Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
https://foodsystemsjournal.org

Social value of a Canadian urban food bank garden

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Submitted January 24, 2022 / Revised April 20 and May 16, 2022 / Accepted May 18, 2022 / Published online August 29, 2022

Citation: Martin, W., Pham, A., Wagner, L., & Werner, A. (2022). Social value of a Canadian urban food bank garden. *Journal of Agriculture, Food Systems, and Community Development, 11*(4), 197–222. https://doi.org/10.5304/jafscd.2022.114.013

Abstract

The Garden Patch—an urban agriculture program of the Saskatoon Food Bank & Learning Centre (SFBLC)—relies on corporate and individual donations in a time of growing austerity. The SFBLC does an excellent job of communicating programs to donors, but they had not previously completed a return-on-investment analysis. A social return on investment evaluation study for the 2018 growing season provided guidance on the most significant impact of the organization's strategic objectives and provided an additional tool to communicate

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Author Note

Portions of this work are in a report on the Saskatchewan Public Health Association's website (Pham, 2018).

Funding Disclosure

College of Nursing Ideas Incubator fund, University of Saskatchewan, and the Saskatchewan Public Health Association contributed to training and data collection.

Conflicts of Interest/Competing Interests

Adrian Werner was employed with the Garden Patch at the time of data collection and analysis. He did not receive honoraria for participating with the study team.

Authors' contributions

Wanda Martin: Conceptualization; writing–original draft publication; writing—review and editing. Anh Pham: Methodology; data collection and analysis; writing—report for partners; writing—reviewing and editing. Lindsey Wagner: writing—reviewing and editing. Adrian Werner: data collection; supervision; writing—reviewing and editing.

the program's value to donors and the community. This work indicates the monetary value of social benefits gained from the investments made to the SFBLC for its urban agriculture program. Data sources included harvest data, volunteer logs, budget, and workshop attendance; key informant interviews with community members, volunteers, and staff; and community-based telephone and online surveys. It also included in-person surveys with community members accessing food hampers. With feedback from stakeholders, we measured the most valued program outcomes. The inputs and resources to run the Garden Patch were valued at CA$96,474 in 2018.[1] The outputs were vegetables for food hampers, gardening skills, physical and psychological health, and work and educational experiences. Outcomes were valued using financial proxies. For each outcome, the deadweight, attribution, and displacement were considered and discounted to calculate the impact value of $155,419. The final calculation is expressed as a ratio of present value divided by the value of inputs. We conservatively estimate a $1.61 of social value created for every dollar invested in the Garden Patch. We also analyze this method in the context of the current societal neoliberal paradigm, recognizing that there is much work to be done to advance food security and social justice.

Keywords
Social Return on Investment, Food Bank, Urban Agriculture, Garden, Social Value

Introduction

Smaller Canadian cities are struggling with multiple social concerns such as income and food insecurity at levels previously seen in larger urban centers (Kading & Walmsley, 2018). Saskatoon, a prairie city in central Saskatchewan with a population of 337,000, ranks 17th in size among Canadian municipalities in 2020 (Statistics Canada, 2021). The median annual income for an individual in Saskatoon is low at $40,670 (City of Saskatoon, 2021). Public health programs and not-for-profit organizations that support vulnerable and disenfranchised people struggle to operate under austerity in Canada's current economic and social environment (Cunningham et al., 2016; Guyon et al., 2017). Federal and provincial investments in public health systems have decreased, and many public health professionals consider the global neoliberal agenda a threat to health, wellbeing, and equity (Kading & Walmsley, 2018; Schrecker, 2016). Demonstrating the monetary value of social programs is increasingly important to ensure a broad allocation of resources and satisfy funders (Banke-Thomas et al., 2015). Social return on investment (SROI) measures financial value relative to the resources invested in programs to capture some measure of the social value.

Public health programs can benefit from having evidence of impact on society and the value that programs funders provide in supporting healthy populations. For example, the Saskatoon Food Bank & Learning Centre (SFBLC) provides services to the community such as emergency food, sundry low-cost items, and work and volunteer opportunities. This food bank has been operating since 1983 with no core government funding. Instead, the program relies on corporate and individual donations (Saskatoon Food Bank & Learning Centre, 2020). The SFBLC has several programs, one being the Garden Patch, which began in 2010 (Saskatoon Food Bank & Learning Centre, 2020). The Garden Patch engages volunteers to grow shared and distributed food through the emergency food basket program.

The Garden Patch began as a volunteer-operated grassroots initiative to convert a weedy and vacant city block in the City Park neighborhood of Saskatoon, Canada, into a productive space for growing food for the SFBLC. Between 2010 and 2018, the Garden Patch produced over 110,000 lbs. (50,000 kg) of vegetables for distribution through emergency food hampers at the SFBLC (Garden Patch, 2021). The Garden Patch (2021) reported that its primary goal was to grow fresh and nutritious food using sustainable food production techniques. The program goal included community engagement and asset-building opportunities and nurturing a network of local Saskatoon residents capable of achieving food security by growing

[1] All currencies in this paper are in Canadian dollars.

food. The objectives for the Garden Patch as a program of the SFBLC are engagement, education, demonstration, food access, and food policy (personal communication, Adrian Werner, September 15, 2019). Each objective has a set of key activities, and every activity serves multiple purposes. The primary purpose of the Garden Patch is to provide fresh, healthy vegetables in the food hampers for clients, people, and families who are marginalized. The purpose of this SROI study was to quantify the benefit created by investing donor funds and organizational resources into this enterprise. The results of this study supported the SFBLC's goal of evaluating its programs against its strategic objectives. Furthermore, the analysis provided a quantitative metric of the Garden Patch's impact for corporate and individual sponsors who financially support and value the SFBLC's work. The SROI provides a deeper understanding of the social value received from the investment made and highlights the efforts of the staff and community members.

Literature Review

Gardens, be they flowers, shrubs, trees, or food, provide many assets to urban settings and are collectively identified as green infrastructure (Bellezoni et al., 2021). Green infrastructure that produces food is known as urban agriculture, which encompasses a variety of food-growing methods in an urban setting (Martin & Wagner, 2018). The Sustainable Livelihood Framework (Morse & McNamara, 2013) is one way to understand the assets when examining urban agriculture. The framework is centered on five livelihood assets: natural, human (personal), social, physical, and financial. We use this framework and a brief analysis of urban agriculture's role within the current socio-political context to explore the literature on urban food gardens.

Natural Assets

Quality food production is only part of the health benefits of urban agriculture. There are additional means to sustainable livelihoods that can increase health equity. Natural assets in urban settings are essential for good health. Green infrastructure has positive effects on quality of life and wellbeing, including improved mental health (Colley et al., 2020; Coutts & Hahn, 2015), better social cohesion (Hartig et al., 2014), a slower decline in physical activity in aging populations (Dalton et al., 2016), and reduced mortality (Crouse et al., 2017). Allen and Balfour (2014) reported that wealthy areas of a city are ten times more likely to have quality green space, experience better health outcomes, and live longer. There is a relationship between access to green space and better health regardless of economic status. Exposure to green space moderates income-related inequity in physical and mental health (Allen & Balfour, 2014). Urban agriculture can improve cities' natural assets and sustainability by contributing to soil fertility, supporting pollinators and water quality, regulating pests and pathogens, and mitigating greenhouse gas emissions that contribute to climate change (La Rosa et al., 2014). Improving natural assets in the urban environment is essential for a healthy population.

