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Community gardening : exploring motivations, benefits and gardener experience

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**Community Gardening:
Exploring motivations, benefits and gardener experience**

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Masters of Environmental Studies Thesis
Northern Environments and Cultures
Lakehead University**

**Submitted in partial fulfillment of the degree of
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CHAPTER 1

INTRODUCTION

1.1 Introduction

A food system is a set of interrelated functions that includes food production, processing and distribution, food access and utilization by individuals, communities and populations, and food recycling, composting, and disposal (Dahlberg, 1993; Cornell University, n.d.; Community Food Security Coalition, 2009). Food systems are dynamic and complex, and reflect unique social, cultural, environmental, and economic factors and circumstance. For the better part of human history, most people ate food that was produced and distributed within local food systems (Xuereb, 2005). However, in the last several decades, there has been an increasing trend toward industrialization and globalization, and the subsequent concentration of ownership and control of food systems around the world (Koc & Dahlberg, 1999; Heffernan & Hendrickson, 2005; La Trobe & Acott, 2000; FAO, 2004; Scrinis, 2007).

Agricultural systems have become increasingly industrialized and mechanized, relying on machinery and chemical inputs, rather than people and natural processes, to increase food yields (La Trobe & Acott, 2000). Increasing consolidation of food production has concentrated power in the hands of fewer and fewer corporations, resulting in reduced individual and community control over food production methods and

inputs, and food choices. Today, food is largely considered a commodity rather than a basic human right.

Moreover, urban growth, in both population and size, has reached unprecedented levels in most parts of the world. This has resulted in additional socio-economic and environmental problems. Food security has also become an increasing concern of urban populations, as urban growth has resulted in the conversion of a significant portion of green space and good-quality, often scarce, agricultural land into urban sprawl (Koc, McRae, Mougeot & Welsh, 1999). Urban dwellers are increasingly distanced from food production activities and, consequently, the majority of people in urban populations have very little understanding of how their food is produced, transported, processed, or distributed (Koc et al., 1999). The majority of food is purchased through the dominant structures (i.e. grocery stores) that encourage the unsustainable production and transportation of food around the world. Given these issues, meeting the growing food needs of urban dwellers around the world poses significant challenges. According to the 2006 Census, over 80% of Canada's population lived in urban areas; this number is expected to increase (HRSDC, 2011).

Recently, there has been an increasingly emergent recognition of the limitations and the broader socio-economic, health and environmental problems associated with the nature and organization of the industrialized and globalized food system (Feenstra, 2002; Lyson, 2005; FAO, 2004; Kneafsey, 2010; Donald, Gertler, Gray & Lobao, 2010; Morgan & Sonnino, 2010). Problems of soil and water depletion and contamination, food safety, animal welfare, declining rural communities, rising obesity and diet-related health problems, and growing food insecurity (Donald et al., 2010; Kneafsey, 2010) are widespread. Additional concerns about environmental issues relating to the long distance

transport of food, including fossil fuel usage, pollution and climate change impacts, as well as the environmental and human health implications of chemical inputs in food production are becoming more apparent.

These concerns have led communities worldwide to explore alternatives to this global food model that focus on creating healthy, resilient local food systems that better meet the needs of their community members and reduce social, environmental and economic costs associated with the industrialized and globalized food system (Koc & Dahlberg, 1999; Feenstra, 2002; Winne, 2005; Scrinis, 2007). Community food security is a movement based on the re-localization of many food system activities in response to these concerns (Pelletier, Kraak, McCullum, Uusitalo & Rich, 1999). Popularly termed the local food movement, this movement is a “collaborative effort to build more locally based, self-reliant food economies - ones in which sustainable food production, processing, distribution, and consumption are integrated to enhance the economic, environmental and social health of a particular place” (Feenstra, 2002, 100).

The Canadian food movement is a rapidly expanding, diverse, and powerful force for change (People’s Food Policy, 2011). Efforts to rebuild local food systems are gaining momentum as increasing numbers of individuals and organizations at local, provincial and national levels develop diverse initiatives that address inequities in food systems that affect human and environmental health, and local economies. Several of these are outlined below.

Initiatives like Food Secure Canada, a national voice for the food movement, work to unite people and organizations working to advance food security in both Canada and globally. Their vision is based on three interlocking commitments: zero hunger, sustainable food systems, and healthy and safe food for all (Food Secure Canada, 2011).

In 2008, Food Secure Canada initiated the People's Food Policy Project, a pan-Canadian, collaborative grassroots effort to develop Canada's first national food policy. The People's Food Policy, released in April 2011, was developed by a diverse network of individuals and organizations within the growing food movement, who collaboratively articulated "a vision for a healthy, ecological and just food system that will provide enough healthy, acceptable, and accessible food for all" (People's Food Policy, 2011, 4).

The Metcalf Foundation, which recently funded research to tackle food system reform, released the 2010 report collection 'Metcalf Food Solutions' with recommendations designed to build a healthy, ecological, equitable and financially viable food system for Ontario (Metcalf Foundation, 2011). Sustain Ontario, one of the report authors, is a province-wide, cross-sectoral alliance that promotes healthy food and farming. Sustain Ontario takes a 'collaborative approach to research, policy development and action by addressing the intersecting issues related to healthy food and local sustainable agriculture' (Sustain Ontario, 2011).

Other initiatives like FoodShare and The Stop Community Food Centre, both located in Toronto, Ontario also focus on long-term approaches to hunger and food issues. FoodShare Toronto, Canada's largest community food security organization, works on food issues 'from field to table'. Their work includes innovative grassroots projects that advocate for equitable public food policy, and promote healthy eating, urban agriculture, food distribution and preservation, public education on food security issues, and community capacity building (FoodShare, 2011). The Stop develops programs that increase access to healthy food in a way that maintains dignity, builds community and challenges inequality (The Stop, 2011). These programs include sustainable food systems

education, urban agriculture initiatives, community cooking and advocacy, food drop-ins and food banks.

In Thunder Bay, organizations like the Food Security Research Network (FSRN), and the Food Action Network (FAN), work to build a strong, local, resilient food system. FSRN, which is affiliated with Lakehead University, supports food system research, cultivates community service learning opportunities, and works to enhance local food marketing, production and distribution in an effort to overcome barriers to food security in Northwestern Ontario (Food Security Research Network, 2011a).

FAN, which is affiliated with the Thunder Bay District Health Unit, also works to improve community food security in the Thunder Bay region. FAN's mission is to create awareness, support food projects, advocate for policies that support community food security, promote locally produced food, and act as an information centre for community food security in the District of Thunder Bay (Food Action Network, 2010).

These diverse, multi-level organizations and initiatives all share, as one component of their approach to community food security, a focus on developing urban agriculture initiatives to address food inequity and access issues, as well as the broader social, economic and human and environmental health implications of the global food system. Community gardens consistently figure prominently in this focus.

Community gardening is one form of urban agriculture that has seen tremendous growth in the last few decades (Irvine, Johnson & Peters, 1999; Zimmerman, 2008). They have a long history in Canada, and gardens are increasingly becoming a part of the urban landscape. Today, many communities across the country have vibrant and ever-expanding community gardening programs; these represent one part of a larger, community-wide response to community food security.

Community gardens are diverse and may vary enormously in what they offer, according to local needs and circumstance, (Ferris, Norman & Sempik, 2001), but a broad definition of a community garden is “a piece of land gardened collectively by a group of people” (American Community Garden Association, 2007; Ecolife, 2011). Community gardens are developed to address numerous priorities and goals, including improved community food security, neighborhood greening, crime reduction, community development, sustainable urban design, and environmental education. With the support and initiative of inspired community members and community organizations, as well as municipal governments, community gardens are thriving.

Within the City of Thunder Bay, there is a flourishing community gardening movement, with over 20 active community gardens across the city (Food Action Network, 2010; Food Security Research Network, 2011b). The Thunder Bay Community Garden Collective was formed in 2008, with a mission to “increase food security through community gardens by coordinating information and resources and facilitating the development of new gardens” (Thunder Bay District Health Unit, 2008). In addition to the numerous individual community members who participate, these community gardens provide space where community organizations serve the diverse needs of their clients. These organizations develop programming, conduct therapy and rehabilitation activities, and provide a space where opportunities for education and social inclusion abound.

The City of Thunder Bay has demonstrated its support for community food security initiatives. The City’s EarthWise/Community Environmental Action Plan has as one of its goals: “to build a more just and sustainable local food system in Thunder Bay that promotes social justice and supports local production, storage, processing, sale and distribution of food (City of Thunder Bay, 2011). In 2008, the City endorsed the Thunder

Bay Food Charter, which guides decisions, policies and collaboration for food security and provides a framework for the development of a sustainable local food system (Thunder Bay District Health Unit, 2009).

The City of Thunder Bay also recognizes the contribution that community gardens make to both individuals and the community as a whole. In 2010, the City adopted a Community Gardening Policy (City of Thunder Bay, 2010), which outlines basic rules for community gardens occurring on municipally owned property and not-for-profit community groups gardening on private property who wish to receive some support from the City. Thunder Bay's community gardens may provide local solutions that address some of the socio-economic and environmental problems associated with the global food system.

1.2 Research Questions

Despite the widespread increase in urban community gardens, and the recognition of the diverse benefits they are reported to deliver to both individuals and communities, there is insufficient research that explores the reasons why people participate in community gardening programs. There is abundant research that has explored the benefits of community gardening, however much of this research excluded the direct experience of the community gardeners themselves. Instead, it focussed largely on the experience of community garden coordinators and other organizers, which does not accurately reflect the true experience of the community gardeners themselves (Curran, 1993).

As community gardening initiatives become more widespread and increasing numbers of individuals and communities choose to participate, a deeper understanding of both the factors that motivate an individual to join a community garden and the direct benefits derived from participation becomes essential. Thus, the purpose of the current

research was to explore the direct experience of community gardeners, with two specific research questions in mind:

- (1) What motivates an individual to engage in community gardening?
- (2) How does community gardening impact the following four variables: perceived food security, gardener wellbeing, gardener knowledge, and connectedness to nature?

This research incorporated both quantitative and qualitative methods using a mixed methods approach; data collection methods included survey questionnaires, semi-structured interviews and participant observation. The Food Security Research Network Campus Community Garden was used as a case study. The research was conducted over the duration of the 2010 growing season and the research participants included the community garden members and a control group. We were interested in delineating how a community gardening experience impacted these four variables; consequently, data were collected both before and after the growing season, in an effort to capture any changes that may have occurred as a result of the community gardening experience.

This research aimed to deepen our understanding of the community gardening experience. The results may allow for the creation of community gardening programs that inspire, support and enhance participation so that the diverse benefits of participation may be realized. It may also lead to a greater understanding of how and why individuals are drawn from the current agri-industrial food system into more sustainable local food systems that make important contributions to community food security, and human and environmental health. Additionally, these results may inform public policy aimed at supporting community gardening initiatives, as well as additional broader community food security initiatives.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Community gardens have increasingly become a part of the urban landscape as a community response to food insecurity and urban expansion, and to the socio-economic, environmental, and health problems associated with the industrialized and globalized food system (Baker, 2004; Zimmerman, 2008). The growing participation in community gardening calls for a deeper understanding of the motivations and effects of participation in community gardening programs so that community members' needs are met and the diverse benefits of participation are actualized. The current research explores the direct experience of community gardening, with a focus on two main research questions:

- (1) What motivates an individual to engage in community gardening?
- (2) How does community gardening impact the following four variables: perceived food security, gardener wellbeing, connectedness to nature and gardener knowledge?

The purpose of this research is to deepen our understanding of the true nature and impact of the community gardening experience, specifically from the perspective of the community gardener. Much of the literature on community gardening excludes the direct experience of community gardeners themselves and instead focussed largely on the

experience of community garden coordinators and other organizers. This may not accurately reflect the true experience of community gardeners themselves. Research by Curran (1993) reported that community garden organizers and community gardeners have different opinions about the benefits of community gardening. Curran's research showed that community garden organizers believed that community gardens improved the environment, benefited the wider community and led to political empowerment, whereas community gardeners emphasized personal and psychological benefits, but never environmental benefits or political effect. This highlights the importance of investigating the direct experience of community gardeners in order to deepen our understanding of the motivations of community gardeners and the impacts and benefits of participation in community gardening programs.

2.2 Motivation

In psychology, motivation is defined as the process that initiates, guides and maintains goal-oriented behaviours. It involves the biological, emotional, social and cognitive forces that activate behavior (Cherry, 2011). There are numerous motivation theories that have been proposed. For a review of motivation theories, see for example Wood, Wood, Wood & Desmarais, 1999, Westen, 1999, Weiten & McCann, 2010. A common thread among motivational theorists is that humans are motivated by an enormous diversity of motives (Weiten & McCann, 2010). Motives are the needs, wants, interests, and desires that propel people in certain directions. Most theories distinguish between biological motives that originate in bodily needs (i.e. hunger, thirst, sleep), and social motives that originate in social experiences (i.e. the need for achievement, autonomy, social bonds) (Weiten & McCann, 2010). Motives cannot be directly observed, but are inferred from behaviour (Westen, 1999).

An alternative approach to understanding motivation was advanced by Abraham Maslow (1970), who proposed a hierarchy of needs to account for the range of human motivation (see Figure 2.1). Maslow believed that throughout our lives, we work toward achieving the top of the pyramid, self-actualization, or the realization of all of our potential. As Westen (1999, 447) explains:

At the most basic level is physiological needs, such as those for water and food. Next are safety needs, for security and protection. Having satisfied physiological and safety needs to some extent, people are motivated to pursue closeness and affiliation with other people, or what Maslow calls belongingness needs. Next in the hierarchy are esteem needs, including both self-esteem and the esteem of others. Finally, at the highest level, are self-actualization needs, the need to express oneself and grow, or to actualize one's potential. Self-actualization needs differ from all the previous levels in that they are not deficiency needs; that is, they are not generated by a lack of something (food, shelter, closeness, the esteem of others). Rather, they are growth needs, motives to expand and develop one's skills and abilities.



Figure 2.1
Maslow's Hierarchy of Needs (Source: AllPsych Online, 2004)

A community garden provides a setting where community members from diverse socio-economic backgrounds come together to grow food. Presumably, the needs of these

individuals will vary and reflect their individual circumstances, preferences and experiences. Whereas gardeners with higher incomes may not be motivated to participate in the garden because of economic constraints or limited access to food, individuals with limited incomes may be more so motivated by these constraints. Exploring motivation may reveal diverse reasons to join to community garden, which may in turn reflect different levels of need within Maslow's Theory, from basic physiological and safety needs to higher level self-actualization needs. Such insight into motivation may inform the development of future community gardening initiatives, including programming, and may encourage additional participation and maximize benefit.

Research by Curran (1993) and Gelsi (1999) showed that presumed benefits obtained from gardening provided a powerful motivator to participate in community gardening. Thus, if motivation relates to goal-oriented behaviour, an exploration of motivations to join a community garden could shed light on the needs, wants, interests and desires (i.e. motives) which drive participation and also the diverse benefits participants hope to obtain from participation.

2.2.1 Community gardener motivations

The recent growth of community gardening initiatives and their reported diverse benefits call for a greater understanding of the factors that motivate participation. A review of the literature revealed few studies that explicitly explored the motivations of community gardeners and only two that explored motivation to join a community garden within the context of any motivational theory.

Waliczek, Mattson & Zajicek (1996) conducted a national (US) survey of community gardeners using a set of quality of life questions based on Maslow's hierarchy

of needs model. The results showed that community gardens meet quality of life needs on the higher levels of self-esteem and self-actualization (Waliczek et al., 1996). In fact, the results showed that the majority of gardeners surveyed reported that gardens meet all of these needs, with African-American and Hispanic gardeners reporting statistically significant higher responses than Whites and Asians on most of the questions.

Lee (2001) conducted a survey of community gardeners in San Jose, California to investigate motivations and benefits of community gardeners, with specific emphasis on immigrant participants. Her results showed that most gardeners felt healthier, proud of their accomplishments, and relieved of stress; these were benefits she related to the physiological, self-esteem, and self-actualization needs of Maslow's hierarchy of needs model.

The few additional studies that explored motivation(s) to participate in community garden programs focused on broader influences for participation, rather than individual motivations. Clark and Manzo (1988) conducted one of the first studies to investigate factors influencing participation in community gardens. The study showed that the degree to which a person cared about and was sensitive to his or her environment may have played a role in their willingness to participate in a community garden.

Armstrong (2000) surveyed 20 community gardening programs in upstate New York in an attempt to identify characteristics that may be useful to facilitate neighborhood development and health promotion. The research concurrently explored motivations for participation in the community gardens. The most commonly expressed reasons for participating in gardens were access to fresh/better tasting foods, enjoyment of nature, and health benefits, including mental health. In the gardens assessed in urban areas, the enjoyment of nature/open spaces, benefits to mental health, and improved access to a

food source for low-income households were cited more frequently than in gardens in rural areas, where the practice of traditional culture was more commonly cited for reasons to join the garden. One of the limitations cited in the paper was the limited resources for the study. This made it possible only to interview the coordinators of the garden programs and not the individual gardeners. Therefore the results were the interpretations of program coordinators and may not accurately reflect the views of all gardeners.

Kingsley, Townsend & Henderson-Wilson (2009) also explored community gardener motivations using gardener interview data from Kingsley and Townsend (2006), who conducted a case study of a community garden in Melbourne, Australia. The 2006 study investigated how community gardening may facilitate social capital in its members. Specifically, they investigated how the community garden contributed to the enhancement of health, wellbeing, and contact with nature for urban dwellers. Gardener motivations cited in the study included the desire to be more socially connected with the community, a love of gardening, the desire to be involved in an environmentally sustainable program, and to eat self-grown organic vegetables.

Consistent with other studies that explored motivations to garden, research conducted by van den Berg, van Winsum-Westra, de Vries, Sjerp & van Dillen (2010) on allotment gardeners reported similar reasons for gardening. Stress relief was the most significant reason, followed by staying active and staying healthy. Social contacts were rated as very important by only 17 percent of the gardeners.

Clayton (2007) also investigated motivations for gardening, and the relationship of motivations to attitudes toward nature and to gardening practices. She proposed that understanding such motivations might inform attempts to promote more sustainable gardening practices. Although Clayton's research focused on backyard gardens, the

results may provide some insight into motivations for other forms of gardening (i.e. community gardening). Spending time outdoors, observing nature and natural processes at work, and relaxation were rated as significantly more important than the other motivations, which included working with your hands, trying new plants, producing food or herbs, and demonstrating effort or gardening expertise.

It is important to note that in Clayton's (2007) study, gardeners were asked to rate this list of benefits (above) which were then taken to represent an individual's motivation to garden. This approach essentially creates the assumption that benefits equal motivation, and does not allow for the exploration of potential differences between motivation to garden and the benefits derived. For example, a gardener may be motivated to start gardening for reasons that may differ from the actual benefits they receive from the gardening experience. Without exception, the research that cited motivations for participation in community gardens concurrently investigated perceived community gardening benefits. Presumably, an individual's initial motivation to join a community garden is related to the benefits they hope to derive from their community gardening experience; however, no explicit investigation of the connection between motivation to engage in community gardening and actual experienced benefits was found in the literature.

The limited research on motivation shows that community gardening motivations were based on desires to access nature, to be more socially connected with community, to improve access to healthy food, to be involved with a more environmentally sustainable program, to access health benefits, and for a love of gardening. Despite the fact that community gardens are often developed in low-income neighborhoods (Koc et al., 1999; Armstrong, 2000; Hallberg, 2009), no research was found to indicate that community

gardeners themselves were motivated to participate because of these concerns. It is possible that community gardens are created in response to these broader neighborhood or community level concerns, but that other factors figure more prominently in an individual's decision to participate in a community garden.

Understanding what motivates participation has potentially significant implications in a number of areas. First, understanding what motivates participation could improve the organization of community gardens to better meet the needs of its members. This may in turn help maximize gardener participation and ensure the realization of the diverse benefits of a community gardening experience. A deeper understanding of participant motivation may also provide insight into how and why an individual is drawn from the contemporary food system into alternative food system initiatives; this may have important implications for community food security and the development of sustainable local food systems. Finally, understanding participant motivation could also inform public policies aimed at facilitating and supporting community gardening efforts.

Given the significant rise in community gardening in Canada over the last few decades, and the growing awareness of its contributions to community food security, research that expands our understanding of this phenomenon is warranted. In the current study, motivations to join the community garden and the benefits derived from experience are explored separately. Motivation is explored only in the preseason and benefits are explored only in the post season.

The Gardener Motivation Scale was created to expand our understanding of what motivates participation in community gardening. It includes seven motivations categories, some of which were identified in the existing literature, and others that were identified through informal discussions with community gardeners, as well as personal experience

with gardening. These categories included motivation to join the community garden based on: (1) economic concerns, (2) health concerns, (3) a desire to increase social connections, (4) environmental concerns, (5) global food system concerns, (6) an interest in gardening, and (7) a desire to connect with nature.

The direct measure of these seven distinct motivation categories served to both strengthen the existing literature and to provide further insight into additional diverse participant motivations that were not previously explored in the existing research. Despite the growing concern for the economic, health, social, and environmental implications of the global food system, no research exploring motivation to join a community garden based on these concerns were found in the literature. This study aims to fill this gap and to explore the other motivations that have been either infrequently explored in previous studies, or that have not been explored with the community gardeners themselves. The current research does not make the assumption that motivation equals benefit, and explores each separately.

2.3 Benefits of community gardening

There is an abundant literature exploring the diverse and numerous impacts and benefits of community gardening. However, much of the research excluded the direct experience of the community gardeners. This is critical in order to deepen our understanding of the direct impacts and benefits of involvement in community gardening programs to individual participants. The current research investigated the direct benefits of community gardening on community garden participants with respect to the following four variables: perceived food security, gardener wellbeing, connectedness to nature and gardener knowledge. The existing research on these four variables is summarized below.

2.3.1 Perceived food security

Food security can be viewed from a variety of perspectives and at multiple levels, and numerous definitions have been proposed. The World Food Summit 1996 (WFS), of which Canada is a signatory, defined food security as:

a condition in which all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2001).

Despite numerous international commitments, food insecurity, which has been recognized as an important determinant of health (Public Health Agency of Canada, 2004), is estimated to affect almost one in ten Canadian households (Che & Chen, 2001; Tarasuk, 2005; Kirkpatrick & Tarasuk, 2008; Tarasuk & Vogt, 2009). This presents significant implications for public health (Ledrou & Gervais, 2005; Tarasuk & Vogt, 2009).

Research on household food insecurity showed that it was significantly associated with poorer health status across multiple dimensions of health, including physical, mental and social health (Vozoris & Tarasuk, 2003). Specifically, health issues associated with food insecurity include compromised nutrition, obesity, chronic conditions, distress and depression (Che & Chen, 2001; Vozoris & Tarasuk, 2003; Lyons, Park & Nelson, 2008; Tarasuk & Vogt, 2009).

Income adequacy is an important indicator of food security; numerous studies have shown that the prevalence of food insecurity increases markedly as income adequacy declines (Che & Chen, 2001; Vozoris & Tarasuk, 2003; Ledrou and Gervais, 2005; Health Canada, 2007; 2009; Tarasuk & Vogt, 2009).

Food security has become an increasing concern of urban populations (Koc et al., 1999), as unprecedented levels of urban growth place additional strain on an already-problematic food system. Cities require vast areas of land for their sustenance and have

come to depend on large amounts of food being brought in from outside the land area they actually occupy (Deelstra & Girardet, 2000). The environmental impact of supplying these urban centers with food, including the chemical inputs and energy required for production, processing and transport is significant. According to the 2006 Census, over 80% of Canada's population lived in urban areas (HRSDC, 2011). This number is expected to increase, thus urban agriculture initiatives such as community gardening may present opportunities to increase food production in urban centers and, consequently, food security.

More recently, there has been a growing recognition that food insecurity issues are embedded within a larger context of the global food system and the broader ecology (Dietitians of Canada, 2007). This recognition is embodied in community food movements, in which food issues (anti-hunger, ecological sustainability, health and safety) are being framed within a broader concept of community food security (Dietitians of Canada, 2007; Community Food Security Coalition, 2009).

Community food security (CFS) offers a systems approach to food security. It has the same goal as other approaches to food security (i.e. to end hunger and food insecurity) (Winne, 2005; Dietitians of Canada, 2007), but has a broader scope that emphasizes long term, systematic and comprehensive approaches to address food insecurity for everyone, not specifically low-income people (Hamm & Bellows, 2003; Dietitians of Canada, 2007). Hamm and Bellows (2003, 37) provide the following definition:

Community food security is defined as a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice.

Part of the vision of moving toward community food security includes the creation of local, sustainable alternatives to the global food system model. Community gardens have figured prominently in this vision and have become important resources for the community food security movement (Baker, 2004). Community gardens are viewed as a ‘self-provisioning’ activity, which promotes self-reliance and skills development (Koc et al., 1999).

Community gardening has been found to promote food security in several ways. For example, Kantor (2001) reported that community gardening improved households’ food security by increasing the quantity, quality, and affordability of food for local residents. An earlier study of food consumption among participants in a community garden in Philadelphia (Blair, Giesecke & Sherman 1991) found that community gardeners consumed larger quantities of cruciferous vegetables such as broccoli, kale, cabbage, cauliflower, and Brussels sprouts and smaller quantities of dairy products, citrus fruits, baked goods, and soft-drinks than their non-gardening counterparts. More recently, studies by Johnson and Smith (2006), Wakefield, Yeudall, Taron, Reynolds & Skinner (2007), Alaimo, Packnet, Miles & Kruger (2008) and Lackey & Associates (1998), all reported that community gardeners (and individuals living in households with community garden participants) consumed more fruits and vegetables.

Community gardens have also been found to contribute to family food budgets by reducing the amount of money that must be spent on purchasing food from other sources (Johnson & Smith, 2006; Moskow, 1999; Kantor, 2001; Patel, 1991). Research by Baker (2004) and Wakefield et al. (2007) also showed that community gardens improved access to culturally appropriate foods that were often difficult to find, and/or very expensive and of lower quality when available for purchase locally. Hannah and Oh (2000) also reported

that gardeners consciously planted foods that were either unavailable or expensive in local stores.

The existing research reports numerous food-security related benefits of community gardening; however, it does not measure the actual perceived food security of the garden participants themselves, either before or after participation in a community gardening program. The current research fills this gap by investigating whether a change occurred in participants' level of perceived food security as a result of participation in a community garden. This was accomplished by measuring the research participants' levels of preseason and postseason perceived food security.

Perceived food security is a measure of an individual's confidence in their ability to access nutritious and safe food (Stroink & Nelson, 2009). The Perceived Food Security Scale, developed by researchers at Lakehead University (Skavinski & Stroink, 2008), was used in the current research to measure if any change occurred in participants' level of perceived food security as a result of participation in the community garden. The following information provides a broader perspective of food security and reports on the literature that demonstrates the contributions that community gardens make to food security.

2.3.2 Gardener wellbeing

The concept of wellbeing has emerged as an important indicator of the growing acceptance of a broad definition of health (Germov, 1999; Grbich, 2004). According to the World Health Organization, health incorporates a 'state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity (Kingsley et al., 2009). Numerous studies have explored the abundant and diverse health and

wellbeing benefits of community gardening; the majority explored these benefits simultaneously. For the purpose of this research, gardener wellbeing encompassed physical, mental, nutritional and social wellbeing.

