fruit and nut trees; and field gleaning. This report primarily focuses on field gleaning; however applicable best practices from literature on fruit tree gleaning have also been included. The USDA (2009) defines field gleaning as the “collection of crops from farmers’ fields that have already been harvested or fields where it is not economically profitable to harvest”.

Field gleaning is highly relevant to Chatham-Kent, as the municipality is one of the largest producers of sweet corn, tomatoes, green peas, and other produce in Ontario (OMAFRA, 2006). However, according to research by the Centre for Community Based Research (n.d.), Chatham-Kent residents have difficulty accessing fresh produce due to income and transportation challenges such as public transit routes, public transit service, and distance to grocery stores. Field gleaning can potentially provide increased access to healthy and nutritious foods for low-income communities, and opportunities for food surplus re-distribution and industry level management of food waste. It can also present opportunities at the individual, community, and government levels for creating tangible health, social, and economic outcomes.

Municipal Considerations

Through an environmental lens, gleaning can be understood as a method to manage unwanted or “unfit” foods, commonly referred to as food waste and/or surplus food. Although there is no universally accepted definition of food waste in the academic and grey literature, its overlap with the concept of food surplus recovery¹ or food recovery can be useful for municipal decision-makers and planners considering the economic and social outcomes of gleaning on food security at the community level (Garrone, Melcini and Perego 2013; 2014).

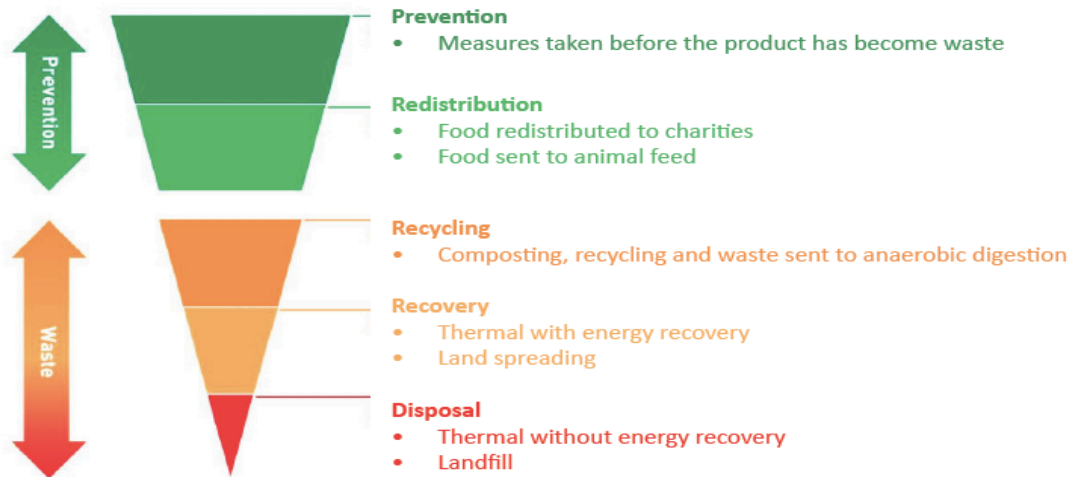
The primary driving force behind food waste is consumer demand and food safety fears. However, in 2014, a Canadian food waste study conducted by the [Provision Coalition](#) found that approximately 30% to 40% of produce is likely to end up in a landfill or as compost - a total cost of \$27 billion a year. Factors like excess purchases, infrequent purchases, and misperceptions about shelf life all contribute to an increase in food waste at the end-user level. The most wasteful products are those with short sell dates, such as fresh produce, and meat and dairy products. (Sert et al., 2014; Uzea et al., 2014).

¹ Surplus food recovery is the redistribution of safe food that is produced, manufactured, retailed or ready-to-be-served, but for various reasons is not sold to or consumed by the intended customer (Garrone et al., 2014).

Although contributing less waste than at the consumer stage, field or production stage waste accounts for 9% of overall food waste. Production losses are when foods are rejected for failing to meet quality or food safety specifications. Specific factors for food waste at the field or production stage include climate change and weather extremes, incorrect planting, incorrect harvesting, market conditions, labour shortages, over-production to cover losses at the market, regulatory standards, and food safety restrictions. (Uzea et al., 2014)

Figure 1 ranks various waste management strategies according to their attractiveness from a sustainability perspective (Uzea et al., 2014). At the municipal level, priorities for waste reduction include addressing the sources and causes of waste, and subsequently considering re-distribution when waste cannot be avoided. As re-distributed food items are used for their intended purpose (consumption), the foods are no longer considered waste. Food donation programs can potentially create substantial cost savings for agri-businesses. For example, Kraft Canada saved more than \$100,000 in annual shipping and landfill tipping costs (Cooper, 1997) and Second Harvest, a food rescue organization, was awarded the Green Toronto Award for Environmental Leadership because it was estimated that they saved the City of Toronto approximately \$300,000 annually by diverting food from the waste stream (Thang, 2009). Therefore, a focused re-distribution strategy for consumption is not only as an avenue to relieve food security or a counter-movement that challenges the “hegemonic” business practices (Hassanein, 2003; Lappin, 2004), but an opportunity to for considerable industry and municipal cost recovery and savings.

Figure 1: Waste Management Hierarchy



Source: Waste Resources Action Programme, 2013

Governance and Partnerships

Gleaning programs are typically structured as an agreement between a donor and recipient. In general, these parties are the food producer (e.g. produce farmers) and the emergency food provision agency (e.g. food bank, food pantries, and soup kitchens). Generally, this arrangement may be understood as a “win-win” scenario because surplus food is redirected to “feed the hungry”. However, unpaid labour and limited resources can strain this donor-recipient relationship. The literature highlights the need for a more mutually beneficial model that shifts away from the current food charity model. Alternative solutions, such as field gleaning, would lessen the food system waste significantly for both partners. The following section provides an overview of the current landscape of field gleaning practices and the challenges faced by key stakeholders, specifically farmers and food banks.

Field Gleaning Approach

There are various approaches to implementing a field gleaning program that have been identified in literature. These include:

- Farmer is “hands-on” by using their own resources (e.g. labour and time) to glean and deliver donations.
- Farmer is “hands-off” and produce is left on the fields, and separate labour and delivery is arranged.
- Allocation of land designated for produce is strictly used for donations. (OAFB, 2013)

However, as noted above, the current food charity model can strain the farmer-food bank relationship. The Research Shop of the University of Guelph, in collaboration with [FarmStart](#)², produced a report that lists a series of recommendations to help shape the farmer-food bank relationship to provide mutually beneficial opportunities (Chiu and CoDyre, 2012). The report identified the most frequently cited challenges as difficulty coordinating logistics and lack of financial incentives to sustain ongoing relationships.

- Logistical challenges include land, farming resources, equipment use, storage and transportation – each item implies significant costs that cannot generally be adequately covered by food banks (Chiu and CoDyre, 2012).
- Financial challenges stunt growth in the relationship between farmers and food banks. Ontario food banks require private fundraising and/or collaboration with community partners to support their work (Chiu and CoDyre, 2012).

The underlying issue of both logistical and financial challenges is limited resources and assets that are available and accessible to donors and recipients.

² FarmStart started in 2005 as a program to work with new farmers and the agricultural sector to provide a relatively risk free means for people from no-farm backgrounds to enter the sector. They primarily work with new Canadians, youth, and those choosing farming as a second career. Source: <http://www.farmstart.ca/about-us/>

While some challenges are shared experiences, academic literature has documented that the current food charity model is a donor-driven initiative and unequally benefits donors while burdening emergency food provision programs (Tarasuk and Eakin, 2005; Campbell et al., 2013).

Food Charity Structure Reassessed

Food Bank Canada's "[Hunger Count 2012](#)" report states that the total amount of food donated to food banks accounts for 0.3% of the annual value of food products manufactured in Canada. The report goes on to explain that the food given to households each visit generally lasts between three to five days, and major constraints arise around providing sufficient amounts of food on a consistent basis. The report calls for increased donations, particularly of fresh foods, to increase the supply and nutritional value of foods being provided to clients. However, a sustainable approach for increasing produce in food banks requires increased internal capacity in this secondary food system (Food Banks Canada, 2013).

Tarasuk and Eakin (2005) critically discuss issues with food surplus donations to food banks. The authors state that it is not necessarily a "win-win" scenario, as the handling of surplus food is resource expensive (Tarasuk and Eakin, 2005; Campbell et al., 2013). Labour and time to sort edible foods, repackaging foods for longevity, and determining product safety compound staff's responsibilities. Food bank staff relies heavily on volunteer support to perform these "relatively unskilled tasks" (Tarasuk and Eakin, 2005). It was observed that novice volunteers were more likely to be assigned these tasks while experienced volunteers were occupied with client interviews and food distribution. In turn, damaged foods were not effectively filtered and inedible foods were included for distribution. The authors argue that the receipt of substandard foods is because of a culture where food bank clients have few rights in this secondary food system. Food bank clients often adopt food consumption and procurement patterns that fall outside social norms (Hamelin et al., 2002; Hitchman et al., 2002). As a result, food bank clients' needs are masked because of social exclusion that divides members of society as donors and "grateful" recipients (Tarasuk and Eakin, 2003; Thang, 2009).

Other literature describes how food surplus driven food assistance programs steer away from alternative food supports or social programs due to limited paid staff and resources (Wakefield et al., 2012). Thang (2009) states alternative solutions should incorporate need for community leadership and participation and development tools that promote non-stigmatizing approaches to providing individuals facing food security challenges with greater control over the food they consume.

Strategic Partnerships

Strategic partnerships between various stakeholders are crucial for short-term and long-term impact. A coordinated and integrated approach is necessary to strengthen the farmer-food bank link by developing a mutually beneficial model. The literature illustrates the need for both municipal and community participation to build a mutually beneficial model. Gleaning programs include key stakeholders, such as municipal staff, non-profits, non-governmental organizations (NGOs), agri-businesses, local residents, and advocates (Food Recovery Council, 2007; Knezevic et al., 2013).

While the common field gleaning structure is a public-private partnership, other governance structures used for other food security initiatives can be applied to field gleaning to support and strengthen the farmer-food bank relationship.

Relevant governance models include:

1. Partnerships between the municipality and community where the community partner takes on the role of the expert and the municipal staff provide additional support.
2. Multi-stakeholder partnerships that politicians, municipal departments, community groups or non-profits, industry, or NGOs.
3. Regional partnerships between municipalities and industry associations to achieve scale and prevent the duplication of work. (Deloitte, 2013)

Chiu and CoDyre (2012) suggest multi-stakeholder partnerships should include farm associations to help address challenges around industry support and resource barriers for farmers. In Ontario, potential partners include the Ontario Tender Fruits Association, Ontario Federation of Agriculture, and Ontario Fruit and Vegetable Growers Association. Garnering support from industry groups can help to consolidate efforts, generate resource support like storage and delivery, increase access to a greater number of farmers, and encourage industry members to favorably view partnerships with food banks. In turn, farmers can receive collective support from the different associations and corporate bodies to help alleviate some of their costs through grants or programs. (Chiu and CoDyre, 2012)

Research shows the need for community organizations (e.g. non-profits, charities, and social enterprises) to help address challenges relating to food bank staff and coordination. Specific concerns include meeting farmers' expectations, clear communication to all stakeholders, appropriate number of gleaners, training in proper harvesting techniques, etc. (Howard, 2014; LifeCycles Project Society, 2010). A dedicated community organization can help manage coordination and resources, as these groups play a vital role in addressing farm-food bank barriers. They can also engage community members in addressing local needs, improving food security, addressing food waste, and identifying appropriate

practices for the re-distribution of food surplus. Gleaning initiatives can be established as extensions of existing programs or be the sole mission of an organization. For example, gleaning programs in Canada and the U.S. have collaborated with meal programs, senior centers, low-income housing facilities, youth and children programs, school snack programs, and drop-in centres (Savina, 2009). Some organizations also channel produce through larger organizations that glean and distribute from the restaurant and retail sector (Chiu and CoDyre, 2012).