Human Assets

Human assets refer to knowledge, skills, ability to labor, and good health that allows people to pursue a livelihood (Sustainable Rural Livelihoods Advisory Committee, 1999). Howard and Britcha (2013) have identified gaps and deficits in Canadians' food knowledge and skills. Food literacy is a concept in the literature that involves understanding the entire lifecycle of food: growing, preserving, distributing, and accessing food, and where it goes when discarded (Sumner, 2013). Additionally, Kabisch et al. (2015) outline the human health and wellbeing aspects of urban green spaces, highlighting a correlation to reduced obesity and stress levels. Leake et al. (2009) identify the physiological, nutritional, and psychological health benefits of growing food in urban settings. Urban agriculture production in a group setting can improve food literacy and provide mechanisms to enhance physical and psychosocial wellbeing (Lovell et al., 2014).

Social Assets

Social assets involve networks and connectedness that foster cooperation (Morse & McNamara, 2013). Specifically, this asset includes community engagement, inclusiveness, and neighborhood stewardship (Sustainable Rural Livelihoods Advisory Committee, 1999). Robust civic engagement is

essential for cities to achieve successful comprehensive urban agriculture and to meet the challenges for many local food networks (Lutz & Schachinger, 2013). The social interaction in community gardens can play an essential role in retaining and transmitting collective knowledge on growing food and managing the local ecosystem, enhancing the human asset dimension (Barthel et al., 2015). Community gardens support community cohesion and the development of social capital as these urban spaces provide a means for developing social networks and social skills (Rogge et al., 2018).

Physical Assets

Physical assets include the basic infrastructure in the urban setting, including water supply, transportation, and access to information (Sustainable Rural Livelihoods Advisory Committee, 1999). Urban agriculture can improve physical assets with green roofs that reduce interior spaces' heating and cooling burden (Food and Urban Agriculture Advisory Committee, 2012). It can lessen the burden on municipal sewer systems and reduce urban carbon dioxide levels by stimulating productive reuse of urban organic waste and reducing the energy footprint (Specht et al., 2014; Toronto Food Policy Council, 2012). Physical assets can be expensive, but the improved infrastructure can have long-term benefits for the community (Sustainable Rural Livelihoods Advisory Committee, 1999). A community garden can be a physical asset to a city that provides space for community empowerment and developing collective forms of working (Cumbers et al., 2018).

Financial Assets

Financial assets are the cash or equivalents available to adopt livelihood strategies (Sustainable Rural Livelihoods Advisory Committee, 1999). Financial assets tend to be the least available to those who have the most to gain from improving health equity (Marmot et al., 2008). Lwasa et al. (2014) reported on the evidence that urban agriculture can reduce poverty and enhance livelihoods and regulate environmental processes. Furthermore, urban agriculture strengthens the city economy by adding what is called an "import substitution industry" involving marketing, processing, and distributing through small enterprises (Smit & Nasr, 1992). Such an industry contributes to improving health equity by providing opportunities to generate income and meet food security needs.

Urban Agriculture and Food Justice

The World Health Organization (de Leeuw et al., 2014) reports on the need for integrated policies and programs based on intersectoral collaboration that can ensure a healthy and sustainable food supply, improve social cohesion, and provide environmental and economic benefits that can improve health equity. Promoting sustainable livelihoods requires various sectors involved with the natural, human, social, physical, and financial assets (Sustainable Rural Livelihoods Advisory Committee, 1999). Exploring programs based on such assets opens a window across sectors, providing space for the comprehensive practice of health promotion.

However, these programs must also be considered critically as to how they interact with (or possibly perpetuate) broader social structures. Although urban agriculture has often garnered associations in the public sphere as an activity associated with social justice, how urban agriculture programs are executed can vary greatly and have the potential to reinforce unjust social structures (Reynolds, 2015). It was particularly noted by Tornaghi (2014) that the disciplinary fields to first address urban agriculture in the academic literature took an uncritical approach to advocacy for the practice, without considering any potentially problematic practices in the area, such as the impact of access to land and/or municipal restrictions on land use, motivations for urban agriculture (leisure versus food sovereignty or subsistence), or the use of urban agriculture as a greenwashing tool in sustainable development models without considering its broader impacts.

It is worth noting that urban agriculture was once a common practice within city limits, but that this shifted in the early to mid-1900s through the enforcement of elitist, racist regulations favoring a white middle- and upper class who could afford to buy food as opposed to growing it (Bouvier, 2014). Urban agriculture is a social endeavor influenced by our dominant social structures. Ensuring that

these urban agriculture projects have a positive impact and are socially just in their application depend on whether a critical, liberatory approach was taken during their design. When looking at possible downsides or harms of urban agriculture projects, it has been noted that some projects frame themselves in a neoliberal type of self-help framework without addressing the root causes of the food insecurity that they purportedly want to address (Weissman, 2015). As another example, some projects reinforce white dominance in these urban agriculture initiatives, even if occurring in areas where urban agriculture participants are predominantly Black or people of color (Reynolds, 2015). Additionally, when looking at the impact of social structures on access to funding and resources to start or maintain urban agriculture projects, it has been noted to vary greatly due to structural racism and the demographics of who is involved in an organization's leadership (Reynolds, 2015). As noted by Reynolds et al. (2020), naming these effects of unjust social power structures is key in a movement toward food justice.

Another factor to consider should be whether the implementation of such a project allows for further austerity measures and dismantling of social welfare programs due to the option of urban agriculture allowing people to be self-sufficient (Tornaghi, 2014) or through increased reliance on the not-for-profit or volunteer sector (McClintock, 2014). Furthermore, it can play a direct role in the gentrification of low-income urban neighborhoods (McClintock, 2014). Thus, though there are numerous potential benefits of urban agriculture projects, the practice of urban agriculture should not be regarded as a social panacea. There are known shortcomings. Urban agriculture has the potential to mask food insecurity without addressing root causes, and may further entrench the neoliberal self-sufficiency mindset, allowing for rollback of social safety nets. It also has the potential for harms, dependent on how projects are implemented. However, urban agriculture is not a simple good/bad dichotomy (McClintock, 2014). Instead, it should be considered as a complex social subject that requires critical reflection like other social endeavors to ensure that it is rooted in socially just principles. It can be a useful tool when considered alongside other broader, systemic changes.

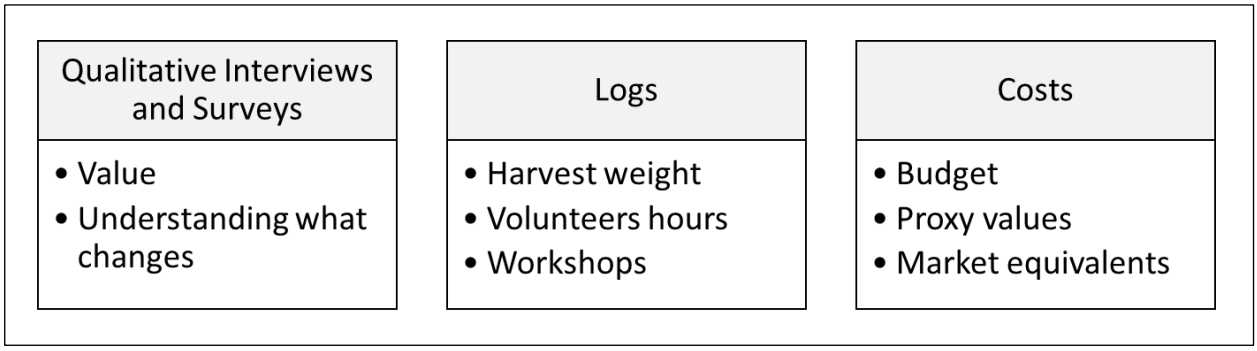
Considering food justice as the backdrop to this study is important because we are putting an economic value on a social outcome, which fits in a neoliberal paradigm. The purpose of the study was to quantify the benefits of the program, but urban agriculture has far-reaching implications and is not the answer to household food insecurity. There are, however, other social goods to an urban agricultural program, and the SROI approach allows for program users to identify beneficial aspects. This opens a pathway for critical consideration of why such a program would have value to the end user.