Wakefield et al. (2007) investigated the direct experience of community gardeners, and the health impacts and benefits of community gardening, using Toronto, Ontario as a case study. This was a community-based study that used participant observation, focus groups and in-depth interviews to examine the perceived health impacts of community gardening. The primary benefits reported included: improved mental and physical health, improved access to fresh wholesome food and improved nutrition, contribution to healthy living, interaction with nature, and relationship building. Much of the existing literature similarly reported that community gardening could lead to positive health outcomes.

Physical activity and exercise were frequently reported as benefits of community gardening. Research by Wakefield et al. (2007) and Twiss et al. (2003) showed that community gardening offered opportunities for increased physical activity and exercise. Lawson (2006) and Kingsley et al. (2009) also reported that community gardening promoted physical fitness and recreation. The research showed that gardening is one of the most commonly practiced types of exercise (Crespo, Deteyian, Heath & Sempos, 1996; Magnus, Matros & Strackee, 1979; Yusuf, Croft, Giles, Anda, Casper, Castersen & Jones, 1996) and is a recommended form of physical exercise (Pate et al., 1995). Gardening was ranked a moderate to heavy intensity physical activity (Brooks 1988; Dannenberg, Keller, Wilson & Castrelli, 1989; Ford et al., 1991). Research by Nieman (2003) showed that people gain significant health benefits by undertaking as little as 30 minutes of gardening daily.

The nutritional benefits of community gardening are related to increased access to fresh food and increased dietary intake of fruits and vegetables (Alaimo et al. 2008; Armstrong, 2000; Blair et al., 1991; Dickinson, Duna, Paulsen, Rilveria, Twiss & Weinman, 2003; Irvine, Johnson & Peters, 1999; Kantor, 2001; Kingsley et al., 2009; Lackey et al., 1998; Twiss, Johnson & Smith, 2006; van den Berg, 2010). These benefits were covered in greater detail in the Section 2.3.1, under the discussion of food security benefits of community gardening.

Mental health benefits were also attributed to community gardening. Wakefield (2007) reported that many of her research participants believed that being part of a community garden was stress-relieving, and was thought to contribute to improved mental health. She reported that “one component of this feeling of improved mental health seemed to be that participants found the opportunity to interact with nature relaxing and calming” (Wakefield 2007, 97). This is consistent with research by Milligan et al. (2004) on community gardens as therapeutic landscapes, which reported that the interaction with nature was an implicit component of the mental health benefits derived from community gardening. McBey (1985), Armstrong (2000) and Alaimo, Reischl & Allen (2010) also reported of the psychological benefits of community gardening.

Milligan et al. (2004) investigated the potential benefits of gardening activity for older people, and the extent to which communal gardening activity on allotment sites may be beneficial to the health and mental wellbeing of older people. The research explored the factors that appeared to affect participants’ health and wellbeing, including the extent of their physical and mental activities, their social networks, and the extent to which nature, natural landscapes and the local environment affected their everyday lives. The data revealed that the gardeners experienced numerous well-being benefits from

community gardening, including: physical and mental benefits, psychological benefits from their passive involvement with nature, improved social networks and supports, and increased social inclusion. They found that communal gardening on allotment sites creates ‘inclusionary spaces in which older people benefit from gardening activity in a mutually supportive environment that combats social isolation and contributes to the development of their social networks’ (Milligan et al., 2004, 1782).

Numerous studies also investigated the social benefits of community gardening. Among these benefits to overall well-being, community gardens were reported to build friendships, reduce crime and beautify neighborhoods (Patel, 1991; Curran, 1993; Alaimo et al., 2010). Patel’s (1991) and Baker’s (2004) research showed that community gardens become places for social interaction and community building, and that gardening promotes a community atmosphere that gives people an opportunity to meet others, share concerns, and problem-solve together. Gardening also serves as a way to break down some of the social barriers existing between neighbors.

Community gardens were shown to increase social capital through the development of social ties and an increased appreciation of social diversity (White & Lake 1973; McBey, 1985; Baker, 2004; Kingsley et al., 2009). Measures of social capital have been associated with various measures of health (Lochner, Kawachi & Kennedy, 1999; Gold, Kennedy, Connel & Kawachi, 2002). Kingsley and Townsend (2006) used a case study at the ‘Dig In’ community garden in Melbourne, Australia to explore the extent to which a community garden provides opportunities for enhancing social capital. Benefits reported in this study include increased social cohesion, which they described as the sharing of values that enable identification of common aims. Social support and social

connections were also cited as important social benefits of community gardening in this research.

Similarly, Glover (2004) found that a community garden could be both a consequence and a source of social capital. As a consequence, it was the end product of a persistent network of individuals who formed a garden network committed to its development. As a source of social capital, it strengthened social ties and facilitated further social connections among neighbors. Research by Alaimo et al. (2010) also suggested that organizing neighborhoods for gardening and beautification could improve perceptions of social capital among those who participated.

The existing literature shows that there are abundant wellbeing benefits relating to community gardening. These benefits include physical, nutritional, mental and social benefits to participants' wellbeing. In addition to these, connection to nature has been cited in the literature as both a motivator and a benefit of participating in a community garden. As outlined below, research shows that connection to nature provides important health and well-being benefits; these relate to both physiological and psychological health benefits. The current research is interested in exploring whether participation in a community garden can provide a connection to nature experience which may consequently provide some additional well-being benefits.

In the current research, connectedness to nature is explored separately from the other well-being measures for three reasons: 1) it is identified as a separate motivator and benefit in the existing literature, 2) a distinct scale (the Connectedness to Nature Scale) is used to measure this construct and, 3) the health and well-being benefits relating to connection to nature within the community garden are not explicitly measured; rather, they are implied.

2.3.3 Connectedness to nature

The restorative and health promoting effects of contact with nature, in terms of both mental and physical health, are well documented (Hartig, Mang & Evans, 1991; Ulrich, 1984; Van den Berg, Hartig & Staats, 2007). Research suggests that humans are linked with the natural environment, and that human beings have evolved to feel a special connection with the natural world. Biophilia is a term coined by Wilson (1984) to describe what he believes is an evolutionary need to experience the natural environment and an attraction toward living things.

Research has shown that people perceive natural environments as more restorative than urban environments. Berto (2005) asked volunteers to rate the restorative quality of slides of natural and urban environments. The slides with the highest ratings of restorativeness were all nature scenes, while those with the lowest ratings of restorativeness were all urban scenes. The research also showed that recovery from mental fatigue was greatly helped by the availability of restorative environments and experiences.

Davis, Green & Reed, (2009) reported that human beings are dependent both physically and emotionally on the natural environment and, in turn, the fates of species and ecosystems are dependent on the actions of human beings. This research goes on to say that whether or not individuals feel “close” or “connected” to nature, they are interdependent with nature in the sense that the wellbeing of nature can affect the wellbeing of individuals (and vice versa).

As humans on the whole become increasingly urbanized, we are spending more time indoors and, consequently, less time interacting with our natural surroundings in both our work and leisure life (Mayer & Frantz, 2004). Over a decade ago, Evans and

McCoy (1998) estimated that the average human spends 90% of their life within buildings. Wilson (1984), Gullone (2000) and Kellert (2002) have suggested that despite modern humans' urbanized lifestyle, the intrinsic connectedness to nature remains. Based on the trend of continued urban growth, an increase in time spent indoors is logically anticipated. This may have negative effects on human health and wellbeing.

Lewis (1996) reported that gardening is one of the most common ways of interacting with nature/green spaces in the urban environment (Kingsley et al., 2009). Interaction with nature in the community garden was also cited in the research as a benefit of participation in a community garden, and was associated with feelings of improved mental health (Milligan et al., 2004; Wakefield et al., 2007; Kingsley et al., 2009). Kingsley et al. (2009, 212) reported that their research participants "acknowledged that watching plants grow and being actively involved in the process gave members a 'connection with the earth' and allowed them to be 'in touch with nature'".

Kaplan and Kaplan (1989) have suggested that 'nearby nature' plays an important role in benefitting health. Community gardens may thus provide important opportunities to connect with nature within urban settings, and this may in turn have important implications for human health and wellbeing. However, there is little in the research that explores, explicitly, the opportunities that community gardens present in terms of creating connections between people and nature, or the benefits derived from a nature experience within an urban community garden context. The current research addresses this gap by exploring how a community gardening experience impacts participants' feelings of being connected to nature.

Mayer and Frantz (2004) developed the Connection to Nature Scale (CNS), which assesses feelings of connection and oneness with nature, and predicted ecological

behaviour and subjective wellbeing. It is a multi-item scale, which is designed to tap an individual's affective, experiential connection to nature. It follows from Leopold's contention that people need to feel they are part of the broader natural world if they are to effectively address environmental issues (Leopold, 1949). Findings from research using this scale support the argument that connection to nature is an important predictor of ecological behaviour and subjective wellbeing (Mayer & Frantz, 2004; Davis et al., 2009).

2.3.4 Gardener knowledge

The fourth variable that was explored in the current research was gardener knowledge, specifically, how the experience of community gardening impacted participants' levels of knowledge about gardening. A gardener knowledge scale was developed to measure levels of knowledge related to: planting, tending and harvesting a garden, preserving harvested food, weed control, and water conservation techniques.

Patel (1991, 1) described community gardening as “an educational process for changing the minds and actions of people so they can ‘help themselves’ attain economic and social wellbeing.” Dow's (2006) research on community gardening reported that community gardens provide sites for diverse educational benefits, including the development of gardening and job skills, learning about natural processes and the importance of environmental conservation, and the development of leadership skills.

Several studies reported that community gardens provided specific opportunities to learn food production skills (Cornell University, n.d.; La Trobe & Acott, 2000; Twiss, 2003; Holland, 2004; Wakefield et al., 2007) to increase food and agricultural literacy

(Cornell University, n.d.) and to exchange and share knowledge (Feenstra, 2002; Teig, Amulya, Bardwell, Buchenau, Marshall & Litt, 2009).

A report by Bartolomei, Corkery, Judd & Thompson (2003) assessed the role of community gardens in fostering community development and neighborhood improvement in a public housing context. The report concluded that the community gardens were an educational resource, providing useful information about sustainable garden practices. The study reported that the gardens provided opportunities to learn about horticulture, cultivation techniques, composting and recycling, which were perceived as important benefits to community garden participants.

Macias (2008) explored the impact of community-based agriculture, including community gardens, on local communities in terms of food equity, social integration and natural human capital. He defined natural human capital as a portable asset in which we invest time and resources over a lifetime to increase our knowledge of the natural world. The term also included a focus on our dependency on, and interaction with, the natural world. His research showed that community gardens provided the social context in which interactions with both the natural world and with other people came together and created natural human capital. He reported that:

...sharing information about the best methods for organic growing, putting those methods into practice through the physical activity of working in the garden two or three times a week, and taking communal responsibility for the care and use of tools and common area are three ways community gardening structures the social acquisition of natural human capital among community members” (Macias, 2008, 1098).

Research by Wills, Chinemana & Rudolph et al., (2009) investigated the impacts of an urban food garden in Johannesburg one year after it was established. The garden was established by a University Health Promotion Unit. The results showed that the

garden was a site for learning for both community members and university students. Both groups learned about gardening techniques, the use of herbs for medicinal purposes, nutrition and cooking practices and other gardening practices like composting. The garden also became a site for research and teaching, as well as a model for service learning by students and for social investment by the university.

Another study on urban youth in Minneapolis showed that participants in a community gardening program had a better understanding of the food system, a highly developed understanding of the gardening process, and an enhanced understanding of healthy versus unhealthy food (compared to youth who did not participate in the community gardening program) (Lautenschlager & Smith 2007).

Corrigan's (2010) thesis explored the challenges of community gardening and the extent to which community gardens encouraged involvement with food systems. The research also evaluated the viability of improving food security in multiple locations through a Community Food Security Approach (i.e. community gardening). Her results showed that community gardens provided educational opportunities for individuals with all levels of gardening ability, including both adults and children; however, she did not expand on the nature of these opportunities or the magnitude of the impact. She reported that participation in community gardens did increase food system awareness and involvement, and that an important step towards increasing food security was education on the importance of healthy eating through nutrition, gardening, and cooking workshops.

Despite the obvious potential for educational opportunities within community gardens, few studies were found to explore the direct effects of these opportunities on the gardeners themselves. Again, much of the reported research excluded the involvement of the community gardeners themselves; therefore the question of how knowledge was

gained and/or affecteded by participation in a community garden remains unclear. The current research addressed this gap by investigating whether a significant change in gardening knowledge occurred as a result of participation in a community garden program.

2.4 Present Study

The present study explored two main research questions:

- (1) What motivates an individual to engage in community gardening?
- (2) How does community gardening impact the following four variables: perceived food security, connectedness to nature, gardener wellbeing and gardener knowledge?

Overall, there was a significant literature that explored a number of the aspects of community gardening relevant to the current research. However, there were numerous gaps in the existing literature in terms of both motivations and community gardening benefits.

In some of the existing research, the terms motivation and benefits are used interchangeably. This creates the assumption that what motivates an individual to join a community garden is equal to the benefits they derive from their experience, or that motivation is equal to presumed benefit. The current study treated these two as separate; in the preseason, it explicitly explored gardener motivations to join the community garden, whereas in the postseason (at the end of the gardening season), it explored the benefits of the community gardening experience. This allows for a differentiation between the two as well as an opportunity to express benefits that may differ from initial motivation.

Given the large garden membership and the diverse demographic within the membership, differences in reasons for joining the garden (i.e. motivation) were

anticipated; these are likely to reflect individual circumstance and needs. The current research explored relationships between motivations, benefits and different demographic variables, which were not found to be explored in any of the existing literature. It aimed to explore whether different demographic variables impacted an individual's motivation to join a community garden, and also whether these demographic variables were somehow related to perceived benefits.

Additionally, few studies have explored motivation within the context of any motivational theory (i.e. Maslow's Theory). Exploring motivation within this context may reveal motivations that reflect differing levels of need (i.e. from basic physiological and safety needs to higher level self-actualization needs). For example, when we think of an individual joining a garden, we may make the presumption that their motivation is in some way related to food security, whether that be simply a desire to improve access to food or to reduce food costs. However, the present study explored a diverse range of motivations that may reflect equally diverse levels of need. As the interest in, and growth of, local food system initiatives (i.e. community gardening) grows, a greater understanding of these needs and, subsequently, motivation to join a community garden, will become increasingly important for the development future programs so they may maximize participation and benefit.

Although a number of the motivations explored in the present study have been identified in previous studies, no studies to date have used a motivation scale to assess the level of multiple, diverse motivations within the context of community garden membership. Moreover, no studies have explored or identified motivation to join a community garden based on concern for the global food system. The present study

explored this motivation, in addition to the 6 others mentioned above in both the quantitative and qualitative methodologies.

The present investigation of the four research variables on gardening benefits (i.e. perceived food security, gardener wellbeing, connectedness to nature and gardener knowledge) will serve a similar purpose in terms of both strengthening and deepening the existing research. Although these benefits have previously been reported in the literature, the mixed methods allowed for a more thorough and insightful reflection into the nature of these benefits to the gardeners. The present study further strengthens the existing research by focusing its investigation on the direct benefits of community gardening as reported by the community gardeners themselves. This includes direct measures of each of these four variables in a pre- and post-season approach in order to develop a concrete measure of changes over the course of the gardening season. This has not previously been done.

Furthermore, it placed a strong emphasis on the qualitative data and included the responses in the words of the gardener themselves. This provides a rich, compelling and, at times, very personal account of the impacts of the participants' community gardening experience.

CHAPTER 3

METHODS

3.1 The Case Study: The FSRN Campus Community Garden

The case study area/research site was the Food Security Research Network Campus Community Garden, which is located on Lakehead University Campus in Thunder Bay, Ontario (see Figure 3.1). The garden was established in 2008 as a combined research/demonstration and community garden. The year the research was conducted (2010) was the garden's second year of food production (community gardening activities).

The garden consists of 140 10x10 foot garden plots. Of these, 120 plots are allocated to the community garden, while the remaining 20 plots are allocated to Lakehead University faculty and Food Security Research Network staff for research and garden demonstration purposes. The garden membership is diverse, consisting of faculty, staff and students from Lakehead University, as well as numerous individuals, families and organizations from the broader community. Individuals pay an annual membership fee to garden at the site. The 2010 garden membership numbered 80 community gardeners.



Figure 3.1
Location of Food Security Research Network Campus Community Garden

3.2 A mixed methods approach

A mixed methods research approach was used to investigate the motivation(s) for individuals' participation in community gardening, and to explore the impact of community gardening on the following four variables: perceived food security, gardener wellbeing, connectedness to nature and gardener knowledge. Creswell et al. (2003, 212) defined mixed methods as:

A collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of data at one or more steps in the process of research.

The mixed methods approach adopted in this study consisted of survey questionnaires, interviews and participant observation. This allowed for a study design which combined both objectivist and constructivist epistemologies. The objectivist

position, which emanates from the quantitative research (i.e. survey questionnaires), holds that reality exists independently of the researcher; the constructivist position emanates from the qualitative research (i.e. semi-structured interviews and participant observation), which sees truth and meaning as constructed and interpreted by individuals (Gray, 2009). Mixed methods research is becoming increasingly recognized as the third major research approach or paradigm (Johnson et al., 2007), the first approach being quantitative and the second being qualitative.

A mixed methods research approach was chosen for a number of reasons. First, as Hanson et al. (2005) suggested, using mixed methods allows researchers to simultaneously generalize from a sample to a population and to gain a richer, contextual understanding of the phenomenon being researched. This approach is also pragmatic, as it is based on a view of knowledge as being both socially constructed and based upon the reality of the world we experience and live in (Johnson et al., 2007). Additionally, the combination of methods allows for triangulation. The term, which originally comes from surveying, describes using different bearings to give the correct position (Clifford et al., 2010). In research it refers to using multiple methods or different sources of information to try and maximize an understanding of a research question (Clifford et al., 2010). Triangulation helps to strengthen the validity of the findings as it ensures that the results converge or corroborate one another and that the inherent bias of one measure is counterbalanced by the strength of the other (Gray, 2009).

A mixed methods approach also allows for complementarity, by measuring overlapping but also different elements of a phenomenon. For example, the quantitative methods in this research were used to measure certain levels or rankings of variables, while the qualitative methods were used explore the influences, perceptions, or

experiences of these variables. Complementarity increases “the meaningfulness and validity of constructs by capitalizing on inherent method strengths and counteracting inherent method biases” (Gray, 2009, 214).

3.3 Data Collection

The current research approach used three data collection instruments: survey questionnaires, semi-structured interviews and participant observation. The data was collected sequentially, over an eight-month period.

3.3.1 Quantitative Methods: Survey Questionnaires and Measures

Survey questionnaires were used to collect the quantitative data. All surveys were designed and administered through the online survey software Survey Monkey. In an attempt to capture changes to a number of variables over the course of the gardening season, two sets of survey questionnaires were developed: Preseason Surveys and Postseason Surveys. Two study groups completed the surveys: (1) the Gardeners and, (2) the Control Group. Participants from each study group were asked to complete both a preseason survey and a postseason survey. The four surveys are identified as follows: (1) Preseason Gardener Survey; (2) Preseason Control Group Survey; (3) Postseason Gardener Survey; and (4) Postseason Control Group Survey. Cover letters were provided and informed consent was obtained from all participants. The surveys, cover letter and consent form are included in Appendix 1.

Both Preseason Surveys (i.e. the Preseason Gardener Survey and the Preseason Control Group Survey) were administered in May 2010, at the commencement of the gardening season. Both Preseason Surveys included demographic information and the following four measures: (1) Perceived Food Security, (2) Gardener Wellbeing, (3)

Gardener Knowledge, and (4) Connectedness to Nature. Additionally, the Preseason Gardener Survey included the Gardener Motivation Scale. Both Preseason Surveys included additional questions relating to the community gardening experience.

Both Postseason Surveys (i.e. the Postseason Gardener Survey and the Postseason Control Group Survey) were administered in September 2010, towards the end of the gardening season. Both postseason surveys included re-measures of the following: (1) Perceived Food Security, (2) Gardener Wellbeing, (3) Gardener Knowledge, and (4) Connectedness to Nature. The Postseason Gardener Survey included additional questions relating directly to gardening experience, including food sharing practices, gardener satisfaction, and impacts of community gardening on various food security constructs.

3.3.1.1 Perceived Food Security Scale

The Perceived Food Security (PFS) Scale was developed by Lakehead University's Dr. Mirella Stroink (Skavinski & Stroink, 2008). It uses a 5-point Likert scale (1= strongly disagree to 5=strongly agree), and asks that participants indicate their agreement with 17 items measuring participants' confidence in their ability to access nutritious and safe food. The scale has shown adequate psychometric properties in pilot research. Examples of scale items include: "I am able to access enough food to meet my needs" and "The ways that I access food are reliable". The PFS Scale has been found to correlate positively with sense of community, socio-economic background and self-rated nutrition and health (Skavinski & Stroink, 2008). The PFS Scale was administered in all four surveys in an effort to explore to what extent a community gardening experience may impact perceived food security.

3.3.1.2. Gardener Wellbeing

Gardener wellbeing was assessed using a six-item scale in which participants rated their overall general health, their physical and mental health, their level of physical and social activity, and their level of nutrition on a 5-point Likert scale (1=poor to 5=excellent).

3.3.1.3 Gardener Knowledge

Gardener knowledge was assessed using a seven-item, 5-point Likert scale (1=poor to 5=excellent). The seven items explored knowledge relating to planting, tending and harvesting a garden, preserving harvested food, weed and pest control and water conservation techniques.

3.3.1.4. Connectedness to Nature Scale

The Connectedness to Nature Scale (CNS) is a 14-item measure of an individual's trait levels of feeling emotionally connected to the natural world. Participants indicate their agreement with each statement on a 5-point Likert scale (1=strongly disagree to 5=strongly agree). Mayer & Frantz (2004) reported on five studies that assessed the validity and reliability for this scale; the results support the idea that connection to nature leads to concern for nature, as the CNS has also been shown to relate to a biospheric value orientation, and is an important predictor of ecological behaviour, and subjective well-being. The CNS was administered in all four surveys (the Preseason and Postseason Gardener Surveys and the Preseason and Postseason Control Group Surveys) in an effort to explore to what extent a community gardening experience may impact one's sense of connectedness to nature.

3.3.1.5 Gardener Motivation Scale

No scales measuring motivation to join a community garden were found within the literature; rather, the studies that sought to explore motivation asked individual gardeners or garden coordinators directly about the factors that influenced participation in the garden. The Gardener Motivation Scale was thus developed to create a quantitative measure of the motivation of individuals to join the community garden.

The Gardener Motivation Scale uses a 5-point Likert scale (1=strongly disagree to 5=strongly agree). It consists of 35 items, which are divided into seven sub-scales. The seven sub-scales correspond to the seven broad motivation categories (for joining a community garden) that were predicted early in the research process through the literature review, informal discussions with other gardeners, and personal experience. These seven motivation sub-scales include: (1) Economic Concerns; (2) Social Connections; (3) Health Concerns; (4) Environmental Concerns; (5) Global Food System Concerns; (6) Interest in Gardening, and; (7) Connection to Nature. Each of the seven sub-scales consists of five items. The Gardener Motivation Scale was administered in the Preseason Gardener Survey only.

The reliability of all five scales was assessed using Cronbach's alpha. All scales showed acceptable level of reliability. Table 3.1 lists the means, standard deviations and reliabilities by survey and participant group. See Appendix 2 for full surveys and scales.

3.3.2 Qualitative Methods

Two data collection methods were used to collect the qualitative data: semi-structured interviews and participant observation. The interview questions are included in Appendix 3.

3.3.2.1 Semi-structured Interviews

Twenty semi-structured interviews were conducted with the community gardeners between October and December 2010. The interviews consisted of a series of open-ended questions, which attempted to elicit descriptive responses relating to their experience of being involved in the community garden. The interviews were based on a phenomenological approach, which holds that “any attempt to understand social reality has to be grounded in people’s experiences of that social reality” (Gray 2009, 22). The interviews thus aimed to explore how the participants experienced and gave meaning to their individual experience of community gardening.

The main topic areas explored in the interviews included: (1) motivations for joining the community garden; (2) perceived benefits of participation; (3) perceived impacts of community gardening on gardener wellbeing, gardening knowledge, food security, and connectedness to nature, and (4) challenges and opportunities. Early interviews were based on ten questions; however, as trends began to emerge through these interviews, additional questions that served to explore these trends more deeply were added to subsequent interviews. In total, 14 core questions were explored with the majority of the participants.

All gardeners were invited to participate in the interviews and 20 agreed to volunteer. All interviews took between 30 and 60 minutes to complete. Eighteen of the twenty interviews were conducted face-to face; the remaining two interviews were conducted over the phone (at the request of the participants). All interviews were audio recorded, transcribed and coded thematically.

Many of the interview questions were similar to those asked in the Preseason and Postseason Surveys. The overall aim of these interviews was to explore more thoroughly the individual gardener's experience and to capture more descriptive data relating to this experience. The semi-structured nature of the interviews allowed for some probing of views and opinions and for respondents to expand on their answers. This is vital when "a phenomenological approach is being taken where the objective is to explore subjective meanings that respondents ascribe to concepts or events" (Gray, 2009, 373). This allowed for a deeper exploration of both established themes and new or divergent ideas in the process.

3.3.2.2 Participant Observation

Participant observation was not originally chosen as a research method for this study. However, once I began working in the garden, the significance of the opportunity presented by my role as both garden coordinator and garden member (i.e. gardener) became clear. The regularity of both my involvement in garden activities and my interaction with the other gardeners (i.e. participants) at the study site, allowed me to participate in and observe the diversity of perspectives, interactions, interpretations and activities taking place at the garden. A decision was made to incorporate participant observation into my methods, and an amendment was subsequently made to the Lakehead University Ethics Board.

Participant observation took place at the study site on a regular basis throughout the growing season. This included observations of: (1) interactions between the gardeners, (2) interactions between the gardeners and other garden staff, (3) my own interactions with the other gardeners and garden staff, (4) formal garden events such as the Educational Workshop Series, Garden Celebrations, and Work Parties, (5) garden activities and work (i.e. planting, tending, weeding, harvesting, etc.), and (6) interactions with non-members visiting the garden site.

Rich data emerged through these observations, and seemingly simple daily events and interactions at the garden became meaningful. All observations were recorded in a garden notebook, and reflections on emerging themes were reflected upon regularly.

Participant observation allowed for real-time, in situ examination of the events, experiences, perceptions and opinions of community garden participants within the study site. It also allowed for a more thoughtful examination of gardener experience, as it “created an opportunity to move beyond the participants’ opinions and self-assessed interpretations of their attitudes, behaviours and experiences, and allowed for an examination of their actions in practice” (Gray 2009, 397). Additionally, it allowed for the discovery of potential social meanings and interpretations of gardener activities.