Case Study: Pierce County, Washington

Pierce County is a strong case study illustrating multi-stakeholder partnerships where academic institutions are responsible for community engagement and gleaning coordination to help build community capacity. In 1990, Washington State University Cooperative Extension Expanded Food and Nutrition Education Program (EFNEP) started a gleaning project in the Pierce County region. The project aimed to improve access to fresh produce for low-income families and “increase self-sufficiency and sense of self-worth of participants”. Gleaning volunteers or gleaners were recruited from a range of community stakeholder groups. They recruited through the Department of Health and Human Services, Special Supplemental Nutrition Program for Women, Infants and Children (WIC), food banks, and newspapers. Training was provided and experience supervisors were paired with volunteer gleaners. Additional training was also offered that covered food preservation, gardening, and nutrition. During the 1997 gleaning season, around 50 gleaners participated and approximately 110,000 pounds of produce was harvested. Gleaners took home approximately 25,000 pounds of fresh produce and around 85,000 pounds was donated to the Pierce County Emergency Food Network. (Hoisington et al., 2001)

Practical Considerations

Practical considerations of program logistics and successful gleaning programs were primarily found within the grey literature. Activities indicated in manuals and guidelines were compiled to highlight practical considerations for gleaning programs.

Liability

Food safety scares and regulatory standards are mentioned in the literature as driving forces for unsalable foods to become considered as food waste. Although food items considered in this category are generally edible, regulatory standards

and food safety fears create barriers to economic profitability for the farmer. (Uzea et al., 2014)

Table 1 outlines the legislations that protect farmers, non-profits, and charitable organizations.

Table 1: U.S. and Canadian Legislation

Location	Practice
United States	<ul style="list-style-type: none"> • The U.S. legal system protects farmers as long as “negligence or intentional misconduct” is avoided. • Legislation is enforced by the U.S. Department of Agriculture (USDA) and the Federal Crop Insurance Corporation (FCIC). • Donations must not contain substances or conditions identified by the Food and Drug Administration or other public health organizations as “injurious to human health”. • Legislation that absolves farmers, non-profit organizations and charities of any liabilities include: Public Law 104-210, “Emerson Good Samaritan Food Donation Act”, and Public Law 105-19. (USDA, 2008)
Canada	<ul style="list-style-type: none"> • Canadian farmers are protected by provincial legislation. • The <i>Donation Food Act</i> in Ontario was passed in 1994, which protects the donor and the director, agent, employee or volunteer of a food bank that distributes donated foods. • Parties are not liable for any damages resulting in injuries or death caused by the consumption of food unless the food was adulterated or unfit for human consumption. • Nearly all of Canadian provinces have a similar legal framework (e.g. British Columbia’s Food Donor Encouragement Act 1997). (Sector Source, 2015)

It is important to note that while U.S. farmers are protected federally, Canadian farmers are protected provincially. A national strategy committed to support gleaning could bolster efforts for food re-distribution with municipal governments implementing context specific solutions. Furthermore, although provincial governments play a role in food bank donations, agreements are essentially made between the farmer and food bank. Municipal governments can serve as mediators so that the farmer-food bank relationships are not spoiled due to lack of legal guidance.

Public education on food safety related to gleaned produce can be a municipally and/or community led initiative. As regulatory standards may not change,

increased public support can create a shift in the food system away from the food diversion model where “unsalable” foods are immediately treated as waste. Municipalities are better situated to engage local residents.

Determining Scope of Gleaning Initiatives

Gleaning initiatives can have a variety of structures governing how produce is partitioned and shared, and determining an approach to distribution will depend on community needs and project goals. Some organizations sell a portion of the fruit and vegetables while others use set distribution ratios amongst the farmer/landowner, the pickers, and the charitable organization. For example, the Neighbourhood Harvest in Oregon has a distribution ratio where a quarter of the fruit goes to each the tree owner, volunteer picker, a charitable group, and sales (Savina, 2009). The LifeCycles Victoria Fruit Tree Project, on the other hand, divides the harvest into thirds, and leftover produce is processed and sold as juices or preserves. The revenue made from these sales can be used to generate funds for the gleaning program (LifeCycles Project Society, 2010). Alternatively, the Fresh Food Partners Gleaning Program in York Region organizes low-income members of the community to go to farmer’s fields and pick the remaining produce for their own consumption. The program is free to participants in order to increase access to fresh foods at no cost.

On the next page is a table that outlines different factors that need to be considered for determining the scope of a gleaning program.

Table 2: Factors to Determine the Scope of the Gleaning Program

Goals	<p>Success is measured by:</p> <ul style="list-style-type: none"> • The amount of produce gleaned • The number and the quality of harvests in a year • Targeting key members of the community (low income individuals, youth, the elderly etc.) • Understanding primary, secondary and tertiary goals
Geographic Area	<p>Define the geographic area and work within testable parameters</p>
Types of Produce	<p>Determine what produce is available, what people can use, and what is most efficient for volunteers to pick. (Solid Ground, n.d.) For example, some groups may do better with fresh produce like apples and pears but others may prefer cooked and processed produce, such as a senior center. In addition, some foods are best when eaten right when they are picked (Savina, 2009).</p>
Add-On Programs	<ul style="list-style-type: none"> • <i>Education</i>: This is an important value-add to gleaning efforts because it can be a community engagement tool. Example, The Fallen Fruit project in Los Angeles involved artists to help map all the fruit on public property to get communities thinking about new ways to use their city. • <i>Skills-based workshops</i>: This is a way to advertise and attract new participants to the gleaning project. It is also a good way to keep volunteers and community members interested. Workshops can include preserving, canning, pruning and grafting, bee workshops etc. (LifeCycles Project Society, 2010) • <i>Social enterprise</i>: Gleaned produce can be processed into other edible products. The LifeCycles Fruit Tree Project in Victoria, British Columbia works with entrepreneurs on a line of products that include gelato, pastes, jellies, apple cider vinegars and hard cider. The products are sold to the public markets. All of the revenue is redirected to finance equipment needs (LifeCycles Project Society, 2010). • Additional programs can include orchard tours and lectures.

Volunteer Steering Committee

It is important to have a diverse (expertise, age, socio-economic and cultural backgrounds, etc.) and interested group of community members when planning a gleaning initiative. Solid Ground and LifeCycles specifically suggest a steering committee to provide advice and make sure that the mission is being met in every activity (Savina, 2009; LifeCycles Project Society, 2010). It is suggested that a committee is comprised of a minimum of 5 to a maximum of 10 members (Savina, 2009). The committee can determine the gleaning initiative's or organization's goals, targeted geographic area, types of produce gleaned, and the intended use for the produce.

Harvest Manager

The literature recommends having dedicated harvest managers to coordinate gleaning programs. Harvest managers ideally have farm experience and the ability to address farmers' concerns and direct gleaning teams with minimal disruption to farming operations (Howard, 2014). The primary goal for the harvest manager is to ensure gleaning activities meet the expectations of the farmers and communities served. The manager needs to reassure the farmers and/or landowners that the fields will be treated with care and that the gleaning team is self-sufficient (LifeCycles Project Society, 2010; Howard, 2014). The role of the harvest manager can be quite extensive and overwhelming.

Season	Harvest Manager Tasks
Pre-Harvest	<p>Participant Data Collection:</p> <ul style="list-style-type: none">• To determine the type of gleaning activity, a database of willing farmers, volunteers and the potential crops is referenced as an important tool. Capacity to collect data depends on the level of staff involvement and commitment.• Gathering data can be a “hands-off” or “hands-on” activity.• Savina (2009) suggests online registration to be the most effective as it requires minimal staff time to gather responses. The major disadvantage is that it requires some technical skills of the staff person and the community member (e.g. farmer, volunteer).• Another “hands-off” approach is strategically placing questionnaires or survey forms at a community centre and/or other high-traffic locations.• A digital platform, like an online map, is a creative approach to raise awareness about gleaning activities and document potential gleaning sites. An example is http://city-fruit.appspot.com. Online maps can visually represent relevant information like locations of gleaning sites and the produce

	<p>gleaned. By clicking on a specific point on the map, a farmer's information can appear and relay information on how they have contributed to the gleaning initiative.</p>
	<p>Community Engagement:</p> <ul style="list-style-type: none"> • Finding committed volunteers can be made easier by contacting organizations like large charitable organizations, churches, service clubs and school groups. • Some organizations have a database of community volunteers and a wide audience of individuals interested in volunteering. • High school students are also ideal as they have service learning requirements and are available during the peak gleaning season in August and September. (Savina, 2009) • A method for farmer recruitment is actively communicating with local and regional farming associations and using their networks to maximize reach (Savina, 2009). • Word of mouth, flyers, neighbourhood canvassing, targeted list serves, social media, and print media are cited methods to gain volunteers (Savina, 2009; LifeCycles Project Society, 2010; Howard, 2014).
	<p>Needs Assessment</p> <ul style="list-style-type: none"> • Harvest manager should perform a needs assessment of the community program that would benefit from gleaned produce. • The assessment should articulate the appropriate types and amounts of produce that can be effectively managed by the organization. • Storage space should also be included in needs assessment. (Savina, 2009)

Laura Reinsborough, Founder and current Project Director of Not Far from the Tree, discussed how most of organizing and planning for gleaning programs is done during the fall and winter (Laura Reinsborough, personal communication, January 23, 2015). However, planning does not guarantee the amount of produce ready to pick at any given time. Volunteer numbers are also relatively unpredictable until the day of the actual harvest event, also called “harvest parties”. The harvest manager needs to be prepared for various skill sets of volunteers.

<p>Harvest Season</p>	<p>Harvest Training - Items project coordinators need to cover during training:</p> <ul style="list-style-type: none"> • Proper apparel (long-sleeved shirt, long pants, closed-toed shoes, eye protection, hat etc.). • Materials and equipment volunteers need to bring - water, bags,
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	<p>bee/wasp allergy protection).</p> <ul style="list-style-type: none"> • Instructions on how and what to harvest - avoid taking fruit from the ground because of risk of E. coli and damaged produce spoil faster. • Tips on how not to damage the farmer’s crops or access roads. • Minimize the risk of introducing pests or disease. • Proper transportation of produce from the field to the truck. • Safety procedures – injury prevention, terrain hazards, other threats to gleaner. • Liability, injury, or accident claims – consider commercial. general liability insurance and volunteer waiver forms • Harvest schedule, group assignments, and site specific details. Howard, 2014; LifeCycles Project Society, 2010; Savina, 2009)
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Many of the items can be shared prior to harvest time, but having in-person meetings close to the actual harvest time is preferred. Reinsborough believes in accepting a wide range of volunteers, even those with limited experience (Laura Reinsborough, personal communication, January 23, 2015). The organization has been able to grow because of the training program that transitions experienced volunteers into leadership roles. They serve as “pick leaders” who do the coordination for each site and manage a group of volunteers. This includes ensuring volunteers are using proper gleaning techniques and avoiding damage. (Reinsborough, personal communication, January 23, 2015)

<p>Post-Harvest Season</p>	<p>Harvest Data Collection - Harvest data should include the following information:</p> <ul style="list-style-type: none"> • <u>Farmer or food producer information</u>: name, contact information, level of interest. • <u>Produce data</u>: type, location, typical readiness date, quality. • <u>Harvest data</u>: specific plot accessibility, equipment needed, pounds harvested, quality, amount of volunteer time and amount distributed. (Savina, 2009; LifeCycles Project Society, 2010)
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The documentation of harvest data is crucial. Data entry can be done by a steering committee member or volunteer (Savina, 2009). However, the harvest manager should be responsible for converting the data for application. Over time, an in-depth inventory of field gleaning sites can be used for informing stakeholders, refining processes, and determining readiness to increase scale. It can be difficult for a single individual to manage all these tasks and may require some delegation. However, it is imperative that the harvest manager is the point of contact to oversee all the aspects of a dedicated region or zone.

