

**THE APPLICATION OF SUSTAINABILITY ASSESSMENT: A COMMUNITY  
GARDEN ASSESSMENT TOOL**

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Community gardens provide numerous benefits, are important to sustain, and are significant to public health. They go beyond tangible benefits such as improved food security, nutrition and physical activity and can be the host of intangible benefits such as improved leadership, social networks, and quality of life. The essence of a community garden's dynamic transcends across multiple intervention levels making the community garden a flexible initiative. However, recent evidence indicates that community gardens struggle with discontinuation. The overarching goal of this paper is to examine longevity and sustainability issues as they relate to community gardens. I will apply a systematic framework of organizational structure and improvement (Sustainability Assessment Modeling (SAM)) to better understand community garden sustainability. Specifically, I propose the use of the SAM framework to develop a community garden assessment. SAM quantifies stakeholder's values, perceptions, and both economic and environmental costs. One aim of this paper is to explore the literature related to SAM and how this model can relate to public health, with a discussion of its methods, strengths, and limitations. The ultimate objective is to synthesize this information into a proposal of an effective, sustainable-focused assessment for community gardens. The participatory assessment process I propose will utilize indicators of organizational strengths, weaknesses and success of community gardens, such as longevity.



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## 1.0 INTRODUCTION

In May 2009, I started my practicum work in Wilkinsburg, PA at the Grounds of Faith Community Garden, and We Care Food Pantry sponsored by the Second United Presbyterian Church located on Hay Street. The purpose of this practicum was to develop basic fact sheets on minority health status and nutrition issues among the low income population, participate in the grant writing process, as well as assist with the food pantry and garden procedures. One of the main objectives of the practicum was the development of a formal patron survey to properly quantify needs of the population to use for future grant writing and planning next programmatic steps.

With the opportunity to work on several projects for the group with exposure to the organizational structure, several recommendations can be made for organizational improvement specific not only to this organization, but also community gardens in general. Community gardens provide numerous benefits and are important to sustain. However, recent evidence indicates that community gardens struggle with frequent discontinuation. Therefore, the overarching goal of this paper is to examine longevity and sustainability issues as they relate to community gardens. I will apply a systematic framework of organizational structure and improvement, Sustainability Assessment Modeling (SAM), to better understand community garden sustainability.

Sustainability refers to the capability to keep up, or prolong. It is also related to a method of using resources so that the resource is not depleted or permanently damaged (Webster's New Millennium Dictionary of English). Longevity is defined as a long duration of life or long

continuance (Webster's New Millennium Dictionary of English). When comparing both terms, the former has an implication of the use of resources and is often used to describe methods to maintain the environment. However, resources can refer to a variety of things including but not limited to: money, staff, time, supplies, and natural resources. Both terms refer to elongating life. The definition of sustainability and longevity in this paper is to use resources in a way that prolongs the life of the community garden.

Specifically, I propose the use of the SAM framework to develop a community garden assessment. SAM quantifies stakeholder's values, perceptions, and both economic and environmental costs. SAM is relatively new in the accounting realm of cost benefit analysis, however, one of the enhancements that it is capable of is allowing critical contributions to a discussion where social values and opinions can emerge and be respected as indicators in this model (Frame and Cavanagh, 2009). This can be of great value especially when considering the complexity of public health issues.

I propose the application of the SAM framework in a public health context to elicit discussion on the feasibility of use of this framework within community gardens. To do this, I present an assessment to examine organizational aspects of community gardens and how this structure relates to sustainability and longevity. I will explore organizational aspects by using sustainability analysis of organizational objectives, evaluative criteria, and the broader network of other resources.

Sustainability assessment has been recognized as a new way of thinking about impact assessment and cost-benefit analysis with the ability to make significant shifts towards sustainability. The proposed assessment is designed in a way to identify strengths and weaknesses related to organizational aspects within community gardens which reflect longevity.

These identified strengths and weaknesses provide valuable information about the organization. My ultimate hope is that this will lead to useful recommendations for community garden organizations. I will also discuss several limitations in this paper as the SAM framework extends beyond program longevity components.

Also important to organizational structure are community organizational theory constructs that form the foundation for participatory approaches to leadership. These constructs will be discussed as ways to enhance community and organizational development. I will discuss strategies for implementing these principles in terms of community organizing at the community garden level, with regard to strengthening a community garden organization.

Several research questions branch from the overarching goal to be addressed in this paper:

- The first is “What are the potential benefits of community gardens in a public health context?” To answer that question, I will review the literature to describe both the public health benefits and sustainability organizational aspects of community gardens.
- The second question addresses “What is SAM? and how can this framework be translated to public health and community garden organizational sustainability?” Answering that will require that I explore the literature related to SAM and how this model can relate to public health, with a discussion of its methods, strengths and limitations.
- Third, “What previous work has been performed in regard to sustainability of community garden organizations, and what types of frameworks have been presented?” and “what are some tools and methods that are used for sustainability analysis?” I will review the literature on sustainability and community garden aspects to address these questions.
- The final question is “What are some recommendations for assessment design that can be

applied to community gardens?” I will synthesize this information into a proposal of an effective, sustainable-focused assessment for community gardens.

The literature will provide a background to the benefits of community gardens and make an argument that they are worth sustaining. Also, examining what makes other gardens successful will be helpful in designing the assessment. A brief introduction will be given on the community garden in Wilkesburg, PA as this is an existing relationship and potential partnership to implement the assessment. Also important to community organization and building approaches are models that emphasize community strengths, as well as identification of shared values and goals within a diverse group and system. Therefore, an overview of the SAM literature will provide a background and useful discussion when considering methods to incorporate in the assessment. The last objective is to synthesize recommendations for building a sustainability assessment for community gardens. Applying these concepts into a useful assessment will ultimately yield helpful recommendations for community garden organizations to improve leadership, structure and policy.

## **1.1 BACKGROUND**

Community gardens have several purposes and have the ability to serve as a vehicle to mobilize community initiatives. They go beyond tangible benefits such as improved food security, nutrition and physical activity and can be the host of intangible benefits such as improved leadership, social networks, and quality of life. They can be the foundation to community empowerment as well as participation and the construction site of problem solving. Community gardens also capture neighborhood beauty and harvest improved environmental aesthetics. The

essence of a community garden's dynamic transcends across multiple intervention levels making the community garden a flexible initiative.

