



Original Research Article

Gleaning in the 21st century: Urban food recovery and community food security in Ontario, CanadaJennifer Marshman^{a*} and Steffanie Scott^b^a Wilfrid Laurier University^b University of Waterloo**Abstract**

Historic gleaning activities in Europe took place in farmers' fields where gleaners could collect the leftovers of the harvest. One of the primary motivations for modern gleaning in Canadian cities is to donate fresh food to local organizations such as food banks. As there is currently little research in this area, this study aims to explore how gleaning initiatives contribute to community food security. The study is based on interviews and surveys with volunteers from several gleaning organizations in Ontario and uses the Dietitians of Canada's Food Security Continuum as a framework for analysis. The study found that gleaning contributes to all three stages of the Food Security Continuum: initial food systems change, food systems in transition, and food systems redesign for sustainability. Respondents felt that the amount of food harvested could be scaled up. Moreover, there were benefits that augmented community food security, such as increased food literacy, food awareness, community cohesiveness, and a fresh food supply. Overall, this study improves our understanding of how gleaning initiatives can contribute to community food security. With better ongoing support from the community and on the policy agenda, such projects could further enhance their impacts.

Keywords: Community food security, food security continuum framework, gleaning, urban food recovery, urban agriculture

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Introduction

Gleaning unused field crops as a means of food procurement has been common practice for as long as there have been farmers' fields. The word "gleaning" conjures images of poor peasants hunched over fields holding sparse sheaves of grain. This interpretation is due, in part, to the way gleaning has been expressed in works of art. One of the most famous images of gleaning is by Jean-Francois Millet (1857). In this painting, three women are seen in an empty field holding a few stalks of grain. One of the women is painfully stooped, alluding to the backbreaking nature of the work. Hovering over them is a male figure on horseback—likely the property owner or his steward. It is an interpretation entrenched in a culture where inequalities are addressed by making room for charitable acts while still maintaining acceptable social, gender, and class boundaries.

This classic image of gleaning illustrates a historical perspective on food (in)security when field gleaning was an act of subsistence. The implication is that the arduous process of harvesting such scant pickings, piece by piece, would be done only out of necessity and not by choice. However, before the sixteenth century, gleaning was simply the final phase of the harvesting process when a person or group would follow the harvesters and collect fallen grain (Vardi, 1993). This changed during the 1700s when the French government became increasingly concerned with individual (private) property, primarily for taxation purposes. It was then that a new, theologically justified, delineation of who could glean (women, the poor, and infirm) and who could not (farmers, able bodied) came about. Gleaning ceased to be the final step in the harvest, and instead became an act of charity (Vardi, 1993).

Modern gleaning as a form of harvesting fresh food, when differentiated from other forms of food recovery such as dumpster diving¹, shares both similarities and distinct differences from these historical accounts. Gleaning has become a form of food recovery in which individuals and groups volunteer their time and donate a significant portion of the harvest to social service organizations. This suggests a shift away from allowing food-insecure people to fend for themselves towards a more community-based approach, and a larger participatory effort to reduce food insecurity. While historical gleaners could only collect the meagre leftovers in farmer's fields, today food recovery groups are driven by the bounty of unharvested food growing in and around urban spaces. Historical gleaning was very much farm and field oriented in rural spaces. Now, modern gleaning takes place in a multitude of contexts, in both urban and rural contexts.

This paper presents the results of a study that explores how gleaning initiatives may contribute to community food security (CFS), based on the perceptions of volunteer gleaners. This research addresses a gap in the literature on urban gleaning in Canadian cities, and how

¹ The term gleaning is used in this paper to refer to the harvesting of fresh, surplus, food from where it is grown. Similar gleaning activities include (but are not limited to) foraging (McLain, Hurley, Emery, & Poe, 2014), dumpster diving (Haselwanter, 2014), food redistribution (Heynen, 2010), and food bank gardening (Food Banks Canada, 2016).

these activities contribute to CFS. Exploring the perceptions of volunteer gleaners provides important information for gleaning organizations that rely on volunteers for harvesting the food.

The first part of this paper reviews the benefits of gleaning in the form of urban gleaning groups in Canada. Next, we describe the concept of CFS with links to gleaning activities, followed by a description of the ways that gleaning activities contribute to CFS based on the perceptions of volunteer gleaners. We apply the Dietitians of Canada Food Security Continuum (FSC) framework (2007) to analyze volunteer perceptions, and conclude with directions for future research.

Setting the stage for food recovery

Food recovery has been taking place in different forms for centuries. There are several historical accounts of gleaning (Badio, 2009; King, 1992; Vardi, 1993), but this paper addresses a gap in research on modern gleaning initiatives, particularly in an urban, Canadian context (Bartlett, 2012). Since Canada's first formal fruit tree project² was founded in 1998 in Victoria, British Columbia (Lifecycles Project Society, 2003), more than 28 formal gleaning projects have emerged across the country (Hidden Harvest, 2012). The structure of food recovery groups varies but the primary reasons for their formation are consistent across groups: reducing food waste, community building, improved access to local foods, knowledge sharing, and addressing climate change. Each one of these issues has direct links to food security.