Methods

SROI is a principles-based method for measuring extra-financial value (i.e., environmental and social value not reflected in conventional financial accounts) relative to resources invested. Social Value UK has standardized the SROI method, providing a consistent quantitative approach to understanding and managing the impact of a project, business, organization, fund, or policy (Krlev et al., 2013). This method puts financial "proxy" values on the impacts noted by stakeholders that do not typically have market values (Social Value UK, 2020).

SROI evaluation is a structured way to understand a program using a relatable number. However, a program tells a story, and there is a story told by this value (Social Value UK, 2020). This number incorporates the program's social, environmental, and economic costs and benefits. SROI is about value rather than just a financial number. This paper aims to understand the ratio value created from benefits compared to costs calculated for the Garden Patch's growing year of 2018 (the year data were collected). The study was an evaluative type of SROI using retrospective data. It included a combination of qualitative, quantitative, and monetary summaries of information about the program and its outcomes (see Figure 1). Table 1 displays the details of the surveys and interviews. The results can assist in making program decisions about effectively providing for the community's needs. There are five main stages in the SROI process, outlined below (Social Value UK, 2020).

Figure 1. Method Structure



Identifying Key Stakeholders

Data for this study began with a stakeholder analysis, targeting those involved in the Garden Patch operations. A summary of the six stakeholder groups included in this analysis and their involvement in the program is in Table 1. Emergency food basket program clients were members of the community attending the SFBLC to receive the vegetables grown in the Garden Patch. Some of the clients had also volunteered in the Garden Patch. Many volunteers attended the garden to do various tasks to keep the vegetables and plants growing well. It was essential to speak with long- and short-term volunteers who used the emergency food basket program to understand the value of the Garden Path program. Upon completion, the Garden Patch offered a course with a "Gardening 101" certificate. Staff members taught gardening and employment skills and subsequently provided written reference letters to help participants obtain jobs. The staff members at the Garden Patch maintained the land, organized volunteers, guided tours, taught workshops, collected data, and evaluated the programs. Adopt-A-Plot Teams consisted of groups of friends, family members, or coworkers who volunteered together to adopt a few rows at the Garden Patch over the growing season. Finally, there are two beehives located in the Garden Patch. The

Table 1. Stakeholder Involvement

Stakeholders	Population	Sample	How involved
SFBLC clients	Approximately 20,000 people	113 surveys	• Medium interest in getting involved in the evaluation process • Honorarium provided
Volunteers	Over 2000 visitors and volunteers and about 50 school groups go through the Garden Patch each season	227 workshop participants	• Medium interest • Lower priority for some volunteers • Did not contact volunteers that came very few times
Gardening 101 participants	Two participants	One key informant interview	• High interest and engagement in providing feedback • High level of impact and outcomes for those enrolling in the Gardening 101 course
Adopt-A-Plot	26 teams of people	13 surveys	• Medium interest • Multiple recruitment emails sent to volunteers to participate
Garden Patch staff	Seven staff members	Conversations with the manager and structured interviews with all Garden Patch staff	• High interest and engagement in the evaluation process • High priority compared to other stakeholders
Beekeeper	One beekeeper	One key informant interview	• High interest in providing feedback

beekeeper and the garden program split the honey evenly. One beekeeper attended to these hives, donating a portion of honey to the emergency food basket program. The beekeeper taught a workshop as well. In turn, the bees helped increase the yield in the garden.

We did not consult some stakeholders directly for the evaluation. According to the garden manager, the garden had several supporting partners, but these partnerships did not have costs or benefits that directly affected community members. These stakeholders are listed in Table 2, along with the input and output indicators.

This study was submitted to the University of Saskatchewan Ethics Review Board (Behavioural Ethics Identification No. 196) and considered exempt as a program evaluation study. However, we did have an informed consent process, and the study was conducted following the information we presented to the review board.

Mapping Outcomes

Outcomes are products of program activity that indicate that a change has occurred (Social Value UK, 2020). The evaluator conducted key informant interviews with key community members, volunteers, and staff members with expertise and experience in the Garden Patch. Key informant interviews are in-depth, qualitative interviews with individuals who play a significant role in the community and are selected based on knowing the subject matter (Miles et al., 2014). Interviews were voice recorded, transcribed, and coded for outcome themes.

Evidencing and Valuing Outcomes

Based on the results of mapping the outcomes, we developed surveys to gather quantitative data. The surveys were made up of structured, direct questions with multiple-choice answers. They were conducted in person at the SFBLC with community members. Additionally, we reviewed existing information, prior evaluations, and data sources from the Garden Patch. A review of site documents can be a cost-effective means of obtaining available data without interrupting program implementation (Miles et al., 2014). Included in the analysis were sources such as harvest data, volunteer logs, the organization's budget, and workshop attendance data. We used this data to value the Garden Patch's inputs, outputs, and outcomes. The outputs and outcomes are detailed in Table 2 and Appendix A.

The SROI methodology uses financial proxies to indicate the value of a program outcome (Social Value UK, 2020). The outcomes are mapped against indicators, then assigned a financial proxy. For example, a gardening skill obtained at the Garden Patch could also be obtained at a local gardening course that participants would pay to attend. Therefore, the proxy is the cost of such a course. The indicators and values are in Appendix B and the sources for financial proxies are in Appendix C. Similarly, the vegetables from the garden could have multiple price points, so many were considered to obtain a reasonable (not inflated) value. The list of vegetables and values are in Appendix D.

Establishing Impact

The impact is essential to understanding the depth of meaning a program can have and helps prevent overclaiming its importance. For each change, we considered the deadweight, attribution, and displacement subtracted from the indicator value to calculate the impact value. Deadweight is the value once we consider how much the outcomes would happen without this program. Attribution is the value indicating the extent that the outcomes are related to the program rather than other activities. Displacement is the value representing whether the program activities are displacing other activities—would participants have taken a yoga class instead of working in the garden, for example. These are conservative estimates made by the researcher based on interviews, literature, and experience in the local context. We asked the following questions for each outcome: Would the change have happened anyway? Is any change caused because of other changes? Has this activity simply moved something rather than changed it?