Participant observation involves working or acting alongside people in order to observe their interactions with their social environment to explore how it changes their ideas and behavior, and their own reflexive awareness of these changes (Gray, 2009). Given my combined roles as researcher, staff and gardener, I consequently spent a significant amount of time at the garden throughout the season. I became a member of the group, and became immersed in the research setting. As a result, I began to understand some of the gardeners’ experiences by experiencing them myself.

Due to the diversity of my roles within the garden, it was necessary to be conscious, on a consistent basis, of any assumptions and mental constructs (i.e. values, motivations, emotions) that I brought to the observation activities. As such, it was necessary to avoid discussions about the research with the gardeners in any way and at any time during the growing season. Although the gardeners were aware that participant observation was being conducted, the observation activities were carried out in a way that was not overt. In an effort to avoid the gardeners changing their behaviours, I carried out the observations informally and on a regular basis, during casual discussions and interactions at the garden, while I myself was gardening and/or working near to and with other garden members.

Using a mixed-methods approach allowed for a more holistic perspective of the research, and helped strengthen the data by ensuring that the inherent bias of one measure was counterbalanced by the strengths of another. The reliability of the data was also strengthened because the same basic themes were explored through the multiple research methods, thus allowing for a more consistent and thorough exploration of the original research questions.

3.4 Research Participants

Research participants consisted of two groups: (1) the gardeners at the Food Security Research Network Campus Community Garden, and (2) a control group. The control group was selected randomly through the researcher's general email contact list. Requests were sent out to both groups, inviting them to participate in the research.

The Preseason Gardener Survey was completed by 53 of the 80 community gardeners, while 56 individuals completed the Preseason Control Group Survey (109 participants in total). Thirty six percent of the participating gardeners were new to the

garden (i.e. it was their first year participating in the garden); the remaining 64% were returning gardeners (i.e. it was their second year participating in the garden). The Postseason Surveys were completed by 44 community gardeners and 33 control group participants.

Basic demographic information, including age, gender, ethnicity, income and education levels, was collected for both groups in the preseason surveys; the results are shown in Tables 3.2 through 3.6. An independent samples t-test revealed a significant difference between the community gardening group and the control group on age, $t(106) = 3.68, p < .001$, such that the community garden members were significantly older than the control group (Table 3.2). The groups were also compared on gender, education, income, and ethnicity using a chi-square analysis. No significant differences were found. Therefore, while the community gardening group was older than the control group, the two groups were otherwise similar on the remaining demographic variables.

The overall education level of the participants was high, with 90% of participants reporting an education level of college or higher. Education levels were also similar between the participant groups: 22% of gardeners and 20% of the control group had a college diploma, while 63% of gardeners and 76% of control group reported a university level education (undergraduate or masters/doctoral).

Ethnic distribution was similarly consistent between the participant groups, with 93% (92% of gardeners and 96% of control group) of respondents identifying themselves as 'white'. Two percent of gardeners and 4% of control group participants self-identified as Aboriginal.

Table 3.2
Preseason survey participant mean age by group

	Gardeners	Control Group
Mean Age	47.9 years	39.1 years

Table 3.3
Preseason survey participant gender by group

Gender	Gardeners	Control Group	Total # participants	%
Female	38 (72%)	42 (75%)	80	73
Male	15 (28%)	14 (25%)	29	27
Total	53	56	109	100

Table 3.4
Preseason survey participant education levels by group

Education Level	Gardeners	Control Group	Totals	%
Less than high school	1 (<1%)	0	1	<1
High school	7 (14%)	2 (4%)	9	9
College	11 (22%)	10 (20%)	21	21
Undergraduate degree	23 (45%)	32 (64%)	55	54
Masters/doctorate	9 (18%)	6 (12%)	15	15
Total	51	50	101	100

Table 3.5
Preseason survey participant income levels by group

Income Level	Gardeners	Control Group	Totals	%
Less than \$20 000	7	6	13	13.3
\$20 000-\$39 999	9	9	18	18.4
\$40 000-\$59 000	14	8	22	22.4
Greater than \$60 000	19	26	45	45.9
Total	49	49	98	100

Table 3.6
Preseason survey participant ethnicity by group

Ethnicity	Gardeners	Control Group	Totals
White	46	47	93
Aboriginal (First Nations, Inuit, Metis)	1	2	3
Hispanic	1	0	1
Asian	1	0	1
South Asian	1	0	1
Total	50	49	99

CHAPTER 4

RESULTS

This section summarizes all results of the research. Quantitative and qualitative results are reported separately, and will be discussed in further detail in Chapter 5.

4.1 Quantitative Results

This section summarizes the quantitative results for the study's two research questions:

Question 1: What motivates an individual to join a community garden?

Question 2: How does community gardening impact perceived food security, connectedness to nature, gardener wellbeing and gardener knowledge?

4.1.1 Results for Research Question 1

The means and standard deviations for the seven motivation categories (economic concerns, health concerns, social connections, environmental concerns, global food system concerns, interest in gardening, and connection to nature) were determined and are displayed, in order of greatest motivation to lowest motivation, in Table 4.1.

The means for the motivations were compared using first a repeated measures Anova, which revealed an overall significant difference among the motivations, ($F(6, 306) = 65.64, p = 0.000$). The mean motivations were then examined further using paired samples t-tests; the results are displayed in Table 4.1. Motivation to join the community

garden based on health concerns, environmental concerns and connection to nature were not significantly different from each other. However, health concerns motivation and environmental concerns motivation were significantly greater than motivations based on interest in gardening, concern about global food system, social and economic motivations.

Table 4.1
Mean values for gardener motivations

Motivation	N	Min.	Max.	Mean (M)	Std. Deviation (SD)
Health Concerns	52	3.50	5.00	4.24 _a	0.44
Environmental Concerns	52	2.20	5.00	4.13 _a	0.65
Connection to Nature	52	3.00	5.00	4.07 _{ab}	0.50
Interest in Gardening	52	2.20	5.00	3.96 _b	0.52
Global Food System Concerns	52	1.80	5.00	3.92 _b	0.70
Social Connections	52	1.20	5.00	3.49	0.70
Economic Concerns	52	1.00	4.80	2.70	0.76
Valid N	52				

Note: Means that share a subscript are not significantly different.

4.1.1.1 Motivation and demographic analyses

The seven motivation categories were examined for relationships and effects on four demographic variables: gender, age, education level, and income level. No analyses were conducted between motivation and ethnicity, as the diversity within the sample was too low.

Using a one-way ANOVA, significant gender differences were found for two motivation categories: motivation based on health concerns and motivation based on interest in gardening. Specifically, females ($M = 4.33$, $SD = 0.48$) scored significantly higher than males ($M = 4.04$, $SD = 0.19$) on health motivation, $F(1, 51) = 4.98$, $p = 0.03$ and on interest in gardening (females $M = 4.09$, $SD = 0.45$, males $M = 3.64$, $SD = 0.57$), $F(1, 51) = 9.18$, $p = 0.004$. These results suggest that females are significantly more likely

to be motivated by health concerns and by an interest in gardening to join a community garden than males.

Correlation results between the motivations categories and age, education, and income level are presented in Table 4.2. Significant negative correlations were found between motivation based on economic concerns and education level and between motivation based on economic concerns and annual income. This means that as a gardener's education level and annual income increased, the less likely they would be to join the community garden because of economic concerns.

A significant negative correlation was found between motivation based on economic concerns and education and between motivation based on economic concerns and income. This means that as age and income increased, participants were less likely to join the garden because of economic concerns.

Significant negative correlations were found between motivation to join the garden because of environmental concerns and age, and also between motivation to join the community garden based on concerns for the environment and annual income. This means that as participants' age and income increased, they were less likely to be motivated to join the community garden because of concerns about the environment.

A significant negative correlation was also found between motivation based on global food system concerns and annual income. This means that as income increased, gardeners were less motivated to join the community garden because of concerns about the global food system.

4.1.1.2 Motivation and research variable analyses

The seven motivation categories were correlated with the four primary research variables: perceived food security, connectedness to nature, gardener wellbeing and

gardener knowledge. Significant correlations were found between several of the motivation categories and both preseason and postseason measures of the above variables. The results are shown in Table 4.3.

Table 4.2
Correlations between motivation categories and demographic variables

Motivation		Age	Education level	Annual Income
Economic concerns	<i>r</i>	-0.113	-0.353*	-0.521**
	<i>p</i>	0.432	0.011	0.000
Environmental concerns	<i>r</i>	-0.382**	-0.018	-0.387**
	<i>p</i>	0.006	0.901	0.006
Global food system concerns	<i>r</i>	-0.228	-0.010	-0.356*
	<i>p</i>	0.108	0.947	0.012

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Motivation to join the community garden based on economic concerns showed a significant negative correlation with both preseason and postseason perceived food security. This means that gardeners who were more motivated to join the garden because of economic concerns also reported lower perceived food security.

Motivations based on health concerns, environmental concerns, and connection to nature all showed significant positive correlations with both preseason and postseason connectedness to nature. This means that those gardeners who were more motivated to join the community garden because of health concerns, environmental concerns or because they wanted to connect with nature reported higher scores on measures of connectedness to nature in both the preseason and postseason.

Motivations based on global food system concerns showed a significant positive correlation with preseason connectedness to nature. This means that those gardeners who were more motivated to join the community garden because of concerns about the global food system also reported higher connectedness to nature in the preseason.

Table 4.3 Correlations between motivation categories and pre- and postseason perceived food security (PFS), connectedness to nature (CNS), gardener wellbeing and gardener knowledge.

Motivation	Preseason PFS	Postseason PFS	Preseason CNS	Postseason CNS	Preseason Gardener wellbeing	Postseason Gardener wellbeing	Preseason Gardener knowledge	Postseason Gardener knowledge
Economic concerns	<i>r</i> -0.510** <i>p</i> 0.000	-0.644** 0.000	-0.070 0.623	-0.321 0.110	-0.171 0.225	-0.313 0.119	-0.046 0.746	-0.008 0.970
Social connections	<i>r</i> -0.092 <i>p</i> 0.518	-0.377 0.058	-0.050 0.725	0.019 0.926	0.055 0.700	0.035 0.854	-0.040 0.778	0.134 0.523
Health concerns	<i>r</i> -0.011 <i>p</i> 0.939	-0.258 0.203	0.538** 0.000	0.560** 0.003	0.032 0.820	0.038 0.852	0.255 0.069	0.019 0.926
Environmental concerns	<i>r</i> -0.065 <i>p</i> 0.646	-0.227 0.265	0.444** 0.001	0.447* 0.022	0.089 0.531	0.213 0.296	0.204 0.146	0.126 0.547
Global food system concerns	<i>r</i> -0.216 <i>p</i> 0.124	-0.332 0.097	0.343* 0.013	0.272 0.179	-0.058 0.683	0.032 0.878	0.115 0.418	0.124 0.554
Interest in gardening	<i>r</i> -0.198 <i>p</i> 0.160	-0.498** 0.010	0.369** 0.007	0.341 0.088	0.241 0.085	0.216 0.290	0.355** 0.010	0.102 0.629
Connection to nature	<i>r</i> 0.022 <i>p</i> 0.387	-0.261 0.198	0.429** 0.002	0.591** 0.001	0.045 0.753	0.278 0.168	0.023 0.872	0.363 0.075

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Finally, motivation to join the community garden based on an interest in gardening showed a significant negative correlation with postseason perceived food security, and significant positive correlations with preseason connectedness to nature and preseason gardener knowledge. This means that those gardeners who were more motivated to join the garden because of an interest in gardening were more likely to rate lower on postseason perceived food security, and higher on both preseason connectedness to nature and preseason gardener knowledge.

4.1.1.3 Additional motivation analyses

The seven motivation categories were also correlated with numerous additional variables that were measured only in the postseason gardeners' survey. The analyses revealed significant correlations, which are displayed in Table 4.4.

A significant positive correlation was found between motivation to join the garden because of an interest in gardening and gardener satisfaction. This means that the more motivated the participants were to join the garden because of an interest in gardening, the higher they rated their satisfaction with their community garden experience. Significant positive correlations were found between motivations to join the community garden based on economic concerns, health concerns, environmental concerns, global food system concerns and an interest in gardening and concern about the current global food system. This means that the more motivated the participants were to join the garden based on economic concerns, health concerns, environmental concerns, global food system concerns or an interest in gardening, the higher they rated their concern for the current global food system.

Table 4.4
Correlations between motivation categories and measured postseason variables.

Motivation		Gardener satisfaction?	Concern about current global food system?	Garden tending frequency?	Participate in the garden next year?	Improvement in family food security?	Contribution to community food security?	Increased awareness of local food security?	Contribution to family food budget?
Economic concerns	<i>r</i>	0.249	0.301*	-0.353	-0.124	0.047	0.028	0.185	-0.031
	<i>p</i>	0.220	0.030	0.077	0.554	0.820	0.890	0.366	0.881
Social connections	<i>r</i>	0.021	0.070	-0.179	0.226	0.306	0.380	0.156	0.434*
	<i>p</i>	0.918	0.621	0.383	0.278	0.129	0.056	0.446	0.030
Health concerns	<i>r</i>	0.120	0.388**	-0.221	0.075	-0.032	0.246	0.044	0.280
	<i>p</i>	0.561	0.004	0.278	0.722	0.877	0.225	0.830	0.175
Environmental concerns	<i>r</i>	0.218	0.631**	-0.497**	-0.015	0.122	0.592**	0.100	0.418*
	<i>p</i>	0.284	0.000	0.010	0.943	0.552	0.001	0.628	0.038
Global food system concerns	<i>r</i>	0.130	0.603**	-0.557**	0.188	0.173	0.528**	0.100	0.248
	<i>p</i>	0.527	0.000	0.003	0.368	0.398	0.006	0.627	0.232
Interest in gardening	<i>r</i>	0.415*	0.456**	-0.443**	0.019	0.196	0.511**	0.291	0.424*
	<i>p</i>	0.035	0.001	0.023	0.929	0.337	0.008	0.150	0.035
Connection to nature	<i>r</i>	0.169	0.237	-0.192	0.160	0.133	0.369	0.188	0.188
	<i>p</i>	0.411	0.091	0.349	0.444	0.516	0.063	0.358	0.369

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Motivations based on environmental concerns, global food system concerns, and an interest in gardening correlated negatively with garden tending frequency. This means that the more motivated gardeners were to join the garden because of these three motivations, the less frequently they tended their plot.

Motivations based on environmental and global food system concerns, and an interest in gardening correlated positively with the degree to which the participants felt that the community garden contributed to community food security. This means that the more motivated gardeners were to join the garden because of these three motivations, the higher they rated the community garden's contribution to community food security.

Motivations based on social connections, environmental concerns, and an interest in gardening correlated positively with the degree to which they felt their garden food contributed to their family food budget. This means that the more motivated gardeners were to join the garden because of these three motivations, the more significantly they were likely to rate the contribution their garden food made to their family food budget.

4.1.2 Results for Research Question 2

Repeated measures analysis of variance was used to determine if participating in the garden had significant impact on perceived food security, connectedness to nature, gardener wellbeing and gardener knowledge. Group (gardener vs. control) was entered as the between subjects variable and time (preseason vs. postseason) was the repeated variable. If participating in the garden had a significant impact on perceived food security, connectedness to nature, gardener wellbeing and gardener knowledge, these ANOVAs should reveal significant interactions between time and group so that

significant increases over time are seen in the gardening group but not the control group.

A criteria of $p < 0.05$ was used to determine the significance of results.

4.1.2.1 Impact of community gardening on perceived food security

The repeated measures ANOVA analysis revealed no significant effect of group (i.e. gardener group vs. control group) and no significant effect of time by group.

However, the analysis revealed that there was a significant effect of time ($F(1, 45) = 12.12, p = 0.001$). Mean perceived food security across group equaled 3.76 ($SE = 0.07$) in the preseason, and 3.98 ($SE = 0.10$) in the postseason. This means that no significant difference was found in perceived food security between the gardeners and the control group overall, and no significant interaction; however, there was a significant difference in perceived food security between the preseason and the postseason such that both groups felt greater food security in the postseason than the preseason.

4.1.2.2 Impacts of the community gardening on gardener wellbeing

The repeated measures ANOVA analysis revealed no significant effect of group (i.e. gardener group vs. control group), time, or interaction between group and time. This means that no significant difference in wellbeing was found between the gardeners and the control group, no significant difference was found in wellbeing from preseason to postseason for either group, and no significant interaction was found.

4.1.2.3 Impacts of community gardening on gardener knowledge

The repeated measures ANOVA analysis revealed a significant main effect of time on gardening knowledge, ($F(1, 44) = 4.16, p = 0.048$). Mean gardening knowledge across group at preseason was 2.51 ($SE = 0.11$) and at post season was 2.62 ($SE = 0.11$). This means that there was a significant increase in gardening knowledge for both groups from the preseason to the postseason. There was also a significant main effect of group on

gardening knowledge, ($F(1,44) = 10.98, p = 0.002$). Mean gardening knowledge for gardeners was 2.91 ($SE = 0.14$) and for control group was 2.22 ($SE = 0.15$). This means that gardeners indicated significantly higher levels of gardening knowledge than did the control group. There was no significant interaction between group and time.

4.1.2.4 Impact of community gardening on connectedness to nature

The repeated measures ANOVA analysis revealed no significant effect of group (i.e. gardener group vs. control group), time, or interaction between group and time. This means that no significant difference in connectedness to nature was found between the gardeners and the control group, no significant difference was found in connectedness to nature from preseason to postseason for either group, and no significant interaction was found.

4.1.2.5 Correlations between research variables and demographic variables

Correlations between perceived food security, connectedness to nature, gardener wellbeing and gardener knowledge (both preseason and postseason) and three demographic variables were also found; the results are reported in Table 4.5. A significant positive correlation was found between both preseason and postseason perceived food security and annual income. This means that in both the preseason and postseason samples, as annual income increased so too did measures of perceived food security.

A positive correlation was found between postseason connectedness to nature and education level. This means that as education level increased, so too did the measure of connectedness to nature in the postseason.

A positive correlation was found between postseason gardener wellbeing and education. This means that as education level increased, so too did the postseason measure of gardener wellbeing.

Positive correlations were also found between both preseason and postseason gardener knowledge and age. This means that as age increased so too did the measures of both pre- and postseason gardener knowledge.

Table 4.5
Significant correlations between preseason and postseason variables and demographic variables

Variable		Age	Education	Annual Income
Preseason PFS	<i>r</i>	0.033	0.132	0.347**
	<i>p</i>	0.190	0.190	0.000
Postseason PFS	<i>r</i>	-0.006	0.256	0.519**
	<i>p</i>	0.968	0.082	0.000
Postseason CNS	<i>r</i>	-0.077	0.302*	0.066
	<i>p</i>	0.611	0.039	0.668
Postseason gardener wellbeing	<i>r</i>	-0.209	0.315*	0.270
	<i>p</i>	0.163	0.031	0.076
Preseason gardener knowledge	<i>r</i>	0.325**	-0.063	0.028
	<i>p</i>	0.001	0.530	0.785
Postseason gardener knowledge	<i>r</i>	0.422**	0.038	0.177
	<i>p</i>	0.004	0.803	0.256

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

4.1.2.6 Level of concern about the current global food system.

Research participants were asked to rate how concerned they were about the current global food system. The results are shown in Table 4.6. Only 2.8% of respondents reported being ‘not at all’ concerned, while over 58% reported being ‘very’ or ‘extremely’ concerned. This concern was correlated with three demographic variables (age, income and education) as well as the four research variables (perceived food security, connectedness to nature, gardener wellbeing and gardener knowledge); significant correlations are shown in Table 4.7.

Table 4.6
 Responses to survey question: “How concerned are you about our current global food system? n=109

	Frequency	Percent
Not at all	3	2.8
slightly	11	10.1
moderately	31	28.4
very	41	37.6
extremely	23	21.1
Total	109	100

These results showed that there were significant negative correlations between concern for the current global food system and income and perceived food security at both the preseason and postseason. This means that as income and pre- and postseason perceived food security increased, concern for the current global food system decreased. There was also a positive correlation between concern for the global food system and preseason gardener knowledge and preseason connectedness to nature. This means that as the level of gardening knowledge or connectedness to nature in the preseason increased, so too did the concern for the current global food system.

4.1.3 Additional descriptive analyses

A number of additional results from the survey questionnaires are reported below. These relate to gardener experience and additional perceived benefits.

4.1.3.1 Impact of community gardening on local food security awareness

Research participants were asked to rate how significantly their community gardening experience increased their awareness of local food security. The results are shown in Table 4.8. Only 4.7% of respondents reported that their experience did not at all increase their awareness. The remaining 95.3% of respondents reported that their community gardening experience did, to varying degrees, increase their awareness of

local food security. Just over 44% of respondents reported that their community gardening experience increased their awareness by ‘much’ or ‘a great deal’.

Table 4.7

Significant correlations with concern for global food system

		How concerned are you about our current global food system?
Income	<i>r</i>	-0.288**
	<i>p</i>	0.004
Preseason PFS	<i>r</i>	-0.222*
	<i>p</i>	0.024
Postseason PFS	<i>r</i>	-0.356*
	<i>p</i>	0.014
Preseason gardening r knowledge	<i>r</i>	0.193*
	<i>p</i>	0.044
Preseason CNS	<i>r</i>	0.391**
	<i>p</i>	0.000

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.8

Responses to survey question: “In your opinion, how much has community gardening increased your awareness of local food security?” n = 43

	Frequency	Percent
Not at all	2	4.7
Little	4	9.3
Somewhat	18	41.9
Much	13	30.2
A great deal	6	14.0
Total	43	100

4.1.3.2 Contribution to family food budget

The survey also asked participants to rate how significantly the food they grew in their gardens contributed to their family food budget. The results are shown in Table 4.9. Only 7.1% of respondents reported that the food they grew did not at all contribute to their family food budget. The remaining 92.9% reported that the garden food did, to varying degrees, contribute to their family food budget. Almost 55% reported it contributed ‘somewhat’, and 14% reported it contributed ‘much’ or ‘a great deal’.

4.1.3.3 Contribution to community food security

The contribution of community gardening to community food security was also explored; the results are shown in Table 4.10. All participants reported that community gardening contributed to community food security, but to varying degrees. The results are similar to those for how much community gardening increased awareness of local food security, with just over 44% of respondents reporting feeling that community gardening contributed ‘much’ or ‘a great deal’ to community food security.

4.1.3.4 Nutritional value of garden food

Perceptions of the nutritional value of garden food were also explored in the surveys; the results are shown in Table 4.11. Less than 5% of the respondents felt that the nutritional value of garden food and grocery store produce were the same; 67.4% reported that they believed garden produce is much more nutritious.

4.1.3.5 Garden tending frequency

Research participants were asked how often they tended their garden; the results are shown in Table 4.12. The results showed that 25.6% of gardeners tended their plots less than once per week. The majority of gardeners, 53.5%, reported tending their gardens between 1 and 3 times per week.

Table 4.9

Responses to survey question: “How significantly did the food you grew in your garden contribute to your family food budget (i.e. did it lower the amount of money you spent on food bought elsewhere?)” n = 42

	Frequency	Percent
Not at all	3	7.1
Little	10	23.8
Somewhat	23	54.8
Much	4	9.5
A great deal	2	4.8
Total	42	100.0

Table 4.10

Responses to survey question: “In your opinion, how much does community gardening contribute to a community's food security?” n = 43

	Frequency	Percent
Little	6	14.0
Somewhat	18	41.9
Much	13	30.2
A great deal	6	14.0
Total	43	100.0

Table 4.11

Responses to survey question: “What is your perception of the nutritional value of the food you grew compared to typical grocery store produce?” n = 43

	Frequency	Percent
Garden produce is much more nutritious	29	67.4
Garden produce is somewhat more nutritious	12	27.9
They are the same	2	4.7
Total	43	100.0

Table 4.12

Responses to survey question: “On average, how frequently did you go to the garden to tend your plot?” n = 43

	Frequency	Percent
Less than once per week	11	25.6
1-3 times per week	23	53.5
4-6 times per week	9	20.9
Total	43	100.0

4.1.3.6 Food sharing practices in the community garden

Food sharing practices were also explored in the survey questionnaires. The respondents were asked about both the quantities of garden food that they shared and with whom they shared it. The results are shown in Tables 4.13 and 4.14, respectively. The results show that only 1 gardener or 2.3% of the sample did not share food from his/her garden. The remaining 97.7% of respondents reported sharing a portion of their garden food. Almost 49% of participants reported sharing between 10% and 25% of their garden food; 21% reported sharing over 25% of their food

The results showed that there were diverse sharing arrangements among the gardeners. Almost 24% of gardeners reported sharing their food exclusively with family members; 14.3% shared exclusively with friends. Almost 60% of gardeners reported sharing their food with more than one group; 16.6% reported sharing food with family, friends and neighbors. The results also showed that 17% of gardeners donated a portion of their food to emergency food programs.

4.1.3.7 Gardener satisfaction and future participation

Participants were asked to rate their satisfaction with their community gardening experience and whether they would participate in the garden next year. The results are shown in Tables 4.15 and 4.16, respectively. The results show that 76.7% (33 out of 43) of participants rated their community gardening experience as very good or excellent. No participants rated their experience as poor and only one gardener (2.3% of sample) rated his/her experience as fair.

When asked if they would participate in the community garden next year, 88.1% of respondents reported they would. The reasons for deciding to not participate next year were not explored in the surveys but will be explored more thoroughly in the qualitative results section.

Table 4.13

Responses to survey question: “What portion of your food did you share with others?” n = 43

	Frequency	Percent
Zero	1	2.3
Less than 10%	12	27.9
10%-25%	21	48.8
25%-50%	7	16.3
Greater than 50%	2	4.7
Total	43	100.0

Table 4.14

Responses to survey question: “With whom did you share your food from the garden?” n = 42

	Frequency	Percent
Family	10	23.8
Friends	6	14.3
Neighbors	1	2.4
Family and friends	10	23.8
Family and neighbors	1	2.4
Family and emergency food programs	1	2.4
Friends and emergency food programs	1	2.4
Family, friends and neighbors	7	16.6
Family, friends, neighbors and emergency food programs	3	7.1
Friends, neighbors, emergency food programs	1	2.4
Family, friends, emergency food programs	1	2.4
Total	42	100.0

Table 4.15

Responses to survey question: “Please rate your satisfaction with your community gardening experience.” n = 43

	Frequency	Percent
Fair	1	2.3
Good	9	20.9
Very good	21	48.8
Excellent	12	27.9
Total	43	100.0

Table 4.16

Responses to survey question: “Would you participate in this garden next year?” n = 42

	Frequency	Percent
Yes	37	88.1
No	5	11.9
Total	42	100.0

Finally, research participants responded to 3 additional questions related to their community gardening experience. Responses to all three questions are reported below.

4.1.3.8 “What was the best part of your community gardening experience?”

The responses to this question were diverse, but several themes were found. Several gardeners had multiple responses; consequently, total responses exceed 100%. Almost 50% of participants reported that the best part of their community gardening

experience was the access to healthy, fresh local food. Several of these gardeners also stated that knowing both where their food came from and that it was chemical free was the best part of their experience. For approximately 25% of participants, the best part of the experience was reported as the opportunity to learn through watching others in the garden and trying to grow new things. Networking and socializing were reported as the best part of their experience by almost 17% of the gardeners. Another seventeen percent reported that watching the life cycle of the plants, watching things grow and watching the progress of their garden were the best parts of their community gardening experience.