The first official urban fruit tree project in Ontario was the Hamilton Fruit Tree Project, founded in 2005. Other large urban centers also have formal gleaning projects including the Toronto-based group Not Far From The Tree, Hidden Harvest in Ottawa, the Appleseed Collective Revival in Guelph, and the Gleaners Guild in Waterloo Region. Available data indicate that more than 50,000 pounds of fruit was officially recovered in 2014 from these groups alone. This number indicates the potential of gleaning groups to contribute a significant amount of fresh food to food recovery efforts.

Gleaning contributes to CFS in a variety of ways. For example, volunteer gleaners are provided with instructions on how to safely and appropriately harvest the food they are gleaning. This contributes to food literacy³ in several ways, including providing a basic understanding of how and where food grows. Seasonal and local food literacy is also improved by exposing volunteer gleaners to the kinds of food available in their region. Volunteers who choose to take home some of the harvest may also be exposed to new foods or ways of preparing or preserving those foods.

² Fruit is the focus of most of this discussion, however, many of these organizations are gleaning other fresh foods such as tree nuts, garden produce, and field crops.

³ Food literacy has been described as proficiency in food-related skills and knowledge (Truman, Lane, & Elliot, 2017).

Urban gleaning can also contribute to CFS through waste reduction, improved access to local foods, knowledge sharing, and addressing climate change⁴. These are some of the ways that modern gleaning differs from historical gleaning when food was harvested for subsistence. Another benefit of gleaning is providing fresh, unprocessed food to emergency food providers such as food banks (Finn, O'Donnell, & Walls, 2014).

Gleaning has taken on different social meanings through the centuries. Vardi (1993) gives a detailed historical account of the perceptions of gleaning and the various iterations of field gleaning activities. This narrative includes a description of the shift away from the rights of the poor to glean in fields after the commercial harvest, to the emphasis on individual (private) property. Modern gleaning has taken on a new form once again, which remains understudied in food recovery literature; volunteer gleaners participate not necessarily to feed themselves, but to serve a variety of motivations from decreasing food waste to providing food to social service organizations that need it. Badio (2009) sums up the issue as follows:

In an effort to reduce fiscal deficits, governments have, over the last few decades, slashed social programs that protect the welfare of low-income families in Canada. As a result, the responsibility for providing for the poor is returning to communities and non-profit organizations. Centuries after the undermining of gleaning, communities across North America are reviving and modernizing the ancient practice to tackle one dimension of poverty—food insecurity (p. 2).

References to gleaning generally refer to rural gleaning in farmer's fields: “[to] gather, pick up, after reapers in a cornfield” (Webster's, 1990, p. 179), “[t]he act of collecting leftover crops from farmer's fields after they have been commercially harvested or on fields where it is not economically profitable to harvest” (Glean Canada, 2015). To date, no context-specific definition for urban gleaning exists, indicating the need for further research in this area, and an updated definition to better conceptualize modern gleaning as a means of food procurement in urban spaces. The lack of a comprehensive definition stems in part from the wide variety of activities that can be considered a form of gleaning. A definition of urban gleaning should differentiate itself from other forms of (alternative) urban food procurement such as dumpster diving (which may include non-food items such as clothing), food redistribution (which includes collecting surplus prepared food from restaurants), and food bank gardening (which is gardening with the intention of donating to emergency food providers). These other activities are also ripe

⁴ North Americans waste an estimated 168 million tonnes of food every year (CEC, 2016). Organic food waste contributes to the formation and release of methane gas, which has a global warming potential 25 times greater than carbon dioxide (EPA, 2018). The Environmental Protection Agency of the United States (EPA) has created the Food Recovery Hierarchy, which identifies feeding hungry people as one of the top two most socially, environmentally, and economically beneficial ways to prevent and divert food waste (EPA, 2018).

for exploration and further research. However, in this paper the term “urban gleaning” refers to the harvesting of fresh food in cities (from where it is grown) that would otherwise go to waste⁵.

Community food security

Community food security (CFS) is defined as: “All persons in a community having access to culturally acceptable, nutritionally adequate food through local non-emergency sources at all times” (CFSC, 1997, p 4). The concept of CFS includes not only hunger relief, but also local, sustainable food production through the empowerment of marginalized people (Alkon & Mares, 2012). This conceptualization of CFS takes into consideration the environmental concerns of food systems (Brinkley, 2013; Dietitians of Canada, 2007). Environmental health has become one of the primary indicators of CFS, along with sociological indicators (Ontario Public Health Association, 2002). In these ways, CFS is both a refined and an expanded embodiment of the term “food security”. It is refined in that it has become more focused on scale (i.e., community-based) and unites many previously distinct advocacy groups such as public health advocates, environmentalists, community development groups, farmers, church groups, and anti-hunger advocates (Fisher, 1997). It is an expanded definition because it addresses a wide range of issues associated with a healthy food system, beyond hunger (e.g., environmental, ecological, social, economic, etc.) with a common goal (CFSC, 1997).