Harvest Administrator

The harvest administrator supports the harvest manager, particularly with community engagement. The position should manage communications with volunteers and community groups. The administrator is tasked with informing gleaners of any training sessions, assigning sites, and arranging transportation. They also make sure that equipment and supplies are brought to the field and returned. Most importantly, they assist in making sure that the produce has been properly stored and distributed. (Howard, 2014)

The produce donated to the charitable organization must match the type and quality of produce with its end use. Some groups do better with fresh produce like apples and pears, while other prefer cooked and processed produce, such as a seniors center. In addition, some foods are best when eaten right when they are picked. Hence, gleaning events need to be scheduled with the charitable organization's hours of operation mind. Again, it is recommended to document this information in a database to ensure that picking and deliveries are consistent and effectively communicated (Savina, 2009).

Resources

Field gleaning initiatives require immense amounts of resources and supports for farmers and food banks. The most common resource barriers for both farmers and food banks are lack of finances and physical assets, such as storage and transportation for produce delivery. The literature highlights the need for more consistent funding to start and sustain projects over time.

Incentives and Funding

Consistent funding is one of the most important factors to a sustainable gleaning program for farms and food banks. Financial funding is needed to help offset some of the labour and resources costs for both farmers and emergency food provision agencies. Nearly half of food banks are completely volunteer-run and the majority of them receive no government funding (5% receive funding from government). Quebec and New Brunswick are the only provinces that offer some provincial funding (Food Bank, 2013). Common funding sources include:

- Foundation-based grants
- Community partnerships
- Consumer support
- Cash donations from private citizens (Food Bank, 2013)

One example of a farmer-food bank initiative is the Community Harvest program, for which the Ontario Association of Food Banks (OAFB) received financial support from the Ontario Trillium Foundation and a group of provincial organizations (Chiu and CoDyre, 2012). Heifer International is another foundation that has shown interest in supporting farmer-food bank programs (Chiu and CoDyre, 2012). Private citizens, including farmers, have also been funding sources to facilitate farmer-food bank linkages. For example, Cedar Down farms fundraises through the sale of Community Supported Agriculture (CSAs). They use the CSA shares to provide weekly salad greens to the Hanover Salvation Army. Cedar Down farms also dedicates a specific amount of fresh produce for a weekly donation to Chalmers Community Services in Guelph.

The Research Shop report (Chiu and CoDyre, 2012) also suggests that long-term maintenance of farmer-food bank links should include financial incentives for farmers. In Ontario, there is one piece of legislation that encourages the agricultural sector to increase in-kind donations to food banks. In 2013, through the suggestion of the OAFB and the support of the Canadian Federation of Agriculture, the provincial government began providing farmers that donate a portion of their produce with a Fresh Food Tax Credit. It was an amendment to the Taxation Act 2007 included in the final draft of Bill 35, *Ontario Local Food Act*. The tax credit is a non-refundable 25% of the total sum of the fair market value of each donation. The tax credit is only eligible for agriculture products produced in Ontario that are donated to community food programs registered as charities. The donated produce must be provided to recipients without charge. For the federal government, every Canadian dollar invested in this tax credit can generate more than seven dollars worth of food for food banks. As Ontario accounts for 35% of food bank use in Canada, Food Banks Canada advocates this to be an attractive incentive for food producers. (OMAFRA Bill 35; *Local Food Act* 2013; Food Banks Canada, 2013). Similar tax incentives and programs have been implemented in several U.S. States including Oregon, Iowa, Ohio, Colorado, Pennsylvania and more (Food Banks Canada, 2013). In addition to financial incentives, there can be incentives directed for training, business growth and resources.

Case Study: Food to Bank on Program, Washington, DC

A co-op program funded through the Washington Co-op Farm Fund trains new farmers and offers mentorship by veteran farmers and connects them to food banks that serve as their guaranteed market. The following are the program's eligibility criteria:

- A commitment to a future and livelihood in agriculture
- A commitment to sustainable farming practices
- A viable farm/business plan that targets a new market or one with sufficient room to grow

- A willingness to obtain a business license
- A minimum of one to three years of agricultural experience
- Less than three years of owner/operator experience
- Farm must be in Whatcom or Skagit Counties of Washington (Touch the Soil, n.d.)

The program is managed by a community organization, Sustainable Connections. The farmer instructors and prospective farmers have contracts with food banks to provide them with particular crops in certain quantities and quality. All aspects of the program are coordinated by Sustainable Connections and according to the harvest season. The main objective for this program is to bring fresh produce to food banks, add new farmers to the region, and keep the farming community alive. Participating farmers receive benefits, such as public exposure through Sustainable Connections' "Far Map and Guide" and local wholesale producer/buyer director, and access to trade meetings. They also receive media coverage including print publications and marketing tools (Touch the Soil, n.d.).

FarmStart runs a similar program to the Sustainable Connections' program in Ontario. However, FarmStart does not encourage their farmers to support food banks or collaborate with food banks as a market place for their farmers. The OAFB would be ideal an organization to consider providing attractive grants and making connections between food banks to FarmStart farmers. The OAFB could also bring in veteran farmers for workshops and encourage growth in the agriculture sector.

Non-profit organizations taking on the responsibility of coordinating gleaning activities and, possibly, food transportation also need consistent funding. Generally, organizations working on food security report spending considerable energy and time on securing resources, as well as limited ability to respond to criticisms of their work or commit to structural change. (Wakefield et. al, 2012)

Equipment

The following list is of equipment commonly needed for field-gleaning harvest (Savina, 2009; LifeCycles Project Society, 2010; Howard, 2014):

- | | |
|---------------------------------|--|
| • Scale | • Sharp Knives |
| • Ladder | • Fruit picking tools, with extensions |
| • Harvest containers | • First Aid kit |
| • Commercial picking bags | • Rake for clean up |
| • Food-grade storage containers | |

When gleaning from an orchard farm, it is helpful to have ladders that range from six to twenty feet tall. Fruit picking tools are useful because of their cage-like head that are best for harder fruits, like pears and apples (Savina, 2009). Plastic bags should be avoided as any form of storage, as they prevent circulation and water condensates can damage produce. Storage containers should ideally be shallow, as deep containers can increase the likelihood of produce on the bottom being damaged. Equipment can be bought at wholesale prices from hardware stores. (Savina, 2009)

Storage and Transportation

Once produce is harvested, it needs to be delivered to the food bank. Handling gleaned produce requires intensive planning and coordination. This includes distribution, transportation, and storage. Challenges with transportation and storage are often compounded by the irregular availability of produce for emergency food use (Chiu and CoDyre, 2012). Depending on the partnerships and existing physical assets, storage is a persistent barrier. Most food banks are “make-shift” facilities and have little space to store perishable and non-perishable items (Tarasuk and Eakin, 2005; Chiu and CoDyre 2012). Some storage requirements include on-site cold storage that can handle various amounts and types of produce. Orders may not always be the same depending on the harvest.

When is ready to be transported, they must be in a container to avoid contamination while simultaneously keep the food at the proper temperature. Large batches of foods may need to be separated into several smaller containers. Foods that are not shelf-stable or have a short sell date must be immediately refrigerated, which requires a refrigerated truck. Record keeping for food safety helps track and establish accountability (Food Recovery Committee, 2007).

Food transportation to a food bank or pantry is often the farmer’s responsibility. The OAFB created one solution by introducing the Community Harvest program to provide transportation, and have designated receiving warehouses/hubs paid for by the OAFB and a portion of the food banks budget. Another suggestion is for farmers to take on responsibility for bringing food to the local food bank while the OAFB provides province-wide transportation of produce to food banks whose location may be difficult to be serviced by local farmers. (Chiu and CoDyre, 2012)

A non-profit or charitable organization taking on the responsibility of produce transportation and delivery can verify policies on health-department-certified drivers. Resource sharing, like refrigerated trucks, is a useful way to lessen overhead costs. A more creative example is Maple Leaf Harvest. The organization is a non-profit food rescue organization that uses a “just-in-time” delivery model that takes advantage of technology. They use a mobile app that allows food donors to post foods they have on hand and potential recipients

communicate their specific food needs. Maple Leaf Harvest drivers quickly pick up the food items and deliver them to the intended social agency. The organization is able to keep flexible hours of operations by being available 24/7 and do not store any food in warehouses. (Maple Leaf Harvest, 2015)

Recommendations

Municipal Consideration

- Develop a municipal understanding of gleaning as a food waste management solution that can be integrated into a food redistribution strategy that targets food access challenges.

Governance and Partnerships

- Involve a diverse group of stakeholders from private and public sectors to establish clear and strong partnerships.
- Mediate discussions and promote transparency to strengthen the relationship between farmers and food banks.
- Municipalities can lead in developing relationships between farmers and industry associations and networks.

Practical Considerations

- Form a volunteer steering committee to determine the objectives and scope of the gleaning program.
- Hire an experienced harvest manager to serve as a farmer's point-of-contact and to collaboratively work with the steering committee.
- Incorporate skills-based workshops and/or a social enterprise to help form a sustainable program with value-added services benefiting community stakeholders.
- Develop a program based on the needs of the end-user or consumer.
- Record and track harvest data, and farmers and volunteers participating in gleaning program each season for future grant writing and to refine processes and procedures.

Resources

- Determine collaborative ways to pool together funding and resources between common stakeholders.
- Approach different public and private funding sources.
- Develop strategy to share assets and equipment between social agencies, farmers, and farm associations (storage space and delivery trucks).

PART 2:

EDIBLE GARDENS

Edible gardens or edible landscapes are widely understood as interventions that can increase food security by addressing some of the challenges emerging from contemporary food production systems. These initiatives can shift production of fruits and vegetables away from profit-making activities to address food access issues. They use food-producing plants in the constructed landscape and combine fruit and nut trees, berry bushes, vegetables, herbs, edible flowers and ornamental plants into aesthetically pleasing designs. These designs can be incorporated into any garden style and can include anywhere from 1-100% edible species. Edible landscaping creates a multi-functional landscape that provides returns to the community (e.g. fruits, vegetables) on investment of water, fertilizer, and time (Davidson, personal communication, December, 2015).

The literature identifies a variety of opportunities for edible gardens that have been developed and implemented by municipalities and communities. While increased access to high quality food from local sources is the primary reason for creating edible gardens, such initiatives also have a range of secondary outcomes and benefits (Sacramento Hunger Commission, n.d.; True Consulting Group, 2007; Lovell, 2010; Kamloops Food Policy Council, 2013; Urban Agriculture Working Group, 2013; Edible Landscapes Committee, 2014; Alas and Bootan, personal communication, January 14, 2015). Health, socialization, relaxation, recreation, community inclusiveness, skill development, and community beautification can all be enhanced by edible gardens. Ecological and environmental benefits have also been identified³ (GrowTO, 2012; Kamloops Food Policy Council, 2013; Edible Landscapes Committee, 2014; Alas and Bootan, personal communication, January 14, 2015).