Several formal definitions of community gardens exist. Webster's dictionary defines community gardens as "a piece of land cultivated by members in a community, especially in an urban area" (Webster's New Millennium Dictionary of English). Glover (2003) defines community gardens as "organized initiatives that use land to grow flowers or food for collective benefit with shared resources such as space, tools, and water" (Glover, 2003). Community gardens help improve the urban landscape, reflect neighborhood pride, and create community catalysts for neighborhood improvement (Langhout, et al. 1999; Schmelzkof, 1995). Community gardens are a place for active community participation and provide the opportunity to address neighborhood issues to push for reform and change (Linn, 1999).

However, others explain the definition of community gardens with an inexpressible description. Ferris et al. (2001) characterize the community garden as "indefinable" where, the community garden serves as a venue with malleable uses that are shaped to fit the needs of the public, and where defining interventions might limit the creative responses to community need (Ferris, Norman et al., 2001). Whether using a rigid or loose definition, community gardens have the ability to transform neighborhood liabilities into both tangible and intangible community assets (Glover, 2003; Linn, 1999).

## **1.2.1 Description of The Grounds of Faith Community Garden in Wilkinsburg and We Care Food Pantry**

### **Statistics of Wilkinsburg**

Wilkinsburg has a population of 19,196 according to the 2000 Census data (United States Census Bureau). The median household income is \$26,621 with 15.9% of families living below poverty, and 18.7% of individuals living below poverty level (United States Census Bureau). Sixty-three percent of the Wilkinsburg population over the age of 16 are in the labor force while 5.1% are unemployed (United States Census Bureau).

### **We Care Food Pantry**

We Care Food Pantry was established in 1982 and provides monthly perishable and nonperishable food distribution for residents of Wilkinsburg. It is operated by members of the Second United Presbyterian Church on Hay Street in Wilkinsburg. The pantry is a member of the Greater Pittsburgh Community Food Bank. Estimated costs for the pantry are between \$800 - \$900 each month totaling \$16 - 18 per family. Recent utilization trends indicate that there has been a steady increase in the number of families who use services from the We Care Food Pantry. In January 2006, an average of 27 families per month were using services; compared to the most recent average from October - December 2009 equaling 55 families per month.

The pantry uses the Grounds of Faith Garden to help supplement fresh produce. Additional programs from the pantry include a casserole program, held the same night as the food pantry. Congregation members donate freezable casseroles that are to be re-heated the night of food distribution. Patrons have the choice to eat a free meal in the church hall with tables and music for a social eating environment, or they can take the meal home in carryout containers.

## **Grounds of Faith Garden**

The Grounds of Faith Garden was established in 2007 with a primary goal to supplement the We Care Food Pantry program with fresh fruits and vegetables. What was once an overgrown, dangerous, vacant lot adjacent to the church and a part of Wilkinsburg's Taylor Park, has been turned into a 5,000 square foot beautiful green space with approximately 300 square feet of garden space. Lauren Broyles, community gardener and church member, explains that "when we initially began turning the ground, we uncovered large rocks, hundreds of bricks, and other debris like old dinnerware that had been used as fill approximately 20 years before when extensive sewer line work was done on the property." In other words, the land was used as a dumping ground.

Because the garden is located in a lot shared by the city of Wilkinsburg and the church, Lauren continues to explain that "the overlapping property boundaries, and the fact that the space was largely unused, responsibility for its maintenance was unclear. Between the limited personnel, budget, and resources of both the church and the city of Wilkinsburg, grass mowing was inconsistent and often done in patches on an as-needed basis. Weed control was poor; aesthetically, the grass looked only partially cared-for, and trash and dog waste were common." Now the lot is kept-up by members of the church who plant, harvest, and attend to regular maintenance.

## **Description of Garden**

The garden aims to use organic procedures with environmentally friendly processes. No chemicals or fertilizers are used, and natural bug repellent methods (e.g. tobacco juice) are utilized. Lawn shavings and newspaper are used to create mulch to help retain water and prevent weed growth. To conserve water, the garden uses an underground drip-hose and rain barrel. The



rain barrel was donated from the Nine Mile Run Watershed Association, whose mission is to “ensure the restoration and protection of the Nine Mile Run Watershed through citizen engagement, demonstration projects, and advocacy” (Nine Mile Run Watershed Association). The donated rain barrel provided an opportunity to train for rain barrel installation, and educate on water conservation.

In 2008, a butterfly garden and woodland meditation area were added. The butterfly garden was previously a small perennial garden established by children in the congregation over 10 years ago, but had since grown over and became a compost pile where lawn shavings were being placed. The butterfly garden was cleaned out and is now planted with flowers to restore the beauty that was once a part of the park.

The woodland meditation garden is a small wooded area that was previously overgrown with brush, weeds, vines, downed trees, and heaped with trash, including beer cans, broken glass bottles, plastic toys, tires, old clothing, and miscellaneous pieces of metal and brick. This raised safety concerns for any visitor to the park and motivated volunteers to clean up the area. Lauren Broyles recognized that “while the area was soon weeded and much of the debris removed, it did not truly become a more aesthetically pleasing place until we received help from the Community Church of Ben Avon, who donated an inordinate amount of perennials, ferns, and other shade-loving plants, concrete benches as well as two full days of labor for ongoing maintenance and mulching.”

Other small perennial gardens around the property were largely untended and overgrown with weeds. Most received minimal attention, primarily during bi-annual service project days from a local Christian school. A small iron gazebo was donated and added to the side of the

property in the spring of 2009 in addition to a grape arbor that was constructed with the help of Northmont Presbyterian Church, adding to the aesthetics of the property.