There are many emergency food providers (food banks, soup kitchens, etc.) that rely on food recovery initiatives, such as gleaning, to provide a much needed source of fresh food to their clients (Hoisington, Manore, & Raab, 2011). The contribution of emergency food providers towards achieving nutritional adequacy for vulnerable citizens has been explored in past research, and researchers agree that the nutritional quality of emergency food must be improved (Bell, Wilbur, & Smith, 1998; Cotugna & Beebe, 2002; Gany et al., 2013; Hoisington et al., 2011; Wakefield, Fleming, Klassen, & Skinner, 2012). Gleaning fresh foods in urban spaces as a means of food procurement for emergency food providers is one way to help meet this need.

Food banking has met with criticism for depoliticizing poverty and providing a band-aid solution for food insecurity that places the responsibility in the hands of the hungry without addressing the root causes (Tarasuk, Dachner, & Loopstra, 2014). While food banks have become iconic symbols of welfare failure, it is suggested that they “can serve as potentially virtuous arenas of common life, in which social response to the phenomenology of need can lead eventually to political and ethical ruptures in the art of the possible within capitalist realism” (Cloke, May, & Williams, 2017, p. 721). Debating the (de)merits of food banks is beyond the

⁵ A more conventional form of gleaning would be harvesting fresh food from rural farms, but with the growing number of farms located in urban settings (Mok et al., 2014), it is no longer sufficient to refer to agriculture as a rural activity.

scope of this paper, however, the glaring contradiction of providing food to emergency food providers to address food insecurity is addressed.

Emergency food providers offered food assistance to hundreds of thousands of Canadians and close to 350,000 Ontarians in 2016 (Food Banks Canada, 2016). The 2004 Canadian Community Health Survey was the first of its kind to use a standardized test to measure food security in the Canadian population (Tarasuk & Vogt, 2009). Results of the Community Health Survey indicate that 9.2 percent of Canadian households were food insecure in the previous 12 months⁶. Close to 900,000, or 2.4 percent of Canadians accessed food banks in March 2016 (Food Banks Canada, 2016). These numbers demonstrate the need for new and innovative measures to bolster CFS in Canada.

The Food Security Continuum Framework

The Dietitians of Canada FSC (2007), adapted from McCullum, Desjardins, Kraak, Ladipo, & Costello (2005), is used as a framework to help conceptualize gleaning as a tool for improving CFS. We have chosen this framework to analyze CFS because of the embeddedness of community throughout the continuum, which is comprised of three stages: 1) initial food systems change; 2) food systems in transition; and 3) food systems redesign for sustainability. Each stage includes evidence-based strategies and activities that can assist in the planning process of food security programs (Table 1).

Table 1: The Dietitians of Canada Food Security Continuum with selected strategies that gleaning groups are involved in

Stage of Continuum	Strategies
Stage 1: Initial Food Systems Change	<ul style="list-style-type: none"> i) Educate clients on healthy food and lifestyle options ii) Support existing charitable/emergency food outlets to provide timely service in a dignified manner
Stage 2: Food Systems in Transition	<ul style="list-style-type: none"> i) Connect charitable/emergency food programs with local urban agriculture, community shared agriculture projects, and other local food producers. ii) Create multi-sector partnerships and networks that work toward community food security iii) Facilitate low-income consumers' access to farmers' markets, community shared agriculture projects, and community gardens.
Stage 3: Food Systems Redesign for Sustainability	<ul style="list-style-type: none"> i) Work with governments, organizations, and communities to develop policies for (a) land use that facilitates urban agriculture and (b) increasing a community's food self-reliance. ii) Promote the development of community food charters.

Source: Dietitians of Canada (2007), and authors' fieldwork.

⁶ This number did not include the territories, people living on reserves, or people without a fixed address. Inclusion of these populations would significantly increase this number.

Methods

This case study profiles volunteers from several gleaning organizations in the province of Ontario. Sixteen interviews were conducted with volunteer gleaners and group coordinators. An online survey was also completed by an additional 14 volunteers. Twenty-nine of the 30 respondents provided demographic data as presented in Figure 1 (age), Figure 2 (relationship status), Figure 3 (number of children living at home), Figure 4 (income status), Figure 5 (education completed), and Figure 6 (work status).