The following is a review of best practices around the planning and implementation of edible garden projects that are municipally driven and community-led. Best practices were collected and categorized into municipal planning; governance and partnerships; resources; participatory planning and community engagement; practical considerations; and edible garden sites. The report on edible gardens encompasses relevant literature that referred to the subject as *public produce*⁴, *urban agriculture*⁵, and *edible landscapes*.

³ Growing food locally reduces the embodied energy of the food because of lower transportation distance and less packaging and processing. As a result, locally grown food reduces greenhouse gas emissions and global warming impacts. It also conserves energy by reusing urban waste products, including biodegradable wastes for compost and waste-water for irrigation, and contributes to biodiversity conservation, particularly when native species are incorporated.

⁴ Public produce is defined as publically grown and freely accessible edible plants (Kamloops Food Policy Council, 2013).

⁵ Urban agriculture refers to the “production and harvesting of fruits and vegetables, and the raising of animals or cultivation of fish for local consumption in and around cities” (Deloitte, 2013).

Municipal Planning

Edible gardens involve growing fruits and vegetables on public land to increase food access, and as a result the literature often highlights municipal planning as a highly important factor in food systems change (Deloitte, 2013; True Consulting Group; Higgins, personal communication, January 17, 2015; Urban Agriculture Working Group; Richmond Food Security Society). However, prior to engaging in municipal planning, it can be useful to examine current understandings around the terms “edible” and “beautiful” as they relate to edible landscapes.

Conceptualizations of “edible” and “beautiful” are governed by political and social norms that have historically evolved (Iacovetta, Korinek, and Epp, 2012).

Locating potential challenges deriving from the use of these terms are important to note as they influence municipal planning (Chatham-Kent municipal staff, personal communication, January 23, 2015). In addition, municipalities should consider that at the public planning level, food has traditionally been excluded due to the perspectives that: a) food producing is an agricultural activity that takes place in rural areas; b) the food system seems to be working, i.e. no change is required; and c) the built environment does not directly affect the food system (Food Matters Manitoba, n.d.). Understanding the dominant discourse around these socially, politically, and historically governed concepts that influence the current food system and municipal planning highlights opportunities for change.

Policy

Policies surrounding edible gardens are pertinent to a variety of municipal departments. Pothukuch and Kaufman (1999) highlight current issues that relate to municipal policies in food systems planning, noting “the current piecemeal approach fails to recognize the linkages among food subsystems and between food systems and other community systems like housing, transportation, land use, and economic development” (Pothukuchi and Kaufman, 1999, p. 6).

Municipalities can develop an integrated policy approach to deal specifically with edible gardens and reduce barriers to production and distribution in municipal regulation (Food Matters Manitoba, n.d.; Higgins, personal communication, January 17, 2015). Reports on best practices related to edible gardens identify a range of policy areas that municipalities can establish or utilize to support the planning and implementation of edible landscapes.

Policy Area	Best Practice
Planning	Official plans can designate areas and strategies for urban agriculture or develop “flexible approaches” to producing food in open space zones ⁶ (Deloitte, 2013; True Consulting Group, 2007).
	Official plans can recognize edible landscapes/urban agriculture to provide strategic direction for future bylaws. Best practice: Guelph. (Urban Agriculture Working Group, 2013)
	Secondary neighbourhood plans can prioritize food and gets resident input into the process (Higgins, personal communication, 2015).
	Create food policy councils (sanctioned by local governments and are usually comprised of representatives from different areas of the food system community) that can support comprehensive food systems planning (Pothukuchi and Kaufman, 1999).
	City planning departments can work in collaboration with the food policy council (or create a department of food) to develop comprehensive food systems plans (Pothukuchi and Kaufman, 1999)
Bylaws	Bylaws can be created or amended to support edible gardens, such as soil, water, compost, pesticides, sewers and drains, building permits, fences, site alterations, property standards, trees and parks (Urban Agriculture Working Group, 2013).
	<p>Edible gardens can be defined within zoning bylaws as a distinct form of use that is permitted in all zones. Alternatively:</p> <ul style="list-style-type: none"> • Include edible gardens as a permitted land use • Include edible gardens as a zoning category • Create an urban agriculture/edible landscape zoning overlay <p>Even though climate and contextual differences are apparent, these practices apply across geographies. Best practices: Seattle,</p>

⁶ Open spaces can include public parks, squares, etc. where people live, work, and visit. Source: <https://www.designcouncil.org.uk/sites/default/files/asset/document/open-space-strategies.pdf>.

	Chicago, Detroit, San Francisco, Ottawa, Philadelphia, and Toronto. (True Consulting Group, 2007)
	Zoning bylaws can be used as a tool to scale projects' size and scope (Urban Agriculture Working Group, 2013).
	New green roof standards can be incorporated into bylaws and building codes (True Consulting Group, 2007).
	Periurban ⁷ agricultural zones can be designated in municipal development plans as parts of "green belts" or "green corridors" (True Consulting Group, 2007).
Taxation	Taxation mechanisms can be provided as financial incentives. They can generate funds to acquire land or buildings, or fund programs and services. These types of exemptions have been used to acquire land, enable land sharing or leasing, promote edible gardens among home owners, and bring farmland into production. Best practices: Permissive Tax Exemption that provides tax relief for lands and buildings that offer community benefit (Richmond Food Security Society) and the City and County of San Francisco's Urban Agriculture Incentive Zones that were implemented by the Public Health Unit (San Francisco, 2012; City and County of San Francisco, 2014).
	Tax credits can be provided for edible garden properties. Best practice: State of Maryland's legislation stating authorities give tax relief to urban agriculture land. (Deloitte, 2013)
Food and Agriculture Plans	Municipal edible garden or urban agriculture plans can be created. Best practice: Toronto's urban agriculture plan. (Higgins, personal communication, January 17, 2015; GrowTO, 2012)
	Food strategies can be developed and include edible gardens to provide a high-level plan expressing the municipality's dedication to improve all elements of the region's food system. These documents help guide future decision making and recommends specific courses of action. Best practices: Toronto, Edmonton, and Vancouver. (Urban Agriculture Working Group)

⁷ Periurban refers to dichotomous environments that have experienced urban growth and become with mixed urban and rural characteristics (Iaquinta and Drescher, 2000).

Development	<p>Edible gardens can be built into landscapes through new land development:</p> <ul style="list-style-type: none"> ● Land for edible gardens can be included in environmental impact review criteria for new developments and businesses. ● Edible gardens can be incorporated into new developments, and tax credits can be provided to developers who incorporate edible landscapes into their designs. ● Developers can build community gardens or edible landscapes into multifamily developments. ● Multi-use site development can support the use of building spaces, residential gardens, back yards, etc., for edible landscapes. (True Consulting Group, 2007; Richmond Food Security Society, 2013; Higgins, personal communication, January 17, 2015)
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Land Inventories and Land Use

Research shows that one of the biggest issues arising around producing food in communities or public areas is limited access to suitable land (Lovell, 2010; Moreland Food and Garden Network). However, locating ideal land for edible gardens can be a challenge for municipal planners because of the necessary infrastructure required for projects, such as water access. Health risks are also a concern due to historical and unsafe land use practices, such as use of pesticides. These factors highlight the importance of site analysis for edible landscapes to ensure that the risks are identified and mitigated accordingly. For this reason, municipalities often create land use plans and conduct land inventories to enable interested stakeholders to easily identify land available for edible garden projects. See Appendix E for steps to conducting a land inventory for municipalities. (True Consulting Group, 2007; Lovell, 2010)

Municipalities and communities can consider land use opportunities to incorporate edible garden initiatives in various ways. Innovative land use opportunities include:

- Municipalities support the use of public lands for edible gardens, such as along railways, under power lines, in parks, military bases, schools, golf course fairways, or airport-approach areas. (True Consulting Group, 2007)

- Municipalities can consider options for edible gardens in the planning and redesign of institutions and municipal facilities. (True Consulting Group, 2007)
- Municipalities make “permanent protection of agriculture status” for particular sites, such as Montreal’s Permanent Agricultural Zone. (Deloitte, 2013)
- Municipalities include edible gardens in their managed open space strategy. (True Consulting Group, 2007)
- Municipalities utilize buffering techniques, such as edge planning, vegetated or constructed barriers, natural corridor edges, building setbacks, adjacent land use compatibility, and reduced densities near productive agricultural areas to plan and reduce urban/agricultural conflicts. (True Consulting Group, 2007)

The following case studies demonstrate how municipalities can support the engagement of residents and stakeholders to create solutions through working together on the development and implementation of edible gardens.

Case Study: Vancouver, BC

The City of Vancouver indicated its commitment to food security in 2003 when it approved a motion supporting the development of a “just and sustainable food system”. Specific examples of innovative edible landscape practices include the City’s policy statement for the development of an area to pursue opportunities for edible landscaping on both public and private land, the Park Board passing a motion to assess opportunities for planting fruit trees in public spaces with potential strategies including a trial period for selected fruit trees, a community orchard operated by a stewardship group, and an educational workshop on fruit production. The municipality also hosted a fruit tree giveaway, partnered with residents to maintain edible landscapes by allowing residents to plant and maintain traffic circles, boulevards, and neighbourhood greenways, and installed green roofs on their conference centre and public library. (True Consulting Group, 2007)

Case Study: Richmond, BC

As one of the biggest challenges to edible landscapes is competition for suitable land (Lovell, 2010; Moreland Food and Garden Network, 2012), many communities are conducting land inventories to identify useable land for growing. In 2012, the Richmond Food Security Society conducted a food land inventory to

locate and assess the food growing potential of vacant, under-utilized, and government owned parcels of land in the municipality. The process was guided by best practice criteria used in other cities, including Vancouver, Portland, Seattle, Oakland, and Victoria. A municipal role was providing guidance to a working group comprised of City staff, British Columbia Ministry of Agriculture and Lands (BCMAL) staff, and a Kwantlen Polytechnic University. GIS information was provided by the City and BCMAL. They utilized a number of evaluative criteria to prioritize sites for physical visits. Key informant interviews were conducted with experts in relevant fields and a literature review furthered their understanding of the challenges and opportunities to growing in Richmond. Following the land inventory report, the city planned to host open house forums for stakeholders to discuss the recommendations that were developed. Based on the recommendations and forum discussions, an Action Plan was going to be created to assist the stakeholders with mobilizing around land use, food security, and agriculture. (Richmond Food Security Society, 2013)

Governance and Partnerships

The literature highlights that edible gardens require a coordinated and integrated approach, as there are varying levels of intervention required. Key stakeholders for edible garden initiatives identified by experts and the literature include municipal staff, councillors, non-profits, non-governmental organizations (NGOs), architects and architect landscapers, businesses, developers, residents and communities, advocates, and consultants (Higgins, personal communication, January 17, 2015; Alas and Bootan, personal communication, January 17, 2015). Each stakeholder has a unique role to play in the development and implementation of edible garden projects.