4.1.3.9 “What was the greatest challenge of your community gardening experience?”

The majority of responses to this question fell into five main categories: garden disease, the lack of time for gardening activities, transportation to the garden, theft in the garden and garden work. Over 40% of respondents reported that garden disease and pests, specifically the Colorado potato beetle and tomato blight were the greatest challenges of their community gardening experience. Almost 25% of respondents reported that finding the time to plan and tend their garden, to harvest their food and to do volunteer hours in the garden presented the greatest challenges. Transportation to and from the garden was reported by 12% of respondents as their greatest challenge. Theft of produce in the garden and the amount of work were each reported as the greatest challenge by 10% of respondents. Additional challenges were related to concerns with the weather and the plot fee.

4.1.3.10 “Name one thing that could improve your community gardening experience.”

Responses to this question could be divided into two main categories: (1) things the community garden organizers could do to improve the participant’s community gardening experience, and (2) things the community gardener could do. The majority of

responses to this question were related to things that the community garden organizers could do. These included ensuring better gardener compliance with garden rules; specifically, ensuring that gardeners removed diseased plants in a timely manner in order to decrease disease transmission in the garden. Improving opportunities for social networking, communication between garden staff and gardeners and security measures to prevent theft from garden plots were also reported as ways that the garden organizers could improve the participants' community gardening experience. The few responses relating to what the gardeners themselves could do to improve their community gardening experience included better planning of their gardens and finding more time to enhance their participation experience.

4.2 Qualitative Results

An exploration of the two research questions using qualitative data collection methods (i.e. semi-structured interviews and participant observation) resulted in an abundance of data. This created a rich medium, from which it was possible to draw a diversity of results that explored the research questions in greater detail.

This section reports the qualitative data, which reflects the direct experience of the community gardeners. This includes the results on gardener motivations, and the effects of community gardening on food security, gardener wellbeing, social connections, gardener knowledge and education, and connectedness to nature. A number of additional benefits relating to community gardening are also reported.

This section includes the liberal use of verbatim quotes from the gardeners' interviews, for a number of reasons. First, one of the principal goals of the research was to explore the direct experience of the community gardeners. Using the participants' own

words gave voice to these individuals and allowed them to express, in their own words, their own views and feelings relating to their experience. It also empowered the research participants by demonstrating the value of what they said. Additionally, this approach aimed to deepen understanding of specific constructs. As Corden & Sainsbury (2006, 13) report:

Verbatim quotations could offer readers greater depth of understanding. Peoples' spoken words sometimes show the strength of their views or the depths of their feelings or, on the other hand, their passivity and lack of engagement in ways that the researcher's own narrative could not.

The gardeners' words provided a rich, powerful and compelling account that brought to life the gardeners' direct experience of community gardening. Their inclusion served to increase the accuracy and conciseness of the results.

A concerted effort was made to quantify the numbers of responses to any given question in the interviews, as well as in the participant observation exercise. Where concrete numbers are not available, I have opted to use the following to describe the numbers of responses, discussion points, ideas expressed, and observations: 'few' will be used to describe up to three, 'several' will be used to describe between four and eight, and 'many' will be used to describe more than eight.

4.2.1 Motivation to join a community garden

Interview participants were asked: "What was your primary motivation for joining the community garden?" Three main motivations were reported: (1) access to land to grow food, (2) improved access to fresh vegetables, and (3) education about gardening and food production. This section explores these three motivations that, ultimately, fall under a larger theme of food security. Table 4.17 provides a summary of

the qualitative results pertaining to the question of motivation; these top motivators are explored in greater detail below.

4.2.1.1 Improved access to fresh, healthy food

Nine of the twenty interviewees reported that their primary motivation to join the community garden was to have improved access to fresh, healthy food. This desire for improved access to fresh, healthy food appears to be rooted in concerns for both human and environmental health.

...the idea of having fresh produce; that was my number one priority. I'm really into fresh food, organic food, and stuff like that. I've always tried to make that a part of my diet, so (it is great) having an opportunity to grow all of the things that I really like. (INT11)

(My) primary motivation was to grow food. (INT7)

To me, as an individual...it is just having the knowledge that you know where that food came from when you put it on the table, that it hasn't travelled thousands of miles and there might be a disease or an insect or something sprayed on it. (INT8)

I think first of all (I was motivated by) just the experience of growing and eating food. I don't really have an interest in flower gardening at all, so that was my primary motivation. (INT9)

Table 4.17

Top three motivations to join the community garden as reported in 20 interviews

Motivation	Number of interviewees
Improved access to fresh, healthy food	9
Access to land to grow food	8
Education about gardening and food production	3

Over the course of the gardening season, I had at least ten discussions at the garden with gardeners who expressed that having access to organic food was a major motivation for their participation in the community garden. A few gardeners stated that the costs of organic food in grocery stores were prohibitive. Some expressed skepticism

about the organic industry, and were unsure whether the organic food they bought at the grocery stores was truly organic. These gardeners felt that the best way to ensure that they were getting top quality, chemical-free food was to grow it themselves; the community garden provided them with that opportunity.

4.2.1.2 Access to land

Eight of the twenty interviewees reported being motivated to join the community garden because they did not have access to land that they considered either suitable or adequate for food production. Four of these eight participants lived in apartments and had no yard, while the other four had yards that were too small, too shady, or otherwise unsuitable for food production. These gardeners saw the community garden as an opportunity to have a piece of land upon which they could grow food.

I wanted to be able to grow my own vegetables and I can't do it at my house. So, here was an opportunity that I was actually going to be able to grow something. (INT18)

I grew up on a farm with a garden and being able to grow my own food was important to me and I wasn't able to do it at my home in the city. So this was an opportunity to do that within the city. (INT19)

(I) always wanted to have more gardening space because I have a real shady yard, lots of trees. There is never an opportunity to grow as much as I'd like. This looked like a wonderful opportunity to grow some food in a sunny location. (INT7)

(I) heard that there was a garden space available and I don't have any yard, so that was it (my motivation). (INT9)

We have gardens at home too, but they're half shaded all day. (INT16)

4.2.1.3 Education

A desire for educational opportunities was expressed during both the interview process and participant observation activities as another primary motivation for joining the community garden. Shortly after I sent out the Preseason Gardener Survey, which

included the Gardener Motivation Scale, one female gardener approached me to explain that her primary motivation to join the community garden was not represented in the Gardener Motivation Scale. She explained that her primary motivation was based on a desire to educate her children about their food system. Specifically, she wanted to educate them about where their food comes from, how it is produced, how to eat with the seasons, and the benefits of local food production and consumption. She is an academic with abundant gardening knowledge and experience and wanted to provide an experiential learning opportunity for her children to acquire food production and self-sufficiency skills. This gardener also participated in an interview and reiterated this motivation:

(I was motivated primarily) for educational purposes for my step-children, and I had some success. To expand on the educational thing, we have a blended family and my new family didn't really understand where food came from, or the seasons of vegetables. They were especially mixed up, I think, because they came from the southern hemisphere, so they were always requesting and, even my husband buying, way out of season vegetables that were being transported from the southern hemisphere and that was hard for me. I didn't like that. I thought the best way to deal with it was to take pleasure in seeing the seasons and understanding what grows locally and what grows in the northern hemisphere and all of those sorts of things...they got it. (INT6).

This motivation appears to have been shared by several families at the garden.

Over the course of the season, I watched five families who regularly worked together in their garden plots and involved their young children in all gardening tasks. These tasks included turning the soil, planting seeds, watering, weeding and harvesting. These families also interacted with their neighbours and the children often assisted with basic tasks in those neighbouring plots. These gardeners spoke of their desire to expose their children, at a young age, to opportunities to learn about local food production, to develop food production skills and to increase food literacy. Several older garden members expressed their joy in seeing families working together in the garden and in watching

children engage in gardening activities. They emphasized the importance of educating children and youth about gardening.

In discussions at the garden, four other gardeners (who did not do an interview) expressed that the educational opportunity that the community garden presented was a major motivator for joining. Two of these gardeners were inexperienced and felt that they would learn best by working alongside other gardeners and possibly finding mentors in the garden. The other two were more experienced gardeners who felt that they could still benefit from the knowledge of the other gardeners and acknowledged that there was always more to learn about gardening. They also expressed a curiosity and interest in learning new gardening techniques. Both inexperienced and experienced gardeners expressed that they wanted to have access to informal educational opportunities at the garden, as well as more formal educational opportunities, in the form of gardening workshops and other teachings from more experienced gardeners and/or staff.

4.2.1.4 Additional motivations

The garden membership included a number of community organizations, whose membership participated in community gardening activities. One organization that was particularly active in the garden was the Brain Injury Association of Thunder Bay and Area (BIATBA). Their clients regularly engaged in garden activities and the organization incorporated these activities into their therapy and rehabilitation programs. They had one staff person who was responsible for the general maintenance of the garden, and she brought clients to the garden on a regular basis over the course of the gardening season (at least 1-2 times per week). The main organizer of the BIATBA garden plots was also on the organization's board, and she described the organization's motivation to join the community garden as follows:

I am on the board of directors of BIATBA...and we were trying to come up with some ideas for community awareness for clients with brain injuries and for their families and the general public. So based on some of my work with my brain injury clients and thinking of how to engage them in meaningful activity I started thinking about the idea of having a place where they could go to spend time with family, friends, just by themselves, or with their workers, to help engage in meaningful activity. We looked for a spot to run a community garden and I heard about your garden and so we applied for a spot. We had two plots the first year. This is our second year, (we have) four plots this year. Awareness was the biggest thing. I wanted to do a meaningful activity for people that would raise awareness of brain injuries and services for brain injuries and prevention. I wanted a place where, if people had a brain injury, and there was a place where they could come and just talk or talk while being engaged, that would offer them an opportunity to do that. Because not everyone has that opportunity and I just find that with clients with brain injury it is just nicer if they are engaged. They're going to talk more about their lives and stuff than if you're just asking them questions, and just to feel normal. (INT20)

4.2.1.5 Motivation change over garden season

Three gardeners explained that they felt their motivation had changed over the course of the season. While they might have been initially motivated to join the garden in order to improve their access to healthy food, their experience in the garden changed their motivation for continuing to garden there. One novice male gardener reported during an interview:

At first it (my motivation) was for fresh produce, but what it actually became was growing stuff locally instead of having stuff travel from different parts of the country for me to get. It's kind of ridiculous, so why not just use what we have here and I can grow it myself, maintain it myself. I kind of realized what the earth is actually giving to me. When I get stuff from the grocery store I go in grab it and leave. But when I'm growing it myself I realize that I need the earth pretty badly to actually survive, and if something happened to all the food that was coming in, I'd be screwed. (INT17)

Two other gardeners described how they were initially motivated to try gardening out of curiosity; they had other friends involved at the garden who were encouraging them to join, and they were simply curious about gardening. However, after experiencing

some success with growing food, they explained that their motivation to continue gardening in future years would be to try out new gardening techniques, to work towards increasing their yields, and to learn food preservation skills.

It appears that motivation(s) to join the community garden was closely tied to the benefits that the gardeners hoped to derive from their experience. Although not always expressed in these specific terms, the majority of gardeners appear to be motivated, at a fundamental level, by improved food security. The gardeners wanted access to suitable land in order to grow healthy, organic food. They also wanted to access educational opportunities for themselves and their families, so that they might learn and/or improve their gardening knowledge and food production skills.

4.2.2 The effects of community gardening: the benefits

The reported benefits of community gardening were diverse, and expressed through both the participant observation activities and the interview process. The garden participants were asked during the interviews to identify what they felt were the greatest benefits of community gardening to both individuals and communities. Many of the interviewees reported multiple benefits, some of which were similar for both individuals and communities. The primary benefits of community gardening that were reported by the interviewees related to: (1) food security, (2) knowledge and education (3) social connections, (4) well-being, and (5) economics. Stress relief was also identified as a benefit of community gardening to individuals by four of the 20 interviewees. Five of the 20 interviewees reported they considered community gardening to benefit the environment. Table 4.18 summarizes the results.

4.2.2.1 Food security

Specific to food security, the interviewees reported several benefits of community gardening. These benefits included: increased access to nutritious and safe foods, economic benefits, increased community food security, increased awareness about food security issues, and reduced feelings of vulnerability relating to both their personal food security and community food security. Many of the interviewees cited multiple benefits. Table 4.19 summarizes these results which are discussed in greater detail in the following section.

Table 4.18
Primary benefits of community gardening cited by interviewees

Benefits	Number of responses	
	Benefits to individuals	Benefits to communities
Food security	14	10
Knowledge and education	11	9
Social connections	4	11
Well-being	5	8
Economic	7	2
Stress relief	4	-
Environment	-	5

Table 4.19
Reported benefits of community gardening cited by interviewees

Benefits	Number of responses
Increased access	8
Economics	9
Increased awareness	7
Reduced vulnerability	12
Community food security	10

4.2.2.1.1 Access to healthy and safe foods

Eight gardeners reported that they benefited from improved access to fresh, healthy foods as a result of their participation in the community garden. Many gardeners expressed their belief that garden produce is simply better tasting and nutritionally

superior to store-bought food. The gardeners felt this was a result of garden food being harvested at its peak ripeness and nutrition level. These gardeners believed that much of the produce purchased in grocery stores is harvested before it is ripe, and that this lowered the nutritional quality of the food. They felt the nutritional quality of store-bought food was also diminished as a result of its long-distance transport. This perception of superior taste and nutrition was expressed regularly by the gardeners the gardeners in the garden, particularly during peak harvesting times.

You get good vegetables (from the garden). Vegetables from the store, most of the time they pick them when they're still not mature yet. What you plant is mature and tastes way better. (INT12)

(I benefited from) having the fresh produce, by going from garden to table for a meal. (INT5).

For individuals, it's just better food than supermarket food. (INT13).

...it seems like the food has more nutrients in it if it is grown locally and so more benefits from eating local foods. (INT17)

(It is better food) because it's organic, no pesticides at all there. As well, you know where the food came from. (INT14)

The vast majority of the gardeners planted common crop varieties, such as carrots, beans, peas, lettuce, onions and potatoes. Several of the more experienced gardeners explained that they preferred the crops they knew, the ones with which they had the most knowledge of, and experience with, growing. They explained that they chose these varieties because they knew they would get good yields. Other gardeners preferred a more experimental approach, and planted a mix of common crop varieties and a number of novel varieties that they could not purchase in Thunder Bay.

Over the course of the growing season and during the interviews, eleven gardeners expressed their concerns about food safety. These concerns related primarily to the use of

pesticides and other chemical inputs used in conventional food production, as well as genetically modified foods. These gardeners reported that by growing their own food, they had greater control over the quality of their food and how it was produced. They knew it was grown locally and organically, and that it did not have to travel from afar. This helped reduce their concerns about food safety.

Having the knowledge that you know where that food came from when you put it on the table, that it hasn't travelled thousands of miles and there might be a disease or an insect or something sprayed on it. I grow my own stuff and it just feels better. (INT8)

There is the idea for me the food that we're getting in the grocery stores are being adulterated with chemicals, with unknown genetic experimentation...there are so many things going on. (INT10)

...(I have) not as much of a concern (about) food security but food safety. There are so many chemicals in the foods that you buy from the store. So if you can plant your own, that relieves your concerns quite significantly. (INT12)

I was able to provide food for my family that was chemical free. I didn't have to worry about pesticides. You pick a carrot from your garden, wipe it on your pants, and just eat it. You didn't have the thought: 'Oh my goodness, what has this been sprayed with?' I think that is the biggest benefit of that garden, is I know I've got safe, or as safe as anything is these days, food for my family. (INT18)

4.2.2.1.2 Economic benefits

Nine of the interviewees noted the significant economic benefits they received as a result of their participation in the community garden. These gardeners reported benefiting from cost savings on store-bought food and associated transportation costs, as well as reduced costs of seeds, materials, supplies and tools, as the garden provided opportunities for sharing many of these resources.

(I had) lower grocery bills. I can't remember the last time I did a full load of groceries. I mean, I'm going to have to start now (fall time). It has really affected my food budget. (INT9)

I estimated that I saved over \$200 on groceries just by growing. (INT13)

The big thing that people are going to be worried about is obviously money. So it's cheaper to actually grow it yourself. The way our society is set up, it's always trying to get profit. You have food there at your (disposal); you don't have to go to the grocery store to buy all of these fruits and vegetables. (INT17)

Obviously there (are) economic implications as well, just because food is expensive and particularly fresh vegetables can be expensive. And we live in a society where potato chips and manufactured things are super cheap, but if you want fresh peas you pay through the nose for it, or fresh tomatoes or that kind of thing. We live in a society where the economy seems a little topsy-turvy in terms of what is easily and cheaply available as to what is the way it actually should be. So this is a small way to remedy some of that by providing fresh food that you know is good. (INT14)

Also you can get vegetables that you can't buy from the store. They're too expensive to buy. (INT12)

Program leaders with two community organizations in the garden also reported economic benefits to their clients as a result of growing food in the garden. Both organizations work with clients who are economically disadvantaged; this food was shared amongst their clients and reduced the amount of money that they had to spend at the grocery store.

With (the Brain Injury Association), a lot of their clients are financially having issues, and they feel that they will be getting more people out to the garden because of that. So that is one direct impact. I do know that I also thought of that when we delivered a bag of food to people; it was families that would have benefited from having that food. (INT20)

I can think of a few families, who are lower income families...who that would be a significant amount of money if you went to grocery store and bought that amount of food. People were so grateful. Fresh produce is costly. (INT20)

The broader economic benefits were discussed with several avid gardeners over the gardening season. During the interviews, two gardeners also spoke about the larger

scale benefits to the local economy through supporting community gardening and other local food system initiatives.

People can buy from local gardens, and they can keep a lot of the money inside the city rather than getting taken outside. It will make people realize what benefits there are to actually eating locally, and have a better respect for their actual community. (INT17)

There is huge potential (through local food initiatives) for economic development and food security, economic security, relationship building and values clarification. (INT4)

4.2.2.1.3 Food security awareness and vulnerability

The gardeners were asked in the interviews about their level of awareness of local food security and food system issues, and their sense of feeling connected to the food system. Seven of the interviewees reported that participating in the community garden increased both their level of awareness of local food security/food system issues and their sense of connection to the food system.

Definitely. Without a doubt (it increased my connection). I've never eaten zucchini with such pride. The meals I ate for my own garden were so much more fulfilling. (INT9)

Yes I think so because it is a very much more personal thing and it's a different feeling (than) you get by eating food that you've grown yourself instead of something that you just went and swapped money for to a kid in a uniform behind a conveyor belt. Beep beep beep. (INT13)

Yes, I think so. Simply by virtue of eating what I grow, and having at least a couple of meals that are largely made up of things I grew myself. (INT14)

Yes, especially when you see something grow out of the garden, and maybe the colour or the size is very different than what you see in the grocery store that makes you really aware of: "how did they get theirs so huge and colourful?" Maybe it's supposed to look this small, and this colour. That's part of the knowledge thing, where someone said 'no it's fine, it tastes fine, it's supposed to be that colour.' (INT15)

It definitely did. I definitely realize the role I can myself play in the actual production of food. And if I don't smarten up and spread the awareness to

other people then I realize that it can become problematic way down the line... (INT17)

I was more responsible for my own food, definitely, if that's being more connected, ya. I produced food for us to eat as opposed to expecting somebody else to do it for me. So I am more connected to it that way, ya. (INT18)

In a way, in that I was helping my children to connect with it. Maybe not me personally. Although if I'm not growing anything, I don't feel as connected. If I didn't have this patch at the community garden, I wouldn't feel as connected to the food system. But being able to do it myself and then pass it on to my children helps make me feel much more connected. (INT19)

I think it's maybe a combination of the garden and some of the events here that have made me more aware of how precarious the food security issue is and how things we take for granted now maybe won't be taken for granted 20 years from now or whenever some big catastrophe might happen. It certainly has made me more aware of how dependent (we are) on the southern US and Mexico. (INT14)

Yes. I guess in that sense, yes because when my food died on me, or I didn't get to it properly... I mean obviously in the future when I have to make serious changes with food, and so it just makes me wonder how we are going to change the way we are, because we all expect everything to be so easy and convenient and yet gardening and preserving is hard when you're not used to it. It feels very inconvenient and time-consuming and in that sense of food security, I just wonder what's going to give and how are we going to adjust because I'm having a hard time adjusting and some people don't even garden so, so they're that much further removed. (INT15)

With respect to vulnerability, many of the participants reported that they recognized the vulnerability of the current food system to any number of disruptions, including climatic, economic, political, and environmental. These gardeners expressed their recognition of our community's dependence on an environmentally and economically unsustainable food system.

When asked whether participating in the community garden and developing gardening and food self-sufficiency skills helped reduce their personal sense of

vulnerability within the larger system, there was a range of responses. Some gardeners, particularly the more experienced gardeners, expressed a recognition of the complexity of the issues regarding the current food system and felt that participating in the community garden did little to ease their sense of vulnerability.

It is difficult: the weather, the elements. I am also aware of how vulnerable we are if we get cut off. If a war happens somewhere, or there is a huge disaster or something, our food source could be cut off just like that, because they all come from further south or someplace. We are very vulnerable in that sense. So I am aware of that vulnerability. It helps a little but, I'm still not feeling secure at all. Even if I can grow something, how long it takes to grow how much. If I have to count on that plot to support myself, I will be hungry. It is not easy to grow things. Especially in this climate. (INT5)

I don't have any land to grow the food on and I know that any community garden is tenuous; it can go at any time, under our current societal structure. If you're landless, having the skills to work with the land doesn't really increase your security. (INT4)

In terms of sense of security, I'm a profit of doom and gloom, and am very disturbed about climate change, so that is not something that I feel any better about because of the garden. (INT7)

Particularly because of the location of Thunder Bay, the short seasons, perhaps our age, if we had a big garden somewhere in the country it might be different. I mean, it (community gardening) sort of helps a bit, but it doesn't solve the problem obviously. (INT10)

I have a family who is extremely concerned about how vulnerable (we are) with the food system. It does (help) somewhat, but I mean, you couldn't completely survive on what I have in the freezer. No matter how hard you tried, three people are not going to live on my chard and kale and beans. (INT18)

At the same time, many experienced and novice gardeners who reported that having the ability to develop gardening and food production skills through participation in the community garden was empowering, and did reduce their overall sense of vulnerability within the current food system.

Yeah, definitely (my participation in the community garden) did (increase my awareness). It made me realize that I actually have to take care of the whole land if I'm actually going to be eating healthy, so I can't just be taking from the earth. I have to give something back in order to receive the benefits as I'm going along. So it has definitely given me a chunk of awareness. It is a symbiotic relationship. (INT17)

I knew that things were sprayed with pesticides and stuff, but just reading and talking about it (with other gardeners) makes me more aware of all that might actually be in my food that I am feeding myself and my family. And, I never really thought about how you transport; the overall footprint of bringing food in from everywhere. Participating in the garden has allowed me to not participate in that. If I need green vegetables, I walk down to my basement; I don't go to the supermarket and go buy the California 'whatevers'... I'm not buying those anymore. I'm walking to my freezer and so I'm not helping all of that continue, or I'm helping it not to continue, however you want to look at it. (INT18)

I feel like there is an alternative, if things get even worse, I have a stronger commitment now to growing as much of my own food during the summer, or at least as much as I am able to do. I have a stronger commitment now to that than before the community garden. (INT7)

I would say that gardening at the community garden has fed into my own home garden. If I had to supply myself and my family with food that is no longer being flown in or whatever, what would I be able to provide? I realize I'd have to get more in tune with the seasons and I'd really have to learn about cultivating seeds and when to start plants and really planning about food storage. So I think it gets you starting to think about that as a definite possibility. In terms of skills, sure, I think it feels really empowering to be able to know that you can grow a significant amount of food if you have to. (INT20)

I think it is way better now to have this actual skill to grow food. If someone didn't have that, say there was a big economic downturn, and someone didn't know how to take care of food, then it may be problematic for them to actually survive. Knowing how to do this you can understand what affects the food that is actually being produced, how we can prevent some of the things that are happening. Or, the other way, improve the way people are taking care of the environment as a whole or knowing how to actually grow food, being able to sustain their actual life. I think it is definitely beneficial and something that people should learn somewhere down the line. (INT17)

Anything that I can do to put food on my own table and produce it myself, I'm going to try to do. So, I feel very vulnerable, and the cost of food I think is huge and increasing all the time, and the cost of eating healthy and

organically is huge, so I think we're so vulnerable when it comes to food and proper nutritious food. Certainly being able to grow it myself helps me feel a little bit better. (INT19)

I gardened a little bit when I was young and throughout my life so now I feel that is a skill that everybody should have, definitely. It's nice to know that if worse comes to worse or if there's some kind of problem like a calamity in the world at least you could grow your own crops. (INT11)

Definitely. I think I could be very self-sufficient if I needed to be using things from the garden. I certainly could stretch it a long way if I needed to. And I do, I use everything, and I compost everything back to the soil. I like that cycle. I've been doing it for years now. This is not a new trend for me. I was gardening when gardening wasn't trendy. (INT5)

I know that I can always go to the store and buy food, but I think it is important for everyone to know, I want to teach self-sufficiency. If anybody had to grow their own food that grew up in my house they would know how to do it. They are never going to go hungry, no matter what they go through. The economy is so nuts right now, goodness knows, and we're running out of oil, we've become dependent on food that is shipped from the other side of the world. That is totally ridiculous. We have all this land and we're not using it. (INT6)

4.2.2.1.4 Community food security

With respect to food security, another theme that emerged through the participant observation and interviews was the contribution that community gardening makes to community food security. Specifically, food sharing practices and educational opportunities through the community garden were considered to benefit community food security.

Food sharing practices were explored through discussions at the garden over the growing season, through observations of food sharing practices between garden members, and also through the interview process. Several gardeners reported sharing food both within the garden (i.e. with other gardeners) and beyond the garden membership. On many occasions, I watched gardeners share food at the garden, and exchange quantities of different varieties. During an interview, one gardener explained this sharing practice:

One day I went into the garden and (my garden neighbour) was doing her kale and I was pulling some things. She asked me if I wanted to have some kale and I asked her if she wanted some potatoes, and that was great. That happened a few times. (INT5)

The gardeners also reported sharing food with family, friends and neighbours, and donating excess food to local emergency food programs. These donations were made both individually and collectively, through a garden-initiated food collection program.

A formal Food Donation Program was developed at the community garden in 2010, in response to concerns expressed by the gardeners about food that was wasted in the garden in the previous year. Three food collection events were organized at the garden during the harvest season. At these times, gardeners were given an opportunity to harvest excess or unwanted food, from their individual plot(s). Twelve gardeners donated food through this program. This food was collected and donated to the Lakehead University Student Union Food Bank and the Regional Food Distribution Association of Northwestern Ontario (RFDA), a local organization that distributes food to city and regional food banks. In total, over 200 lbs. of food were collected. Upon closer investigation of these activities, some interesting themes emerged.