Figure 1: Age distribution of the 29 participants who provided demographic data

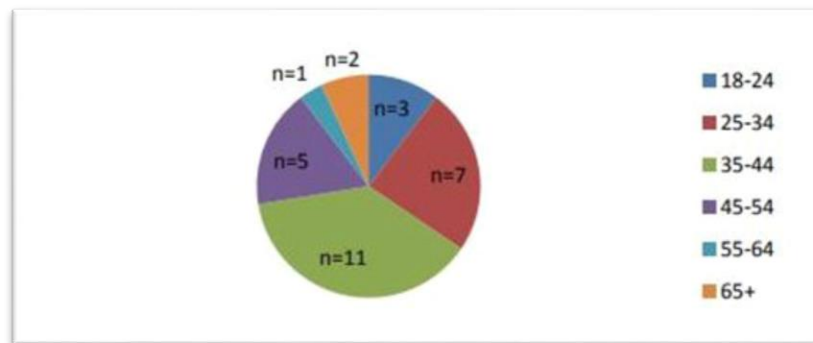


Figure 2: Relationship status of volunteer gleaners

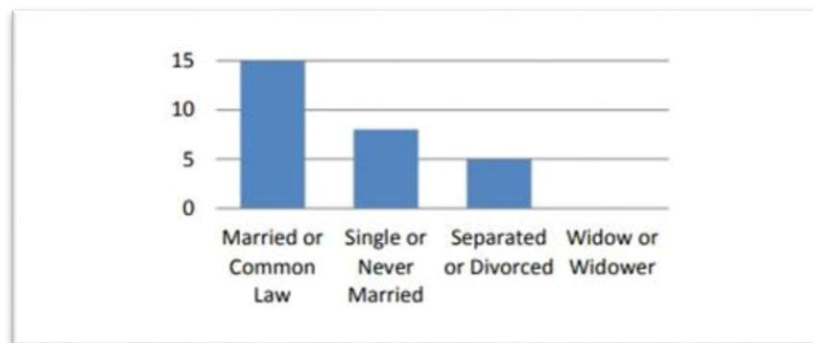


Figure 3: Number of children in the home of volunteer gleaners

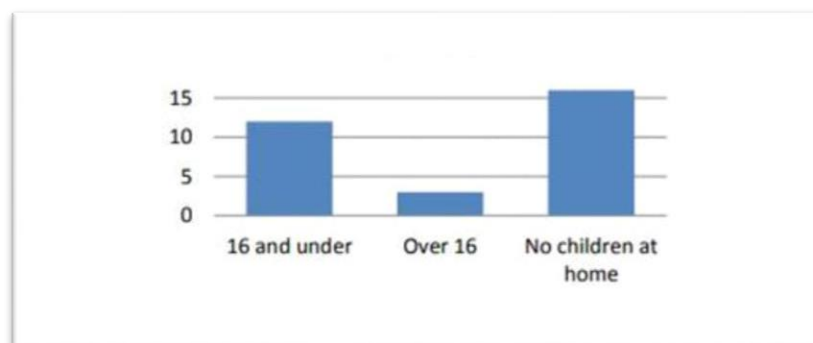


Figure 4: Number of volunteer gleaners in each category of ‘yearly household income’, in thousands

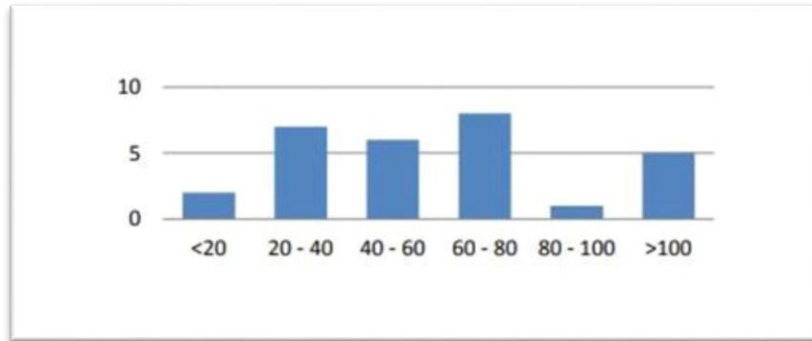


Figure 5: Highest level of education of volunteer gleaners

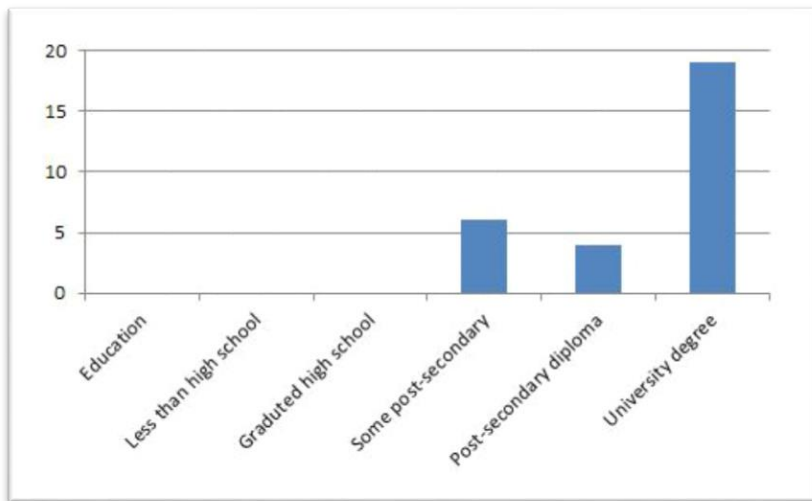
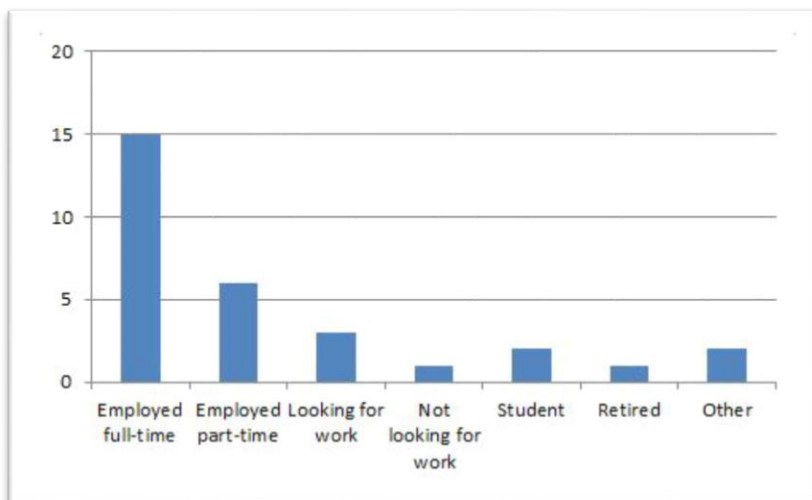