Below are five governance models for food security initiatives that can be applied to edible gardens:

1. Municipal departments take the lead. This can also mean linking edible landscapes to other municipal responsibilities, such as recreation, water storage, and nature conservation.
2. Partnerships to allow for cooperation between municipalities and the community. Deloitte (2013) noted that this model is most useful when the municipality does not have a strong program delivery model in place, and the partner can take on the role of expert.
3. Multi-stakeholder partnerships to bring together participants from different areas, including politics, municipal departments, non-profits or NGOs, and

- industries. This model is more commonly used for larger-scale initiatives, policies, and programs.
4. Regional partnerships between municipalities to organize regional initiatives. These are most often used to achieve economies of scale and prevent duplication of work.
 5. Public-private partnerships refer to partnerships between a municipality and private sector businesses. This approach is best suited for initiatives that require the on-the-ground expertise from players in the private sector. (Deloitte, 2013; True Consulting Group, 2007)

However, an area that is often missing in governance and partnerships is post-planning. Vanessa Ling Yu, Founding Director of FoodSpokes states, “Post-edible or community garden planning, residents often disappear and gardens struggle without paid staff support. Only in the rarest cases does a community group organically take the lead for all upkeep involved with a garden. And even then, supports such as in-kind space for meetings, conflict resolution, and inclusion supports may be needed for more equitable access” (personal communication, February 18, 2015). See Community Engagement for information for participatory planning and sustainable community involvement in edible gardens.

Resources

As edible gardens are an attempt to shift production and distribution away from private and profit-making activities to public processes that increase food access, the literature and expert interviews reveal that projects require a significant amount of resources. Resources are required both to start and sustain projects over time (Alas and Bootan, personal communication, January 14, 2015). A range of resources and the stakeholder groups that can support the process of acquiring them include:

- Tools, Sheds, and Fencing: Municipalities or community groups can create travelling tool libraries and/or encourage connectivity among growers to organize tool sharing agreements; and municipalities can provide sheds and fencing around relevant edible garden sites (Deloitte, 2013).
- Staffing: As a significant challenge for edible gardens is project management (Barlett, 2012), it is recommended by experts and in the

literature to appoint a municipal staff and/or community worker to oversee local edible garden projects. Best practices: City of Toronto hired a community garden staff allowing individuals to apply for gardens and get support to start the process, and San Francisco's Administrative Code states that at least one full-time municipal staff will be hired to coordinate urban agriculture initiatives (San Francisco, 2012; Deloitte, 2013; Higgins, personal communication, January 17, 2015). With limited funds, the community can outreach and engage community members - the more people involved, the more sustainable the project will be (Sacramento Hunger Commission, n.d.).

- **Funding:** Insecure funding impacts the long-term success of community-led edible garden projects (Alas and Bootan, personal communication, January 14, 2015; Chatham-Kent Salvation Army, personal communication, January 23, 2015). Municipalities can convert funds from development or Section 37 (Ontario-wide Planning Act) into money that can be used for community benefit (Higgins, personal communication, January 17, 2015). Alternative measures to ensure sustainable funding/resource provision include partnerships with local garden stores or nurseries, working edible landscapes into a property's existing landscaping budget, and developing permanent intern positions from local university or college students. For example, Lotherton Village's Fruit Orchard received donations from a church group who gave tools and equipment, and a tree service company that donated about 120 cubic yards of wood chips used for mulching around trees and in their garden. (Sacramento Hunger Commission, n.d.; Alas and Bootan, personal communication, January 14, 2015)
- **Water:** Municipalities can connect edible gardens to city water sources or recycled water; alternatively, municipalities and communities invest in rainwater collection, storage systems, and small-scale water saving irrigation systems (True Consulting Group, 2007; Urban Agriculture Working Group, 2013; Deloitte, 2013). Municipalities can also provide incentives to the community, such as a utility service fee discount for green infrastructure reflecting savings to the municipality in the form of reducing the municipality's storm water sewer management costs (Deloitte, 2013).
- **Compost:** Municipalities can connect compost programs to edible gardens and establish low-cost facilities for "close to the source" collection and sorting of organic wastes (True Consulting Group, 2007; Deloitte, 2013).
- **Information:** Municipalities can publish information on edible gardens, including policies and success stories, through websites, print mediums,

etc. to increase community awareness (Deloitte, 2013). Communities can access information relating to edible landscaping from books and articles, and/or consult with local experts (Sacramento Hunger Commission, n.d.; Alas and Bootan, personal communication, January 14, 2015).

Case Study: San Francisco

In 2011, San Francisco amended its Administrative Code to create an Urban Agriculture Program that oversees and coordinates all relevant activities. The holistic code provides a range of supports, including resource provision. Section 53.4 (6) states that one goal is to “provide garden resource locations in neighborhoods across the City, at existing sites where possible either that provide residents with resources such as compost, seeds, and tools, with at least 5 completed by January 1, 2014” (San Francisco, 2012). The city is working to address the most significant barriers to urban agriculture, specifically land and water access, by providing \$100,000 to ensure areas zoned for growing have access to water, and to develop incentives for landowners, particularly those with vacant properties awaiting development, to allow temporary urban agriculture projects (Deloitte, 2013).

Community Engagement

Higgins, Founding Director of Food Forward, states that community involvement in bureaucratic systems and municipal processes can be a challenge, and municipalities can have difficulty finding real ways for community members to get their voice heard in food systems change (personal communication, January 17, 2015). When planning edible garden projects, diverse stakeholder engagement, including community members, is a crucial component throughout project’s design, planning, and implementation phases (Food Matters Manitoba, n.d.; Dubbeling et al., 2009; Dubbeling, 2010; Sacramento Hunger Commission, n.d.; Alas and Bootan, personal communication, January 14, 2015).

Participatory planning is a best practice that can be useful in the community engagement process. This approach aims to build a more participatory government, create public-private partnerships, overcome distrust, link community members to government, and ensure that municipal policies and programs adequately meet community needs. It can improve the assessment of

situations through the inclusion of diverse perspectives, and enhance the likelihood of success, sustainability, and ownership during the implementation phase. Participatory planning also empowers communities that are often marginalized. (Dubbeling et al., 2010; Dubbeling et al., 2009; Sacramento Hunger Commission, n.d.)

Following participatory planning, a variety of community engagement activities can be used to ensure that projects improve food production, distribution, and subsequently consumption to support those experiencing lack of food security (Sacramento Hunger Commission, n.d.; San Francisco, 2012; Deloitte, 2013; Alas and Bootan, personal communication, January 14, 2015). Below are examples of community engagement initiatives that have been successful:

- Communication plans to share information about short term and one-off events, and support long term public awareness (Kamloops Food Policy Council, 2015). Maps, online tools, media coverage, and other communication tools can be utilized (Barlett, 2012; Kamloops Food Policy Council, 2013).
- Community events (Sacramento Hunger Commission, n.d.; Alas and Bootan, personal communication, January 14, 2015)
- Workshops to teach residents how to maintain and care for edible landscapes (Sacramento Hunger Commission, n.d.; Alas and Bootan, personal communication, January 14, 2015)
- Training programs (Sacramento Hunger Commission, n.d.)
- “One-stop shops” for information, programming, and technical assistance (San Francisco, 2012)
- Physical hubs for creating and sharing knowledge. MetroAg and FoodShare are two organizations developing such a learning centre in Toronto that can support researchers, practitioners, advocates, and other (Nasr, J., MacRae, R., and Kuhns, J., 2010).

Challenges for community engagement frequently experienced by municipalities include: time consumption; potential for conflict, as a greater number of diverse perspectives are involved; directional shifts until the groundwork for collaboration is laid; less focused efforts and compromise on the part of organizers; and high expectations put on municipal officials (Sustainable Cities Institute, 2015).

Challenges for community engagement in the community include: long-term commitment of individuals, as edible gardens can take a significant amount of time to be successful leading community members to become disappointed, frustrated, and ultimately disengaged (Alas and Bootan, personal communication, 2015; Sacramento Hunger Commission, n.d.); and resident turn

over (particularly in low-income communities), however project staff can design a method for engaging new residents to edible landscaping and determine ways for longer-term residents to share their related knowledge and skills (Sacramento Hunger Commission, n.d.).

Case Study: Lima, Peru

In Lima Peru, the city engaged in a successful multi-stakeholder participatory planning process for policy formulation and action planning around urban agriculture. The process was broken into three stages:

Stage 1 - Strengthen local capacities to enhance stakeholders' understanding of urban agriculture and its impacts, and reinforce commitment or buy-in to the planning process.

Stage 2 – Conduct a situation analysis to analyze urban agriculture and better understand the approaches, locations, stakeholder roles, current policy/by-law context, and potential issues or challenges.

Stage 3 – Engage in action planning to collectively bridge the gap between stakeholders and institutional actors, exchange information and knowledge, coordinate planning, implement and monitor projects, determine the institutionalization of certain projects, and develop a strategic plan for urban agriculture.

This collaborative process resulted in urban agriculture establishing legitimacy and then integration into the city's economic development and land use plans, with an annual budget. Institutionalizing urban agriculture allowed for the initiatives to be incorporated into the normative municipal frameworks and strategic development and land use plans, and supported the development of specific policies that facilitate and regulate its practice. (Dubbeling et al., 2010)

Practical Considerations

Practical considerations for edible garden projects are primarily found within the grey literature. As edible landscape projects have the potential to be untidy and attract pests if not properly planned and coordinated (Barlett, 2012), a number of logistical considerations for municipalities and communities have been identified

to ensure smooth project implementation. The following are a set of recommendations that can be applied to the various edible landscape sites.

Compost:

- Edible gardens provide more yard waste than typical sites; compost onsite or municipalities can provide additional municipal pick-ups or designated areas for composting organic waste.
- Challenge: Some gardens cannot accept donated organic materials without a municipal permit. Opportunities to address this include providing compost through the municipality or sourcing compost through co-operative organizations. (Urban Agriculture Working Group, 2013)

Risk Management/Liability:

- Develop risk management requirements, such as liability insurance and liability waivers, for implementing controversial programs. (LifeCycles Project Society, 2010; Deloitte, 2013)
- Consider scale of edible landscape projects. Scale can present challenges that lead to worries regarding potential nuisances and impacts on surrounding land uses. (Urban Agriculture Working Group, 2013)
- Consider soil safety as it relates to in-ground edible garden initiatives. Although, many of the perceived risks of edible gardens are often effectively precluded by existing environmental protection and public health regulatory frameworks. (Urban Agriculture Working Group, 2013)
- Safety issues will vary depending on the project. For example, untended fruit trees can be a hazard if an individual is hit by a falling fruit or slips on a fallen fruit on the sidewalk. In this case, some municipalities have removed fruit trees, such as Scarborough, North Yorkshire (Daily Mail, 2010, as cited in Barlett, 2012), while others have found ways to address the issue, such as in Seattle where the City suggested growing vegetables or berries in a “planting strip” (a small unpaved area between the sidewalk and street) (Seattle Public Utilities, n.d., as cited in Barlett, 2012).
- Safety orientations can be organized to identify relevant concerns for volunteers. (LifeCycles Project Society, 2010)
- Food handling safety presents itself at each stage of food production and distribution, from ensuring seeds are sown in safe soil to safety preparing vegetables for consumption. Community groups or municipal public health units can organize education activities around reducing risks of food borne illness to mitigate risks, and take care around soil safety, storing and applying manure, tracking soil between sites, and handling produce. (Urban Agriculture Working Group, 2013)

Distribution:

- Not all community members will be physically able to access produce grown in edible gardens, especially in a timely manner. For this reason, coordinated projects can ensure produce is appropriately distributed to those lacking food security. (Barlett, 2012)
- Determine an approach for distribution based on local needs and project objectives. Common models of distribution include:
 - Free range – Produce is free to everyone. This should be well communicated and residents might need encouragement to pick the fruits and vegetables. Some groups, such as youth, might also need education around how and when to pick the produce. (Sacramento Hunger Commission, n.d.)
 - Allotment/Adoption – Trees or other plants/plots are adopted by individuals, families, or groups in an allotment-style (Alas and Bootan, personal communication, January 14, 2015)
 - Donation – Groups decide on a distribution formula. The Victoria Fruit Tree Project divides its harvest into thirds (one third to each homeowners or volunteers, community groups or organizations that can use the fresh produce, and the remainder is kept to generate funds for the project through fruit and/or juice sales. (LifeCycles Project Society, 2010)