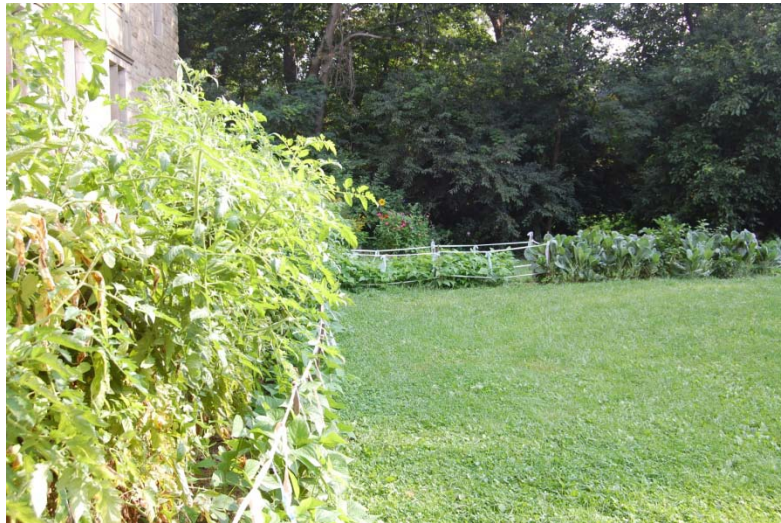
The property has evolved into a neighborhood usable space. What was once before an unusable, dangerous vacant lot has transformed into a space where people can walk their dogs, play with their children, or sit back and enjoy the scenery. Additionally, neighbors have commented positively on the grounds' appearance, have donated vegetable and flowering plants for the gardens, and have made cash donations to the gardening projects. The grounds have also been used as a venue for children's birthday parties, community sno-cone nights, and a Children's Hospital of Pittsburgh event distributing free bicycle helmets for children. The grounds now serve as a safe play area for the children attending the daily Parent's Morning Out Program, which has also been able to do on-site children's activities related to gardening and environmental stewardship. Lastly, the garden has been helpful in supplementing fresh items to the food pantry.

Beyond expanding programs and usable space, Lauren adds that the garden has added a dimension of "visibility that has spawned the recent response to our request for extra produce from neighbors and/or the Homewood Community Garden in Squirrel Hill. People perhaps want to help because they see a project in motion, a shared hobby, a shared commitment to organic." Lauren adds that "our own garden and activities perhaps legitimize us as a worthwhile entity to share with our partners. We're not just asking for a donation, we're asking you to supplement what we already have going."

### **Additional Partnership**

Other community partnerships besides previously mentioned Community Church of Ben Avon, Northmont Presbyterian Church, and the Nine Mile Run Watershed Association include

the Wilkinsburg Shade Tree Committee. In the spring of 2009, the garden was accepted as a neighborhood tree-planting site by the Wilkinsburg Shade Tree Committee, and was provided with a free tulip tree for transplantation near the corner of Hay and Lamar Streets. Additionally, in July 2009, the garden was included as a site during the Edgewood Garden Club Tour, which showcases local gardens and serves as a fundraiser for the Edgewood Garden Club.



**Figure 1.** Grounds of Faith Community Garden

### **1.2.2 Literature Review of Community Garden Benefits**

Community gardening offers a variety of health and social benefits. The programs often serve as a catalyst for other improvements in individuals, communities, and policies. The following is a review of the literature that investigates community gardening benefits and effects. Several studies show that community gardens provide a variety of benefits including improved lifestyle

practices, mental health, and social aspects of the community as well as allow the opportunity for education and skill-building. Community gardens encourage healthy living, through better nutrition and promote physical activity to combat obesity to support public health efforts (Kirkpatrick, Tarasuk, 2009; Pudup, 2008; Armstrong, 2000; 2005; Lombard et al., 2006; Wakefield et al., 2007). Additionally, community gardeners are reported to have improved mental health from participating in community gardening (Armstrong, 2000; Wakefield et al., 2007). Gardens allow time and space for leisure as well as provide the opportunity to increase education, enhance skills within the community, and provide a variety of social and economic benefits (Ferris and Sempik, 2001; Fusco, 2001; Hancock, 2001; Schmelzkopf, 2002; Berti, Krasevec, FitzGerald, 2004).

Specific to nutrition, community gardens positively influence food choice and increase fruit and vegetable consumption (Armstrong, 2000; Alaimo et al., 2008; Devine et al., 1999; Lombard et al., 2006; Morón, 2006). Devine et al. (1999) suggest that the association of experiences with foods eaten from a garden, either in the past or present, are linked to having an increased preferred taste and improved consumption of fruits and vegetables (Devine et al., 1999). Additionally, community gardens improve food access while providing better nutrition (Irvine, Johnson, Peters, 1999; Twiss et al., 2003; Wakefield et al., 2007). One study shows that adults with a household member who participates in a community garden consumes 1.4 times more fruit and vegetables per day than those who did not participate, and is 3.5 times more likely to consume fruits and vegetables at least five times a day (Alaimo et al., 2008). It is also suggested that adults who improve their nutrition will raise children who make better nutrition choices (Reynolds et al., 1999). This is exemplified by one study proving that children who are exposed to variety of fruits and vegetables are more likely to consume them (Reynolds et al.,

1999). An additional study demonstrates a relationship between parents modeling healthy behaviors and improved weight loss in overweight youth (DeMattia and Lee Denney, 2008). Improved fruit and vegetable intake and dietary influence of adults on children's choices are important factors in addressing obesity and better overall health of both adults and youth.

Community gardens provide the canvas for additional successful programs and skills around nutrition. Nutritional outcomes improve when garden programs include nutrition education and agricultural training programs (Berti, Krasevec, FitzGerald, 2004). Another study associates gardening and cooking skills with an increased understanding of strategies for improving fruit and vegetable consumption (Devine et al., 1999). Flanigan and Varma (2006) explore the effectiveness of WIC (Women Infant and Children) educators in community gardens concluding that nutrition educators who promote community and home gardens through education classes, field trips, or providing seedlings, resulted in significant increases in visits to community gardens and gardening at home by participants (Flanigan and Varma, 2006). Most importantly, the intervention was statistically significant in increasing fruit and vegetable intake (Flanigan and Varma, 2006).

Furthermore, community gardens provide additional valuable hands-on experience and learning opportunities for gardeners (Hancock, 2001; Langhout, Rappaport, Simmons, 2002; Matteson, Ascher, Langellotto, 2008; Schmelzkopf, 2002). Gardens have been proven to be a successful vehicle for child and adult education where change can be made on both individual and environmental levels (Ferris and Sempik, 2001; Fusco, 2001). Community gardening has the flexibility to be incorporated in different types of public health programs including effective initiatives to improve health. For example, one study incorporated community gardening in a comprehensive diabetes program that tied education and services together to help effectively

prevent and control diabetes (Armstrong, 2000). Additionally, Kirkpatrick and Tarasuk (2009) cited community gardens as a place that encourages continual learning (Kirkpatrick, Tarasuk, 2009).