Figure 6: Work status of volunteer gleaners



Note: One respondent was both a student and working part-time and was recorded on this graph as a student.

Data collection took place from January 2015 to March 2015 through purposive sampling from the following six food recovery groups: The Appleseed Collective Revival, the Halton Fruit Tree Project, the Hamilton Fruit Tree Project, Hidden Harvest, Not Far From the Tree, and the Gleaners Guild of Waterloo Region. At the time of data collection, there were approximately 1995 volunteers registered with these organizations⁷ (Table 2).

Table 2: Number of paid and volunteer gleaners registered with these groups⁸

	Not Far From The Tree (Toronto)	Hidden Harvest (Ottawa)	Appleseed (Guelph)	Hamilton Fruit Tree Project	Gleaners Guild (Kitchener)
Year established	2008	2011	2013	2007	2014
Number of registered volunteers	1200	~609	~75	50	~61
Number of paid staff	2 FT + seasonal PT	2 FT	0	1 PT	0

Results and discussion

This study revealed a number of contributions that gleaning makes to CFS. Following the FSC conceptualization, gleaning contributes to CFS in all three stages.

Stage one: Initial food systems change

In stage one there are two strategies in which gleaning groups are very active. The first is, “educate clients on healthy food and lifestyle options” (Dietitians of Canada, 2007, p. 6). Healthy food is inherent to gleaning efforts because gleaned food is fresh and unprocessed. When asked, several interview respondents specifically mentioned improved access to fresh foods, rather than canned or processed foods that dominate food bank shelves. One respondent said, “...from what I understand about the kind of food that’s available to...food banks is that the food is typically highly processed or not fresh and that’s the areas that most people are lacking.” (A7) Another respondent said:

It’s helping people who have time to go pick the fruit and get a little part of it and enjoy maybe new fruit that they haven’t tried before, and then the donation aspect of it is meeting the needs of people who don’t otherwise have food. Especially fresh food. (A5)

⁷ Data on the number of volunteers for the Halton Fruit Tree Project was not provided.

⁸ These numbers have grown; however, this is to give an idea of the number of volunteers at the time of the research.

Gleaning also contributes to a healthy lifestyle for volunteers because it requires physical activity. Several respondents talked about the experience of being outdoors and how it helped with their mental health by providing an enjoyable and relaxing experience. One respondent said:

...it's probably a combination of the colors of everything and the sounds that the plants make in the wind and just that whole kind of experience ... being out in the sunlight it just calms you down and it's just this wonderful [laughing] experience...being just outside in general...outside where I can be kinda surrounded by plants,...I find it's just a really nice way to [pause] to calm down. (A4)

The second strategy that gleaning groups are active in is supporting “existing charitable/emergency food outlets to provide timely service in a dignified manner” (Dietitians of Canada, 2007, p 6). Most gleaning initiatives donate gleaned food to emergency food providers and other organizations. Because the food is fresh, donations are made as soon as possible after they are harvested, making it more timely than most store-bought produce which can travel for thousands of miles before reaching its destination. A common donation practice is the “thirds model”: one-third goes to the volunteers, one-third goes to the property owner where the food is harvested, and one-third goes to a local organization that can use the food.