Storage:

- Poor storage and rotting produce can lead to pests, messes, further fruit rotting, etc.
- Fruit is kept better if it is unbruised with the unbroken skin and the stem attached.
- Rodents can be a concern, especially if the produce is stored outside. Store produce off the ground to prevent contamination and out of the sun in as cool of a location as possible. The Storage for Fruit Tree Project stores produce in backyards, sheds, and office spaces.
- Produce should be monitored daily to ensure that none of it is rotting. (LifeCycles Project Society, 2010)

Maintenance:

- Clearly designate responsibilities and ensure that these are understood by community members, staff, project staff, maintenance staff, and funders. Project organizers can persuade youth and adults, maintenance staff, landscapers, and property managers to each help with watering, pruning,

- harvesting, etc. Sharing the tasks can lead to no one person feeling fully responsible for the edible garden. (Kamloops Food Policy Council, 2013)
- Community coordinators or lead staff can arrange workdays with volunteers (including corporate groups, youth programs, etc.), partners, and others from the community. This helps keep volunteers engaged, and work parties bring people together for a common purpose (Kamloops Food Policy Council, 2013; Alas and Bootan, personal communication, January 14, 2015).
 - When community groups encourage residents to ‘adopt’ a tree, the adoptee becomes responsible for maintaining and caring for the tree. (Alas and Bootan, personal communication, January 14, 2015; Sacramento Hunger Commission, n.d.)
 - Coordinators or lead staff can keep lists of all major improvements or tasks that need to be worked on by larger work groups. (Kamloops Food Policy Council, 2013)
 - Regular maintenance schedules are developed and ideally include consistent and regular monitoring of the edible garden initiative. The project team can set-up a small maintenance committee with members who are knowledgeable of natural insects, weeds, and disease control. If it is practical and the project is using municipal or school property, they can arrange for one of their horticulture staff to provide support. (Kamloops Food Policy Council)
 - Dedicated community staff, partners, or professional landscapers/gardeners take the lead on providing or organizing training for more technical maintenance, such as pruning (Alas and Bootan, 2015; Sacramento Hunger Commission, n.d.).

Pest Management:

- As noted, fruit trees and other edible gardens can attract pests, including rodents, insects, and other animals. However, there are a variety of targeted and localized approaches to address these issues. (Barlett, 2012; Alas and Bootan, personal communication, January 14, 2015)
- Practice Integrated Pest Management (IPM), “a knowledge intensive, ecologically based decision making process that uses a variety of management tools and methodologies to suppress pest populations to acceptable levels but relies primarily on natural mortality factors” (Evergreen, 2012).
- Learn about the different pests and how to recognize them, and monitor the garden on a regular basis, including pests and beneficial species, to

- identify any problems that might occur (Evergreen, 2012; Kamloops Food Policy Council, 2013).
- Track the effects of weather and environmental conditions, set a threshold for tolerance, and take meticulous notes on the effectiveness of treatments. (Evergreen, 2012; Kamloops Food Policy Council, 2013)
 - Plant refuge areas for natural enemies to encourage natural predators to be biological controls, such as ladybugs. Other examples include bringing in predator insects, using microorganisms, and inciting beneficial animals. (Evergreen, 2012; Kamloops Food Policy Council, 2013)
 - Practice preventative approaches, such as using of clean tools, choosing disease resistant or tolerant plants, planting in the right place, starting with healthy transplants, timing planting, planting trap plants, fertilizing less, incorporating organic amendments, top-dressing permanent installations with organic mulch, allowing good air circulation by pruning with care, rotating annual plants, providing appropriate water quantities, and watering in the morning. (Evergreen, 2012; Kamloops Food Policy Council, 2013)
 - Use organic and inorganic materials, including chemical controls (i.e. pesticides) as needed. This can be applied using repellants, mechanical/physical removal, soaps, minerals, oils/sprays, and compost teas. (Evergreen, 2012; Kamloops Food Policy Council, 2013)
 - Certain municipalities have pesticide bans. Although many edible garden projects will be organic, these bans may impact some farming practices. (Urban Agriculture Working Group, 2013)
 - Explore behavioural controls by tapping into insects' natural responses to colours, odors, and light through pheromones, kairomones, and colour attractants (Evergreen, 2012; Kamloops Food Policy Council, 2013).
 - Municipalities or community groups can create local pest identification charts or guidelines to help with the education process around pest management (British Columbia, 2014).
 - Specific to fruit tree projects: select disease-resistant varieties for the local area, plant sacrificial trees, prune trees in dormant season or summer to open up the canopy to improve exposure of fruit to sun, air circulation and spray coverage, remove all fruit from the trees at harvest and destroying any insect-infested or disease-infected fruit.

Harvesting:

- Promote harvesting produce on a regular or daily basis, as fallen produce attracts pests and contributes to fungal and bacterial plant diseases and insect infestation.
- At the end of the season, ensure clean-up and the discarding of any dead plants. (Kamloops Food Policy Council, 2013)

Municipal Resources:

- Municipalities can create edible garden guidelines on a variety of relevant topics, as well as other educational tools, for landscapers, developers, and the community.

Measuring and Monitoring Outcomes:

- Maintain records of the amount harvested and distributed (by weight) and numbers of volunteers, volunteer hours, contacts, outreach events, etc. (Kamloops Food Policy Council, 2015; Alas and Bootan, personal communication, January 14, 2015)
- Conduct baseline evaluations at the beginning of projects, followed by process evaluations during or immediately after project development activities, and impact evaluations after a process or activity. As edible gardens can take years to develop, it is likely that the most striking results will come years after the start of the project. (Sacramento Hungry Commission, n.d.)
- Municipalities evaluate the community's fiscal capacity to secure reasonable funding and programmatic capacity to implement projects (San Francisco, 2012).

Edible Garden Sites

There are a range of sites being used for edible gardens by municipalities and communities to improve food production and distribution, and create food systems change, at a local level. Four major sites or locations of edible gardens have been outlined with case studies to illustrate best practices. These include fruit trees/arboriculture, boulevards and underutilized land, rooftop gardens, and community gardens. Local considerations, such as policy and partnerships, will guide municipal and community decisions around the feasibility of various sites.

See Practical Considerations for additional information on implementation practices.

Fruit Trees/Arboriculture

Both academic and grey literature sources reveal that fruit trees/arboriculture is a widely practiced, sustainable, and successful edible garden initiative. Fruit and nut tree projects have been found to have a range of benefits, including increasing healthy eating, addressing obesity, building community, providing education opportunities, closing cross-generational gaps, reducing carbon footprints, providing shade, leisure space, and supporting wildlife habitats (Vickers et al., 2010; Urban Agriculture Working Group, 2013). They can be planted in backyards and parks, or planted as orchards (The City of Calgary, 2014; Alas and Bootan, personal communication, 2015).

Municipalities are planting fruit and nut trees into public beautification projects recognizing their aesthetic value, as well as using them for educational/demonstration purposes. They allocate staff to oversee the projects implementation, and often start with pilot projects to gauge feasibility. Alternatively, communities can take the lead on fruit tree projects. These projects are often designed for increasing food access in particular communities the lack food security. (Urban Agriculture Working Group, 2013; Edible Landscapes Committee, 2014; The City of Calgary, 2014; Alas and Bootan, personal communication, January 14, 2015).

Challenges identified by City Studio, a community group in Vancouver that grew fruit trees on boulevards, include:

- Finding a steward, however offering a paid position through funding can addresses this issue.
- Volunteer engagement over the long-term, however providing volunteers with fresh fruit from the trees can provide incentive.
- Navigating the various levels of bureaucracy: “Many of the steps to make our orchard a reality were interdependent. This was confusing and difficult, and groups attempting to replicate our process may find this a significant deterrent. We couldn’t get approval without a steward, but we couldn’t get a steward without a concrete idea of the project, and that depended on approval. We needed funding to buy the specific plants we wanted, but we needed a steward, approval and community support letters to apply for

funding. We had to balance the needs of the steward with the requirements of the City – for example, the City wanted the steward to visit the site every day during the fruiting season, but the steward was worried that this may not be possible – and that was difficult to achieve. Many people from the City were excited and supportive of this project, and yet to please all the interested parties, a daunting amount of acrobatics was required.” (City Studio, 2012, p. 9)

Boulevards and Underutilized Public Land

Boulevards and underutilized public land are potential sites for edible landscaping. Information on this topic is somewhat limited in the literature with the majority of it available through municipal program websites. Public spaces can host community gardens, planters, hedges, and fruit trees. Some municipalities are also enabling and encouraging homeowners to plant on portions of the statutory right-of-way to grow food (City of North Vancouver, n.d.).

Feasibility of planting specific crops will depend on space, existing infrastructure, liability and safety concerns, etc. The produce usually has a pre-determined distribution system, such as half to food banks or other food assistance programs, and the remaining to the volunteers or community.

Rooftop Gardens

Rooftop gardens allow food to be grown on public and private buildings. Growing mediums are built into roof's material (“green roofs”) or through containers. These initiatives have been shown to reduce heating and cooling costs by up to 20%, lengthen roof lifespan, reduce precipitation going into storm water runoff, absorb carbon dioxide emissions, and increase biodiversity (Food Matters Manitoba, n.d.). Rooftop gardens can be incorporated into integrated storm water management plans and liquid water management plans (True Consulting Group, 2007).

Although rooftop gardening is somewhat new in Canada, they have been successfully installed on Canadian municipal buildings in Vancouver, Burnaby, and White Rock, and Kitchener/Waterloo who has at least six rooftop gardens

(Food Matters Manitoba, n.d.), as well as on a significant number of private buildings. Internationally, in Switzerland there is a policy requiring new buildings to dedicate an area of green space on their roof equivalent to the amount lost due to construction (Food Matters Manitoba, n.d.). Municipal staff can take the lead on growing fruits and vegetables on public rooftops, and developers can partner with community groups to provide expertise and on the ground support (Higgins, personal communication, January 17, 2015).

However, rooftop gardens are not suitable for all roofs, and the high initial costs can be a deterrent (Food Matters Manitoba, n.d.). Policy considerations related to rooftop gardens include accessory structure permits and regulations, height restrictions and exceptions for rooftop gardens, and noise generated by fans (True Consulting Group, 2007).

Community Gardens

Community gardens are plots of land where community members can garden and grow fresh produce for sale or direct consumption. They can be located on public or private land, and are often located in communities where lack of food security is an issue (Alas and Bootan, personal communication, 2015). They can also be allotment style, or used for public/demonstration purposes.

Community gardens often involve collaboration between municipalities and the community, where the municipal government provides the land, equipment, and infrastructure (such as access to water and fencing) and community members or groups organize to maintain the gardens. When community groups establish gardens they often receive resources through a range of sources, including through (some of what are municipal) and donations (Alas and Bootan, personal communication, January 14, 2015). Fruits and vegetables grown in allotment gardens are harvested by and for the individual grower, whereas public/demonstration gardens distribute produce to volunteers, programs, etc. (Deloitte, 2013)

Case Study: Lotherton Village, Toronto ON

Lotherton Pathway has established both community garden and fruit orchard sites to address local food security. Lotherton is a privately owned condo community comprised of a combination of high rise buildings and town houses.