Calculating the SROI

The final calculation of impact for the Garden Patch is expressed as a ratio of present value as indicated by the impact divided by the value of

Table 2. Inputs and Outputs

Stakeholders	Inputs	Value (CA$)	Outputs
Staff includes: • Urban agriculture program manager • Horticulture coordinator • Engagement coordinator • 2 horticulture assistants • Fall horticulture assistant	• Time, commitment, skills, expertise, experiences • Wage of $/hr. • Producing and harvesting vegetables	$121,313.48	• 5,325 hours of staff time invested, 7 employed staff, 21720.4 lbs. of vegetables produced • Evaluations and data collection costs
	Professional development	$3,548.13	• Job satisfaction, cell phones, T-shirts, shoes
	Workshop presentation	$782.30	• Over 27 workshops and 234 participants
	Student education	$184.29	• 20 student groups volunteered
	Safety-related items	$45.27	• Safety for the volunteers and staff
	Irrigation system	$2426.81	• Site development
	Site improvement	$1,232.11	• Site development
	Communication and events	$2,630.09	• Program exposure and promotion • Funder promotion
Volunteers Adopt-a-Plot School groups and corporate groups	Materials for gardening	$9,255.51	• Lbs. of vegetables produced
	Time and commitment	$0	• 3,870 hours of volunteering and gardening experience
	Materials specifically for Adopt-A-Plot group	$1,211.97	• 26 Adopt-A-Plot groups involved
	Time and commitment from school groups	$0	• 19 school groups involved, 453 students and teachers and 737.25 hours invested
City of Saskatoon	Land	$1.00	• Renting the lot for the Garden Patch
	Water bills	$5,719.97	• Watering plants and lbs. of vegetables produced • Handwashing stations
University of Saskatchewan	Support and partnership	$0	• Committee meetings with Garden Patch • Healthy Yards demonstration garden • Teaching workshops • Hiring students and providing work experience
CHEP Good Food Inc.	Support and partnership	$0	• Committee meetings with Garden Patch • Healthy Yards demonstration garden • askiy[a] interns teaching workshops • Provide Gardening 101 certificate
Saskatchewan Waste Reduction Council	Support and partnership	$0	• Master gardeners' input, help with gardens • Provide 6 workshop sessions • Healthy Yards demonstration garden
Saskatoon Food Council	Support and partnership	$0	• Partners with the Urban Ag Holiday Party • Host the Urban Ag tour and collaborate on committees to discuss policy changes and garden laws
Saskatoon Seed Library	Time, commitment, expertise	$0	• Provide seeds and teach 3 workshops
Funders and corporate partners	Funding for salaries, developmental costs, gardening materials	$0 cost to the Garden Patch	• Funders are mentioned on the staff T-shirts and at the Community BBQ
Beekeeper	Time and equipment for maintaining beehives and harvesting honey	$695.77	• 75 lbs. of honey donated to the food bank • Greater vegetable yield • 1 workshop taught
Total		**$96,474.01**	

[a] askiy (all lower-case spelling) is the Cree word for earth, and is the name of a program training youth to grow food for a market garden.

inputs. It was essential not to overvalue the outcomes, and care was taken to provide a modest and transparent process description.

Results

Evidencing and evaluating outcomes were done using interviews, surveys, and existing documents. Qualitative analysis of the social value is presented below using the sustainable livelihoods framework. This is followed by the vegetable harvest records and quantitative descriptive surveys. Pseudonyms are used for all interviewees to protect their anonymity.

Qualitative Description

The Garden Patch was seen as an excellent opportunity to beautify a neglected area of the city. While the city block on which it is located has the potential for buildings, it was vacant and used as a dumping site for those who wanted to offload garbage. The City of Saskatoon recognizes vacant lots as a challenge and thus leases the land to the SFBLC for CA$1 per year. Having the garden on the vacant land is a service to the city. As John (a dedicated volunteer) indicated, "When the Garden Patch was first being tilled up, I thought it was a good use of underutilized land, and we shouldn't have vacant lots that are growing weeds, so I like the concept; I like the idea of using the space to be a productive source of food."

Being surrounded by apartments, the residents interact positively with gardeners even though they did not participate in the garden. As Frank (volunteer) noted, "I'd be out there picking away and weeding, and then someone would come out of those apartments right there, and they'd wave and say hello, and stuff like that. So, the interaction that I had with the community right there was good. It seemed like they were happy with it there and didn't have any problems with it." The garden provided a natural beauty service to an otherwise neglected space and freed the city of time and costs for the upkeep of the block.

The garden served as a learning ground for both new and experienced gardeners. Growing food on such a scale is unusual for people living in urban settings. An accessible experience allowed people to develop new skills and try them in their home gardens. Karl (employee) explained, "I went in with zero knowledge basically and came out feeling confident enough that I could grow my own food, so that was really awesome." Similarly, Sharon (employee) intended to apply the new information in a future garden:

> I would've learned anything that was kind of larger-scale; I did learn from the Garden Patch. Things like using plastic mesh, and drip irrigation, I wouldn't have had an opportunity to have tried that out before…. I'm expecting I'll likely implement some ideas next year in my own garden of some things I've seen, and it just gives me lots of opportunities to think about, "Oh, could I try this out in a garden in the future?"

Ryan (volunteer) had some gardening experience but came away with a range of new ideas and techniques.

> I also learned a bit about putting an irrigation system together. I learned a bit about transplanting potted plants. … There were a couple of others. I learned about the three sisters growing technique; growing corn circled with bean and squash. The corn provides a climbing structure for the beans. The beans fix nitrogen into the soil, and the squash kind of provides a living mulch. And I learned a little bit about the soil. Like using a fork in the soil instead of rototilling kind of helps with the fungus network in the soil. And those are kinda some of the things I learned. I had a little bit of gardening experience before, but those are some new things I picked up.

It can be challenging to learn new gardening skills, given the fairly short growing season and space required. Having a productive working garden allowed for volunteers to invest in learning new skills that may have been inaccessible otherwise.

The Garden Patch provided a space for social interaction and a place for the human spirit to thrive. People expressed how working in the garden supported their mental health and provided a

venue for connectedness and social activity. Chris explained how he could use his skills and make meaningful connections:

> Well, it certainly helped me make new friends, and like … what I call my tribe, the urban gardeners, it certainly helped me make new friends, new connections this way. I felt useful, and my gardening skills were able to help people. I could teach new gardeners. I was given responsibilities right away and told to go, like nobody was micromanaging, so that was very … it felt really good to be good at something and trusted with those responsibilities. It was fun pulling together at harvest time, and like we had to work hard together as a group to get it all done really quickly before the frost came, and it's …. I don't know; it just makes you feel proud and good, like all those new friends are good friends, and you've done something good together.

Other volunteers described how it helped deal with depression by working alongside people excited about what they were doing. The garden provided space for people to engage at their own pace and be part of something important for the SFBLC and the greater community.

The garden supplied the typical physical assets of rainwater catchment, biodiversity, and air purification that plants provide in an urban setting. There was also the physical presence of being situated in a neighborhood where help and support could be readily at hand. Karl (employee) explained, "I think that's definitely something that we do for specifically the City Park neighborhood—we're like a really nice, welcoming type space, for everybody." Vaughn described the garden as providing an additional service of neighborhood watch.

> One lady was walking down the alley, and she ended up twisting her ankle really bad to the point where she couldn't move, and she had a dog, and so we basically were able to bring her into the Garden Patch and offer support and basically get someone to come and pick her up and stuff like that. So, the idea that we're kind of around and we're always moving around probably does wonders for things like crime in the community, and on top of that, we offer a service of basically making sure that that area—that entire square block—remains to a certain standard of cleanliness or upkeepness, with the byproduct of producing food for the broader community of Saskatoon, and education on agriculture.

Maintaining an ordered and welcoming space went beyond the food production mandate.

The garden provided several financial assets, such as freeing the city from maintaining the site and providing the natural and physical assets that the municipality could otherwise supply. The garden also provided work experience and references for volunteers to gain paid employment. Vaughn described how volunteers could use their experience to advance their own financial needs:

> The first thing that they're trying to do is build up a bit of a work ethic, or a work regime, so they can basically become employable, so probably about six people would show up regularly, and they would treat it as if we were their job, and they would report to us, and it was a little weird for me off the start because they would be like, "I was supposed to be here at 10. I'm sorry I'm late." And I'd be like, "You're a volunteer." Right? But I kinda caught on to what they were trying to do. They were trying to basically—for whatever reasons—whether they were depressed, or having issues, basically getting experience. They were using this as a platform. So, we had people that were from outside of Canada, like people from Africa, that were coming in regularly, and then Adrian (Senior Manager) would get calls looking for references. And usually, after we would get the calls for reference, then that person would stop showing up, so we would assume at that point he or she got a job.