Many gardeners expressed concern about food wasting, particularly during discussions at the garden. They explained how they were disturbed in the previous year to watch good food go to waste in the garden. They spoke of how they were tempted to take food from garden plots that were either poorly tended or abandoned, and to donate this food to others in need. Several gardeners explicitly expressed feeling that it was a privilege to grow food there and that they felt a sense of responsibility to not waste food. Many gardeners felt that they had an added sense of responsibility, given that this was a community garden, to ensure that any excess food from the garden was donated to

individuals and families in need in our community. These gardeners also expressed feelings of guilt if they did waste, and feelings of helplessness when they saw food on other plots go to waste. One female gardener expressed these concerns during her interview:

I didn't really find it happened as much this year because you had asked if people had extra food to donate it, but the year before there were a couple of plots where you saw food growing and you thought 'oh, if we could just take some', because you could see that it was a waste but you didn't feel like you could take it. But you thought you should so it wouldn't go to waste. (INT20)

When asked why these gardeners were donating food, rather than using it themselves, several reasons were reported. The primary ones were that the gardeners felt they lacked time and/or food preservations skills. Five gardeners explained that they simply had too much food; they did not expect their garden plot(s) to produce the quantities it had. They acknowledged that, if they donated this food, they would likely have to purchase many of these items in the grocery store during the winter months. They acknowledged that they might be costly and of lower quality, but the lack of time and food preservation skills presented significant barriers.

Several younger gardeners expressed in that they had simply not learned any food preservation skills. Several older, more experienced gardeners reported feeling relatively knowledgeable about how to use fresh food, but four of these gardeners did not know any techniques to preserve food for later use. Three of these more experienced gardeners spoke of their childhood, and about how their parents 'put up' large quantities of food, from their own gardens, for winter. They felt that the ease of access to grocery store food, coupled with an expectation to access all varieties of produce year-round have resulted in a widespread loss of once-necessary food preservation skills. During the interviews and in

discussions at the garden, several gardeners remarked at how quickly, essentially within one generation, these skills have been lost. These gardeners expressed a desire to develop food preservation skills and requested future workshops that focused on this.

Those gardeners who donated food felt that better garden coordination this year had reduced food wasting in the garden. Three gardeners who did not have excess food for donation also expressed their concerns about wasting and were grateful to have the food collection program in place to capture this food; they were also bothered by food that was wasted in the previous year. In addition to these organized food collection events, garden staff received at least 15 individual food donations from gardeners. Several also reported bringing donations from their gardens to other emergency food programs in their respective neighborhoods. These gardeners reported that this program helped the community garden make an important contribution to community food security.

Another theme that emerged from the qualitative results' analysis was how the garden served to inspire several garden participants' family members and friends to begin growing food. By inspiring others beyond the garden membership, three gardeners felt the benefits of growing food were moving beyond the boundaries of the community garden and out into the community, where it served collectively to increase community food security.

The spin off from (my gardening) too is that my daughter has built a garden out in the country. Actually both daughters have started growing things, where they had no interest before, which has been great. I mean, they could always come to me and get it, but this way here they're doing it themselves. They see the value of having it (a garden). And you feel really good when you do something like that. (INT5)

You don't know how much you're influencing other people or what they do. A number of people I know are now gardening" (INT5)

My other daughter who had the baby, whose garden I did all the work for, she probably won't be back up at this garden, because she got her father-in-law to build her one out at camp where she ended up being all summer. So, it caught on...she watched her grandparents and me garden, and she caught the bug. Watching me do it gives them the bug, it makes them realize that they don't have to go to the store and go and buy the organic carrots, and stuff that costs so much money. You can grow yourself an organic carrot. That's where my carrots went. My new granddaughter is sucking back all the carrots I grew in the garden, that's ok. (INT18)

Additionally, several gardeners felt that this community garden was a visible example of a local food security initiative, which served to increase awareness and promote gardening and local food production. One gardener expressed her thoughts on the broader impact that community gardens have on community food security:

As a community, I was just talking the other day, actually, about all of the different community gardens in the city and how food security and the (Food Security Research Network) and all that stuff is really on the rise in Thunder Bay... I personally think it's fantastic. Just visually being able to see that, our garden is a little bit withdrawn from the road, you can't really see it too much but people walking by would be able to see it...just being able to see (community gardens) around and knowing that that's going on I think it's impacting on Thunder Bay as a whole. All the publicity around (community gardens) and being able to have public events, just being able to have that many more people. Presumably the people involved in our garden wouldn't have gardens if it wasn't for this. So you've increase it (awareness and participation) by just that many more people right off the bat. And I just think it's important to increase the knowledge of where our food comes from and what we have to do to be able to have food. It increases the importance of food and the reflection on what food means and the energy that goes into producing. (INT9)

In the interviews, several gardeners did feel very hopeful of the contribution that community gardening makes to overall community food security. Several commented about how community gardening may not solve all of the problems with the food system, but it does play an important role in moving individuals and communities towards greater food security.

So it (community gardening) is definitely a step in the right direction but it is important to keep an eye on expectations. Like, from these small steps of

just growing food myself and preserving for myself, bigger and better things will spring. Like, this supermarket system didn't appear overnight either. It took decades to build up and so whatever is going to take its place will do the same. And that dynamic will be repeated on a personal level too. (INT13)

People have a politic now about growing your own food and staying away from the big agribusiness and this (the community garden) gives them an opportunity to operationalize that politic and to grow that understanding in really holistic ways. As individuals it allows people to expand their ability to take care of themselves, they can always think of the community garden and find other community gardens or maybe start one themselves. (INT7)

The more people that know how to grow their own food the better off we are. It's healthy for everybody. It is healthier to have space done up as vegetable gardens then it is as lawns with fertilizer and watering that is not going to any good except looks. I really think it is a good way to use our land, to grow our own food. " (INT6)

... I didn't know that there was so much more to learn. So I think that has taught me about just how developed this art and science is becoming, people are getting really smart about it. That is really good for our community because presumably there will be a time when we cannot access the big grocery businesses and then we will be able to take care of ourselves. (INT7)

4.2.2.2 Gardener wellbeing

The gardeners were asked during the interviews whether they felt that their participation in the community garden improved their sense of wellbeing. The gardeners reported that they received numerous benefits relating to their physical, mental and social health, as a result of their participation in the community garden. The results are summarized in Table 4.20 and discussed in greater detail in the following section.

Table 4.20

Reported well-being benefits of community gardening cited by interviewees

Well-being benefit	Number of responses
Physical-exercise	5
Physical-nutrition	7
Mental	6
Social	8

4.2.2.2.1 Physical health benefits

The physical benefits reported by the gardeners relate specifically to physical exercise and to improved diet and nutrition. With respect to physical exercise, five gardeners reported that the physical work involved in the range of gardening-related activities, including tilling, weeding, watering, and harvesting provided opportunities to exercise.

One benefit was the exercise of gardening itself. It's a lot of hard work, especially at first tilling the soil, planting, weeding, so forth. (INT11)

I can't imagine not gardening. For me to get the physical wellbeing, digging that patch and weeding it first thing in the year, wow, that was a good good workout. (INT19)

It is a healthy kind of thing because there is exercise involved, and you're learning. (INT1)

Also, exercise (is a benefit), because having a garden you have to maintain it. You have to put in your hours working there and that creates a healthy lifestyle... (INT17)

Many of the nutritional benefits that the gardeners reported receiving through their participation in the garden are reported in Section 4.2.2.1.1 Access to healthy and safe food. Access to healthy food was considered a significant health benefit and was regularly discussed at the garden, particularly towards the end of the growing season when an abundance of food was being harvested. Many gardeners spoke regularly of their harvests, and of how much tastier and more nutritious they believed their garden food was, compared with store-bought food. In the interviews, seven gardeners related this superior nutrition to the freshness of their garden food, their ability to harvest at the foods' peak ripeness and nutrition content, and their knowledge of how the food was produced (i.e. no chemicals). These gardeners felt this freshness and nutrition had important implications for their health.

I had great tasting food that is more nutritious than anything you can buy... (INT13)

...if you grow it yourself you know everything that happened to it, there's no extra pesticides or anything on it. So I think it would improve people's diets. (INT17)

...being able to grow my fresh food and knowing what was going into my food, in terms of nutrition and pesticides, or no pesticides. That is a huge benefit to me and my family, and my children particularly. Definitely that is important to me, knowing what is going into our bodies and being in control of that. (INT19)

This is a health issue for me because we do have diabetes and different conditions that run in our family. It is like preventative, I don't want them to have to deal with the repercussions of having too much sugar, too much salt. (INT8)

4.2.2.2.2 Mental health benefits

Several gardeners cited mental health benefits as a result of participating in the community garden. These mental health benefits were reported both during informal discussions with the gardeners at the site and through the interview process. The six gardeners who reported mental health benefits during the interview had varying levels of gardening experience, and all reported experiencing restorative, therapeutic and stress-relieving effects that they associated with being in the garden. Many participants at the garden were faculty and staff of Lakehead University; many reported going to the garden regularly during their work day as a form of stress-relief. Also, despite this being a community garden, many gardeners expressed that they found peacefulness and solitude in the garden. Many gardeners described this as being particularly restorative:

I would go there after a stressful day, on the days that I had the energy to, and I would leave an hour later just feeling completely renewed. (INT9)

Mentally, it was awesome because to get away from work and walk up in the sunshine or ride my bike...being outside in the sunshine and the fresh

air for an hour every afternoon. It was just awesome. It was just such a stress relief to go up there. (INT18)

I also think it (gardening) is a mental release..., you get positive psychological benefits from it, rather than being pretty stressed out. You go there, at times is a little stressful but obviously it's relaxing to go there and just pick around in the garden. It definitely helped out a lot for myself. (INT17)

I get used to the smell of the earth. It makes you feel like you're home. It is comforting. Just digging and pulling-it takes away stressors and brings you back into the moment. Being in the garden is an emotional experience for me. If something sad happens in your life, you can go to the garden and you see there is still life. (INT8)

Stress relief is a big one (benefit of gardening). I think it kind of slows you down a little bit, like it helps you with the pace of your life to get touched in to something that grows slowly and inexorably. There's not a lot you can do to control it... (INT14)

I've been gardening for 35 years, and I find it is very therapeutic...I have Parkinsons so a lot of times I can't do what I would like to do, and in that space it keeps me contained. I can't go beyond those borders, which is a good thing because I tend to get carried away. Therapeutically, health-wise it got me there and for me there's all kinds of benefits. (INT5)

You know you're in your garden and you're focused on this thing that is not something that is causing you any stress. Even if it is something that is causing you stress like potato bugs. I was able to make that into something funny. I brought my friend and we got rid of them and it was horrifying, but it is a sense of accomplishment. (INT9)

Considering it is a community garden, the thing I really liked about it is the solitude. I find it very peaceful, I do a lot of weeding after work, I'll walk over there about 5 to 6, and I'll often be the only person there. After a day of work I find it really good for unwinding. (INT14)

I just love being there. I just find it so peaceful. It makes me feel better to go there. There is always a place to go, if there is ever any downtime in the day or the evening, there is always something you can do that is going to be enjoyable. You can walk or bike there. I really enjoy being there. It lifts my soul. (INT7)

A few also reported that gardening to them was a spiritual or near-religious experience.

Well, obviously there is the whole sort of soul nurturing aspect to gardening itself, just having your hands in the soil, seeing things grow; seeing these tiny seeds turn into great big bushy plants is deeply satisfying... I'm not a religious person but it does make me feel closer to that spiritual side... like I said, I'm not religious but there is something almost religious about it, or, where I think religion is supposed to take you, you can get there this route (through gardening) as well. (INT14)

...there is just something therapeutic, and I guess that it is mental/emotional, maybe it is somewhat on a spiritual level... about getting in the dirt and starting from scratch and watching things that you plant grow. For me it is necessary. I can't imagine not doing it. (INT19)

4.2.2.2.3 Social benefits

The FSRN community garden is a relatively large community garden. There were over 80 gardeners who participated in 2010. Over the course of the research period, a significant amount of interaction was observed between gardeners, between gardeners and their families, between gardeners and garden staff, and between gardeners and community members.

Although very few gardeners reported that developing greater social connections or relationships in the garden were among their primary motivations for joining the community garden, those who did so stated that they wanted to garden with other people in order to meet other like-minded individuals.

However, several gardeners discussed the social aspect of the community garden as an unexpected and welcomed benefit of participating in the garden. One female gardener commented on how the garden in general, and her interactions with the other gardeners increased both her enjoyment of the garden and her gardening knowledge:

I would say especially in this last year more so than the first year, the sense of community I feel has really increased. I don't know if that is my comfort level or that there are just more people talking to each other more... I really enjoyed that. And I have actually increased my knowledge of gardening as a result of it. (INT7)

Several gardeners also expressed a high level of comfort with others in the garden, describing the garden as a safe place, a place where they were happy to have others with whom to share ideas and work:

Although I've gardened all my life, I've never gardened with others. This is a new experience and there is something really collaborative about the whole process. Everybody's got such great energy; it's like a folk festival. You can put your purse down in the middle of a field and nobody will touch it. And that's the way the garden is, everybody respects each other's space. I like it. (INT7)

People can meet one another, network, share skills, knowledge, interests. It allows people to build relationships based on common basic need. People can feel a part of something that is very positive. (INT4)

(The community garden) develops a safe, cooperative space. (INT4)

Whenever I was there, and any social interaction I had at the garden has been very positive and very mellow, and contributed to that sense of peace and community, that mutual trust that people had, which is just such an anomaly in this society. (INT7)

Yes (there were social benefits), and I connected to a group of people that share that interest, and that feels empowering. It is different than just planting your own vegetables in your back yard and harvesting them. You're doing it as part of community development initiative. This is a good thing to be doing, you want more people to be participating. I felt like I was a part of something. (INT7)

One novice female gardener expressed how the garden provided an opportunity to meet new people she might not have otherwise and to expand her social network:

The people that I know are twenty 'somethings' and social workers. The opportunities to meet anyone that isn't from my workplace or that's already in my social group is welcomed for me because it is a small place and it is hard to meet people anywhere. The fact that I got to talk to this amazing Chinese guy who knows everything about gardening. He's growing burdock in his garden. When would I ever get to talk to someone like that? I got to know the people that I know casually in a completely different way. It was awesome. (INT9)

Many interactions were also observed between the gardeners and other individuals who were not garden members. These were both family members and friends who visited

the garden and/or who came to assist the gardeners either occasionally or regularly. One female gardener explained how she enjoyed involving others in her garden:

I was able to involve other people, I brought my friends to help me every now and then, my parents really really wanted to see it. They came at my grad, and they were all really excited that I was participating. They wanted to see everything I was doing. My mom was really big on it. Either they wanted to feel connected to that community or just to feel confident that I do have a community out there. (INT9)

Moreover, on many occasions I watched non-participating community members wandering through the garden, and admiring the garden plots. I spoke with several of these individuals who were just passing by and were surprised to see the garden in that location. Their curiosity drew them into the garden for a closer look. Some of these community members came to the garden more regularly, when they were walking or biking in the area, or working out at the nearby pool or sporting facilities. They spoke of how the garden was beautiful, peaceful and inviting, and how they enjoyed strolling through it and looking at all of the plants.

Several garden members also spoke of having positive interactions in the garden with curious community members. One female gardener expressed a sense of pride in the garden; she was happy to explain to passers-by what the garden was about and to show them around:

I also had a lot of people come by to see the garden that didn't know about it. I had a lot of people ask me about it, how I got involved, what they could do. A lot of people just walking by, asking what it is all about. So, I felt like sort of an ambassador of the garden. (INT5)

The garden also provided an opportunity for families to work together in the garden. Several gardeners brought their children to the garden regularly and reported that it was a positive bonding experience for their families:

I would have to say it (what I enjoyed most about participating in the garden) would be the family time. I had two boys at the time, now I have three. The two boys and my husband, it was our evening activity. We could go and water the garden and take care of it, and near the end obviously we started harvesting it, pulling the food out. I would say that would be the best one. It was a good, positive activity for our family. (INT15)

...our family did it together, that was really nice. We're not a young family, so we don't have that many projects that we can do together. You feel like you're working together. (INT7)

Staff members from one of the participating organizations also explained that participation in the community garden was particularly beneficial to their clients who felt isolated within the community. Gardening with others at the site provided them with a sense of belonging and purpose. It also allowed them to engage in a meaningful activity in an environment that was non-judgmental and safe. The organization staff members explained it this way:

It provides a place to meet others and gives a context to engage in conversations, so if you go out to the garden, and you come in contact with someone and you start talking about their garden or your garden, and that's all you really need to talk about to have that connection with people. So there is an opportunity to meet someone that you have something in common with, that you might not have that same connection if you met them somewhere else, which is very important for our clients; it gives them that context. And for us too. (INT20)

Many of our (brain injury) clients experience...quite a lengthy period of time in their rehabilitation or their recovery when they are feeling quite isolated socially, but I think that could also apply to a lot of people in general. I think there's a lot of folks that don't feel a sense of community anymore, within the city. (INT20)

I had one very wonderful experience. That was the planting. That day when all these people showed up and we worked together and just had fun in a very non-stressful way, very non-clinical way. It was very human. It was a really nice way to connect and to feel a part of something. And I think all the clients, I think that really brought everybody together, whoever came, together. We had clients and non-clients. One client brought a sister; another brought their partner. We had so much fun. It was just a really good bonding. And I think about the people that came, there

was a sense of belonging and part of the planting, it really does set it up, that this is part of mine. There is an ownership there. I think if we could get more people out to that planting session, we might see more people there all summer. (INT20)

One staff member also explained how gardening at the site with their clients was very beneficial to them professionally, in terms of building stronger relationships and a deeper level of trust with their clients:

Anytime you're involved in an activity with a client, such as (gardening), you're going to be building rapport and building trust and that is going to be a helpful thing in their therapy. Working alongside each other. (INT20)

4.2.2.3 Gardener knowledge and education

Gardener education was a central theme that emerged through both the interview process and the participant observation activities over the course of the research period; this was reported repeatedly as a major benefit of participating in the community garden. The garden provided a rich experiential learning environment, one where there were numerous teachers, including both experienced gardeners and staff, and diverse learning opportunities. Opportunities for learning at the community garden are described in three broad categories: (1) formal educational opportunities, (2) interactive learning and (3) observational learning. Many gardeners described the significant contribution that their community gardening experience made to their individual knowledge and learning process and also how these learning opportunities extended beyond the garden and created benefits for the gardeners' families and friends, as well as the broader community.

4.2.2.3.1 Formal learning opportunities

A formal garden workshop series was offered at the community garden over the course of the gardening season. Garden participants provided input into workshop topic selection at the beginning of the gardening season. The workshops were delivered by a

facilitator (i.e. garden staff) and covered such topics as: composting, garden insect and disease control, permaculture, garden soils, water conservation techniques, food preservation and putting the garden to bed. The workshops were run in the evenings and were generally poorly attended; however, those who did participate reported that they found them beneficial and applied the knowledge learned to their gardening activities. Moreover, the workshop information was made available to all gardeners through email; several gardeners reported that this encouraged further discussions about the workshop topics between the gardeners and between the gardeners and garden staff.

4.2.2.3.2 Interactive learning

Interactions between gardeners, and the sharing and exchange of gardening information between the gardeners, and between gardeners and garden staff, were commonly observed in the garden. Gardeners discussed and shared their knowledge on a broad range of gardening topics, including garden bed preparation and amendment, soils, planting techniques, water conservation methods, plant identification and care, tool usage, information on beneficial and problem insects and treatments, soil health and amendment, harvesting and preservation techniques, and overall gardening knowledge. These interactions took place in both small groups (2-3 people) and larger groups (up to 8 people).

Many of the experienced gardeners readily shared their knowledge with more novice gardeners and expressed a sense of pride in being able to help others. Many reported an increased understanding of a diversity of gardening-related issues as a result of these interactions, and several reported experimenting with the newly learned techniques. Several gardeners described these interactions as very beneficial:

Everybody can go and learn. At a community garden there are so many teachers that everybody can learn what suits them. You learn different ways of doing things. It is really educational. (INT6)

People asked us different things and we would do the same thing to them, especially when we were planting. And when ours was starting to grow so fast, everyone was just amazed! So we'd always get questioned about it. (INT1)

(Community gardening) encourages cooperative skill building among people and sharing knowledge about a very basic need that we all share. It also educates the community about the possibility of people working together and the possibility of growing your own food, especially with the economy we have here. (INT4)

(I really enjoyed) talking to fellow gardeners, I found that a lot of fellow gardeners were actually quite novice at this (gardening) so they often came to me, especially after the first year and (said) wow! How did you do this, how did you do that? So it felt kind of good them coming to me... (INT11)

4.2.2.3.3 Observational learning

Another principal method of learning in the garden was reported as visual observation. One novice female gardener told me early in the season that she was a visual learner, and that the diversity of approaches and gardening techniques visible in the different garden plots provided a rich environment from which she could learn about gardening. Over the course of the growing season, I regularly watched as gardeners strolled through the community garden, observing and examining other gardeners' plots.

During conversations with the gardeners, many reported that they increased their gardening knowledge through simple observation of the diversity of methods and techniques employed by other gardeners. These individuals reported observing a large number of things in their fellow gardeners' plots, including: the vegetable varieties (particularly new or novel varieties), different planting and plant support techniques (i.e. trellises, cages, etc.), the spacing of different varieties, pest, disease and weed problems and treatments, and general progress over the course of the season. Many gardeners stated

that they were fascinated by some of the techniques they saw in the garden, and reported adopting some of these observed techniques, or experimenting with similar techniques.

The gardener interviews confirmed that this approach to learning at the garden was commonly practiced. Many participants expressed the impact this way:

Walking around the garden and seeing how people have done things differently and getting tips on how you might do things differently the next year; that is probably a more organic and more effective way for me who can't get out to the workshops. It is a more effective way of learning because you can see it. You just walk through the garden and you can't help but be inspired by what other people have done and how they've positioned things according to the sun, trying to shade in some areas. And what people can grow! I saw cantaloupes there! (INT7)

I've got some leeks still in there, and they are not growing very much. I did take a lot out but they are still too close, and I notice that someone else has them and they're really nice because they're spaced. (INT1)

For me...you get to see everyone's gardens so you learn from it. You're learning from each other, really. (INT1)

I have actually increased my knowledge of gardening as a result of it (participation in the garden). All the different contraptions and stuff you saw people put up, I feel like I learned a lot even just from peeking at other people's plots, definitely. (INT9)

I also look at many of the other techniques that other people were using to grow the same things. It was interesting to see the different styles of gardening. Square foot gardening, different supports for plants. Some people were using the elevated boxed gardens and that sort of thing. (INT16)

...being also in the community too, in some ways you can watch what other people are doing, so you are learning from other people. It is enrichment, rather than having your own plot in your back yard. (INT5)

I've learned all kinds of things in that garden this year, and through mostly my own trial and error, trying to grow things that I have never tried to grow before, and just talking to other people and just watching all the cool things that people did to try to grow their food. I definitely learned. You walk around and ask somebody about it or just talk about it and wow, it was really cool. If I didn't learn anything else, I learned that you never put vines in with anything else. They need their own turf. (INT18)

There (at the garden) you can see what everybody else is doing. We always watched. We didn't just go to our plot; we looked at what others were doing. We got different ideas. It is good learning, if you like gardening, and then you can learn more. That's great. (INT1)

These educational opportunities were consistently reported as a significant benefit by the community gardeners. The interview participants and all gardeners with whom I spoke at the garden expressed that they improved their knowledge of gardening as a result of their participation in the community garden. Additionally, the gardeners felt that putting to practice the expanding gardening knowledge that they acquired through interactions with other gardeners and observational approaches, offered a significant opportunity to strengthen this knowledge.

My second year was way better than my first year, so I definitely learned. I underestimated how well things would grow, so I overplanted and things got shaded out. This year we were completely optimistic, it is going to tower and shade everything, and we planned the garden accordingly, and everything performed very well. We were completely happy. (INT6)

It is the best way to educate. You can tell and tell and tell, but doing is how you learn. (INT6)

4.2.2.4 Connectedness to nature

Connectedness to nature was commonly reported by the gardeners as a benefit of participating in the community garden. Gardeners often expressed positive feelings relating to being outside and their appreciation for the beauty of the garden as the season progressed. They also expressed their enjoyment of the naturalistic location of the garden, which is situated beside a patch of mixed forest on the edge of the McIntyre River. The gardeners regularly discussed the weather, which, in the summer of 2010, was particularly hot and dry. They also discussed soil conditions, insect infestations, the lack of rain, the abundance of birds and bees in the garden, the groundhogs' attempts to raid the garden, and numerous other nature-related issues.

One interview question asked the gardeners specifically whether the garden provided an opportunity for gardeners to connect with nature. Interestingly, it appears that whether one considers the garden an opportunity to experience nature depends to some degree upon an individual's perspective and perception of nature. For those individuals who grew up in rural areas, the garden was considered less of a connection to nature experience; conversely, for those individuals who grew up in an urban setting, the garden offered a significant nature experience.