Its residents are primarily low-income and newcomer/immigrant families. The local neighbourhood office, Action for Neighbourhood Change (ANC), has been actively working to produce food for local distribution and increase local food security. Residents received approval from the condo board to start a community garden in 2006, and the first planting was in 2008. It was originally a shared garden space, but moved to allotment-style in 2013. Different residents have taken the lead on the garden project. In 2009-2010, they began talking about fruit trees and received funding through the City of Toronto's Live Green Grant. ANC worked closely with a partner, Future Watch, to implement the project. They used online tools to track the carbon footprint, host workshops, and engage children through art projects. ANC staff also worked closely with residents and a local nursery to determine the types of trees to be planted. Each resident family involved with the project "adopted" a tree, which they chose based on the kind of fruit they wanted to grow. ANC organized a series of planting days with residents, including youth and kids, and provided each family with an adoption certificate and adoption pledge outlining their commitment.

The group is in the early phase of implementing the project. Major outcomes of the project so far have been community engagement, education and capacity building, beautification, sense of ownership of the community, and in the near future they will get a significant amount of fresh fruit.

ANC identified a number of issues and challenges with the project so far:

- "It's our dream to have compost" says Alas. The City of Toronto's garbage collection contract is external, meaning there are no City resources for composting.
- Better water access is needed. Having the orchard in a private housing complex means that the condo board must approve major actions. In this case, the group wants a tap in the garden, but the board is not letting them install irrigation from the City's water.
- The group cannot typically access City funding due to being located on private land. They are often working to secure resources and rely mostly on donations.
- Theft of produce from the garden's allotment plots is frequent by humans and animals. This is an anticipated issue for the fruit orchard once trees start producing more fruit.
- A city-wide disease called pear rust has been attacking their pear trees. The City has restrictions on pesticide use meaning the group has been unable to get rid of the air-borne disease. (Alas and Bootan, personal communication, January 14, 2015)

Case Study: Calgary, AB

The City of Calgary is in the process of implementing a five-year fruit orchard pilot project. A total of four fruit tree orchards have been planted. Some orchards are being managed by the City and others are being managed by community groups. The orchards have been established in both existing public parks and on a community organization's property. Different approaches have been used for each of the four sites. In Baker Park, the City planted hundreds of fruit trees. The trees will be used for demonstration and education purposes. Alternatively, at Ralph Klein Park, pear trees were planted into the built landscape around the parking lot.

Pollinators are required for fruit trees; however, the City has found that native bee populations have decreased in recent years. This has led them to introduce mason bees at orchard sites. Mason bee houses are designed to increase the colonization of the orchards' mason bees. Boxes will be removed each fall and stored over the winter to protect bees from predators, then replaced each spring. (The City of Calgary, 2014)

All four planting models will be evaluated over the course of the pilot project. Orchards will be evaluated based on tree survival, fruit production or yield, vandalism, disease and pest management, cost, orchard steward satisfaction, and community capacity to manage the orchards. There are a variety of other case studies and implementation guides on fruit tree projects online and in the grey literature⁸.

Case Study: City of Yarra, Australia

The City of Yarra has been working to create edible gardens at the Burnley Backyard – a run-down community house. It is a partnership between the Richmond Community Learning Centre, the Richmond Community Garden Group, and community members. The site includes garden plots, a kitchen garden, creative work spaces, flexible venues for mixed activities, and a central courtyard. The City of Yarra's budget included a significant amount of funds (\$200,000 Australian Dollars) for the project. The space aims to be transformed into a thriving community hub.

⁸ For example, see LifeCycles Project Society (2010) for a "how to" guide for starting a fruit orchard in the community: http://lifecyclesproject.ca/resources/harvesting_abundance.php

The City also created the Popup Patch at Federation Square. Vegetable plots are made from recycled crates located on the top of a commercial car garage. The space also hosts a range of workshops for the community. (Eagle, n.d.)

Case Study: Montreal, QC

LUFA Farms is a series of eight hydroponic greenhouses on the rooftop of a two-story office building in Montreal. The growing technology developed by LUFA is recognized globally as a state of the art cultivation system. Throughout the different micro-climates of the greenhouses, they are able to grow a variety of crops, including kale, peppers, lettuce, eggplants, cucumbers, etc. without the use of pesticides. In addition to producing 120 metric tons of produce each year, the facility conserves water through recirculation of irrigation water and rain water capturing, controls pests, saves energy, and produces compost on site. (Urban Agriculture Working Group, 2013; Lufa Farms Inc., 2015)

Recommendations

Municipal Planning

- Locate dominant discourse around the concepts of “edible” and “beautiful” as they relate to edible landscapes, as well as assumptions around the role of edible gardens in public planning. These socially, politically, and historically governed concepts influence the current food system, thus highlighting opportunities for change at the municipal planning level.
- Ensure policies are compatible with, and encouraging of, edible garden initiatives, and determine whether additional plans could support the development of edible landscaping, especially in priority areas.
- Conduct a land inventory to determine safe and available land for edible gardens, and identify opportunities for edible landscaping on municipal land and through development.

Governance and Partnerships

- Involve a diverse group of stakeholders and build partnerships with stakeholders not currently at the table to fill gaps, including private businesses.

Resources

- Provide adequate municipal staffing for projects and assess opportunities through staffing allotments, including summer students.
- Provide municipal funding to support projects in the community and invest in edible gardening infrastructure and other resources.
- The community can recruit volunteers, locate grant writers and funding sources, and build relationships with donors who can help provide resources.

Participatory Planning and Community Engagement

- The municipality and community can organize a participatory planning process and create guides or knowledge translation documents to build awareness and capacity.
- Both the municipality and community can develop relevant engagement activities.

Practical Considerations:

- Create clear scope and plans for implementing and evaluating projects based on the nature of the project and needs of the community. These plans should relate to the various areas of municipal concern. With pilot projects, provide clear indicators to support decisions around future expansion of edible gardens.
- The municipality can conduct evaluations on the fiscal capacity of the community to secure reasonable funds to continue implementing edible gardens, as well as the programmatic capacity of the community to carry out strategic plans.

Edible Garden Models

- Identify target communities, such as low-income areas that have a significant need for initiatives to address food access issues.
- Assess the feasibility of the various edible garden sites based on governance, partnerships, resources, etc. to determine local models.
- Determine whether the municipality and community will work in partnership or separately to implement edible landscape pilot projects.

Cultural Considerations

- Edible gardens should consider local demographic needs. In particular, as 10% of Chatham-Kent's population is considered first generation, (Chatham-Kent Local Immigrant Partnership, 2014), cultural food access could be an issue. When addressing food security in the community,

culturally relevant produce should be considered as a critical component of food accessibility.

- Municipalities and community groups can support communities by enabling access of traditional foods through producing and harvesting in traditional ways. Gardens can include culturally relevant crops and offer opportunities for individuals to actively produce space and culture through their construction of place. (Baker, 2004; Riverdale Immigrant Women's Centre, 2014)

Conclusion

Food systems change is about creating stronger and more inclusive food access to increase food security. Ontario municipalities and communities have a vital role to play in the process through interventions around local food production, distribution, and waste management practices. Gleaning and edible gardens are evidenced-based initiatives to drive food systems change, primarily influencing access and consumption. Through increasing the accessibility of fruits and vegetables, population health and wellbeing can be improved.

However, key informants at the municipality of Chatham-Kent (Chatham-Kent municipal staff, personal communication, January 23, 2015) identified the need for a cultural shift towards the acceptance and support for gleaning and edible gardens, in various sectors. A gap in the literature is a lack of clear impacts and evaluation methods from a population health perspective. Another possible area for future research and consideration is the intersection of community food initiatives and technology.

Municipalities and communities can consider the potential impact of gleaning and edible gardens to address local food security. These interventions are steps in the process of creating stronger and more sustainable food systems. However, cross-sector and integrated approaches are required to ensure long-term health outcomes.

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Appendix A

Edible Gardens Interview 1

Interview: ANC Lotherton Village

Interviewees: Tara Bootan, ANC Coordinator; and Beatriz Alas, Community Engagement Coordinator

Interviewer: Alison MacKenzie, Research Consultant

Date: Jan 14, 2015

Location: Toronto, ON

Method: In-person

1. What led to the creation of the orchard?

Lotherton Village is a privately owned condominium area with a combination of high rises and town houses. It is low-income and comprised primarily of newcomer/immigrant families. The neighbourhood started with a community garden in 2006, and the first planting was in 2008. It was a shared garden space, which then moved to allotment-style in 2013. Different residents have taken the lead on the garden project. RAG (resident action grants) funded resident's work and engagement. In 2009-2010, they began talking about fruit trees, and the orchard got funded by the City of Toronto's Live Green Grant. The grant focused on environmental work, meaning CO2 emissions, energy use, etc. ANC worked closely with Future Watch, an environmental group, to implement the project, using online tools to track carbon footprint, host workshops, and engage children through art projects. ANC staff worked with residents and a local nursery to determine the types of trees to be plants (which trees work in this climate, are resistant to pests/diseases, etc.). Each resident family involved with the project "adopted" a tree (and they picked the kind of fruit they wanted like to grow). ANC organized a series of planting days with residents, including youth and kids (even had kid shovels). They provided each family with an adoption certificate and adoption pledge with the commitment outlined.

Key stakeholders: funders (City of Toronto), non-profits (ANC, which is City funded), businesses (nursery), and residents.

2. Can you tell me a bit about how the orchard runs?

- ANC staff hosts workshops with non-profit partners on care, pest management, disease identification, mulching, pruning, etc.
- They also host volunteer days with corporate groups (e.g. large banks), Volunteer Canada (sent Starbucks staff), United Way, and non-profit programs (including youth programs).
- ANC also gets donations to continue its work. For example, church groups have donated tools and equipment, and the “biggest partnership” has been with a tree services company that donated about 120 cubic yards of wood chips (to be used for mulching around trees and in their garden).
- They also frequently consult with experts in the field. For example, Orchard People has brought in an arborist and ran workshops; and Garden Jane did a workshop on compost tea.

Resources and activities: expert consultations, partnerships, donations, volunteers, community engagement, letter writing/petitions (to get to start and getting resources), staff time, grant writing.

3. What have been some of the main outcomes?

- Community engagement
- Education and capacity building
- Down the road, they will get a significant amount of fresh fruit (trees are still young).
- Beautification
- Gives people a sense of ownership of the community

4. What have been the issues or challenges with the orchard?

- “It’s our dream to have compost” says Alas. As the garbage contract in Toronto is external, there are no resources for composting through the City.
- Water access is needed. The biggest challenge is that the private housing will not let them install irrigation from the City’s water. They want a tap in the garden.
- Residents speak to the private condo board, write letters and petitions, etc. to address some of the challenges.
- There are also other barriers because the orchard is on private land. Specifically, they are not typically able to access City funding directly. They always are working to secure resources as funding runs out.

- There is theft of produce in the garden, which is also expected for the trees because they're allotment/adopted. Theft is both from animals and humans.
- Rely mostly on donations (volunteer/resident time and resources – including seeds, mulch, etc.)
- City-wide disease that attacks pear trees (called pear rust). It is a huge problem because the city has restrictions on pesticide use (which are not present outside the city) and they cannot get rid of this air-borne disease.

5. Anything else you would like to add?

The City Councillor has provided soil, etc. that had to be “dropped on City land” because their space is on private land. The local councillor and MP are very supportive. They help to connect ANC with other programs in the city to get resources, such as fencing, rain barrels, and water catchers (though they lack proper tools to install these).