The advantages go beyond the volunteers. Vaughn was also taking the knowledge he gained and applying it to a small market garden business.

> I am starting a farm project outside of Saskatoon with my wife, and a lot of the techniques that I researched to start a market garden I was able to take and use that information to start a lot of projects within my own house and yard area. A lot of things like understanding how, say, a drip irrigation system works, I've been able to learn that working with them directly, and be able to take that forward into food production on a larger scale in my own … production level.

The most significant financial asset is the food value to the SFBLC. As Karl described, "We provide locally grown produce, which is really important from a food bank aspect because—or from a food insecurity aspect—because that's the most expensive stuff, and if you're relying on the food bank to subsidize your food, chances are you're probably not able to make it to the farmers market and stock up on fresh produce, so we help fill in a gap there." Locally grown produce using organic methods is not typically affordable for lower-income people. The garden could produce high-quality vegetables for people who needed them the most. If the Garden Patch did not produce the vegetables, the SFBLC would have purchased additional food to meet the local need.

Harvest, Volunteer, and Workshop Data

The Garden Patch program coordinator provided previously recorded data and tracked and provided 2018 harvest data, the volunteer log, workshop data, and the budget. The harvest data consisted of vegetables and the total weight (21,720 pounds). Using this data, we determined the cost of these vegetables by using farmers market prices and supermarket prices (both budget and higher-priced supermarkets) for a range of $42,020 (supermarket value) to $54,561 (farmers market value). We calculated the average of the farmers market and supermarket costs for a value of $48,291. The quality of these locally grown vegetables would be more like farmers market vegetables, but clients would be more likely to buy vegetables from the supermarket. There has been an increase in vegetable prices since the time of our data analysis, with a 12% increase in 2020 and an expected increase of 5% to 7% in 2022 (Charlebois et al., 2020). Therefore, the value of the garden's production is greater than what we have calculated.

Similar to the harvest log, the program coordinator kept a volunteer log. There were 3,930 hours of volunteering invested into the Garden Patch. Different documented tasks included site maintenance, planting, weeding, harvesting, education, and tours. Workshop attendance and feedback were recorded after each session. There were over 30 workshop topics and 227 participants throughout the growing season, as identified in Table 3.

Some of the knowledge and skills learned at the workshops included using a grow light and fan; starting seeds; vermiculture composting methods; bin and pit composting; learning about edible plants and weeds; dealing with pests; learning about

Table 3. Workshops and Participation, 2018

Workshop Title	No. of Participants
Garden Patch Tour + Compost Demo	27
Plant Seed Library	17
Compost 101	16
Reclaiming Our Prairie	15
Container + Small Space Gardening	15
Beekeeping	13
Harvesting + Using Finished Compost	12
Bread and Berries	12
Seed Library Harvest Party	11
Edible + Medicinal Plants	11
Canning + Preserving	11
Harvesting Wildflower Seeds	8
Traditional Plant Use	8
Hot Composting	8
The Snacking Garden	6
Bioblitz	6
Story of Soil	6
Saving Tomato Seeds	5
Natural Pest Control	4
Vermicomposting	4
Compost Workshop	3
What's that Critter?	3
How to Build an Insect Hotel	2
Plants for Pollinators	2
Saving Rainwater	1
Low Water Gardening	1

beneficial insects, bee mortality and the beekeeping process; general planting; why native plants are essential and how to grow native species; and the make-up of healthy soil.

Client Surveys

Of 116 client surveys conducted at SFBLC, 66 people were familiar with the Garden Patch. One client stated, "Yes, I visit as often as I can! Fantastic, all of it! The knowledge and expertise of the staff are phenomenal, and they listen to suggestions." Additionally, 20 of these people have been to the Garden Patch. Seventy-six percent of the clients were interested in going to the Garden Patch. This shows that some people accessing the emergency food basket program found value in visiting the Garden Patch and were interested in getting involved, especially with special events like a community BBQ, volunteers receiving food, workshops, and work experience programs.

Client surveys also revealed that 46% use all the produce in their hampers, and 45% said there is not enough produce in the hamper. Clients mentioned that produce from either the Garden Patch or grocery stores is sometimes overripe. One client mentioned, "I love the variety of fresh items. If I get something I've never tried before, I enjoy looking up new recipes to try out!" Another client stated, "My family is too big and needs more produce." Fresh, high-quality vegetables are appreciated and necessary for people using the emergency food basket program.

Evidencing and Valuing Outcomes

Using the data above and the budget reports, we calculated the key activities (inputs) under analysis and identified the outputs associated with the key activities. The values represent wages for staff, tools, and infrastructure for gardening, workshop and presentation materials, and educational resources totalling $96,474 (see Table 2). Some inputs did not cost the Garden Patch, such as support and partnership from various organizations, yet they resulted in outputs such as workshops.

Stakeholders indicated important outcomes. The primary outcome was the freshly grown vegetables for food hampers. They also identified the natural and physical assets, education and work readiness, physical and psychological health improvements, confidence in gardening skills, improved community aesthetics and land use, collaboration, and community-building. We identified 12 outcomes that had value or for which we could identify financial proxies for the value (Table 4). For example, gardening education was compared to a Gardening 101 course offered locally, and volunteer hours were calculated at the minimum wage. This may seem low, but conservatism is a key principle of the SROI methodology. The total value of the outputs and outcomes of the Garden Patch for one year was $173,332.

To complete the SROI analysis, the research team considered what would or could have happened, the contribution of others, and if the program activities are displacing other activities. These estimations acknowledge the deadweight, attribution, and displacement of the program. Considering the deadweight, without the Garden Patch there was not a great chance that the vegetables for the food hampers would have existed in the form of organic, locally grown food and voluntarily provided with the same type of community experience and workshop opportunities. However, there were other outcomes that we considered possible (see Table 4). Some volunteers had noted they had already learned skills from another course or from friends and family members. People volunteering at the Garden Patch were interested in gardening or gaining some work experience. Therefore, the attribution percentage was higher. We considered what this program could have taken away from another asset for displacement. The area used to raise vegetables was an empty lot that could have other purposes, such as housing, a park, or commercial infrastructure. The percentage in displacement is low because the Garden Patch did not replace anything in the past but used ignored and unproductive land. Therefore, we calculated the impact value to be $155,419.