Hands-on training opportunities in the garden may extend to valuable work training skills (Ferris and Sempik, 2001; Fusco, 2001; Hancock, 2001; Schmelzkopf, 2002). Several studies have shown that community gardens provide opportunities through self development, skill acquisition, training, and research (Holland, 2004; Twiss et al., 2003; Wakefield et al., 2007). These skills add value to a community by improving the ability and capacity of the community members.

Community gardens also have the ability to improve the environment and aesthetics of the community. They can be used to promote environment sustainability in low income neighborhoods where there is a particular high risk of environmentally degraded environments (Ferris and Sempik, 2001). The gardeners are transforming uninviting urban spaces into beautiful aesthetically-pleasing spaces while actively working together to improve their community (Baker, 2005). Also, the gardens help to improve a neighborhood's livelihood by adding green-space while enhancing attractiveness (Lautenschlager and Smith, 2007; Saldivar-Tanaka, Krasny, 2004; Schmelzkopf, 1995; Schukoske, 2000; Shiness, Glover, Parry, 2004; Thornton, 2009). Furthermore, gardens have provided improved ecology and sustainability (Hancock, 2001; Matteson, Ascher, Langellotto, 2008; Pudup, 2008; Schmelzkopf, 2002; Wakefield et al., 2007). Community gardens have the ability to show an improved environmental awareness and responsibility with the potential to influence youth, and provide the opportunity to connect with nature (Holland, 2004; Baker, 2005).

Several studies have explored safety issues related to community gardens. Community gardens have been proven to stabilize and improve neighborhoods, as well as improve security and provide safe, open spaces (Voicu and Been, 2008; Schukoske, 2000; Matteson, Ascher, Langellotto, 2008). Ferris and Sempik (2001) found that community gardens prove to be a crime diversion (Ferris and Sempik, 2001). Additional studies have found that community gardens provide improved security and safety of the local communities where people feel safe, want to belong, and feel a sense of longevity (Schmelzkopf, 2002; Twiss et al., 2003; Wakefield et al., 2007; Holland, 2004).

Moreover, community gardens provide the opportunity for cultural expressions through culturally appropriate education and growing food where food serves as cultural identity (Baker, 2005; Langhout, Rappaport, Simmons, 2002; Levkoe, 2006; Wakefield et al., 2007). Also, cultural expressions through art in the garden provide unique opportunities to support local culture, heritage, and creativity (Lautenschlager and Smith, 2007; Levkoe, 2006).

Additional costs saving opportunities are provided through community gardens. One study concluded that community gardens provide the opportunity to save money on food expenses (Baker, 2005). Others agree that community gardens create potential cost savings and self-reliance and improve food costs associated with shopping and transportation (Schmelzkopf, 2002; Berti, Krasevec, FitzGerald, 2004; Hancock, 2001; Kirkpatrick and Tarasuk, 2009; Lautenschlager and Smith, 2007; Morón, 2006; Saldivar-Tanaka, Krasny, 2004). Additionally, gardens have created improved food access and variety (Berti, Krasevec, FitzGerald, 2004; Hancock, 2001; Kirkpatrick and Tarasuk, 2009; Lautenschlager and Smith, 2007, Morón, 2006, Saldivar-Tanaka, Krasny, 2004). One study concluded that a rural community garden raised income by saving on grocery purchases and providing a potential to sell excess produce

(Lombard et al., 2006). Lastly, Voicu and Been (2008) reported that community gardens have a significant positive effect on surrounding property value (in this study as much as 9.4% within 5 years of gardens opening in New York) (Voicu and Been, 2008).

Community gardens are proven to have various positive social effects as well. Several studies cited improved social networks and organizational capacity by providing a place to build existing skills of the people within the community (Armstrong, 2000; Glover, Parry, Shinew, 2005; Hancock, 2001; Shinew, Glover, Parry 2004; Voicu, Been, 2008). Additional opportunities exist within the community garden space to connect with neighbors and build connections where people may gather and network (Baker, 2005; Glover, 2004; Linn, 1999). Community gardens can build success, sharing, and social support (Kirkpatrick and Tarasuk, 2009). Hancock (2001) found that community gardens provide the opportunity of increased social capital, through the development of social ties and an increased appreciation of social diversity (Hancock, 2001). The aesthetic accomplishment resulting from the garden leads to improved self-worth and increased pride in neighborhoods (Glover, 2003)

Community gardens are also proven as an effective vehicle to community building. One study concluded that having community gardens in a neighborhood improved the attitudes of residents towards their neighborhood as evidenced by improved maintenance of other properties in the neighborhood, reduction of litter, and increased pride in their neighborhood (Armstrong, 2000). Additional community activities were also organized as a result of the garden, such as tree planting, or crime-watch efforts (Armstrong, 2000). The gardens provide a symbolic focus which increased neighborhood pride and aesthetic maintenance of neighborhoods (Armstrong, 2000; Twiss et al., 2003). Community gardens have the potential to serve as a catalyst to address other community issues, and further both community organizing and involvement (Armstrong, 2000;



Levkoe, 2006; Twiss et al., 2003). The gardens provide the opportunity to connect cross-culturally, while being drawn into broader social movements such as the community food-security movement (Baker, 2005). They provide equal opportunity and involvement in diverse local structures, consultations, and decision making (Holland, 2004). Community garden initiatives have been cited to improve empowerment (Langhout, Rappaport, Simmons, 2002; Kirkpatrick and Tarasuk, 2009; Shiness, Glover, Parry, 2004; Wallerstein and Bernstein 1994). Ultimately, gardens provide a space for community interaction, decision making, problem solving, creativity, and celebration to foster neighborhood ownership and pride (Wilkins, Bowdish, Sobal, 2002; Twiss et al., 2003; Schukoske, 2000).

### **1.2.3 Community Garden Longevity Factors**

Several factors are required to build a successful, sustainable garden. There are many ways to manage or initiate a community garden. However, The American Community Gardening Association (ACGA) has published literature on recommendations to build a strong organization. The recommendations are developed from several core principles including:

- In order for a garden to be a true community resource, it must grow from local conditions, reflect strengths, needs and desires of the community
- Diverse participation and leadership at all phases of the garden operation, enrich and strengthen a community garden
- Each community member has something to contribute

-Gardens are communities themselves, as well as part of the larger community (From The American Community Gardening Association Growing Communities Curriculum, 2006).