Blueberry gathering is a little bit more of a nature experience for me.
(INT9)

...when I think of nature I think of something that is not planted purposely by us. I grew up in a rural setting and I know where food comes from, I know that we don't go to a store, like beans don't grow at the store. I know that beans come from a plant that grows in the ground, and that is really important that my kids understand that as well. So I guess in that respect, and maybe that's because I have this antiquated or old-fashioned idea of what nature is, but if we're so urbanized, then nature might just be getting our hands dirty and planting a seed. I mean I do feel connected in that way.
(INT19)

When I reflect on it more it is a really good example of an urban nature experience. This is our little nature plot that we have. But I'm still very much aware of the wilderness that is outside our back door and how important that is too. That's just me being from Thunder Bay and growing up with the wilderness right there. Let me put it this way, I'm not one of those gardeners who hates weeds. I say, "Go for it weed, you're a survivor". I'll pull it out if it is going to damage my plot but I appreciate it because I like to see nature fight back that way. And I accept the fact that we don't have complete control. I would never want complete control of my garden. (INT9)

...when it is spring time, you should be working in the soil. Especially being in a condo, you feel not attached to the outside environment as much as if you were in a house with a yard. (INT1)

I think a human being should have closer ties with nature. You're sitting at the office working all the time...missing one important part of your life.
(INT10)

There's just something to planting a seed and watching it grow. The eternal process. Just watching what happens. I've always been amazed at how the ground can be frozen so hard and yet there's life underneath it, right there under you. You just plant a seed and you think nothing can come up. It's just watching the process. (INT16)

You're standing in the garden and watching a bird sitting on top of a pole, singing and stuff. You feel very connected (to nature). You hear the geese honking all the time, and watch the groundhogs raise their families, whether you want them in the garden or not, they are there. You do feel more a part of it, other than just enjoying what is around, you do feel more a part of everything because you're growing the stuff. (INT18)

One male gardener reported that he did not make distinctions between what was considered natural and unnatural:

“In terms of connection to nature, I have a fairly daily experience myself, as a part of nature and the everyday things I do as being natural because, one of the catch phrases I like to use is ‘nothing unnatural exists’. It is all made of nature from nature by nature. So, the garden was very very enjoyable to me on lots of levels, and connection to nature is definitely part of that...” (INT13)

Several gardeners expressed a particularly strong sense of connection with nature while in the garden:

It is such a wonderful feeling, the air is just warming up, the dirt between your toes is still moist and squishing a little bit. I would go into the garden barefoot, because that's always what I did when I was a kid. Everything smells wonderful, you know, the sun is just rising and everything is just so alive. It is fantastic. Early morning is definitely my favorite time to do this sort of thing, but it is not the most social time. (INT13)

That first planting was really good because you're right in the garden. When I saw the weeds with all the thorns, I thought “Oh my God!” I think that is when I brought the picnic table. I needed to sit down!” It was very much to connect with nature. (INT20)

I think the thing that people need to get is that we are a part of nature and that the extinction of one species is the extinction of a part of us. And I think that sort of dismemberment that you're referring to, that alienation from those things, is very convenient, because it allows us to just watch climate change go by, and watch how it impacts us: “Oh, isn't it a nice warm day”. And we don't have to think about what is really going on,

because we don't have a day-to-day connection, we don't depend on the rain anymore, so we don't really care if it rains, as a matter of fact we would prefer if it doesn't. And we don't really know how windy it can get, whether that wind is getting bigger, we don't have the experiences and interactions with nature and therefore we don't have those measuring sticks. So we are not really aware of what is happening around us, so I think any experience with nature is a positive experience, and I think that if we could kind of shift the thinking a little bit to the idea that this is part of us. Those bugs in the potato patch-those are just another type of being, just another kind of life. We don't necessarily have any authority over that kind of life, or we shouldn't necessarily have, and we have to learn how to work with that, work in harmony with it. So, any experience people have that helps them bridge that alienation has got to be a socially positive thing. Being a little person in a great huge field of food, in a great huge communal initiative, being one person in a group of many with an ethic and a value that is way beyond me, and that value connects us to nature and to the growth of things, and the death of things and that is profound. So you ask about social connections, and while I can't really profess to have made a lot of new friends there, I know that I am part of a social movement that is bigger than me and connects to the natural world. (INT7)

When I'm out there it's kind of another world, it's relaxing, you have the trees of the river, so I think it's a pretty good connection to the natural environment. The garden itself is kind of open and stark in the spring, there's not really much there. But later in the summer when everything is growing. But in the larger picture yeah I think you're getting a good connection to nature by going to the garden. Especially if you live in an apartment like I do. It's really nice to be able to get out there and relax in a natural environment. (INT10)

Several gardeners also expressed the importance of children having an opportunity to connect with nature through the garden:

...especially with the kids, it is very important, they need to know how a flower grows, or how a zucchini is grown. They have to experience the impressions of food, different situation, different features of food. It makes you a more complete kind of human being. (INT10)

I always taught my kids the earth is our mother and they would really laugh. I said what we do to the earth really impacts us, eventually. It is going to come back. So if the earth is not healthy, we're not healthy. So what we do now, when we go in the spring and we dig up the ground, scratch her back and let all these itches out, let it into the air and then we plant and let things go back into the earth, and then we harvest, we compost, we put it back, so it is all a cycle. But in the fall, when she is getting ready to sleep, we rake the leaves, we scratch her back, and get her

all ready, primed up for this nice long sleep where the snow is going to come and cover her up and let her be energized, like the bears to come back and help us. But if we don't do that, then we are not going to be healthy either. So we have to make sure we take care of the earth and that we do these things that help our mother earth be healthy. (INT8)

4.2.2.5 Additional benefits

A number of additional benefits of community gardening were reported during the interview process. One benefit expressed by several gardeners was a sense of connection with the past. Specifically, these gardeners spoke of a connection they felt to their parents and grandparents, particularly those from whom they acquired a love of gardening.

My mother passed away almost 10 years ago now and I mean I think I gained this love of gardening from her and when I'm in the garden I think of her and it is kind of an opportunity for me to kind of connect with her too, so there's all that going on too. (INT19)

It's also tied into a lot of memories because my mom gardened and when I was little and I just remember eating from the garden and the taste of the food. That would be the main primary reason why I wanted (to join). (INT15)

As I was working in this garden I was thinking about my grandparents' remarkable garden. I had two sets of grandparents on one side he was like "oh I just took a handful of seeds and threw them in". He would have vegetables all year. The other ones were very technical and raising crops of tomatoes and cucumbers in the greenhouse and either approach, I like being able to see the connection in between me and my grandparents and just thinking: "it is okay if I don't get a perfect this year". This is totally a lifelong journey and I'm going to keep on doing this and learning every single year. (INT9)

My mother used to have a very large garden, really large, and really enjoyed gardening. It's in my genes to carry on my mother's tradition. Her whole family was farmers. I don't know if that's a spiritual thing or not. I know that my mother felt very spiritual when she was in the garden. All the time she was growing things and liked to watch them. She'd plant the seeds and then transplant them, and then transplant again. I love that she felt a part of it. (INT10)

I don't know if I really can explain it but there's something about having your hands in the soil, it's kind of an old, not in terms of age, but in terms

of connecting to the past, and the way people have done this for thousands of years, it is kind of primitive. (INT14)

Cooperation and reciprocity were also expressed by the gardeners as important benefits of community gardening. During both interactions with gardeners at the garden and during the interviews, several gardeners reported cooperating with other gardeners and sharing gardening-related tasks and responsibilities. This reciprocally supportive relationship developed between many of the gardeners. The gardeners reported taking care of each others' garden plots while they were on vacation or away from the garden for a period of time during the growing season. Many gardeners considered the cooperative and supportive nature of this dynamic to be beneficial.

(We) can learn from each other. I think that is one of the most important things, because no matter how much I've gardened over the years, I definitely learned things from people this year. And it helped. If I go away, there are people who are willing to help me and water my garden, they didn't just let it dry out and maybe survive. As an individual, that's what I enjoy. (INT18)

I met people in the garden, I watered for them and they watered for me, so there was an exchange that way and it felt really good to be watering other people's gardens. I really got something out of that, for sure. I would come and water my plot, and I'm used to larger gardens, so I was happy to meet other people and help take care of their gardens. (INT4)

Participation in the garden had a particularly profound impact on one female gardener. This individual is an experienced gardener who has spent a significant portion of her life living in poverty; she currently battles a number of major health issues. During our interview she explained how significantly she has benefited from being a member of the community garden:

The idea of being a gardener; my self-concept of somebody who grows food and who has the opportunity to live out the connection that I feel. It has affected me in a positive way. It is a very deep connection, it is very primally important to me. So to not be able to express that, really just because of poverty, not because of unwillingness or anything, makes you

feel deprived and blocks other self-expressions. So, to be able to have a garden as part of my life makes me feel like more of a whole person. (INT4)

This individual went on to explain how being a member of the garden also helped her to break through some personal barriers and improve her quality of life. Prior to joining the community garden, she had a strong aversion to what she described as ‘privilege’, which she associated with the University and higher education. As she spent time in the community garden, she began to meet friendly Lakehead University faculty, staff and students who unknowingly inspired her to explore her assumptions about the University and those associated with it. She had for a long time wanted to access some academic training in order to achieve some employment goals, but perceived too many barriers, which she thought were impermeable to her. She explained it this way:

But being involved in the garden, which was on University property, was one of the things that helped dissolve some of those barriers for me. I am a kinesthetic person, so physically putting my body on University property and finding it to be friendly, made a very big difference in my willingness to feel a part of the University. (INT4)

Over the course of the growing season this gardener slowly began exploring the campus grounds on foot, then began venturing into the buildings. In one building she saw a poster advertising a course that she was interested in taking and, within a few weeks, registered for two University courses. When we conducted the interview, she was into her second month of class and expressed amazement with how she had spent so much of her life feeling as though she could not possibly belong in an academic setting, and how inspired and empowered she felt in having transcended those barriers and established herself as a University student. She put it this way:

I’m beginning to understand what higher learning means. I think it is a privilege to be able to be a student. The garden helped get me back to education. (INT4)

Gardener satisfaction was also explored both in the interview process and through participant observation. When asked whether they would participate in the garden next year, overwhelmingly, the respondents said they would participate. Only 4 gardeners expressed that they would not participate, for the following reasons.

Two gardeners expressed disappointment in the transmission of disease in the garden. Consistent with the quantitative results from the survey questionnaires, the gardeners reported feeling upset and disappointed by a tomato blight that destroyed the majority of tomato and potato crops throughout the garden. These gardeners attributed their loss to the close proximity of other garden plots and of transmission of disease through the garden.

The gardeners reported feeling they had little control over the transmission of disease and of the actions (and inactions) of fellow gardeners with respect to disease control. The two other gardeners who said they would not participate in the garden next year reported the reason as being a change in their living situation, which would allow them to garden at home. One gardener put it this way:

(I'm) not sure (if we will participate next year), because we bought a house with a big yard. The answer is yes, we will grow a little garden patch, but it will be at our own house...so you shouldn't think of losing us, you should think we graduated. We've graduated to being people who are going to grow our own vegetables now. And I hope that our children will grow up growing their own vegetables and taking the pleasure that comes from that.
(INT6)

These combined quantitative and qualitative research results provided a significant amount of insight into the motivations and diverse and abundant benefits of the

community gardening experience. The deeper meanings and implications of these results will be discussed in the following chapter.

CHAPTER 5

DISCUSSION

5.1 Introduction

The current exploration of community gardening motivations and impacts on gardener wellbeing, gardener knowledge, perceived food security and connectedness to nature yielded a substantial volume of data, which provides an abundant insight into the experience of community gardening. This section synthesizes the outcomes of the research, explores limitations and provides suggestions for future research.

5.2 Motivation

My first goal in this research was to investigate motivation(s) for participation in a community garden. During an initial examination of the results, the quantitative and qualitative results appeared to identify different motivations. Whereas the quantitative results identified the top three motivations as health concerns, environmental concerns, and connection to nature, the qualitative results seemed to identify dimensions of food security, namely improved access to fresh, healthy food, access to land to grow food and education about gardening and food production as primary motivations. However, a closer examination of the Gardener Motivation Scale revealed that the results from the two research methods actually reinforce each other.

As discussed earlier, the Gardener Motivation Scale was developed in an attempt to create a quantitative measure of seven diverse motivations, including (1) economic concerns, (2) health concerns, (3) social connections, (4) environmental concerns, (5) global food system concerns, (6) interest in gardening, and (7) connection to nature. A closer examination of both the health concerns and environmental concerns motivation subscales revealed that several of the items in each scale were in fact associated with food security. Specific to the environmental concerns subscale, four of the five items relate specifically to dimensions of food security, namely chemicals in food, food miles and energy consumption in food production, and support for more environmentally friendly local food systems. The high reporting of these motivation categories by the community gardeners thus signifies considerable food security-related motivations for participating in the community garden. The fact that the Gardener Motivation Scale did not include a subscale that explicitly explored food security as a motivation to join a community garden may be a flaw in the design of the scale. Several of the other subscales include items relating to food security and many of these were identified as important within each of the subscales. I would recommend that the Gardener Motivation Scale be reworked to create a more cohesive food security subscale that explores motivations relating to the diverse dimensions of food security. This may clarify the level of motivation to join the community gardens that is based on food security concerns.

Economic concerns were rated as the lowest motivation to join the community garden in the pre-season survey. The reason this motivation rated so low among this group of gardeners may be explained by the gardener demographics. Overall garden participants reported both high postsecondary education and income levels, which were positively correlated. Ninety percent of participants reported the completion of

postsecondary education, with nearly 70% at the undergraduate, masters or doctoral level. Income levels in the garden were correspondingly high, with nearly 70% of gardeners reporting annual income levels greater than \$40 000; 45% of these were higher than \$60 000.

The results also showed that as education and income levels increased, so too did perceived food security, which means that the higher the gardeners' education and income, the more food secure he/she reported feeling. Not surprisingly, significant negative correlations were found between motivation based on economic concerns and both income and perceived food security. This means that participants who reported lower incomes and lower perceived food security were more motivated to join the community garden because of economic concerns. Gardeners who were motivated by economic concerns to join the garden may have believed that their participation in the garden would improve their food security by increasing their access to fresh food, by reducing food costs and/or by reducing the amount of money they would be required to spend to purchase food elsewhere.

Interestingly, significant negative correlations between overall concern about the current global food system and age, income, and perceived food security were found (these three variables correlated positively with one another). This means that those who reported higher age, income and higher perceived food security reported a lesser concern with the current global food system. Likewise, it was found that motivation to join the garden out of environmental concerns was negatively correlated with income and age. At the same time, significant positive correlations were found between concern about the current global food system and motivation based on both environmental concerns and economic concerns. This means that as concern for the global food system increased,

individuals reported being more motivated to join the community garden because of both environmental and economic concerns. Both of these motivation categories are related to food security.

One might speculate that older, more financially secure gardeners felt more food secure and thus potentially less motivated or concerned by environmental and global food system concerns than those with lower incomes. These gardeners may have felt that they had more options with respect to food access and/or food choices, and could thus support alternative food systems that represented lesser environmental concerns. Further research that explores why these gardeners are less motivated by these variables is recommended.

These results seem plausible, given that those gardeners who earn more money would presumably have increased economic access to food through both conventional (i.e. grocery stores) and alternative (i.e. farmers markets and other local food sources) channels and, consequently, increased food choices. Indeed, it has been argued that “consumers in higher income or social class groupings have more flexibility to afford the trade-offs between costs and perceived benefits” associated with local food purchasing (Weatherell, Tregear & Allinson, 2003, 234). Those community gardeners reporting lower income might feel more vulnerable within the current global food system as they might experience reduced flexibility in terms of access to food.

The three key motivations for joining the community garden reported through the qualitative methods were all related to food security. These included access to land to grow food, access to fresh, nutritious food and access to educational opportunities to increase gardening knowledge. Access to land to grow food was cited as a primary motivation by several gardeners. Many gardeners did not currently have access to land because they lived in condos and apartment buildings. Other gardeners reported having

yards that were too small, too shady or otherwise unsuitable for food production. These gardeners felt that the community garden provided an opportunity to access productive land upon which they could grow food. A few gardeners reported using the community garden to expand their home gardening efforts; they did some gardening at their home, but their yards were not large enough to accommodate the level of gardening/food production they desired, so the community garden filled this need.

Several gardeners reported that they had increased their gardening activities during the 2010 gardening season by registering for and working multiple garden plots. They reported having some success gardening on one plot during the previous growing season and felt motivated by this success to expand their gardening efforts and grow more food. Many of these gardeners explained that they were growing larger crops of the vegetables they had grown in the previous year as well as new varieties that they wanted to try; they watched some of their garden neighbors have success with those particular varieties and, in some instances, were invited to sample them.

Many of the participants reported being motivated to participate in the community garden by a desire to improve their access to fresh, healthy food. These gardeners reported that they believed garden food was nutritionally superior to grocery-store food, and wanted to maximize their access to these foods for themselves and their families. Several gardeners also expressed that having access to organic food specifically was a major motivation for participation in the garden. These gardeners felt that the best way to ensure that they were getting top quality, chemical-free food was to grow it themselves; they felt the community garden provided them with that opportunity. For example, one female gardener was awaiting the birth of a grandchild and was growing food specifically for her. She explained to me that when this child reached six months of age in April 2011,

she would be ready to have her first solid foods but there would be no fresh local produce available. This gardener wanted to preserve (i.e. freeze) garden fresh produce to ensure that her grandchild's first foods would be chemical and preservative free.

The third key motivation that was reported by the community gardeners was to access educational opportunities to increase both gardening and food system knowledge. Many gardeners expressed the desire to access experiential learning opportunities for both themselves and their families, specifically for their children. Several gardeners reported being committed to exposing their children to gardening at an early age, to learn about local food production and develop food production and self-sufficiency skills, and to increase food literacy. Specifically, these parents wanted to educate their children about where their food comes from, how to eat with the seasons, the names of common locally grown foods, how to grow food, and the benefits of local food production and consumption.

This commitment was evident in the ways in which parents included their children in their gardening activities. Children were asked to help with planting, watering, weeding, and harvesting, but were also allowed to roam through the garden, to explore and play, and to interact with other children and gardeners at the site

I regularly brought my young children with me to the garden, as they were actively engaged in this gardening project. Similar to other children who spent time in the garden, mine enjoyed exploring the different garden plots, going on bug hunts, picking peas and carrots for sharing with other gardeners, chasing butterflies, watching the groundhogs, and digging in the dirt throughout the garden site. They interacted regularly with other children and other gardeners, and there were always many questions about the plants, the animals, and the "dirt". The garden was a wonderful zone for exploration and

play, as it provided a safe place where their curiosity and creativity were allowed to run freely, where they could interact on many levels with the natural world, and with people who were encouraging, supportive, kind, and inclusive. It was common to watch children engage in gardening activities with others (beyond their families) in the garden, including those in neighboring plots.

My two sons, who are not particularly shy, would regularly approach other gardeners and ask them if they needed any help watering their plants. Without exception, they were greeted by the other gardeners with a smile and a watering can. While they worked together, my children would ask questions about their garden, the kinds of foods they were growing, and they were often offered a sampling of different or unknown varieties. When their work was done they would often pick peas or carrots from our family plot and offer them to their new garden friends. I watched, delighted, as the lessons of helping others, sharing, reciprocity, service, and gratitude unfolded. These relationships grew over the course of the gardening season, and although my children never knew most of these gardeners by name, they referred to them as their garden friends. My sons commonly sought them out when we visited the garden. Similarly, a family who had a plot next to ours also had young children who regularly helped us with our gardening activities, especially the harvesting and snacking.

There is a considerable body of literature trumpeting the importance of childhood play in natural environments as a precursor to environmental interests, careers, attitudes and concerns (Tanner, 1980; Wells & Lekies, 2006). However, urban sprawl and environmental degradation reduce the frequency of urban children's positive experiences with natural elements in their environment (Finch, 2004; Kellert, 2002; Orr, 2002). An evaluative review by Blair (2009) of school gardening programs in the United States

revealed numerous and diverse benefits to children, including the broadening of experience with natural ecosystem complexity, learning about the local ecology and “the clouds, rain, and sun, the seasonal cycle, the soil and its myriad organisms, the insects, arachnids, birds, reptiles, and mammals that visit the garden teach about place” (Blair, 2009, p. 17).

Several gardeners expressed that they felt the community garden presented a significant experiential learning opportunity; this was major motivator for joining. Many inexperienced gardeners felt they would learn best by working alongside other gardeners and possibly finding mentors in the garden. More experienced gardeners felt they would still benefit from the knowledge of other gardeners at the site. Inexperienced and experienced gardeners alike expressed an interest in accessing both informal and more formal educational opportunities (i.e. gardening workshops) at the community garden site.

Many gardeners reported that education was a significant motivation to join the garden. More specifically, these gardeners saw that the diversity of knowledge brought to the garden by the membership presented a significant opportunity for knowledge exchange and sharing within the community garden. The interactive and observational learning opportunities provided a foundation for experiential learning.

Several additional motivations were also reported. Some of the participating community organizations reported being motivated in order to provide their lower-income clients with healthy, affordable food options. The Brain Injury Association of Thunder Bay and Area (BIATBA) reported being motivated to participate in the community garden in order to provide a meaningful activity for people with brain injury, to raise

awareness of brain injury, services and prevention. Participation in the garden was also a way to provide their clients with a safe, meaningful, inclusive and engaging activity.

These results on motivation provide further insight into our understanding of the factors that motivate individuals to participate in community gardening. Consistent with the research by Curran (1993) and Gelsi (1999), it appears that benefits obtained from gardening provide a powerful motivator to participate in community gardening.

Although not explicitly explored in the data collection, the results of this study appear to support the work of Waliczek et al. (1996) and Lee (2001), who concluded that community gardening meets all of the levels of needs on Maslow's Hierarchy of Needs. Given the high education and income level among the garden membership, the majority of the gardeners were presumably not motivated to join the garden for physiological needs (i.e. need for food, water, shelter), but rather were motivated for higher level needs such as need for achievement, education or competence, or needs for self-actualization. Further investigations on motivation using this model could help to deconstruct the commonly held belief that community gardens are for economically disadvantaged individuals and neighborhoods. It might provide additional insight into the diverse and 'higher level' needs that community gardens meet for individuals of diverse socio-economic backgrounds.

The results of this study create an opportunity to make improvements to several of the subscales within the Gardener Motivation Scale, most significant perhaps is the creation of a separate food security subscale as described above. This would help to improve the measurement of several of the motivation constructs. Further studies that identify those factors that attract people to community gardens, and what sets them apart from those individuals who, to date, choose not to participate, will provide insight into

how to encourage greater participation in community gardens. This is important for a number of reasons.

First, as increasing numbers of communities worldwide are initiating community gardening programs, knowledge about motivation to participate in a community garden may inform public policies aimed at supporting community garden initiatives. Also, this knowledge may increase our understanding of how and why an individual may be drawn from the contemporary agri-industrial food system and move towards more resilient local food systems. Consequently, this may allow for the development of community garden programs and, potentially, other alternative local food system initiatives, which inspire, support, enhance and maximize participation so that the diverse benefits of participation may be realized.

5.3 The impacts of community gardening: the benefits

Consistent with other research that explored the benefits of community gardening, the current research showed that community gardening provided individuals with numerous and diverse benefits. Although the quantitative results showed only a significant increase in the level of gardening knowledge in the gardening group compared to the control group, the qualitative results provide a rich, abundant and compelling account of benefits derived from the community gardening experience. The qualitative data included the thoughts and reflections that were reported by the gardeners themselves through the interview process, as well as their actions and behaviours, which were observed through the participant observation activities. The qualitative results revealed meaningful impacts with respect to the four measured variables (i.e. wellbeing, perceived food security, connectedness to nature, and gardener knowledge).

The lack of significant impacts in the quantitative data on well-being, perceived food security, and connectedness to nature are perhaps, in part, explained by the design of the control group in this study. The control group was analogous to the gardeners' group in that it was comprised of a similar number of research participants with comparable demographics, including gender, education, income and ethnicity. The two groups differed only in age, with the age of the gardeners being significantly older. Initially, this was considered to be a strength in the research design; however, a closer examination of the control group revealed some potential concerns.

The control group participants were selected from the author's general email contact list, which had been accumulated over a period of 15 years. It consisted of friends and acquaintances, and professional and academic contacts, who shared many similar personal and professional interests and values. Many of these individuals were eco-centric, environmentally conscious, and outdoorsy, and involved in ecological, outdoor education, community development, and food security-related work. Although none of control group participants were participants in the community garden, the control group participants may have had experiences over the course of the research period that mimicked some of the potential effects of community gardening. These may have included outdoor recreation and tripping, as well as other experiential nature experiences and/or participation in other community food security initiatives. Their experiences may have affected their responses in the postseason, which may have impacted the quantitative results.

In an effort to exclude any control group participants who may have received the benefits of any form of gardening during the research period, the respondents were asked if they were a gardener and if they had gardened during the summer. However, no

definitions of ‘gardener’ or ‘gardening’ were provided. Therefore, some of the control group participants may have been involved in some form of gardening-related activity over the course of the research period, but may not have either perceived it and/or reported it as such. Consequently, these individuals may have been impacted from these activities, which may have affected their responses (compared with someone who did not do any form of gardening whatsoever over the course of the research period).

5.3.1 Food Security

The investigation of the impacts of community gardening on food security revealed that the community garden offered a number of benefits relating to food security. These benefits included increased access to nutritious and safe foods, economic savings on food, increased community food security, increased awareness about food security issues, and reduced feelings of vulnerability relating to both personal and community food security.

The quantitative results showed that there was no significant difference in perceived food security between the gardeners and the control group overall, but there was a significant increase in measures of perceived food security between the preseason and the postseason such that both groups felt greater food security in the postseason. The issues with the control group may have affected the results; additional research with a control group that is more representative of the general population may reveal different results.

Both preseason and postseason mean score measures of perceived food security were relatively high for the sample, suggesting that a significant proportion of gardeners felt reasonably food secure. However, the qualitative results relating to motivation

indicated that the gardeners were motivated to participate in the community garden primarily for food security-related reasons. These included desires to access to land to grow food, to improve access to healthy and safe foods, and to access educational opportunities to increase both gardening and food system knowledge. These motivations indicate concerns about broader dimensions of food security, and may also shed light on how people perceive the concept of food security.

The mean education and income levels among the gardeners were relatively high, and these were positively correlated with perceived food security. In both the quantitative and qualitative data, gardeners expressed concerns about the global food system, including concerns about food miles, chemical inputs, genetically modified foods, and energy consumption; however, this did not appear to have factored strongly in their sense of perceived food security (i.e. it remained high). Although the Perceived Food Security Scale does not solely measure food security based on economic conditions, income may remain a strong factor in individuals' perceptions of food security.

The popular discourse on food security has historically centered on economic access to food; however, in recent years definitions of food security have expanded to include measures of economic and physical access to food that is safe, culturally appropriate, and sustainably produced. The results of this study indicate that food security may continue to be perceived primarily as an economic condition; (i.e. having the economic means to access sufficient quantities of food), rather than being about a more holistic definition and approach to food security. As one gardener put it succinctly: "I never thought of it as food security. I just thought of it as me growing food for my family" (INT8).

Further investigations of gardener perceptions of food security may reveal how people understand different components and measures of food security, and would provide insight into factors distinct from economics that may play a part in an individual's personal sense of food security. Opportunities to share educational resources relating to food security issues with gardeners may also benefit the gardeners in terms of creating a common language around some of the broader issues relating to individual, community and global food security.

Although the cultural diversity within the garden was relatively low, several gardeners from Asian descent expressed that the garden provided an important opportunity to grow their favorite foods that were either not available or affordable locally. Additional research that explores the food security impacts of this garden and other local community gardens on Thunder Bay's diverse cultural population may provide further insight into the magnitude of the contribution of community gardens.

The community garden was also reported to make important contributions to community food security. These contributions were reported in the form of food sharing practices which occurred both in the garden and beyond the garden, and into the community. The results showed that an abundance of excess food produced at this garden was donated to local emergency food programs rather than being preserved for future use by the gardeners. The primary reasons for this practice were cited as being a lack of food preservation knowledge and skills, as well as time to do it. This brings to light the reality that food preservation skills, which were common practice just a generation or so ago, have been lost to a remarkable degree.

Thunder Bay is located in a northern climate with a short, 5-month growing season. This means that food production activities in this region occur for less than half of

the year. For the remainder of the year, our community is largely dependent on the dominant food system, which supports unsustainable food production practices. These foods are produced in warmer climates using energy intensive and socially and environmentally destructive methods, and then transported long distances to our city. Creating educational opportunities to learn food preservation skills should be encouraged at every opportunity. This may help reduce our community's reliance on this current food system, increase and strengthen our community's internal capacity to provide for the needs of its residents, and help increase our community's resilience to external impacts on the food system.

The qualitative results also showed that participation in the garden increased both an individual's awareness of food security, and their sense of connection to the food system. Neither of these were explored in the quantitative data. In terms of the gardeners' sense of vulnerability within the larger food system, a mix of responses in the qualitative data suggested that the gardeners felt vulnerable to varying degrees. It appeared that the more experienced gardeners felt that their participation in the community garden did little to ease their sense of vulnerability, while the newer gardeners generally expressed feeling less vulnerable as a result of participation. Additional research that explores how levels of gardening knowledge and/or gardening experience impacts one's sense of vulnerability within the current food system is recommended.