Calculation of the SROI Ratio

To calculate the impact, we divided the impact value of CA$155,419 by the input value of CA$96,473 for a ratio of 1.61:1. The social impact value shows that we estimate for every $1 invested into the Garden Patch, there is a CA$1.61 of social

Table 4. Impact Value

Financial Proxy of Value	Value (CA$)	Deadweight	Attribution	Displacement	Impact (CA$)
Cost of vegetables averaged between farmers market and supermarket	$48,291	0%	0%	0%	$48,291
Cost of transporting vegetables from a wholesaler in the city	$414	5%	10%	10%	$311
Reducing GHG and pollution—city block of families of 4 in 10 houses	$6,090	0%	0%	10%	$5,481
Education compared with the same Gardening 101 program taught at Gardenline	$56,000	0%	10%	0%	$50,400
Work readiness and volunteer experience paid at minimum wage	$41,429	5%	10%	5%	$33,143
Average cost of Pilates/Yoga in Saskatoon. Average $16 per hour volunteer drop-in x 213 volunteers	$3,408	5%	20%	0%	$2,556
Average cost of compost at $29 per yard x 88 yards in 1 city block	$2,552	0%	10%	0%	$2,327
Cost of renting a space for community gardening workshops and average cost of a paid workshop for 227 participants x $30	$6,810	0%	5%	0%	$6,470
Food safety courses at $65 per person x 45 participants	$2,925	5%	0%	0%	$2,779
Cost of annual maintenance of medium size open area park	$3,500	0%	0%	10%	$3,150
Collaborations and systems policy meetings. Minimal cost for a networking event @$10/hr x 25hrs	$250	5%	5%	0%	$200
34 kg of honey produced for food hampers at $9.15 per kg	$311	0%	0%	0%	$311
Total	**$173,332**				**$155,419**

value created. This SROI assumes an extremely conservative measure of impact.

$$\text{SROI ratio} = \frac{\text{present value}}{\text{value of inputs}}$$

$$\text{SROI ratio} = \frac{\text{CA\$155,419}}{\text{CA\$96,473}}$$

$$\text{SROI ratio} = 1.61$$

Discussion

SROI is a newer evaluation method that can provide both organizations and funders with data to assess if a program is worth an investment. Our number is quite conservative compared to an SROI done in the United Kingdom. The UK Master Gardener Programme reported a value of 10.7:1, listing social, economic, and environmental outcomes (Schmutz et al., 2014). The authors found similar outcomes to our study, including health and well-being, community participation, and training (Schmutz et al., 2014). However, the difference is in applying the proxy values, where we did not include in our calculations psychiatric services, cognitive behavioral therapy, or the economic benefits of preventing premature death. The strength of our calculation is that the outcomes and financial proxy measures are modest and provide proxies for activities that people may do versus therapies that may be socially or financially out of reach for the volunteers.

Furthermore, we did not attempt to calculate the carbon sequestering that the garden provides as was done in the UK study. We did, however, include the cost of pollution if 10 households lived in that space instead of having the garden. This may be considered an oversight since, presumably, the people would live somewhere and still pollute the environment, just not in that area. Calculating

greenhouse gas reduction can be as complicated as SROI, as so much depends on how calculations are made and what is being measured. Cleveland and colleagues (2017) modeled urban gardens by measuring the replacement of lawns, using household greywater, and composting organic waste to determine a two-kilogram lower emission per kilogram of vegetable harvested versus purchased. While measurements and proxy values can be argued, there is evidence that gardens help the environment.

Human assets are a primary concern of organizations such as the SFBLC and are intertwined with natural assets. While we can determine a return-on-investment calculation, the actual value is the meaning that people make of their lives. As we see in our data, the Garden Patch provided multiple assets for human capital, including gardening skills, increased self-esteem and self-confidence, along with physical and psychological benefits. Through this program, clients of the emergency food basket program had access to fresh, nutrient-dense produce that could affect their health in the long term. Leake and colleagues (2009) identified the physiological, nutritional, and psychological health benefits of growing your food in urban settings. The effect can reach beyond SFBLC volunteers and clients. Green areas in an urban setting have positive effects on quality of life and wellbeing, including improved mental health (Colley et al., 2020; Coutts & Hahn, 2015), better social cohesion (Hartig et al., 2014), a slower decline in physical activity in aging populations (Dalton et al., 2016), and reduced mortality (Crouse et al., 2017). Having a garden instead of a vacant lot produces outcomes beyond what we have calculated here. The confidence for work readiness and improving and maintaining a garden are also values that are hard to quantify and have value beyond our calculation.

Based on the value created by educational programming and the ability to increase programming without increased physical land and assets, this may be a way to increase the benefit of the Garden Patch in future years. The educational opportunities were beneficial for interviewees, whether in gaining hands-on experience or learning new skills and techniques. Additionally, more engagement and involvement of SFBLC clients also can increase the project's value.

The Garden Patch provided a means for connecting people around a central activity through formal workshops and informal learning when working alongside other gardeners. Having space and opportunity for community engagement was a significant outcome. Social interaction in community gardens can play an essential role in retaining and transmitting collective knowledge on how to grow food and manage the local ecosystem, thereby enhancing the human asset dimension and social asset dimension (Barthel et al., 2015). Sharing knowledge of local food systems is an essential aspect of the collective identity of people living on the Canadian Prairies, where rural agriculture is the primary export industry. Additional human and social assets include welcoming new Canadians and having accessible means for gaining work experience. Teixeira and Drolet (2018) described the new immigrant challenges in smaller Canadian cities and highlighted the importance of welcoming spaces to help orient newcomers to Canada. The value of that work was not fully captured in this SROI, but it is vital to consider the role of community gardens and the potential for knowledge exchange across cultures.

Collaboration was included in the calculations and was essential, considering the city's food policy and food security groups. Weissman and Potteiger (2018) described how important collaboration is in providing opportunities to strengthen local urban food systems' economic and public health outcomes and contribute to environmental sustainability. Levkoe and Sheedy (2017) highlighted the Canadian context of food movement networks and the importance of collaboration to support transformative change toward a healthy food system. The Garden Patch was part of such ongoing work with the Saskatoon Food Policy Council and other collaborators interested in strengthening the local food system.

The primary physical assets the Garden Patch provides are improved community aesthetics and land use, where there was once a vacant lot across from a central industrialized area. There are five to seven hectares of park space per 1,000 people in the area (City of Saskatoon, 2020), which is moderate park space for the city. The permeable surface

makes it a prime area for stormwater management, reducing the risk of flooding. The garden also provides cooling space, counteracting the heat-island effect. Energy can be saved by producing vegetables closer to the point of consumption, with less need for cooling and packaging (Bellezoni et al., 2021). While urban gardens provide pollinator habitat, pollen can also increase, negatively affecting people with allergies.

Furthermore, there could be heavy metal deposit sources from atmospheric deposition (Bellezoni et al., 2021); however, an environmental assessment conducted at the start of the garden project found no indication of food safety concerns or heavy metals. There are many considerations of the physical assets that an urban garden provides. Quantifying such assets is not straightforward, but the social value can surface in the story that is told.

Our data showed that participants valued the reduced cost of transporting locally produced vegetables. Other financial assets included volunteer independence and work readiness skills, including the food safety course. The garden also provided jobs for staff that they reported as satisfying work. Meaningful work contributes to improved health equity by providing opportunities to generate income and meet food-security needs. Not considered in this evaluation were property value changes due to the transformation of the city block, nor consideration of gentrification. While some cities experience what local people may consider "land grabs" by urban market gardeners (McClintock, 2018), the Garden Patch leases the land, which remains a potential building site.

Overall, this study shows a variety of measurable benefits throughout all areas included in the sustainable livelihoods framework. Using this framework is helpful in conjunction with an SROI evaluation because the framework takes a holistic approach to ensuring that a variety of factors that influence long-term sustainability are accounted for in the analysis. The framework emphasizes the need to look at all aspects of a program or intervention, assess each area for vulnerability to shocks, and build resilience where the system is most at risk (Morse & McNamara, 2013). The model has been used both for analyzing existing scenarios and for planning and development (Morse & McNamara, 2013). Additionally, the framework's comprehensive approach that centers on people and their local knowledge is one of its key advantages (Morse & McNamara, 2013). The benefits of the Garden Patch being seen across all five key indicators in the sustainable livelihoods framework provide further evidence of the program's value over and above the monetary SROI calculation.