In the first stage of the FSC framework, education is a key factor. Respondents indicated that they believe food recovery is a way to gain hands-on experience with food production. Along with learning about what grows locally, gleaners are in a unique position to learn from those with more experience, such as veteran gleaners and urban farmers. Hands-on experience with food can also inform consumers that good quality food does not necessarily have to look “perfect”. As one respondent explained, “...we might get someone who says ‘Oh, the [food]... had some bug holes in it’ ... and that’s a teaching moment ... and I think it’s about having those points of access.” (A16)

Another component of the education provided by gleaning is seasonal and local food knowledge building. Volunteer gleaners have the opportunity to learn about what kinds of food can grow locally and under what conditions. For example, one respondent said, “...I didn't know that you could grow certain fruits in [the city], I mean I'm from the prairies...who would think that you could have cherries and plums and pears and peaches in your backyard?” (A9)

This knowledge can translate into a greater understanding of the benefits of seasonal eating. For example, hyper-local fruit consumed fresh often has a much better flavour and texture than imported fruit. Also, eating seasonally can be more cost effective than purchasing imported fruits and vegetables. For another respondent, doing the hard work of harvesting food gave them a new appreciation for the amount of work that goes into getting food from where it grows, to the table. They said, “...years of gardening and volunteering...really made me appreciate how difficult it is to grow food effectively...and as a result to appreciate the food that I do get.” (A17)

This kind of awareness and knowledge about how and where food is produced is an important step towards creating better connections between food producers and consumers. It is a

form of naturalist knowledge that can provide food directly to people. For example, there are fruit-producing trees and bushes growing throughout urban areas. Knowing when trees are fruiting and how to harvest them can result in a source of fresh, nutritious food.

Stage two: Food systems in transition

In stage two of the FSC framework, Dietitians of Canada recommend connecting emergency food providers with local food producers and urban agriculture initiatives. Food recovery groups are very active in this stage of the continuum. One of the primary activities of most food recovery groups is donating part of their harvest to community organizations such as food banks and soup kitchens. Several volunteers specifically mentioned the donation of fresh foods to emergency food providers that utilize a lot of canned and processed food. One said, "...the donation aspect of it is meeting the needs of people who don't otherwise have food. Especially fresh food." (A5) Another said, "...from what I understand about the kind of food that's available to... food banks is that the food is typically highly processed or not fresh and that's the areas that most people are lacking." (A7)

Not only are these food recovery groups well situated to provide fresh food directly to these organizations, but they also provide food directly to their volunteer harvesters, bypassing any third-party organization. Conceivably, this means that food-insecure people can volunteer their time in exchange for fresh food directly. As one respondent aptly pointed out, "...some volunteers... genuinely need to do this to eat." (A28)

And another said, "...if there are spots being opened up that are involved in the actual harvesting, so if the people who are picking the fruits are gaining access to food, then I think it is improving their food security." (A12) Yet another noted, "...you're giving that food to people in the community who are benefitting from it, so you're helping their food security as well as the volunteers in your group by giving them a share." (A15)

In fact, gleaning initiatives take this one stop further in addressing the "other local food producers" because volunteers will glean on municipal property, public green space, and in residential yards where property stewards do not necessarily consider themselves to be "producers", but where an abundance or fruit/food is growing.

Stage three: food systems redesign for sustainability

Stage three includes working with "governments, organizations, and communities to develop policies for increasing a community's food self-reliance". A 2012 study in the province of Québec showed that social deprivation and low social cohesion increased the likelihood of food insecurity by 45 to 76 percent, independent of other factors (Carter, Dubois, Tremblay & Taljaard, 2012). A lack of social networks can decrease access to resources such as food or information about local food programs. According to the 2012 Québec study, low social

cohesion can reduce neighbourly support that creates a reduced capacity to address food insecurity (Carter et al., 2012). One volunteer describes connecting with other gleaners as, “...with food, people just really want to get to know each other... I found food people that are more... personal.” (A6) Another said, “...the work directly benefits [my community] in so many respects - nutrition and health, anti-poverty, connecting people now for resilience in the future.” (A25)

A study in Toronto explored whether neighbourhood social capital, or “perceptions of social cohesion and trust in one’s community”, had any bearing on food insecurity (Kirkpatrick & Tarasuk, 2010, p. 1140). The study found that when social capital was perceived as being low, there was a greater chance of being food insecure. Walker et al. (2007) demonstrated an inverse relationship between social capital and food insecurity, and Martin, Rogers, Cook, & Joseph’s (2004) data demonstrate that an increase in social capital is associated with a decreased risk of hunger. In this way, developing community relationships and fostering awareness and acceptance can contribute a great deal to increasing the capacity for CFS. Breaking down social barriers and bringing people together was explicit in volunteer perceptions. One respondent said, “... it was the first time that I had volunteered somewhere I felt like I was volunteering *with* who I was volunteering *for*.” (A12) Another said, “... it broke down some of the barriers of what I thought volunteering was, like I always thought it was “us helping them”, but ... I realized it wasn’t... it was more of a community thing...” (A13)

Developing policies for land use that facilitates urban agriculture is another strategy found in stage three. While none of the volunteers explicitly mentioned policy, some gleaning groups, such as Hidden Harvest in Ottawa, work closely with municipal governments to both plant and harvest fruit trees throughout the city. This group has a goal of hosting the largest urban orchard in Canada (Hidden Harvest, 2012).