Appendix B

Edible Gardens Interview 2

Interview: Food Forward

Interviewee: Darcy Higgins, Founding Director

Interviewer: Alison MacKenzie, Research Consultant

Date: Jan 17, 2015

Location: Toronto, ON

Method: Phone

1. Can you tell me a little bit about your work related to edible landscapes/Building Roots Initiative?

Building roots aims to get at the issue of food access and empowerment of people to be involved with food in their own neighbourhood or community (e.g. housing/residential). The focus is on neighbourhood revitalization and new housing developments. It looks to build food infrastructure (gardens, kitchens, markets). Part of it is advocacy – sharing/encouraging development with city planners and councillors, architects, developers, etc., to be involved; and the other part is helping them do that work – education on best practices and helping residents advocate for change (created a toolkit on Building Roots site).

2. Where did the idea come from?

- a) Saw the problem of depleting farm land – asked ourselves how do we get that back.
- b) Interested in how do we use resources (land and financial) to affect broader change. Also, the lack of infrastructure to be using local food in people neighbourhoods to be available.
- c) Also, bring a voice to change policy and bring this forward. Municipal leaders can have influence on developers. Communities can advocate for change and be involved in the process.

Three levels of work:

- 1) Neighbourhood Plans of Official Plan and secondary neighbourhoods plans that can prioritize food and gets resident input into the process. For example, in Alexandra Park (high needs Toronto neighbourhood) – bids on development. Developers are very useful partners.

- 2) Build funds from developments or Section 37 (Ontario-wide Planning Act) into funding that could be used for community benefit.
- 3) Municipal-specific by laws, such as the Green Building Incentive.

3. Best emerging practices you see for edible gardens?

- A lot of US cities have an urban agriculture plan; Toronto has an urban agriculture strategy
- Property owners, including social housing, can be encouraged to provide space for growing or they can take the lead on growing. They can also partner with local groups, non-profits, or residents to grow. For example, Toronto Community Housing Corporation (TCHC) allows land for growing.
- Providing community garden staff at the City level, e.g. Toronto. This has allowed people to apply for gardens and get support to start process.
- Toronto develop is using rooftop of a building for growing. They've contracted Young Urban Farmers (young entrepreneurs) to grow, and they donate produce to CRC (non-profit). Daniel's Spectrum also has a roof garden and they hire an outside expert of help with developing and growing the garden, and they support balcony boxes in a local building for growing produce.

4. Who are the major stakeholders for edible gardens?

- Municipal staff and councillors
- Community agencies and community health centres
- Architects and Architect Landscapers
- Developers
- Residents and communities
- Advocates and consultants

5. Challenges of barriers in your work?

- New idea for the building sector, so one challenge/opportunity is to get the ideas across and mainstream them.
- Bureaucracy of systems and finding real ways for residents/community members to get their voice heard. Disengagement because of municipal process. "Making systems easier."

6. What resources and/or activities are required?

- Cross sector work – getting planners, public health, etc. who have ability to make this happen to be able to connect and gather. Involve residents.
- Financial resources – staff and other supports.

- Leadership – either from a municipal unit or mayor to prioritize and keep the work going.

7. Anything else you would like to add?

A few years ago, there was a Street By-Law that governed boulevard space and what can be grown. It didn't identify include edibles, so city staff interpreted it as edibles can't be grown. Having policies that allow initiatives are key. Review municipal policies and have something to saying that urban agriculture or edible gardens is a priority. This allows each area to get involved with healthy food growing.

Wayne Roberts' book (new) – a useful resource.

Appendix C

Gleaning Interview 1

Interview: Not Far From the Tree

Interviewee: Laura Reinsborough, Founder and Current Project Director

Interviewer: Andrew Park, Research Consultant

Date: Jan 23, 2015

Location: Toronto, ON

1. What led to planning of your gleaning initiative and project? E.g. community needs and past projects?

- A bit by accident
- Started on the City of Toronto museum property and there was a connection with the municipal government – there are 40-50 fruit trees and a working orchard – the staff don't have the capacity that the fruit would be used.
- Inspired by Fallen Fruits initiative that was started by a professor in L.A.
- Started putting words out to friends and reach out to the immediate community
- What was important from the outset – a table at the farmer's market as an important outreach tool that served as a public space where the public can taste some of the apples and individuals would share stories about their experiences with their neighbourhood fruit trees.
- It is very social and community building like a mini public forum.
- Organized fall and winter and then by spring they could harvest.

She is really interested in...

- Most of the work is harvesting from private property – residential property.
- Public property becomes a little more contentious – regarding what is safe to eat and what is an appropriate public act.
- The issue around food safety and non-commercial quality food looks
- What does it mean if the food is coming from an urban environment – toxicity and can we trust soil from our own backyards
- Didn't want to donate food that was of lesser quality and produce that just was not being put to good use.
- She likes to explore gleaning to look at the urban relationship between community members and their urban environment

2. What relationships or partnerships exist between different stakeholders (community members, organizations, City staff, others)?

- Local city councillor who was really supportive, a few councillors were really helpful
- Can improve on the partnership between them and the city
- Having some mentorship from existing charitable organizations was really helpful
- They are a project of a larger charity – gaining access to administrative infrastructure
- Learnt from other groups – mainly from BC – gathering of fruit tree projects – published a manual
- Has created a strong relationship and network with other groups that are doing similar activities
- City of Toronto Soil Assessment Protocol – targeting community gardens to reduce paper work and red tape - no matter what the soil testing says, it is okay to plant fruit trees and eat from those trees – addresses that these foods are not any less than what you would eat from a conventional food
- City of Toronto municipal policy does not have a clear bylaw regarding gleaning on public property.

3. What assets or resources do you have to implement gleaning projects (e.g. infrastructure, land, money, staff)?

- Really depended on other organizations manuals and guidelines. Some examples are: Life Cycles - Victoria BC harvesting our gardens manual; Seattle City Fruit; Abundance Edinborough; FruitShare Manitoba
- Resource and knowledge sharing is needed! So that when projects get started, you have a community to learn and share resources
- Organization currently runs on two staff year round – grow in harvest season, May to June and August to November
- Have a coordinator that is in each ward – 15 wards in total
- Lots of volunteers participate in the picks and equipment - 1200 volunteers
- Lead picks require some sort of training – 65 pick leaders
- Media attention was key for outreach – the actual organization hasn't done a lot of outreach – local on the ground perspective

4. What are potential issues, challenges, or barriers for gleaning projects?

- Hire and support staff is large
- Fundraising is an ongoing task

- Being strategic with scale and being clear about model and stay on course with their objectives – remaining agile and responsive so it doesn't end up top-down and building the right partnership and network
- Scaling growth incrementally

5. What outcomes do you hope to achieve?

- To scale out to the rest of the Toronto – but community building and environmentally sustainable is huge – how the fruit is transported and learning ways to be connected.
- Also, to have a national network is challenging because of the time and resources to organize something like this. Last November there was a meeting of projects across Ontario but nothing has surfaced from that meeting.

Appendix D

Gleaning Interview 2

Interview: Academic expert and previous Second Harvest employee

Interviewee: Michelle Coyne

Interviewer: Andrew Park, Research Consultant

Date: February 4th, 2015

Location: Toronto, ON

Method: Phone

1. Can you tell me your background and involvement in urban gleaning?

I finished my doctoral work at York University and did a dissertation on food waste and urban gleaning and looked at the social and cultural history. I also focused on dumpster diving and worked with the organization Toronto Food Not Bombs. I've also worked on food donor relations for Second Harvest Toronto, an organization that gleans from the mainstream food system.

2. Who are the major stakeholders?

- City municipalities have a big role since they are the decision makers around allowing public food to become more available.
- Municipalities in North America had regulations and restrictions to grow produce in the city, as well as livestock. There was a big push for food outside of the city to push for food access.
- There was a change in the legal system where gleaners were legally permitted and farmers would have always left a portion of their field and give access.
- Gleaning was removed from British Common Law and when Canada was colonized, gleaning was never brought over
- This eventually changed the way societies and communities developed. There used to be communities forming around farms and agriculture activities. But change in legal structure caused a distance between farmer and eater.
- Farms are so far away from the densest parts of the population now. So the people who need food the most don't have access the fields and farmers don't have money to harvest and donate
- The people who eat are no longer a part of the people who make our foods and relationships are with local grocery stores.
- Coyne has noticed that food donors, including farmers, largely invested in keeping the food in their communities

3. What resources do you need to implement gleaning projects (e.g. infrastructure, money, staff)?

- Value-added programs are needed, ones that make organizations more flexible
- Note, that value added programs are helpful but also require a lot of resources. For example, preservation is a really good idea but requires lots resource.
- Opportunities to preserve, rework or cook it into something else can help manage the huge influx of produce. Preservation is key. Gleaning will happen during the fall and bring in a large amount of produce. Immediate consumption won't be possible.

4. What are potential issues, challenges, or barriers for gleaning projects?

- Hunger relief services don't have the capacity to bring on new capacities because they are usually under-funded and under-staffed
- You need community organizations to be the go-between. An example is the Christian Gleaners network where they focused only on gleaning as well as dehydrating produce to create soup mixtures. Specialization is good because of focus.
- Clear funding is a challenge. Consistent funding would allow the organizations to focus on what they do.
- Pooling funds and resources between organizations is a good idea. For example, Second Harvest and Daily Bread Food Bank collectively receive food from the Ontario Food Terminal. In the pas there was competition, but sharing has allowed neither organization was overextended, not doubling efforts, and both have consistent presence at the Terminal.

Appendix E

Steps for Conducting a Land Inventory for Municipalities

Step 1: Develop a list of potential sites from relevant municipal departments and community consultations.

Step 2: Analyze site information using GIS and aerial photos. Parcels of land can then be divided into relevant categories, such as large scale urban farm, small scale urban farm (including greenhouses, forest farming, etc.), community gardens, and growing on impervious or poor soil.

Step 3: Create a criteria and ranking system to prioritize sites, such as zoning type, existing infrastructure, sun exposure, current and future land use plans. Some sites might require in-person visits. Special consideration for land inventories include sunlight, water access, soil, protection from vandalism, access for gardeners, and aesthetics of the neighbourhood (Vancouver Island Community Research Alliance, 2011).

Municipalities can also conduct survey assessment of brownfield sites with potential for edible garden use, with consideration for techniques that do not depend on soil quality, such as raised beds, greenhouse production (True Consulting Group, 2007).

Appendix F

Gleaning-Related Organizations

Name	Website
Fresh Food Partners Gleaning Program	http://yrfn.ca/programs/fresh-foodpartners-gleaningprogram/
Fallen Fruit Tree Project	http://fallenfruit.org
Food to Bank On	https://sustainableconnections.org/foodfarming/FTBO
Kamloops Food Policy Council	http://gleaningabundance.com
LifeCycles Project Society	http://lifecyclesproject.ca
Not Far From the Tree	http://notfarfromthetree.org/about
PEI Food Exchange	http://peifoodexchange.weebly.com/about-us.html
Second Harvest	http://www.secondharvest.ca
Solid Ground	http://www.solid-ground.org/AboutUs/Pages/default.aspx
Washington State University Extension Pierce County	http://ext100.wsu.edu/pierce/

Edible Gardens-Related Organizations

Name	Website
Food Matters Manitoba	http://www.foodmattersmanitoba.ca/category/projects/
Kamloops Food Policy Council	http://kamloopsfoodpolicycouncil.com/programs/
Lotherton Village	http://northyorkharvest.com/lotherton-pathway-community-garden
Richmond Food Security Society	http://www.richmondfoodsecurity.org/community-gardens/about-community-gardens/
Richmond Community Garden Group	www.yarracity.vic.gov.au/DownloadDocument.ashx?DocumentID=4322