However, there is a lack of socio-political context in the data presented in this paper. Both the SROI and sustainable livelihoods framework would allow for the consideration and valuing of political advocacy or social justice, but it would need to come from the interviews as part of the valuing process and part of community-based research. It is important, though, to consider the term "value" and how urban agriculture is taken up. In the current neoliberal paradigms that reign within global geopolitical structures, valuation of social interventions in a market-based, capital framework through a method such as SROI can be a valuable tool to donors to justify contributions (Banke-Thomas et al., 2015) and to inform how organizations allocate organizational resources. As outlined in Banke-Thomas et al. (2015), one of the benefits of SROI is that it allows for the computation and analysis of various stakeholder viewpoints and "value" in a singular ratio. Framing social structures around market-type relations, which in this case would be framing social value as a monetary figure, is one of the critical tenets of neoliberalism (Labonté & Ruckert, 2019). Neoliberalism also emphasizes the need for austerity measures and is detrimental to societal health and health equity (Labonté & Ruckert, 2019). Thus, though SROI uses the market-based framing to show value within our neoliberal society, it simultaneously validates the very environment causing public health and nonprofit programs to struggling in the first place (Labonté & Ruckert, 2019) and creates a need for "value-for-money" evaluations to justify their existence (Banke-Thomas et al., 2015).

Although SROI can be a valuable tool in the dominant neoliberal political paradigm, the validation it provides to existing market frameworks and its shortcomings do not account for how the par-

ticular project addresses the root issues of social justice (whether the project is designed in such a way that it aids in dismantling unjust social factors, or plays a role in reinforcing them) should be acknowledged so that the ethical implications of using such a tool can be transparent. This transparency allows for future discussions of whether framing certain measurable aspects of social structures as market relations is the best path forward, as well as a discussion of the importance of factors that are not necessarily measured, such as how a project situates itself politically. A better understanding of the relationship between social value and neoliberalism allows for questioning the values and assumptions that come with such a system. The SROI can then be framed as a stepping-stone, giving social and not-for-profit organizations a tool to justify their existence until such a time that there is a geopolitical paradigm shift that no longer requires such a market-orientated framing.

Conclusions

A recommendation for the Garden Patch's future years is continued data collection and evaluations to measure social impact and compare values in the future. Additionally, further analysis could look for ways to measure any SFBLC activities that look to impact or address root causes of food security (poverty, unjust social structures, structural racism, etc.) and how issues of social justice are addressed in the structure of the Garden Patch program itself. Additional recommendations are to increase educational aspects of the program, such as the Gardening 101 Course, and continue to engage and involve SFBLC clients with the Garden Patch. A strength of the Garden Patch in this SROI process is that the program has vibrant and detailed data, which enabled the research group to determine the monetary value of its social impact through this SROI process. Through the monetary lens of the SROI, the Garden Patch proves its value, and with this evaluative insight and knowledge, the program is likely to increase its impact in the future years.

Continued data collection and evaluation would provide the opportunity to show further benefits over the years and the potential to highlight longer-term impacts. This SROI evaluation shows that the Garden Patch, a community-based urban agriculture initiative, can turn financial investments into social benefits of greater value than the money invested. Thus, this community endeavor adds to sustainable community development and shows measurable benefits to both corporate and individual donors.

Acknowledgments

We are grateful to Jolene Zidkovich, Laura Hopkins, the Saskatoon Food Bank & Learning Centre staff for supporting this project, and the students who helped transcribe and collect data.

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Appendix A

Table A1. Stakeholders, Outputs, and Outcomes of the Garden Patch, 2018

Stakeholders	Outputs	Outcomes (what changes?)
Saskatoon Food Bank & Learning Centre (SFBLC)	• 3,930 of hours of volunteer time invested into the Garden Patch	• Fresh locally grown produce for the emergency food basket hampers • Increased environmental benefits
Emergency food basket clients	• 21720.4 lbs. of local vegetables produced for the food hampers • Volunteer hours invested into the Garden Patch	• Access to nutrient-dense produce in food hampers • Work experience is developed from volunteering • Decreased risk of chronic diseases and any other diet related illnesses • Learning how to produce and grow vegetables. Reduce food insecurity
Volunteers (including Adopt-A-Plot, school groups and corporate groups)	• 3,930 hours of volunteering invested into the Garden Patch • 21720.4 lbs. of vegetables produced • 3,870 of hours engaging in outdoor physical activity • 26 Adopt-A-Plot groups involved • 19 different school groups involved, 453 students and teachers and 737.25 hours invested • 32.25 yards of compost and 777 bags of leaves • Education and workshop presentations • Over 27 workshops presented, 64 surveys collected from workshop participants	• Learning new gardening skills, composting skills, community building, improved self-esteem, confidence and well-being • Physical health and psychological health increases • Engaging in purposeful activity • Influence in eating healthier produce and foods • Volunteer independence and work readiness increase • Confidence to improve and maintain own garden or start growing their own food • Increased growth in vegetables and learning composting skills • Learning new gardening techniques, composting, building garden beds, beekeeping, harvesting, starting seeds, cooking techniques and benefits of plants
Staff	• 5,325 hours of staff time invested 7 employed staff, 21,720.4 lbs. of vegetables produced • More than 12 different data collection documents produced • Teaching 3 cooking workshops • Offering food safety courses	• Engaging in purposeful activity with job satisfaction • Improving teaching, managing and gardening skills • Sharing food safety and cooking knowledge with others
City of Saskatoon	• Renting the lot for the Garden Patch • Watering plants and lbs. of vegetables produced	• Improve community esthetics and use of land • Space for community engagement and social infrastructure • Providing land for welcoming teaching space
University of Saskatchewan	• Committee meetings with Garden Patch • Healthy Yards demonstration garden • Teaching workshops • Hiring students and providing work experience	• Enhance collaborations and create synergy among Garden Patch and other food related studies
CHEP Good Food Inc.	• Committee meetings with Garden Patch • Healthy Yards demonstration garden askiy[a] interns teaching workshops • Provide Gardening 101 certificate	• Collaborations and build community knowledge through Healthy Yards and workshops

continued

Saskatchewan Waste Reduction Council	• Master gardeners give input and help with the gardens • Provide 6 workshop sessions • Healthy Yards demonstration garden	• Collaborations and build community knowledge through Healthy Yards and workshops
Saskatoon Food Council	• Partners with the Urban Ag Holiday Party • Host the Urban Ag tour and collaborate on committees to discuss policy changes & garden laws	• Collaborations to create policies and by-laws • Building community knowledge through the holiday party and Urban Ag tour
Saskatoon Seed Library	• Provide seeds and teach 3 workshops	• Collaborations and build community knowledge
Funders/ Corporate Partners	• Funders are mentioned on the staff t-shirts and at the Community BBQ	• Volunteer opportunities • Collaborations and build community knowledge
Beekeeper	• 75 lbs. of honey donated to the food bank • Greater vegetable yield • 1 workshop taught	• Honey distributed to the community members • Collaborations and build community knowledge

[a] askiy (all lower-case) is the Cree word for earth, and is the name of a program training youth to grow food for a market garden.