The principles include themes of empowerment, diversity, community participation, asset building, fostering relationships, and integrating community gardens with other organizational strategies which are aimed towards longevity (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Asset-Based Community Development** Successful gardens build on the concept of asset-based community development which includes: the process of identifying local needs, being internally focused on the community in terms of time and energy, putting an emphasis on building local capacities and agendas, and being relationship driven (The American Community Gardening Association Growing Communities Curriculum, 2006). Assets can include the talent or gifts of individuals, small formal or informal groups, and institutions at a larger level (local government or other organizations) who have knowledge or resources to contribute. These resources can include land or buildings with available meeting space (such as schools or parks), donations, publicity, and contributions to community work (The American Community Gardening Association Growing Communities Curriculum, 2006). This information can be gathered through interviews and surveys, or performing a mapping of potential partners to use as an effective tool to identify the type of support lent from that potential relationship (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Community Organizing** The focus of the organization should be to build on the structure of the garden so that it can exist beyond any one player (The American Community Gardening Association Growing Communities Curriculum, 2006). Effective structural characteristics

include: having a simple purpose, equality of power, transparency, and having meetings or mechanisms to increase skills, support and accountability (The American Community Gardening Association Growing Communities Curriculum, 2006). The community should be empowered to make the garden their own so that they do not depend on the garden that was given to them, but rather take pride in keeping the garden which helps to address local needs and issues.

**Leadership Development** Leadership development should be addressed within the organization where there is an ability to identify leaders, help foster development of their leadership skills, and organize and plan for the development of community garden leaders (The American Community Gardening Association Growing Communities Curriculum, 2006). Being able to identify certain leadership characteristics such as motivation, trust, vision, integrity, and creativity prove to be important traits of effective leaders (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Organizational Aspects** A mission and vision for the organization must be developed to provide structure and drive program planning, decision making, organizational planning, and help with fundraising opportunities (The American Community Gardening Association Growing Communities Curriculum, 2006). Strategic planning should be included to assess alignment with mission and goals to mark progress, and identify strengths and weaknesses to continue to make improvements within the organization (The American Community Gardening Association Growing Communities Curriculum, 2006). Planning for an evaluation process will also provide direction in improving the organization by measuring whether goals and objectives are being met (The American Community Gardening Association Growing Communities Curriculum, 2006). Meetings and decision making should be done in an effective manner. Effective strategies include making goals and agendas for the meetings, setting a convenient time and place, actively

recruiting members and assigning meeting roles (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Communications Planning** This should include effective outreach strategies to increase the visibility of the organization in the community and increase legitimacy in fundraisers eyes (The American Community Gardening Association Growing Communities Curriculum, 2006). Coalition building is recommended in order for gardens to continue to develop by combining resources to effectively meet the goals of the organization (The American Community Gardening Association Growing Communities Curriculum, 2006). Networks, partnerships, and collaborations may yield increased credibility, broadened scope, combined skills and ideas, and deepened relationships within the community and are an important piece to the organizational structure (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Fundraising** A fundraising plan should be developed with strategies around an action plan, with objectives to reach budgetary goals (The American Community Gardening Association Growing Communities Curriculum, 2006). Effective outreach should target individuals, sponsors, and corporations (The American Community Gardening Association Growing Communities Curriculum, 2006). Also, establishing a Board of Directors to handle budgeting as well as fundraising matters developed to meet the needs of the organization is an effective strategy for handling budgeting matters (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Environmental factors** Getting a lease agreement for land-use for at least 3 to 5 years, testing the soil for heavy metals or toxins (e.g. lead), and securing water from a public works agency or

friendly neighbor are environmental aspects to consider for longevity (The American Community Gardening Association Growing Communities Curriculum, 2006).

**Community Garden Longevity Survey** In 1998, The ACGA published the National Community Gardening Survey to summarize major trends of community gardens (National Community Gardening Survey, 1998). Six thousand and twenty urban gardeners responded to the survey with the majority being from neighborhood gardens, followed by public housing gardens, and school gardens (National Community Gardening Survey, 1998). The vast majority of gardens report site permanency as an issue with only 5.3% (or 318) of gardens reporting ownership (National Community Gardening Survey, 1998). Thirty-two percent (or 1,941) of gardens reported being in existence for more than 10 years, however, this does not always lead to sustainability (National Community Gardening Survey, 1998). Losses of gardens in the past five years was 9% (or 542 gardens) and new gardens are on the rise with about 30.8% (or 1,851) of the total gardens surveyed (National Community Gardening Survey, 1998).

From 1992 - 1998, Pittsburgh experienced a low overall change in the number of community gardens. This suggests an estimation of permanency and that Pittsburgh is experiencing a slower than normal rate of change in the number of gardens (National Community Gardening Survey, 1998). Overall, Pittsburgh ranked 5<sup>th</sup> out of 38 cities ranked by number of gardens per 10,000 people, reporting 2.9 gardens per 10,000 people, equaling 79 gardens reported in 1996 (National Community Gardening Survey, 1998).

Reported reasons why gardens discontinue include: the loss of interest from gardeners, loss to a public agency, and loss to a private agency (National Community Gardening Survey, 1998). This suggests that perhaps the most important factor is how community interest is maintained and how a garden is valued within a community (National Community Gardening

Survey, 1998). A study that focuses on the group dynamic, as well as management and outside support for the garden might be more telling when further assessing longevity factors (National Community Gardening Survey, 1998).

## **2.0 SUSTAINABILITY ASSESSMENT FRAMEWORK**

### **2.1 SUSTAINABILITY ASSESSMENT LITERATURE REVIEW**

Sustainability Assessment Modeling (SAM) was first developed for use by those working in the oil and gas field. The assessment model is a part of the overall decision-making processes within BP (British Petroleum) (Baxter, Bebbington et al., 2002). SAM is a type of model which enhances sustainability development where “an advantage to sustainability development (SD) modeling is the awareness of environmental, poverty, and human rights issues... and this may facilitate further steps in social and institutional change process towards sustainability” (Söderbaum, 2007). Much of the literature has an emphasis on sustainability defined as environmental prosperity where SAM's original intent is to ensure sustainability issues are considered in organizational decisions (Frame and Cavanagh, 2009). However, when adapted to the arena of public health, sustainability may refer to the simple endurance or longevity of the program based on available resources which can include not only environmental resources, but also social and economic resources. Sustainability modeling assesses organizational structure and crucial components for longevity. Most importantly, the model incorporates a dialogue between stakeholders emphasizing the need for non-monetary goals and values of a project to be weighted and included into an overall assessment.