5.3.2 Gardener Wellbeing

Although the quantitative results revealed no significant effect of community gardening on gardener wellbeing, the qualitative results provided a rich account of numerous health and wellbeing benefits. The gardeners reported that the community

garden opportunities for increased physical activity, improved access to healthy, nutritious and safe food, and improved diet. In terms of mental health, both the garden setting itself as well as the gardening activities offered opportunities for stress relief and restoration. For many gardeners, participation in the community garden also offered an opportunity to slow the pace of life, if even temporarily, to watch the process of growth and change within the garden. The gardeners attributed many of the restorative and mental health benefits of their participation in the garden to the opportunity to connect with nature within the garden, which will be discussed in greater detail below.

The current research also showed that the gardeners benefited from their social interactions in the garden. Although the desire to increase social connections was not identified as a significant motivator for participation in the garden, social connections and relationship building were regularly reported as additional and welcomed benefits of participation in the garden. The community garden provided an opportunity for people to come together and connect, communicate, cooperate, socialize, and build relationships with other individuals in their community. Due to its nature and location, the community garden brought together individuals from diverse socio-economic, cultural, educational and professional backgrounds and provided a genuine mixing of community members. Numerous participants reported benefiting from meeting and interacting with other individuals in the garden they would not likely have had the opportunity to meet in their daily lives outside of the garden.

The age range of the garden participants was 59 years, with the youngest gardener being 21 years old and the oldest being 80 years old (children's ages were not included). This wide age range provided abundant opportunity for intergenerational learning within the garden. This was apparent in both the interactions and knowledge sharing among

garden participants, as well as among families who participated together in the garden. Many families reported that gardening together with their families was the highlight of their community gardening experience. The garden provided an opportunity for both young and older families to work together towards a common goal, and to learn together. Many parents with young children expressed the importance of having “family activities” and spoke of the garden as a bonding experience for their families. The actual educational and knowledge-sharing benefits of these interactions will be described in greater detail below.

Gardeners reported that the interactions with other gardeners enriched their experience and provided opportunities for cooperation and reciprocity, and for sharing and exchanging information and knowledge. The garden provided a ‘common ground’ or shared context from which to begin building relationships with others who shared common interests. Many returning gardeners also reported that their relationships with other gardeners had deepened over the course of their two-year involvement in the garden; they reported feeling more comfortable with the other gardeners, enjoying the company of the other gardeners and looking forward to seeing them in the garden.

In the case of the participating community organizations, the current study revealed that the garden provided a safe and positive space for organization staff and their clients to work together towards a common goal, which was reported as important for relationship building and deepening levels of trust between staff and clients. The garden also provided an important space for social inclusion and reduced feelings of isolation in their clients.

The newly constructed wheelchair-accessible plots and raised beds were regularly used by organization clients and helped to both increase the accessibility of the garden

program and to raise awareness of the challenges and needs of many of our community members. The garden provided a space where participants gained social support in a cooperative environment; several gardeners reported feeling positively about contributing to something healthy and beneficial in their community. Again, participation in the garden established a common ground from which participants of all backgrounds and levels of ability could interact. The presence of diverse community organizations in the community garden also helped to raise awareness of some of the social, economic, health issues, and other challenges faced by individuals and families of our own community.

The development of additional garden programs that encourage greater inclusion of diverse community organizations in the garden may benefit organization staff and their clients as well as the garden membership and the broader community. For example, community practitioners could use gardening programs in their therapy and rehabilitation initiatives to benefit the mental and physical health and wellbeing of their clients, and also to reduce isolation by encouraging greater social inclusion. Community garden staff could develop strategies to strengthen partnerships with local agencies and organizations, and create programs that meet the diverse needs of broader segments of the community.

The gardeners described how cooperation in the garden was an important and beneficial part of their experience. They worked with and supported their garden neighbors when they were away, and were happy to help others in the garden who required additional assistance. These relationships do not appear to have moved beyond the boundaries of the garden (i.e. into friendships); however, this is a relatively new garden and several gardeners did report that their relationships with other gardeners had deepened and grown more comfortable over the course of their two-year participation in the garden. The diverse membership allowed for interaction and mingling between

individuals who may not otherwise have had the opportunity to meet in their daily lives. As different plants, techniques and approaches to gardening from diverse cultural backgrounds were introduced in the garden, several gardeners reported a sense of enrichment in their gardening experience.

Further research that explores the differences in relationships developed at different community gardens would be beneficial to understanding the social benefits that community gardens provide. Also, a longitudinal study that explores how social connections in the garden evolve over time may illuminate how social capital is built in the community garden setting. This may also provide insight into how to create community gardening programs so that social benefits in the garden may be maximized.

5.3.3 Gardener Knowledge

The location of the FSRN Campus Community Garden (i.e. on a University campus rather than in an urban neighborhood) contributed to the diverse membership within the garden. The garden brought together over 80 individuals, consisting of students, staff and faculty from Lakehead University as well as individuals from the broader community. These members came from diverse socio-economic and cultural backgrounds. Again, the age difference between the youngest and oldest gardener was almost 60 years. Within this range were novice gardeners with no form of gardening experience, gardeners with more than 60 years of gardening experience, and every level in between. This heterogeneous mixture of participants supported a broad diversity and range of levels of knowledge, skills, and approaches to gardening, and established an exceptionally rich learning environment. As the plants emerged in the gardens, so too did

this remarkable abundance and diversity of gardening knowledge, approaches, techniques and methods that each gardener brought to his/her garden plot(s).

Although the quantitative results showed no significant difference over time (between preseason and postseason) in levels of gardening knowledge between gardeners and the control group, gardeners did report higher levels of gardening knowledge compared with the control group, in both the preseason and the postseason. Preseason and postseason gardener knowledge correlated positively with age, meaning that older gardeners tended to be more knowledgeable about gardening than their younger counterparts. Preseason gardener knowledge also correlated positively with concern about the global food system, which may mean that more the knowledgeable gardeners were perhaps more aware of the negative implications of the current global food system model.

The qualitative results demonstrated that the community garden created an exceptionally rich learning environment. Knowledge sharing, exchange and acquisition in the garden, through a variety of practices, were common and reported as a significant benefit of participation. Given the time that the gardeners spent in the garden, and the gardeners' involvement in numerous and diverse gardening tasks over the course of the season, the fact that the gardeners reported an increase in their gardening knowledge was not surprising. However, what was perhaps a surprise was the abundance of data that revealed the ways in which knowledge was acquired in the garden. The results showed that the formal gardener education series (i.e. workshops) was not the predominant method of knowledge acquisition in the garden; rather, more informal mechanisms of knowledge sharing and exchange were considered by the gardeners as more significant means of acquiring gardening knowledge. Specifically, two primary practices emerged through the qualitative data analysis: interactive learning and observational learning.

Interaction with other gardeners was expressed as a significant mechanism of knowledge acquisition in the garden. Gardeners reported having regular discussions with their fellow gardeners, wherein they asked questions, shared and exchanged information and knowledge about gardening techniques, methods, and challenges encountered. Additionally, observational approaches to learning in the garden also figured prominently in the ways in which gardeners reported learning in the garden. Gardeners were regularly observed strolling through the garden examining other garden plots and this behaviour was also reported by the gardeners in the interviews. The gardeners explained that they found this observational method particularly beneficial, and explained that through their observations of other gardeners' plots and activities, they increased their knowledge about garden tending, pest control, planting techniques and many other garden related issues.

The garden also served as an important teaching site for children. The Superior Science Kid's Camp participated in the garden and reported having a successful year gardening with their camp participants in the garden. For many students it was their first exposure to gardening and the opportunity to plant, tend and eat from the garden was very exciting for many of the children. Additional research that assesses the benefits of participation in the garden on children would allow for the creation of additional children and youth education programs and greater involvement from diverse community groups.

Community gardens have been cited as providing excellent opportunities for environmental and experiential education; however, there was little in the literature that explored the means by which education and knowledge are learned in the community garden. One exception is the work done by Krasny & Tidball (2009), which involved an exploration of different learning theories in community gardens. Their work involved an assessment of 'Garden Mosaics', a youth and community education program occurring in

community gardens across the United States. The program combines science learning with intergenerational mentoring, multicultural understanding and community action (Garden Mosaics, n.d.). The initial idea for Garden Mosaics came from the realization that “community gardens, because of their unusual blend of people, cultures, plants and activism, offer unique sites for youth education within a community setting (Garden Mosaics, n.d., 1). The program also incorporates undergraduate and graduate research.

Through this assessment of Garden Mosaics, Krasny & Tidball (2009) showed that community gardens provided a context for multiple forms of learning. They reported that “several theories are useful in describing the learning that occurs in community gardens, including those focusing on learning as acquisition of content by individuals, learning as interaction with other individuals and the environment and as increasingly skilled levels of participation in a community of practice, and social learning among groups of stakeholders leading to concerted action among a group of stakeholders” (Krasny & Tidball, 2009, 13).

They explored both interactive and social learning opportunities in the community garden and concluded that, “an understanding of interactive and social learning is useful in considering how a civic ecology practice, such as community gardening, might foster outcomes not only for individuals, but also for the larger social-ecological system” (Krasny & Tidball, 2009, 13). They recommended further research that examines the outcomes of community gardening education programs for individual and groups of participants as well as the role of community gardening programs in the larger social-ecological system. Observational methods of learning were not explicitly emphasized in this research.

The current research showed that observational learning in the garden was a significant method for knowledge acquisition and learning. Community garden education programs that emphasize and encourage diverse learning opportunities and support diverse learning styles should be encouraged in order to maximize knowledge acquisition within the garden. Additional research that explores the contribution of observational learning to overall knowledge acquisition in community gardens is recommended. Furthermore, programs that encourage greater intercultural and intergenerational knowledge exchange should be explored.

5.3.4 Connectedness to Nature

The quantitative survey results did not capture any significant difference in the degree to which community gardeners reported their connectedness to nature between the preseason and postseason. Again, this may be due in part to the nature of the control group, which was skewed towards individuals who are eco-centric, outdoorsy and engaged in environmental issues. The quantitative results did however reveal significant correlations between connectedness to nature in both preseason and post season with motivation to join the community garden because of a desire to connect with nature. Postseason measures of connectedness to nature also correlated positively with education level. This implies that those individuals with higher levels of education were more likely to feel a stronger connection with nature compared with those having lower levels of education.

The qualitative results revealed that connecting with nature was a significant benefit of participating in the community garden. In addition to expressing interest in the physical and biotic attributes of the garden, such as its location, weather conditions, the

diversity of plants, insects, flowers, birds, and soil conditions, the gardeners also expressed that they experienced the restorative effects of being ‘in nature’ in the garden. This is supported by substantial research on the restorative effects of interaction with nature (Berto, 2005; Frerichs, 2004; McBey, 1985; Milligan et al., 2004; Ulrich, 1984).

Of particular interest in the current research was the emergence of data that suggested that one’s perspective and perception of nature seemed to affect whether they considered the garden a ‘nature experience’. Specifically, for those individuals who grew up in a rural setting, the garden was considered less of a nature experience. For these individuals, the garden was perceived as a more ‘built’ landscape, rather than a ‘natural’ landscape, and connection to nature within the garden was not reported as a significant benefit of participation.

Conversely, for those individuals who grew up in an urban setting, the garden offered a significant nature experience. This disparity in perspectives creates an opportunity to explore more deeply the experience of nature among community gardeners. Indeed, it raises numerous additional questions such as:

- How do community gardeners actually define and perceive nature?
- How significantly does one’s perspective of nature affect one’s enjoyment of the garden?
- Does one’s perspective of nature affect what benefits are derived, and how significantly one benefits from participation in the garden?
- How can the benefits of connecting to nature be maximized within the garden in spite of the differences in perception of what is a natural environment and what is a built environment?
- Does the difference in perspectives of the garden as a natural vs. a built environment affect an individual’s motivation to join the community garden?
- How do the results of quantitative measures of connectedness to nature (i.e. Connectedness to Nature Scale or scales measuring similar constructs) differ given different attitudes towards nature?

Given the anticipated continued growth and expansion of urban populations, community gardens may provide increasingly important opportunities for individuals to connect with nature within urban settings. These gardens may provide a setting, within which urban dwellers can experience and receive benefits from nature, including mental/psychological and physical health benefits. Research that explores the above questions as well as additional quantitative measures of connectedness to nature within community gardens would be beneficial.

5.4 A mixed-methods research approach

The strength of a mixed method approach was demonstrated in this research. It combined the strengths and benefits of both quantitative and qualitative approaches, provided an opportunity to collect and analyze the data from different angles, and to “tap different domains of knowing” (Mathison 1988, p.14). This allowed for and encouraged the expression of different facets of knowledge or experience. Bazeley (2002, 144) stated that “people responding to interviews or open ended questions will often raise quite different issues to those provided for in a structured questionnaire asking essentially the same question”. This thought was substantiated in the current research, where the results of the quantitative and qualitative data differed, despite the fact that both data collection techniques were developed to explore the same ideas and constructs and, in many cases, asked the same or very similar questions.

While analysis of the quantitative measures for some specific variables did not yield any significant results, the qualitative analysis did reveal meaningful findings with respect to the same variables. This allowed for a more thorough exploration and analysis of some of the quantitative measures, which created a deeper understanding for some of the results. Additionally, it provided an opportunity to explore ways to improve upon

these quantitative measures for future research. The quantitative approach provided for a statistically sound method of data collection and analysis, while the qualitative approach resulted in a richness of data that may more accurately reflect the feelings, perceptions and experiences of the community gardeners themselves. This combined data provides reliable and credible data that provides sufficiently solid grounds from which conclusions may be drawn.

5.5 Impact on a University community

The FSRN Campus Community Garden provides numerous and diverse benefits to the university community, including faculty, staff, students and also alumni. These benefits include improved diet and nutrition through greater access to fresh, healthy and safe food, cost savings in terms of food budgets and shared resources such as tools and garden inputs, mental health benefits through stress relief, and social networking opportunities.

Faculty, staff and students reported that the garden provided an opportunity to interact with colleagues and students in a non-academic setting. Faculty and staff also reported receiving restorative and stress-relief benefits from being in the garden during their work day. Some reported feeling renewed and more productive at work after spending time (i.e. their lunch hour) in the garden.

Two university alumni also enjoyed reconnecting with their old colleagues and students and felt that the garden provided an important opportunity to stay connected with the university community. One alumnus is particularly proud of the community garden, and has written two articles about the garden; they were published in the quarterly RALU (Retirees' Association of Lakehead University) Newsletter. This individual and his wife are active members in the garden. He regularly rode his bike to the garden at lunch hour

to meet his wife, who is still currently employed at Lakehead University. Together they did some work in their garden plots before sitting in the picnic area to share a lunch.

The garden has also served as a teaching facility, as several Lakehead University faculty have used the garden as an experiential learning site. Faculty and students in soil science and biology have conducted soil samples and other testing in the garden. In one instance, the students in a soil science class conducted soil testing on all of the plots in the community garden. This resulted in a garden map that identified pH, soil type and nutrient condition of each of the 140 individual garden plots. These results were shared with the community gardeners so that the gardeners would understand how they could amend their soils in order to improve soil health. This was a community service learning exercise that provided an opportunity for the students to see the applicability of their course work to real-life situations; both the students and the community members (i.e. the community gardeners) benefited from this exercise. The garden is a tremendous on-campus resource for faculty and staff, which can use the garden as a research and teaching facility. Garden programming that encourages more faculty, staff and student involvement would benefit the broader university community.

5.6 Limitations

A number of limitations were identified over the course of the research. First, the study used the Food Security Research Network Campus Community Garden as a case study. This garden is located on a University campus and overall gardener demographics indicate relatively high member education and income levels; therefore, the overall results should not be considered broadly generalizable. Each community garden is unique in terms of its setting, size, member demographics, and purpose. Further research that explores the differences and similarities in motivations and benefits among community

gardens with diverse member demographics would be useful to increase our understanding of the consistency of these research results.

There were also some limitations with respect to the Gardener Motivation Scale. This was a newly constructed scale and, although it showed good reliability, it can be much improved. Several of the motivation sub-scales included items that measured various aspects of food security; however, because these were not included in a single food security subscale, it was difficult to establish a quantitative measure of how significant this motivation was among the research participants. A reworking of the Gardener Motivation Scale is recommended in order to improve the measurement of motivation based on food security concerns.

As discussed above, the design of the control group was potentially problematic, and may have affected the results. A more thoughtful design of a control group in a similar study is recommended.

Finally, an attempt was made to explore ethnicity within the garden membership. In actuality, the categories chosen were more so a measure of race or racialization than they were of ethnicity. For example, 'white' is comprised of many different ethnic groups who may have very diverse cultural ideas about food, different motivational factors, different experiences and conceptualizations of nature, etc. The categories used in this research were restrictive and insufficient to capture any of these differences; future research exploring ethnicity within community garden memberships should include the use of more appropriate measures.

5.7 Addendum

I am grateful for the opportunity to maintain my position as FSRN Campus Garden Coordinator for the 2011 gardening season. I've been delighted to see so many of last year's gardeners return this year for either their second or third year as members in the garden. I have enjoyed tremendously the opportunity to witness the continued unfolding of this wonderful garden, and have seen numerous and substantial changes in the garden since my involvement began in the fall of 2009.

We had a greater than 60% gardener return rate this year; many of these gardeners have been with the garden since 2009, the first year the garden was run as a community garden. As a result of so many 'veteran' community gardeners we now have a large pool of very dedicated and committed gardeners. I believe their dedication, commitment and contributions to the garden are building a solid foundation for its development. Moreover, the ongoing support and commitment of both the Food Security Research Network and Lakehead University are creating a tremendous resource for both the on-campus community as well as the broader Thunder Bay community. The benefits to all participants are evident and appear to be increasing.

At the time of writing, we are over halfway through this year's gardening season. Socializing, cooperation and volunteerism in the garden this year have increased markedly. The gardeners are spending more time chatting, visiting and helping each other with both individual and communal gardening chores. The veteran gardeners are also making efforts to connect with, orient and support the new gardeners, and a stronger sense of community within the garden is emerging.

I have seen tremendous growth in the involvement of Lakehead University staff and students this year. The benefits of involvement in the garden are becoming better

known within the University community, as increasing numbers of Lakehead University faculty, staff, and students are spending time in the garden as a part of the regular work and school-day routines.

As a result of this research initiative, gardener behaviors in the garden make greater sense to me. As I watch many of the gardeners wandering through the garden looking at other people's garden plots, I realize that they are learning. Their observations of the different crop varieties, methods, techniques, and results witnessed in their fellow gardeners' plots are a rich source of information, and essentially inform their approaches to gardening in their own plots. I have seen numerous examples of different successful varieties and techniques from last year that have been adopted and implemented by gardeners this year. Additional information about some of these observations and activities at the garden are included in Appendix 3.

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Appendix 1

Cover Letter

As a member of the Food Security Research Network Campus Community Garden, I would like to invite you to participate in a research study entitled: Community Gardening: Exploring Motivations and Gardener Experience. This study is being done as part of the requirements for my Masters of Environmental Studies at Lakehead University. The intent of the study is to explore what motivations and benefits associated with community gardening.

The research study will include two components: a questionnaire (administered twice: once in May 2010 and again in late August 2010), and interviews (September 2010). You will be invited to participate in both components, each of which will require approximately 45 minutes of your time. Your participation is voluntary; you may decline to answer any questions and you may withdraw from the research at any time without penalty. The survey will be anonymous; it will not be labeled to identify who completed it. The interviews may be audio recorded to ensure accuracy.

If you agree to participate in this study, please complete the following consent form to agree to participate in the study. By clicking “yes”, you are indicating your willingness to participate in the study. All forms will be kept confidential and anonymous; you will be asked to create a participant code that we will use to match your pre-season survey with your post-season survey, but it will not identify you. All information will be shared only with my supervisors and stored and locked at Lakehead University for 5 years after the study is completed. A summary of the research findings will be available to you once the research is completed. Only aggregate data will be reported, and you will not be identified in any way if the results of this study are published, or presented in a public forum.

This project has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the project you can contact Sue Wright at the Board at 343-8283. If you have any additional questions or concerns please contact me at lchevret@lakeheadu.ca or by phone at (807) 285-2772. You may also contact my research supervisors Dr. Connie Nelson at cnelson@lakeheadu.ca and Mirella Stroink at mstroink@lakeheadu.ca, or by phone at (807) 343-8110.

Sincerely,
Lee-Ann Chevrette
Masters of Environmental Studies (MES) Candidate
lchevret@lakeheadu.ca
(807) 285-2772

Consent Form
Community Gardening: Exploring Motivations
and Gardener Experience

I agree to participate in the Garden Study, which examines motivations, and gardening benefits. The researcher has explained that I will be asked to complete two surveys, between May and August 2010. I have read the cover letter provided.

I understand that I can withdraw from the study at any time, even after signing this form, and there will be no penalty. Any information that is collected about me will be shared only with researchers and will be securely stored at Lakehead University for 5 years. I will not be identified in any way if the results of this study are published.

Signature

Date

(N.B. There will be two versions of this Consent Form: one to accompany the online version of the survey and another to accompany the paper version. The paper version will involve a signature and the online version will have a box to click 'yes' to indicate willingness to participate).

Participant Code Name

Instructions: Please answer the questions carefully, by circling the correct response. You will be asked to take a similar survey in the fall, so we need to create a code name for you that we can use to match your answers on the two surveys, but that cannot identify who you are. It is very important that these questions are answered honestly and accurately both times.

1. What is the second letter of your first name?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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2. What month were you born in?

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	October	Nov.	Dec.
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3. What is the first letter in your mother's first name?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

4. What is the last number in your address (house number)?

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

5. What is the first letter of your middle name?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

We are interested in learning about some of the thoughts and feelings you have about community gardening, food security, and wellbeing. If you volunteer to take this survey, you can choose not to answer any question that you do not want to answer, and you can stop doing the survey at any time without penalty. There is no right or wrong answer. Try to answer as honestly as you can.

Please do not put your name on the survey. Nobody will be able to tell which answers were yours. If you want more information about the survey, please contact Lee-Ann at lchevret@lakeheadu.ca or by phone at (807) 285-2772. When the study is complete, you will be able to get a summary of the research results. We thank you very much for your time and assistance. Please continue if you agree to participate in the survey.

Appendix 2

Survey Questionnaires and Interviews

Survey 1. Pre-Season Gardeners Survey

Section A: Basic Information

1. Is this your first year with the FSRN Campus Community Garden?

a) yes

b) no

2. What is your gender?

female

b) male

c) other

3. What is your age? _____

4. Did your family have a garden when you were a child?

a) yes

b) no

5. Do you currently have access to a yard that is suitable for gardening at your home?

a) yes

b) no

	Not at all (1)	Slightly (2)	Moderately (3)	Very (4)	Extremely (5)
6. How concerned are you about the current global food system?					

Section B: Gardener Well-Being

Instructions: This section explores your beliefs about your personal well-being.

Please rate each of the following using the scale provided:

	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
1. Your overall/general health.					
2. Your physical health.					
3. Your mental health.					
4. Your level of physical activity.					
5. Your level of social activity.					
6. Your level of nutrition.					

Section C: Gardener Knowledge

Instructions: This section explores your gardening knowledge.

Please rate your knowledge of each of the following using the scale provided:

	No Experience	Beginner	Intermediate	Advanced	Master
1. Planting a garden.					
2. Tending a garden.					
3. Harvesting a garden.					
4. Preserving harvested food (canning, drying, freezing).					
5. Weed control.					
6. Pest control.					
7. Water conservation techniques.					

Section D: Perceived Food Security Scale (Skavinski & Stroink, 2008)

Instructions: The following statements refer to your beliefs about food.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I am able to access enough food to meet my needs.					
2. I am able to access the kinds of food that I need.					
3. I have easy access to sources of nutritious food.					
4. Obtaining nutritious food is not a problem for me.					
5. I trust that the ways I access food will continue to be available into the future.					
6. I am able to access nutritious food in ways that are acceptable to me.					
7. The ways that I access food are reliable.					
8. I know several different ways to access food.					
9. I am able to access nutritious food in ways that are acceptable to my culture.					
10. I know how to get enough nutritious food to meet my needs.					
11. The ways that I access food are safe.					
12. I sometimes worry that I will run out of food.					
13. I trust my sources of food.					
14. I am confident in my ability to get the food that I need.					
15. I worry that I will not be able to access enough food to meet my needs.					
16. I am not confident in my sources of food.					
17. I do not have a secure source of food.					

Section E: Connectedness to Nature Scale (Mayer & Frantz, 2004)

Instructions: The following questions are related to your connection with nature.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I often feel a sense of oneness with the natural world around me.					
2. I think of the natural world as a community to which I belong.					
3. I recognize and appreciate the intelligence of other living organisms.					
4. I often feel disconnected from nature.					
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.					
6. I often feel a kinship with animals and plants.					
7. I feel as though I belong to the Earth as equally as it belongs to me.					
8. I have a deep understanding of how my actions affect the natural world.					
9. I often feel part of the web of life.					
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common "life force".					
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.					
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.					
13. I often feel like I am only a small part of the natural world, and that I am no more important than the grass on the ground or the birds in the trees.					
14. My personal welfare is independent of the welfare of the natural world.					

Section F: Motivation

The following statements explore the reasons why you decided to join a community garden.

Please read each of the following statements and respond using the scale provided.

"I joined this community garden because..."

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
(Economic)					
1. I am concerned that I will not have enough money to buy food.					
2. I need to grow food to supplement my food					

budget.					
3. I worry that food at home will run out before I get money to buy more?					
4. I want to save money on food.					
5. My financial situation is uncertain.					
(Social)					
6. I enjoy the social nature of community gardening.					
7. I want to meet new people.					
8. Developing relationships with other gardeners is important to me.					
9. I want to develop ties with others in the community.					
10. I want to build my social network.					
(Physical and Mental Health)					
11. I believe it improves my overall health.					
12. Gardening is good exercise.					
13. It is good for my mental health.					
14. It improves my quality of life.					
15. It helps me improve my level of nutrition.					
(Environmental)					
16. I have concerns about the environment.					
17. I am concerned about the use of chemicals in my food.					
18. I am concerned about food miles (the distance food travels from farm to plate).					
19. I am concerned about energy consumption in food production.					
20. I want to support local food systems that are kinder to the environment.					
(Concerns with Global Food System)					
21. I am concerned about the safety of the global food system.					
22. I believe there are a lot of problems with the global food system.					
23. I am concerned about the sustainability of the global food system.					
24. I am concerned about inequities in the global food system.					
25. I am concerned about the loss of agricultural biodiversity.					
(Gardening)					
26. I love gardening.					

27. I want to become more food self- sufficient.					
28. I want to learn and/or improve my gardening skills.					
29. I want to grow specific varieties that I can't find anywhere else.					
30. I want greater control over the food I eat.					
(Connection to Nature)					
31. Growing food makes me feel more connected to nature.					
32. It increases my appreciation for nature.					
33. It increases my understanding of nature.					
34. Feeling a connection with the environment is important to me.					
35. It will help me strengthen my connection to the environment.					