Appendix B

Table B1. Indicators and Values

Outcome Description	Indicator	Financial Proxy	Value (CA$)
• Fresh locally grown produce for the emergency food basket • Access to nutrient- dense produce in food baskets	Total cost of vegetables	Cost if vegetables are purchased for the emergency food basket using the average of supermarket and farmers' market prices.	$49,643.21
• Reducing gas emissions and increased environmental benefits. • Time saved when transporting vegetables from the Garden Patch since sorting has already been done.	Cost of shipping on same amount of vegetables (lbs.)	Renting a U-Haul truck Size 20' or 26' to move fresh vegetables from a wholesaler in the city (average 10 km from any superstore in the city): rented for 8 hours @ $39.95 + $0.96/kilometers @10km x 2 = $59.15 (7 days)	$414.05
Cost of pollution if families were living in the space instead of having the Garden Patch.	$609 per family using carbon tax return for families – Government cost on pollution	A block of families of 4 living on that block with 10 houses.	$6,090.00
• Education: Learning new gardening skills. • Cmmunity-building. • Improved self-esteem, confidence and well- being.	Gardening 101 education for participants.	Compared with the same Gardening 101 program taught at Gardenline through the University of Saskatchewan: $8,000 a course x 7 participants	$56,000.00
• Volunteer independence and work readiness increase. • Confidence to improve and maintain their own garden or start growing their own food.	• 3,870 hours of volunteering invested into the Garden Patch • 19 school groups involved, 453 students and teachers, and 737.25 hours invested	3,780 hours x minimum wage work ($10.96)	$41,428.80
Physical and psychological health increases.	Cost of low impact exercise class.	Average cost of pilates or yoga in Saskatoon. Average $16 per hour volunteer drop-in. 1 session for each volunteer. Calculated around 213 unique individual groups or volunteers $16 x 213 volunteers.	$3,408.00
Compost for the Garden Patch to fertilize the soil with essential nutrients.	Cost of purchasing compost for the Garden Patch.	$25 per yard minimum cost. $33 per yard maximum cost. Using the average cost of compost: $29 per yard 88 yards in 1 city block	$2,552.00
Learning new gardening techniques, composting, building garden beds, beekeeping, harvesting and starting seeds, cooking techniques and benefits of plants.	Education and workshop presentations. Over 30 workshops presented, 227 participants, 64 surveys collected from workshop participants.	Cost of renting a space for community gardening workshops and average cost of a paid workshop. 227 participants x $30	$6,810.00

continued

Sharing food safety knowledge with others.	Cost of food safety course through other organizations. 3 classes of 15 people.	Food safety $65 per person x 45 participants	$2,925.00
Improve community aesthetics and use of land. Space for community engagement.	Cost of managing and maintaining a park in Saskatoon.	Cost of annual maintenance of medium-size open area park, does not include any building structures.	$3,500.00
Enhance collaborations and create synergy among Garden Patch and other food related studies. Community input on system decision and policy making.	25 hours of time spent collaborating and in meetings.	Minimal cost for a networking event/conference @$10/hr	$250.00
Honey distributed to the community members.	Total cost of honey produced.	75 lbs. of honey @ $9.15/kg	$311.93
Total			**$173,332.99**

Appendix C

Table C1. Financial Proxies and Sources

Reducing greenhouse gas (GHG) emissions: https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/saskatchewan.html
How many houses are in a block? https://en.wikipedia.org/wiki/City_block
Renting a U-Haul: https://www.uhaul.com/Reservations/RatesTrucks/
Composting costs: https://www.canr.msu.edu/uploads/236/79117/Compost_for_Midsize_FarmsQuickCourse8pgs.pdf https://www.improvenet.com/r/costs-and-prices/composting
How many yards are in a city block? https://www.convertunits.com/from/yards/to/city+blocks
Cost of maintaining a medium size park: https://content.ces.ncsu.edu/cost-analysis-for-improving-park-facilities-to-promote-park-based-physical-activity
Master Gardening Course and Garden Fundamentals at Gardenline. (University of Saskatchewan) Gardening 101 Course https://gardening.usask.ca/certificates--degrees/master-gardener1.php
Cost of honey: http://www.omafra.gov.on.ca/english/stats/hort/honey.htm
Food safety course: http://www.rqhealth.ca/department/environmental-health/safe-food-handlers-courses

Appendix D

Table D1. Harvest Data for the Garden Patch, 2018

Crop	Weight (lbs.)	Farmers market unit price (CA$ per lb.)	Farmers market value (CA$)	Supermarket unit price (CA$ per lb.)	Supermarket value (CA$)
Beets	2,131.4	3.03	6,458.14	1.47	3,133.16
Carrots	4,376.8	2.51	10,985.77	1.23	5,383.46
Tomato	2,721.7	4.00	10,886.80	2.77	7,539.11
Spaghetti squash	4,822.5	1.50	7,233.75	1.47	7,089.08
Corn	101	0.71	60.60	3.00	303.00
Pumpkin	411	1.00	411.00	1.50	616.50
Buttercup squash	911.4	1.25	1,139.25	1.27	1,157.48
Swiss hard	141.2	5.19	732.83	2.97	419.37
Zucchini	2,812.1	2.07	5,821.05	2.47	6,945.89
Beans	1,010.6	4.67	4,719.50	3.46	3,496.68
Acorn squash	58.2	1.25	72.75	1.47	85.55
Patty pan squash	205.6	3.00	616.80	3.00	616.80
Kale	15.8	6.91	109.18	13.17	208.09
Parsley	3.4	16.00	54.40	11.76	39.98
Lettuce	112.2	2.50	280.50	7.88	884.14
Hot peppers	16.7	6.00	100.20	19.66	328.32
Sweet peppers	50.3	4.00	201.20	3.97	199.69
Peas	8.2	3.64	29.85	5.62	46.08
Radishes	651.8	2.17	1,414.41	2.02	1,316.64
Spinach	4.6	5.70	26.22	13.17	60.58
Eggplant	21.5	3.25	69.88	2.47	53.11
Rhubarb	12.2	2.63	32.09	2.63	32.09
Cantaloupe	103	2.50	257.50	1.00	103.00
Potatoes	18.6	1.69	31.43	1.47	27.34
Raspberries	3.4	9.00	30.60	14.00	47.60
Oregano	1	16.00	16.00	22.38	22.38
Tarragon	0.1	16.00	1.60	16.00	1.60
Butternut Squash	268.8	2.27	610.18	1.47	395.14
Cabbage	208.3	1.00	208.30	0.97	202.05
Cucumber	139.5	2.00	279.00	1.00	139.50
Weeds	67.6	N/A	N/A	N/A	N/A
Watermelon	66.2	2.00	132.40	0.99	65.54

continued

Turnips	57.4	3.00	172.20	1.47	84.38
Honey	57	9.97	568.29	4.09	233.13
Kohlrabi	43	4.00	172.00	4.00	172.00
Broccoli	16	4.00	64.00	2.97	47.52
Basil	12.5	9.60	120.00	18.07	225.88
Mixed greens	11.6	4.90	56.84	4.90	56.84
Parsnips	10.6	4.75	50.35	1.99	21.10
Stevia	9.4	N/A	N/A	N/A	N/A
Black currant	5.4	28.50	153.90	9.99	53.95
Celery	4.6	0.99	4.55	1.48	6.81
Cucamelon	4.4	6.00	26.40	6.00	26.40
Lavender	2.3	10.00	23.00	10.00	23.00
Shiso	1.8	9.60	17.28	9.60	17.28
Miscellaneous herbs	1.6	9.60	15.36	9.60	15.36
Tomatillo	1.6	4.00	64.00	4.00	64.00
Mint	1.4	14.00	19.60	28.15	39.41
Strawberries	1.2	4.75	5.70	2.95	3.54
Thyme	1	56.29	56.29	28.15	28.15
Lovage	0.9	N/A	N/A	N/A	N/A
Total	**21,720.4**		**57,208.72**		**42,077.70**