Specifically, SAM was intended to provide: "assessment mechanisms that address the integration of various sustainable development dimensions to provide public and private sector decision and policy-makers with tools to understand the impacts of different development pathways on all dimensions of sustainable development; and document success stories in achieving 'win-wins' rather than trade-offs between two or more dimensions of sustainability"

(Frame and Cavanagh, 2009). The model includes dimensions of economics, societal, and environmental aspects with broad categories to include various health and cultural impacts which can be reduced to monetary and non-monetary categories (Söderbaum, 2007). Essentially, the results of the assessment are to yield a graphical representation (SAM signature) of the categories to develop a clear picture of strengths and weakness.

Söderbaum (2007) outlines the following implications of sustainability development (SD) modeling to include: 1. Non-monetary impacts must be considered in a systematic way where (non-monetary) impacts cannot be assigned a monetary value without this consideration, and in some cases cannot be assigned a value at all (Söderbaum, 2007); 2. One standard measuring tool does not exist for sustainability. There are multiple dimensions and stakeholders involved where there must be room for interpretation and decision-making (Söderbaum, 2007); 3. Issues of uncertainty should be expected and must be systematically considered (Söderbaum, 2007); 4. Sustainability Assessment should be based on ideas of ‘good governance’ in the sense that there is open dialogue with the willingness to listen and learn, transparency, responsibility, and accountability (Söderbaum 2007).

Organizational change is a complex adaptive system where “understanding social and institutional change process involves consideration of multiple categories of actors and multiple actors with one category, multiple relationships and networks between actors, multiple institutional arrangements with connected rule systems, multiple levels from local to global, and multiple scientific ideological and other perspectives” (Söderbaum, 2007). Many organizational issues tend to be multiplidisciplinary, complex, and uncertain.

Koppenjan and Hans Klijn (2004) describe tools to map the nature of uncertainties that will not necessarily eliminate uncertainties, but will help to better understand them (Koppenjan,



Hans Klijn, 2004). “Uncertainties arise by strategic and institutional features of the network where a new approach should be outlined to address these uncertainties” (Koppenjan, Hans Klijn, 2004). Approaches to mapping uncertainties in problem solving by using the network approach include conducting actor analysis, game analysis, and network analysis (Koppenjan, Hans Klijn, 2004). These tools will result in the creation of a map of the environment which partners can use to improve the situation (Koppenjan, Hans Klijn, 2004). There is a need to have tools to address these complexities, to make useful recommendations. Bebbington et al. (2007) add that in order to address these ecological complexities, there is a need for more participative approaches which are suggested in sustainability assessment (Bebbington, Brown et al., 2007).

The complex system of a community is often the target of programming. It is at the population level in which public health programming strives to influence. When addressing public health initiatives, often times community organizing and community building can be important aspects of not only community development, but the success and longevity of the program. When attempting to model community organizing, Rothman (2001) defines locality development as a process oriented structure which emphasizes consensus and group dynamics to build community (Rothman, 2001). The model includes two additional typologies: social action and social planning. Social action relates to radical community involvement and empowerment. Social planning also counts on community participation, but also relies on outside expertise (Rothman, 2001). Typically, community development and organizing is a mix of typologies (Glanz, Rimer, Viswanath, 2008).

Several concepts can lend insight to understanding and measuring components of community building in successful organizations. Empowerment, critical consciousness,

community capacity, social capital, issue selection, and participation are central to most community organization and community building models (Glanz, Rimer, Viswanath, 2008).

Specifically, SAM's participatory approach strives to balance power when addressing problems, supporting the democratic process, and addressing issues at multiple levels (Frame and Cavanagh, 2009; Söderbaum 2007). Participative approaches that promote dialogue and understanding of the interrelationships between decision-making processes facilitate group dynamics to help people to see both similarities and differences (Söderbaum, 2007). Additionally, "stakeholder engagement in sustainability issues is critical for the legitimacy and quality of decisions and value-laden judgments in the decision-making process" (Frame and Cavanagh, 2009).

Using a participatory approach is not a novel concept to public health assessment; however, SAM proposes a unique aspect. This is found in the combination of this approach with traditional economic or impact assessment with the assignment of individual value that can later combine into a larger, unified assessment. This individual value assignment is encouraged through open dialogue of stakeholders, where traditionally this process might be skipped overall, or assumptions made on part of the value of the community (Söderbaum, 2007). The assignment of value to non-monetary assets is a classic public health issue where SAM may provide some direction and clarity. Classic participatory research approaches can yield a variety of benefits including the framing of problems defined by the organization including cultural sensitivity, more relevant recommendations and interventions, a higher level of commitment to change, increased trust, and ownership (Minkler, 2005).

Additionally, Kaatz et al. (2005) add that "participation is effective if it allows the views, perceptions, interests, values, and needs of interested and affected parties (stakeholders) to be

integrated into project decision-making” (Kaatz, Root et al., 2005). However, Kaatz et al. (2005) continue, “this needs to recognize that initially stakeholder perceptions and values may not in themselves be aligned with the underlying principles of organizational development” (Kaatz, Root et al., 2005).

SAM presents a useful framework built on the mentioned principles of deciphering monetary and non-monetary assets in a way to lend useful recommendations from the assessment. The model stresses to uncover organizational uncertainties and approach them with assessment methods based on participation, dialogue, transparency, responsibility, and accountability (Söderbaum, 2007). Finally, stakeholder participation is encouraged, recognizing a true democratic process, arguing that there is not always one correct value to assign to any variable when dealing with non-monetary indicators.