Another example is helping to promote and develop food charters, which is also found in stage three. Food charters are descriptive statements of guiding principles for food policy, often with a prescriptive vision or statement of values led by an interdisciplinary group from the affected community. Food charters that promote local food initiatives and support for local farmers are indirectly supporting gleaning activities, since they can be sources of gleaning for food recovery groups. Active gleaning groups demonstrate an engaged community that is interested in local community-building food initiatives that can help to support and promote regional support for food charter adoption. Even though policy did not factor into any of the responses, gleaning and healthy food policies are mutually beneficial and there is room for gleaning groups to grow into this area of activism.

Food waste

Gleaning also contributes to a reduction in food waste, an area not covered by the FSC but nevertheless important to mention. Food waste mitigation needs to be underscored in every discussion about food procurement. In Canada, more than 40 percent of all the food we produce

is wasted each year (Gooch, Felfel, & Marenick, 2010). Global attention on the issue has sparked movements such as *Inglorious Food*, started by the third-largest grocery chain in France (Huffington Post Canada, 2014). In this campaign, misshapen or “ugly” food is sold at a discounted price with a message to consumers about not creating food waste for purely cosmetic reasons. It was not long before Loblaws, Canada’s largest food retailer, followed with their own “ugly food” campaign, selling imperfect apples and potatoes in stores across Ontario and Québec. These new marketing techniques suggest that consumers are interested in changing their behaviours in a way that will help to reduce exorbitant, and unnecessary, food waste. Activities that help to prevent wastage at the source, such as gleaning, could prevent over \$2 billion in annual food waste (Gooch et al., 2010; Gooch & Felfel, 2014). One volunteer said:

... better for it to go to a food bank, even if the food bank isn't the best alternative, than go in the green bin where it would be wasted, because we're trying not to waste. [Food recovery is also] meeting the needs of the homeowners who, otherwise, what are they going to do with all that food? (A5)

Another respondent noted:

I think it's a better way to spend [pause], it's not even spending a resource, it's a better way to redistribute a resource that is being wasted, and I think that's the piece that also spoke to me about food recovery programs, is that it's just wasted.” (A7)

Scale and contradictions

Along with the contributions of gleaning to CFS, there are several problematic issues with food gleaning as a solution to CFS in Canada. To begin with, donating to emergency food providers contradicts the definition of CFS, which includes access to food through non-emergency sources. Even so, some volunteer gleaners feel that gleaning still positively impacts food security and mitigates food waste. One respondent said, “I think any group that’s engaged in that sort of learning is contributing towards the overall trend. It might be small, but any little bit is...helpful.” (A16) Another respondent observed, “...it's not like we're generating anything new...the food would be wasted otherwise, it's not like we're making more to fill a need, we see an abundance here, and the deficit here. (A7)

The relatively small amount of food recovered raises questions about the scale of the impact that is possible with these groups. One respondent felt that it is naïve to believe that these groups can make a big difference, but further observed that although food recovery groups may not provide vast quantities of food, there are other benefits provided through gleaning activities. The idea that the benefits go beyond the number of pounds harvested was raised by more than one respondent. They said, “...if you can get people to [eat fresh food] even once a month versus

not doing it at all the effect that you're having on their ability to get better nutrition into themselves is substantial I think.” (A8) Another noted, “...I still think it's really valuable because it is community building, and it is teaching about sustainability and self-sufficiency, and also a love of nature... so I think it's valuable.” (A3)

In terms of the degree of impact, there is a great deal of potential for these groups to scale up. Residential yards and municipal property are largely untapped resources. Fruit-bearing trees hidden in back yards and along boulevards and public trails are abundant. In Toronto, there is an estimated one and a half million pounds of fruit growing throughout the city and, yet, less than 17,000 lbs. of fruit was harvested in 2014 (Cole, 2015). This indicates that there is a great deal of room for scaling up that would not only provide the benefits discussed earlier, but also change the scope of the food assistance provided to social service organizations.

Scaling up in terms of the number of pounds harvested would not address food security issues during the off-season in many North American cities without the addition of specific food skills. For example, preserving fresh food by canning, freezing, dehydrating, or other methods requires knowledge, skill, and resources. This provides both an obstacle and an opportunity for food recovery programs. Food skills or a lack of *food literacy* referred to as deskilling “has reached a point where it is commonly assumed that the younger generation no longer knows how to manage in a kitchen” (Desjardins & Azevedo, 2013, p. 10). This deskilling is largely due to the changing food environment of the past half century that emphasizes highly processed foods. An overabundance of prepared and processed food on grocery shelves disguises what is essentially a “nutritional impoverishment” and has resulted in a loss or failure to develop food skills (Winson, 2013, p. 287).

A lack of food skills may be a barrier, but it also presents an opportunity for food recovery groups. For example, collaborating with local business and food agencies can help to connect community members and provide access to facilities such as certified kitchens. Hidden Harvest partners with various local food agencies, which allows for “access to kitchen facilities in which to run food preparation and preservation workshops” (Poitevin-DesRivières, 2018, p. 7). These partnerships provide the physical space to run workshops and teach skills such as canning and preserving, and they also provide economic benefits and a “decreased dependence on the cash economy through donation and bartering practices” (Poitevin-DesRivières, 2018, p. 12).