Section G: Demographics

1. What is the highest level of education you have completed?

- a) less than high school
- b) high school
- c) college
- d) university
- d) masters/doctoral

2. Which of the following best describes your annual income?

- less than \$20 000
- \$20 000-\$39 999
- \$40 000-\$59 999
- greater than \$60 000

3. With which of the following groups do you most identify?

- a) White
- b) Aboriginal (First Nations, Inuit, Metis)
- c) Black
- d) Hispanic
- e) Asian
- f) South Asian (Indian, Pakistani)
- g) Other (please specify) _____

Survey 2. Pre-Season Control Group Survey

Section A: Basic Information

1. Are you a gardener?

- a) yes
- b) no

2. What is your gender?

- a) female
- b) male
- c) other

3. What is your age? _____

4. Did your family have a garden when you were a child?

- a) yes
- b) no

5. Do you currently have access to a yard that is suitable for gardening at your home?

- a) yes
- b) no

	Not at all (1)	Slightly (2)	Moderately (3)	Very (4)	Extremely (5)
6. How concerned are you about our current global food system?					

Section B: Gardener Well-Being

Instructions: This section explores your beliefs about your personal well-being.

Please rate each of the following using the scale provided:

	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
1. Your overall/general health.					
2. Your physical health.					
3. Your mental health.					
4. Your level of physical activity.					
5. Your level of social activity.					
6. Your level of nutrition.					

Section C: Gardener Knowledge

Instructions: This section explores your gardening knowledge.

Please rate your knowledge of each of the following using the scale provided:

	No Experience	Beginner	Intermediate	Advanced	Master
1. Planting a garden.					

2. Tending a garden.					
3. Harvesting a garden.					
4. Preserving harvested food (canning, drying, freezing).					
5. Weed control.					
6. Pest control.					
7. Water conservation techniques.					

Section D: Perceived Food Security Scale (Skavinski & Stroink, 2008)

Instructions: The following statements refer to your beliefs about food.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I am able to access enough food to meet my needs.					
2. I am able to access the kinds of food that I need.					
3. I have easy access to sources of nutritious food.					
4. Obtaining nutritious food is not a problem for me.					
5. I trust that the ways I access food will continue to be available into the future.					
6. I am able to access nutritious food in ways that are acceptable to me.					
7. The ways that I access food are reliable.					
8. I know several different ways to access food.					
9. I am able to access nutritious food in ways that are acceptable to my culture.					
10. I know how to get enough nutritious food to meet my needs.					
11. The ways that I access food are safe.					
12. I sometimes worry that I will run out of food.					
13. I trust my sources of food.					
14. I am confident in my ability to get the food that I need.					
15. I worry that I will not be able to access enough food to meet my needs.					
16. I am not confident in my sources of food.					
17. I do not have a secure source of food.					

Section E: Connectedness to Nature Scale (Mayer & Frantz, 2004)

Instructions: The following questions are related to your connection with nature.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I often feel a sense of oneness with the natural world around me.					
2. I think of the natural world as a community to which I belong.					
3. I recognize and appreciate the intelligence of other living organisms.					
4. I often feel disconnected from nature.					
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.					
6. I often feel a kinship with animals and plants.					
7. I feel as though I belong to the Earth as equally as it belongs to me.					
8. I have a deep understanding of how my actions affect the natural world.					
9. I often feel part of the web of life.					
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common "life force".					
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.					
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.					
13. I often feel like I am only a small part of the natural world, and that I am no more important than the grass on the ground or the birds in the trees.					
14. My personal welfare is independent of the welfare of the natural world.					

Section F: Motivation

The following statements explore the reasons why you decided to join a community garden.

Please read each of the following statements and respond using the scale provided.

"I joined this community garden because..."

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
(Economic)					
1. I am concerned that I will not have enough money to buy food.					
2. I need to grow food to supplement my food budget.					

3. I worry that food at home will run out before I get money to buy more?					
4. I want to save money on food.					
5. My financial situation is uncertain.					
(Social)					
6. I enjoy the social nature of community gardening.					
7. I want to meet new people.					
8. Developing relationships with other gardeners is important to me.					
9. I want to develop ties with others in the community.					
10. I want to build my social network.					
(Physical and Mental Health)					
11. I believe it improves my overall health.					
12. Gardening is good exercise.					
13. It is good for my mental health.					
14. It improves my quality of life.					
15. It helps me improve my level of nutrition.					
(Environmental)					
16. I have concerns about the environment.					
17. I am concerned about the use of chemicals in my food.					
18. I am concerned about food miles (the distance food travels from farm to plate).					
19. I am concerned about energy consumption in food production.					
20. I want to support local food systems that are kinder to the environment.					
(Concerns with Global Food System)					
21. I am concerned about the safety of the global food system.					
22. I believe there are a lot of problems with the global food system.					
23. I am concerned about the sustainability of the global food system.					
24. I am concerned about inequities in the global food system.					
25. I am concerned about the loss of agricultural biodiversity.					
(Gardening)					
26. I love gardening.					

27. I want to become more food self- sufficient.					
28. I want to learn and/or improve my gardening skills.					
29. I want to grow specific varieties that I can't find anywhere else.					
30. I want greater control over the food I eat.					
(Connection to Nature)					
31. Growing food makes me feel more connected to nature.					
32. It increases my appreciation for nature.					
33. It increases my understanding of nature.					
34. Feeling a connection with the environment is important to me.					
35. It will help me strengthen my connection to the environment.					

Section G: Demographics

1. What is the highest level of education you have completed?

- a) less than high school
- b) high school
- c) college
- d) university
- d) masters/doctoral

2. Which of the following best describes your annual income?

- less than \$20 000
- \$20 000-\$39 999
- \$40 000-\$59 999
- greater than \$60 000

3. With which of the following groups do you most identify?

- a) White
- b) Aboriginal (First Nations, Inuit, Metis)
- c) Black
- d) Hispanic
- e) Asian
- f) South Asian (Indian, Pakistani)
- g) Other (please specify) _____

Survey 3. Post-Season Gardeners Survey

Section A: Basic Information

1. On average, how frequently did you go to the garden to tend your plot?

- a) less than once per week
- b) 1-3 times per week
- c) 4-6 times per week
- d) daily

2. With whom did you share your food from your garden? Please check all that apply.

I did not share my food

- b) family
- c) friends
- d) neighbors
- e) donated to food banks or other emergency food programs
- f) other (please specify _____)

3. What portion of your food did you share with others?

- a) zero
- b) less than 10%
- c) 10%-25%
- d) 25%-50%
- e) greater than 50%

4. In your opinion, what was the best part of your community gardening experience?

5. In your opinion, what was the greatest challenge of your community gardening experience?

6. Would you participate in the garden next year?

7. Name one thing that could improve your community gardening experience.

	Not at all (1)	Little (2)	Somewhat (3)	much (4)	A great deal (5)
8. In your opinion, how much does growing your own food improve your family's food security?					
9. In your opinion, how much does community gardening contribute to a community's food security?					
10. In your opinion, how much has community gardening increased your awareness of local food security issues?					
11. How significantly did the food you grew in your garden contribute to your family food budget (i.e. did it lower the					

amount of money you spent on food brought elsewhere?					
--	--	--	--	--	--

	Garden produce is much more nutritious (1)	Garden produce is somewhat more nutritious (2)	They are the same (3)	Grocery store produce is somewhat more nutritious (4)	Grocery store produce is much more nutritious (5)
12. nutritional value. What is your perception of the nutritional value of the food you grew compared to typical grocery store produce?					

	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
13. satisfaction. Please rate your satisfaction with your community gardening experience.					

Section B: Gardener Well-Being

Instructions: This section explores your beliefs about your personal well-being.

Please rate each of the following using the scale provided:

	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
1. Your overall/general health.					
2. Your physical health.					
3. Your mental health.					
4. Your level of physical activity.					
5. Your level of social activity.					
6. Your level of nutrition.					

Section C: Gardener Knowledge

Instructions: This section explores your gardening knowledge.

Please rate your knowledge of each of the following using the scale provided:

	No Experience	Beginner	Intermediate	Advanced	Master
1. Planting a garden.					
2. Tending a garden.					
3. Harvesting a garden.					
4. Preserving harvested food (canning, drying, freezing).					
5. Weed control.					
6. Pest control.					
7. Water conservation techniques.					

Section D: Perceived Food Security Scale (Skavinski & Stroink, 2008)

Instructions: The following statements refer to your beliefs about food.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I am able to access enough food to meet my needs.					
2. I am able to access the kinds of food that I need.					
3. I have easy access to sources of nutritious food.					
4. Obtaining nutritious food is not a problem for me.					
5. I trust that the ways I access food will continue to be available into the future.					
6. I am able to access nutritious food in ways that are acceptable to me.					
7. The ways that I access food are reliable.					
8. I know several different ways to access food.					
9. I am able to access nutritious food in ways that are acceptable to my culture.					
10. I know how to get enough nutritious food to meet my needs.					
11. The ways that I access food are safe.					
12. I sometimes worry that I will run out of food.					
13. I trust my sources of food.					
14. I am confident in my ability to get the food that I need.					
15. I worry that I will not be able to access enough food to meet my needs.					
16. I am not confident in my sources of food.					
17. I do not have a secure source of food.					

Section E: Connectedness to Nature Scale (Mayer & Frantz, 2004)

Instructions: The following questions are related to your connection with nature.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I often feel a sense of oneness with the natural world around me.					
2. I think of the natural world as a community to which I belong.					
3. I recognize and appreciate the intelligence of other living organisms.					
4. I often feel disconnected from nature.					

5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.					
6. I often feel a kinship with animals and plants.					
7. I feel as though I belong to the Earth as equally as it belongs to me.					
8. I have a deep understanding of how my actions affect the natural world.					
9. I often feel part of the web of life.					
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common "life force".					
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.					
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.					
13. I often feel like I am only a small part of the natural world, and that I am no more important than the grass on the ground or the birds in the trees.					
14. My personal welfare is independent of the welfare of the natural world.					

Survey 4. Post-Season Control Group Survey

Section A: Basic Information

1. Did you have a garden this year?

- a) yes
- b) no

2. Did you tend someone else's garden this year?

- a) yes
- b) no

Section B: Gardener Well-Being

Instructions: This section explores your beliefs about your personal well-being.

Please rate each of the following using the scale provided:

	Poor (1)	Fair (2)	Good (3)	Very good (4)	Excellent (5)
1. Your overall/general health.					
2. Your physical health.					
3. Your mental health.					
4. Your level of physical activity.					
5. Your level of social activity.					
6. Your level of nutrition.					

Section C: Gardener Knowledge

Instructions: This section explores your gardening knowledge.

Please rate your knowledge of each of the following using the scale provided:

	No Experience	Beginner	Intermediate	Advanced	Master
1. Planting a garden.					
2. Tending a garden.					
3. Harvesting a garden.					
4. Preserving harvested food (canning, drying, freezing).					
5. Weed control.					
6. Pest control.					
7. Water conservation techniques.					

Section D: Perceived Food Security Scale (Skavinski & Stroink, 2008)

Instructions: The following statements refer to your beliefs about food.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongl y Agree (5)
1. I am able to access enough food to meet my needs.					
2. I am able to access the kinds of food that I need.					
3. I have easy access to sources of nutritious food.					
4. Obtaining nutritious food is not a problem for me.					
5. I trust that the ways I access food will continue to be available into the future.					
6. I am able to access nutritious food in ways that are acceptable to me.					
7. The ways that I access food are reliable.					
8. I know several different ways to access food.					
9. I am able to access nutritious food in ways that are acceptable to my culture.					
10. I know how to get enough nutritious food to meet my needs.					
11. The ways that I access food are safe.					
12. I sometimes worry that I will run out of food.					
13. I trust my sources of food.					
14. I am confident in my ability to get the food that I need.					
15. I worry that I will not be able to access enough food to meet my needs.					
16. I am not confident in my sources of food.					
17. I do not have a secure source of food.					

Section E: Connectedness to Nature Scale (Mayer & Frantz, 2004)

Instructions: The following questions are related to your connection with nature.

Please read each sentence and respond using the scale provided.

	Strongly Disagree (1)	Disagree (2)	Neutral/ No opinion (3)	Agree (4)	Strongly Agree (5)
1. I often feel a sense of oneness with the natural world around me.					
2. I think of the natural world as a community to which I belong.					
3. I recognize and appreciate the intelligence of other living organisms.					
4. I often feel disconnected from nature.					
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.					
6. I often feel a kinship with animals and plants.					
7. I feel as though I belong to the Earth as equally as it belongs to me.					
8. I have a deep understanding of how my actions affect the natural world.					
9. I often feel part of the web of life.					
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common "life force".					
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.					
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.					
13. I often feel like I am only a small part of the natural world, and that I am no more important than the grass on the ground or the birds in the trees.					
14. My personal welfare is independent of the welfare of the natural world.					

Semi-structured Community Gardening Interview

1. How did you come to be involved in the Campus Community Garden?
2. What was your primary motivation for joining to garden?
3. What did you enjoy most about your community gardening experience?
4. What do you see as potential benefits of community gardening to:
 - a) Individuals?
 - b) Communities?
5. What are some of the benefits you feel you have received as a result of participating in this garden? Which are most important to you?
6. What kinds of things would make your community gardening experience better?
7. Did your participation in the garden make you more aware of food system/food security issues?
8. Did your participation make you feel more connected to the food system?
9. Did your participation decrease your sense of vulnerability in the food system?
10. Did it improve your family's food security?
11. Did the garden provide an opportunity for you to socialize/improve social connections?
12. Can the community garden provide an opportunity for people to connect with nature?
13. Did the experience help you to improve your gardening knowledge?
14. How did your involvement impact your wellbeing? (physical, mental/emotional, social)

Appendix 3

At the time of writing we are midway through the community garden's third full season. As a result of both my involvement in this research and my ongoing participation in the garden as a gardener, I feel as though I have a unique perspective and insight into a broad range of dimensions of the garden. This is my second full season with the garden and the changes from last year in terms of how the garden works, the involvement of the gardeners and my understanding of some of the core elements in the garden are significant. The garden seems to me now like a living, changing and evolving organism.

This year the level of socialization among the gardeners has increased significantly. More gardeners are found visiting and chatting with their neighbors, discussing their gardens, and walking together to explore and discuss other garden plots. The picnic table is often a busy place, with gardeners sitting and enjoying food together and sharing information about their garden pests, the weather and many other garden-related topics. This appears to be more common among the veteran gardeners, but I have watched many of these veteran gardeners make efforts to connect, orient and support the new gardeners this year. Next year, I suspect I will see some of the gardeners who are new to the garden this year sitting at the picnic table as well.

It also seems that the gardeners are growing increasingly comfortable in the garden. For example, they are very familiar with their roles and responsibilities within the garden and seem to feel a greater sense of freedom to roam further from their plots to chat with other gardeners and explore other garden plots. They express enthusiasm about the garden and there is a strong sense of pride in the garden.

The level of cooperation among the gardeners has also increased significantly this year. Whereas last year gardeners tended more so to stick to their own gardens and work

independently, this year they are helping each other more. For example, we have a significant weed problem in the garden, and gardeners are responsible for weeding not only their garden beds but also the pathway surrounding their gardens. Many gardeners this year have really embraced the weeding efforts in the garden and have weeded not only their own pathways, but their neighbors' pathways as well.

One retired male gardener has literally spent weeks at the garden digging weeds along the major pathways in the garden. Everyone has benefited from this, as it reduces any tripping hazards along the most heavily traveled paths and also reduces the source of weeds to the neighboring plots. This particular gardener speaks regularly of the garden as being a transformative experience for him. This is his third year participating in the community garden. Since his participation began, he has lost close to 40 pounds, which he attributes to both his increased intake of fresh vegetables and his increased level of physical activity in the garden during the summer months. He reports feeling, "healthier than I have in years".

Volunteerism in the garden this year has also increased dramatically. While all gardeners are responsible for donating four hours of volunteer time to the garden for general maintenance, in 2010 a relatively small proportion of gardeners fulfilled these hours. However, this year we have eight community garden plots that are allocated to communal food growing for the purpose of donation to the Lakehead University Student Union (LUSU) Food Bank and other local food banks. There is a dedicated group of volunteers who have participated in the planting and tending of these gardens over the last several months. They work together to water, weed, and identify and destroy insect pests (i.e. Colorado potato beetle), and are discussing how they will divide the responsibilities for harvesting the food from these plots.

At the initial planting of these plots we had over 20 garden members show up to participate. Many of these gardeners grew concerned recently when they noticed that one of the potato plots was infested with Colorado potato beetle. I received numerous e-mails from gardeners explaining that they had spent time at the plots removing these insects. They wanted to ensure that these plants were well taken care of so that there was a healthy crop of potatoes that would be available for donation.

Several gardeners have returned to the same plot for the last three gardening seasons. This means that many have had the same neighbors for three seasons, and have had the opportunity to meet with and interact with their neighbors on many occasions. It is evident that these relationships are deepening. For example the absence of one particularly active couple from the garden at the beginning of this season sparked concern among their garden neighbors. In 2010 this couple was the first to plant their two garden plots, which they tended daily and fastidiously. When their plots grew weedy this spring and it became clear that no one was tending them, I began to receive e-mails from other gardeners, inquiring about their absence. I too grew concerned, given their previous dedication to the garden and their early registration for this year's gardening season, and contacted them to inquire about their absence. I was told that one of them had been battling with some serious health issues. They had been out of town for a prolonged period of time for treatment and thus unable to visit the garden and prepare their plots for planting.

Within days of explaining this to the concerned gardeners, whose plots neighbored this couple's plots, these gardeners took it upon themselves to clear the weeds from both of this couples plots. When this couple finally made it to the garden, they had every intention of spending the evening weeding their plots. Rather, they were met with two

freshly weeded plots that were ready for planting, and were overjoyed by the support, kindness and humanity demonstrated by their fellow gardeners. In the days following, this couple planted both plots, mostly with lower maintenance crops, and they visit the garden when they are able. Their neighbors continue to help with basic upkeep, and are keeping the Colorado potato beetles at bay.

There are numerous examples like this within the garden, where people are helping their less able neighbors, and I feel that the garden is a tremendous venue within which can be witnessed people's humanity in action. As another example, I had an elderly female gardener register late for a garden plot this year. By the time she got to the plot the weeds had really taken hold and it would have taken a substantial amount of time and effort to prepare her garden for planting. Three gardeners who were working nearby offered to help clear her plot for her and within half an hour the combined efforts led to a weed-free plot that was ready for planting. This woman was absolutely delighted, and immediately felt welcomed into the folds of the community garden. I have witnessed countless demonstrations of acts of kindness over the last two years of my involvement in the garden and, as the gardeners' relationships develop and deepen over time, so too does it appear that their levels of comfort, trust and cooperation with each other also deepen. The garden provides opportunities for individuals to help each other, to demonstrate their kindness, and to provide support for those who are less able.

I have been fascinated to witness the ways in which people learn in the garden. At the onset of this research project there was no explicit intention to explore any form of learning theory within the garden; this was not the focus of the thesis. However, to me, one of the most interesting things that emerged out of the qualitative data was that one of the primary ways that people are learning is through observing others.

The combination of the large garden, large garden membership, diverse demographics, and range of levels of gardening expertise together created a wonderful outdoor laboratory that offered incredible opportunities for learning. For example, last year there were four different techniques used by the gardeners to grow tomatoes; they were trellised, staked, caged, and strung. There were also tomato plants that were left untended, which grew along the soil surface. Some gardeners strung their peas; others used netting, while others use no supports at all. The gardeners were able to observe all of these different techniques and learn through observation which they perceived as being most successful. Many of the gardeners reported trying new techniques after they had seen them in the garden. The gardeners also observed different varieties growing throughout the garden and reported trying new varieties as a result of seeing them in other plots.

Recently, I arrived at the garden one evening to find only one other female gardener. She was nowhere near her own plot, which is located close to mine. I observed her for several minutes as she walked slowly through the garden looking at other garden plots. When she returned to her own plot, she approached me to chat. She explained how much she enjoyed coming to the garden and finding herself there alone, because what she enjoyed most about the garden was the opportunity to ‘peek at other people's plots and see what they are growing’. She then looked down and saw my purple beans, which were just beginning to flower. She told me that she was also growing purple beans for the first time this year. She explained that she had been inspired to do so because last year she had really enjoyed the taste of a purple bean that had been offered to her by another gardener on the opposite side of the garden. This year, this same gardener who offered her the purple bean is now helping her to eradicate her Colorado potato beetles.

The levels of cooperation and comfort with each other have also deepened. Last year I received numerous e-mails from gardeners informing me of the presence of potato beetles on their neighbor's plots, and concern of spread to their own plants. This year, I still receive e-mails from the gardeners about potato beetles but they are more so informing me that they have spent time on their neighbor's plots removing their potato bugs. One male gardener recently found a recipe in an *Alive Magazine* for an organic insect spray made out of cayenne pepper, garlic, and onions. He made a large batch and made it available to the other gardeners by placing it in the communal tool shed. He has also taken it upon himself to visit each and every one of the 120 garden plots and spray any potato bugs that he can find. Incidentally, the bug-spray was ineffective at either destroying or deterring the insects; however, his act of kindness was appreciated by the other gardeners.

There is a very selfless element at work here, as many of these efforts are done anonymously and without need for recognition. These efforts make a significant impact on these affected gardeners. To me, this signifies a growing level of comfort among the gardeners; this action demonstrates a level of care and concern that has deepened since the previous year. It appears also that as gardeners get to know each other better, they recognize the constraints of each others' lives, such as being busy with work, single parenting, and lack of transportation, and step in to help and each other.

With respect to connection to nature, what I have witnessed over the last couple of years through both this research and my personal involvement in the garden is that the garden provides a significant opportunity for people to have a nature experience within an urban setting. It was very interesting to me to learn that people's perceptions of nature seem to be relative; for some the garden is a significant nature experience, while for

others it is considered a built environment. I would argue that, despite an individual's perception of what nature means to them, individuals participating in the community garden are still deriving physiological and psychological benefits that interacting with nature provides. However, I recommend that additional research be conducted to explore these relationships.

Additionally, there is a considerable body of literature trumpeting the importance of childhood play in natural environments as a precursor to environmental interests, careers, attitudes and concerns (Tanner, 1980; Mobley et al., Wells & Lekies, 2006). Likewise, there are growing concerns about the loss of opportunities for children to play, explore and connect with nature, coupled with increasing amounts of time spent indoors interacting with electronic media (Zaradic & Pergams, 2007). Finch (2008) referred to this loss of opportunities to play and explore as the extinction of experience. What I have witnessed in the garden over the last two gardening seasons is an incredible opportunity for children to be exposed to and engage with the natural world in a safe environment, with others who are interested, supportive, knowledgeable and encouraging.

These children are eager to explore the plants, insects, animals, and soil within the garden and, through their explorations of both the environment and the natural processes occurring in the garden, they are learning about the natural world, its diverse inhabitants, and the processes that sustain our lives. I am confident that my childhood experiences interacting with nature have played a central role in the development of my own eco-centric leanings, and I am delighted to watch children, my own included, have similar opportunities to interact with the living world.

As we continue to develop into increasingly technological societies that, in many ways, distance us from the natural world, the garden presents an incredibly valuable

opportunity for children to have formative nature experiences within urban settings. These early childhood experiences may very well inform their own attitudes and behaviours towards nature, and encourage them to grow into environmentally engaged, aware, and responsible adults.

From my perspective, continuity has been an important factor in the successful development of this garden. I have been the Garden Coordinator since the fall of 2009, and have developed a good rapport with the gardeners. It has taken time to establish this but there is now a level of comfort that I believe allows for smoother operations in the garden. This garden is the only garden in Thunder Bay that has paid staff and, I believe that the ongoing and consistent support from both the Food Security Research Network and Lakehead University signifies the dedication to the garden, which in turn encourages the gardeners to invest time and effort into the garden. The payback for them is significant, in the form of both tangible benefits (i.e. fresh, healthy, safe food) and intangible (i.e. relationship building, knowledge acquisition, personal growth and awareness). Several of the new gardeners are friends and family members of existing garden members, so it is evident that the benefits are spilling over and beyond the current membership and the garden's appeal is reaching outwards.

Increasing numbers of Lakehead University faculty, staff, and students are participating this year as they hear about the garden from their colleagues and fellow students. Many of these students are new to gardening and are embracing it wholeheartedly. There is a particularly wonderful energy that they bring to the garden; they are curious, energetic, quick to step in and offer help, and open and very keen to learn about gardening from the more experienced gardeners. Many of them live away

from home in apartments where they do not have access to any suitable land to grow food. They see the real value in growing food to save money on their food bills.

I have had enlightening conversations with several of these gardeners, who seem to make important connections between growing their own food, social justice, environmental stewardship and economic sustainability. This may in part be because of their course work, but perhaps it is also due to a greater awareness and growth of the local food movement, which is becoming more deeply entrenched in the actions of their peers. Additional research into perspectives, participation, and benefits of community gardening among University students should be explored.

Returning community service organizations report having greater involvement at both the board and client levels; presumably this is because these organizations are witnessing the benefits derived from participation in the community garden. This summer, the Brain Injury Association of Thunder Bay and Area (BIATBA), one of our participating community service organizations, organized an art workshop in the garden. They hired an artist who led the workshop, which involved making garden markers out of wooden spoons and other art supplies. The workshop was advertised and open to both garden members and the broader public. The workshop was well attended and included clients from BIATBA, other members of the community garden including families with children, and another family who is not currently involved in the garden. These types of initiatives help to break down barriers, reduce isolation, build community, and raise awareness about brain injury in our community. Similar programs are being developed for later in the season.

The educational workshop series that was developed in 2010 was expanded upon this year. Eight workshops are included in the series which is run every second Monday

evening between May and September. Workshop topics include bees in pollination, composting, soil basics, natural fertilizers, seeds saving, putting the garden to bed, extending the growing season and garden pests. A different community expert was invited to facilitate each of these workshops.

At the time of writing, we have had four workshops, all of which were very well attended. Based on the results of the current research, which highlighted the ways in which people are learning in the garden, including experiential, interactive, and observational learning, we attempted to structure this year's workshops so that these approaches were incorporated. The workshops are more hands-on and include walks through the garden to demonstrate specific examples.

For example, we recently had a natural fertilizers workshop. The facilitator spent much of the workshop walking through the garden, with the 30 participants, identifying signs in plants that signaled potential nutrient deficiencies. She then discussed natural approaches to remedy these deficiencies through the use of natural fertilizers such as compost, manure, compost tea, and fish and seaweed fertilizers. I received tremendously positive feedback about this workshop, and this facilitator has since been asked to give a talk to the local Horticultural Society.

I continue to be enthused by my involvement in this community garden. I continue also to deepen my relationships with my fellow gardeners, my knowledge about diverse gardening techniques, and my awareness of the challenges that are posed by the current global food system model. I'm comforted when I reflect upon the combined efforts of the members within this community garden, the support and commitment of the Food Security Research Network and Lakehead University, and all of the diverse benefits that are derived from the garden.

I am also sharing this experience with my young children, who are growing up in this garden and learning so many valuable things about where their food comes from and the processes involved in growing it. These are lifelong lessons. Together we are sharing garden work, developing relationships with our garden friends, learning, and harvesting large quantities of fresh, safe, delicious, and nutritious food which we share with our family, friends, and others in our community who are in need. I sincerely hope to have many more years of involvement in this inspiring, thriving and fruitful community garden.