However, how effective is the process? How does it compare when applied to different project contexts? In order to answer these questions, several case studies reviewing SAM are summarized in the next section. A study was conducted for a waste-management project using SAM. The study demonstrates the usefulness of stakeholder conversations around the non-economic benefits, alternatives for waste management, and identifying social benefits from a wide range of activities (Frame and Cavanagh, 2009). Also, interests from a wider range of potential stakeholders as well as a higher level of engagement were reported by this process (Frame and Cavanagh, 2009). Another case study addressed the use of SAM for a social housing project. A primary issue was the establishment of appropriate measures addressing the social benefits that were identified. For example, it is difficult to determine whether the program results in happier, healthier communities with less crime, as data on these measures are scarce (Frame and Cavanagh, 2009). Essentially, challenges were identified when trying to define measures that

can be appropriately quantified and monetized, and also used in a logical way of relativity (Frame and Cavanagh, 2009).

SAM projects have also been developed in New Zealand and include a resource center, organic waste composting, and community gardens (Bebbington, Brown et al., 2007). In these cases, a “SAM signature” is developed from full cost accounting to indicate changes in economic, environmental and social capital categories resulting from the project (Bebbington, Brown et al., 2007). The process of developing a “SAM signature” proposes to use assessment indicators defined by economic, environmental or social categories. The SAM signature is then used to make a graphical representation of the assessment results (Bebbington, Brown et al., 2007). The process aims to compare the categories to show (pictorially) gains and costs within the project (Bebbington, Brown et al., 2007).

In summary, SAM presents several advantages and limitations. Although it encourages a participatory approach, and a solution to valuing non-monetary indicators, it is still fragmentary in nature, leading to many assumptions and uncertainties. Depending on the project context, different variables may be associated with sustainability. Also, non-monetary values are not always defined by validated measures. There is a need for an “expert” not only to help assign measures to the indicators, but also, graph the final output from the developed SAM signature.

## **2.2 ALTERNATIVE MODELS**

Some of the prominent alternative approaches that exist for impact assessment, decision-based evaluation, and sustainability development are discussed. The models and tools below were cited as most prominent in the literature when looking at sustainability issues. Some of these models are disconnected or fragmentary and are targeted on different issues meant to be identified in

different contexts (Xing et al., 2009). The purpose of this discussion is to highlight differences in each approach, and their strengths and weaknesses to better determine an appropriate method for community gardens.

The prominent approaches are summarized to identify plausible recommendations for assessment of community gardening. These include: program evaluation, Cost-Benefit Analysis, Positional Analysis, Environmental Impact Assessment, the Sustainability Evaluation and Reporting System, and Urban Development SAM. Key issues are discussed to outline their basic principles, strengths and weaknesses when being considered for a community garden project.

Program evaluation models include: formative, process, outcome, and impact evaluation. Program evaluation aims to answer whether or not program objectives are being met, how they are met, and to what extent (Patton, 1997). Like SAM, it is recommended for participation within the community to define the outcomes that are to be measured and define the questions that are to be answered through evaluation.

Cost-Benefit Analysis (CBA) is deals with the ‘correct’ prices or correct rules of monetary valuation for purposes of resource allocation (Söderbaum, 2007). It is argued that perhaps it is not effective or democratic for professionals to declare correct values when evaluating a project or organization (Söderbaum, 2007). Certainly one would wonder about ethics, motivations, and biases when professionals are assigning these values. Additionally, there is a concern when comparing values between different situations where Bebbington et al. (2007) describes as “...‘apples’ taken away from one group of people to provide ‘oranges’ to another group” (Bebbington, Brown et al., 2007). However, Söderbaum (2007) highlights that “CBA is still useful as a method to prepare decisions at the level of society in the special case that all citizens in a community agree on the ideology to be applied and that this ideological consensus

happens to coincide with the ideology built into CBA” (Söderbaum, 2007). Ultimately, there is a need for the accounting discipline to adopt more transparent methods of decision making that facilitate participatory methods and accountability (Bebbington, Brown et al., 2007).

One of the main differences between CBA and SAM is the process of participation through a productive dialogue between stakeholders, allowing the opportunity to debate differences and assign values to parameters (Frame and Cavanagh, 2009). This approach can have a radical impression on the information provided, thus impacting organizational recommendations (Frame and Cavanagh, 2009). Another difference is described through the “aggregated approach” of CBA where all impacts affecting all individuals in society are summarized in one dimensional terms (Söderbaum, 2007). This, compared to SAM, which proposes “highly disaggregated” data to reflect a multidimensional approach to different kinds of impacts and different groups that are kept separate throughout the analysis to more accurately reflect value (Söderbaum, 2007).

Positional Analysis (PA) is a type of organizational model which is built on the idea to bring forth issues concerning impacts in relation to actors and stakeholders (Söderbaum, 2007). This process seeks to clarify issues within the organization between stakeholders and different actors with respect to position, resources, interests, and ideas (Söderbaum, 2007). The ideology aims to monitor impact among social networks to stimulate dialogue to inspire a process of interactive learning (Söderbaum, 2007). The model also speaks to the monetization of values as well as the organizational uncertainties which may arise when approaching decision making. Söderbaum (2007) explains that the approach “involves a systematic focus on how non-monetary and monetary impacts differ between alternatives, with attempts to systematically deal with uncertainty in terms of scenarios and alternatives to analyze commonalities and conflicts of

interest in relation to various affected activities” (Söderbaum, 2007). Critiques with this approach include difficulties with the amount of time and commitment to the process, and representativeness among actors. Additionally, the approach has been criticized as being ‘too flexible’ and can be confusing for specific stakeholders (Söderbaum, 2007).

Environmental Impact Assessment (EIA) focuses on primarily environmental impacts, therefore limiting the assessment information, and is not comparable to CBA, PA and SAM in the same regard (Söderbaum, 2007). The aim is to aggregate all environmental impacts by reference to an index. EIA is related to project specific environmental outcomes, however, this has been largely abandoned due to difficulties with design and implementation (Söderbaum, 2007).

The Sustainability Evaluation and Reporting System (SERS) is an example which calls for the development of further methodologies that broaden the available set of measures by addressing the network aspect within an organization (Perrini and Tencati, 2006). Stakeholder view is important in understanding how relationships and the related engagement processes could impact performance indicators (Perrini and Tencati, 2006). “This perspective could dramatically change the way managers and stakeholders assess organizations, their success, and their role in the society” by using a framework to assess stakeholder viewpoint (Perrini and Tencati, 2006). In the proposed community garden assessment, stakeholder viewpoint is important to this project, but is not the primary focus for organizational improvement and longevity.