Although there are challenges and limitations, respondents felt that food recovery in the form of gleaning provides a positive contribution to CFS. Benefits include increasing food literacy and food awareness, bringing community members together, and supplying fresh food.

Discussion and conclusion

This study contributes a better understanding of how gleaning initiatives contribute positively to CFS based on the perceptions of volunteer gleaners and an analysis of gleaning activities using

the Dieticians of Canada Food Security Continuum as a framework. The contradictory nature of donating food to emergency food providers to improve CFS has also been addressed. Overall, volunteer gleaners felt that this contradiction can be mitigated by the benefits outlined above. In the absence of alternative uses for the abundance of fresh food growing in and around cities, the contributions of food recovery groups should be supported and encouraged to continue the important work of ensuring access to healthy food. In addition, food recovery in the form of gleaning can help to reduce food waste, facilitate community building, improve access to local foods, promote knowledge sharing, and address climate change, all of which have direct links to food security.

Access to volunteer gleaners for this study was limited to those with email access and/or social media accounts. Given that each of the profiled food recovery groups use email as their primary source of communication, this was not considered to be a significant limiting factor; however, relying on this type of communication can ultimately exclude some community members who do not have consistent access to, or knowledge of, computers or social media. The time of year that this study was undertaken was somewhat restrictive. A true ethnographic study spanning an entire harvest season would likely result in a richer narrative on the nature of gleaning activities and the perspectives of volunteer gleaners. Given the small number of respondents—16 interviewees and 14 survey respondents—this research cannot be considered representative of all volunteers or food recovery organizations. With that said, it does contribute new knowledge towards understanding the perceptions of volunteer gleaners and the contributions these groups make to CFS.

For future research, the number of volunteer gleaners who identify as food insecure, or use emergency food providers themselves, should be explored. While understanding how the connections are made between food-insecure people and these types of community initiatives could be a useful tool for food recovery program coordinators, one must be mindful of not creating a new form of neoliberal workfare. In other words, if people who are food insecure need to collect and harvest their own food through gleaning programs, this could be considered a form of mandatory work in exchange for social assistance. Instead, gleaning programs can aim towards “reframing relationships between ‘givers’ and ‘receivers’ to...build solidarity. In this reframing, people providing food and people receiving food are in respectful (and more equitable) relationship with each other, working together towards a state of holistic community food security” (Wakefield et al., 2012, p. 445). To help achieve this, it would be worthwhile to engage with people who are relying on emergency food providers that utilize gleaned fresh food donations to better understand their perspective as recipients. Future quantitative research should aim to measure the contribution of these groups to emergency food providers, as well as their contribution to meeting the nutritional needs of both participants and recipients of the harvests. It would also be useful to explore any changes to the diets of participants and recipients when engaged with these groups. Exploring the different approaches to gleaning taking place across Canada and identifying the successes and challenges faced would also provide new information.

The first National Fruit Tree Project assembly, called Cross-pollinating Canadian Tree Harvesting Organizations, was held in Toronto in November, 2014. The primary purpose of the meeting was knowledge sharing between food recovery groups. Of the twelve food recovery groups present, seven identified the various aspects of volunteer management as one of their main challenges, including recruitment, retention, engagement, coordination, and training (Siks, 2014). All of the food recovery projects profiled in this study have yet to exhaust all of the harvest locations in their respective cities. Meeting this need would require additional coordination and active volunteers. Support and assistance from municipalities could help to meet some of these needs, including mapping resources for existing fruit bearing trees and coordination assistance from city staff. More education about food donation laws is also needed as people are often still hesitant to assume any risk of liability. Finally, food policy councils and food advocacy groups are well situated to partner with food recovery groups to help tap into existing networks and information-sharing platforms.

Food recovery is intimately linked with urban food growing or urban agriculture (UA) activities. The benefits of UA have been widely documented in past research, most recently from a municipal planning perspective. In particular, studies have noted that urban green spaces can reduce the urban heat-island effect, reduce storm water run-off, and provide opportunities for increased physical activity (Knizhnik, 2012). The many benefits of UA activities are largely agreed on (Grewal & Grewal, 2012; Hale et al., 2012; Rydin et al., 2012; Golden, 2013). A study done in Toronto, Ontario, lists some of the economic, community, health, and environmental benefits in Canada's most populated city (Toronto Food Policy Council, 2012). Some of the benefits listed are economic benefits, community benefits, health benefits, and environmental benefits (Toronto Food Policy Council, 2012). There are some studies whose primary critique of UA is that people who are financially insecure cannot afford to participate due to limited access to the materials and space needed for many forms of food growing. Food recovery initiatives may address issues of exclusivity by utilizing fruit-producing trees on municipal property and in public green spaces. Food recovery can also help to connect those people who have the space with those who do not by offering harvesting events in residential yards. Overall, gleaning initiatives contribute positively to CFS improvement efforts, and these food procurement projects should be provided with ongoing support—both on the policy agenda, and in community action.

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