Finally, the Urban Development SAM (UD-SAM) is intended to provide a model of all separate impacts where the impact categories link together impact assessments from different disciplines (i.e. accounting, construction, engineering, planning etc.) into a set of generic impact

categories suggesting that sustainability impacts can be modeled holistically (Xing et al., 2009). The UD-SAM impact categories can also be used as a learning tool to help model complexities, enhance social learning, and promote institutional change (Xing et al., 2009). Methods are borrowed from this study in order to develop the community garden assessment in this paper.

Essentially, SAM is chosen as the framework to make adaptations to because of its proven flexibility, participatory aspects, and methods of monetizing non-monetary aspects. Although sustainability in the purest sense does not translate entirely to the community garden context, effective methods can be borrowed to propose a useful assessment. When designing a tool to use within the community garden context, it is essential to take into account the limitations of the model and define uncertainties and assumptions. Specifically, adaptations are made in response to limitations such as needing an “expert” for modeling and validity of measures.



### 3.0 METHODS

An outline of the SAM framework methods is discussed to specifically tackle the measurement of social, environmental and economic factors. Two methods in particular are discussed in more detail to ultimately design a useful assessment for community gardens. As mentioned above, an objective of SAM is to develop a constructive assessment tool which utilizes a participatory approach to address the larger project dimensions of economic, social and environmental indicators. Specific methods and indicators for community gardens will be outlined based on theory and previously discussed sustainability factors.

Three key areas are identified when assigning and assessing indicators under the SAM framework and are as follows: 1) identifying sustainability indicators, 2) assigning appropriate measurement of indicators, and 3) making a decision based on the results (Koo, 2008; Xing et al., 2009). Several studies propose methods for identifying sustainability indicators and the assignment of value. These methods which include a valuation process through interactive dialogue between stakeholders are outlined below.

Several tools have been proposed for both the identification and measurement of indicators. Difficulties arise when comparing alternatives across different projects and communicating assessment results across difference disciplines to different groups of stakeholders (Xing et al., 2009). Table 1 below outlines several tools proposed from the SAM literature. With each of these methods, there is an understood recognition of the need to be transparent about uncertainties, value judgments, assumptions, and calculation methods. (Bebbington, Brown et al., 2007).

**Table 1. Description of Methods for Identification and Measurement of Assessment**

**Indicators**

Method	Reference	Description
Elements Checklist	Hugé and Hens, 2007	Qualitative assessment questionnaire designed to make sustainable recommendations
Non-monetary Balance Sheet	Söderbaum, 2000	Builds from UK SAM
SAM signatures	Bebbington, Brown, et al., 2007; Frame and Cavanagh, 2009	Performance indicators which are combined by category to produce a representation of positive and negative activities
Full Cost Accounting Externality Quantification	Frame and Cavanagh, 2009	Valuation of intangible effects (mostly used to describe effects on the environment) of one action on another
Sustainability Development Indicators	Xing et al., 2009	Developed from a study which combined a workshop and questionnaire to a large group to identify the most important social economic and environmental aspects related to sustainability.
Integrated and cross-cutting Key Performance indicators	Perrini and Tencati, 2006	Stakeholder engagement
Multiple Criteria Decision Making analyses (as a compliment to the development of SAM Signatures)	International Society on Multiple Criteria Decision Making <a href="http://www.mcdmsociety.org">http://www.mcdmsociety.org</a>	The study of methods and procedures about multiple conflicting criteria which can be formally incorporated into the management planning process
Early causal chain identification	Azar et al., 1996	A proposal for methods to be developed early in the causal chain in order to be more effective

Specifically, two methods are outlined below where processes can be translated to the community garden context. I chose these methods as both are proven to be efficient and

effective, as well as address the important components of participation and valuation of social, economic, and environmental indicators.

The first method is described in a study proposed by Xing et al., (2009). The study identifies indicators through a participatory approach. A set of generic sustainability impact categories were developed from the literature, participatory workshop, and survey conducted with stakeholders to validate measures (Xing et al., 2009). Stakeholder validation involved the identification of the most important indicators and then selecting the most relevant indicators to then be monetized (Xing et al., 2009).

This process encourages collective learning and capacity building achieved through stakeholder participation, which also strengthens the assessment outcome. The participative assessment methodology is both goal-oriented and context-specific, with guidance provided for consideration to larger connected issues (Xing et al., 2009). This process ensures priorities from the group without losing focus on long-term development goals of the project (Kaatz, Root et al. 2005; Xing et al., 2009). It also allows the opportunity for new categorization of assessment indicators and identification of issues with the greatest priority for project stakeholders (Xing et al., 2009). The depth of the participative approach will depend on the requirements of the project (Kaatz, Root et al. 2005; Xing et al., 2009). Overall, this process will increase transparency between players.

In another study, Hugé and Hens (2007) developed an elements checklist when evaluating poverty reduction strategy papers to point to sustainability challenges and opportunities (Hugé and Hens, 2007). The assessment includes a wide range of topics from use of natural resources, empowerment, and assessment mechanisms (Hugé and Hens, 2007). The indicators on the checklist are modeled using theory from the literature. A conceptual framework

is used to describe the ecological nature of poverty (Hugé and Hens, 2007). Each question is scored on a scale from 0 - 2 where 0 indicates no mention of the issue, 1 indicates that the issue is mentioned but not elaborated, and 2 indicates that the issue is fully elaborated (Hugé and Hens, 2007).

A comprehensive, participatory-assessment tool which combines both approaches will be a useful development when addressing community garden sustainability. Therefore, I propose an assessment including the longevity and sustainability factors reviewed from the literature as well as theory driven community development and organization strategies to guide the assessment. The tool draws on the successes outlined from each technique.

The elements checklist design and scoring from the Hugé and Hens (2007) study is used to incorporate some guidance for community garden structure and longevity. Additionally, taking on the participatory approach outlined by Xing et al. (2009) adds value to the assessment process. Ultimately a self-organized participatory effort is proposed as a useful strategy for self-evaluation.

The process will include the formation of a committee to agree on included indicators and also have the opportunity to add additional indicators. The group process will involve a discussion between a team of stakeholders and community members to grade implementation of each question. The assessment will use the 0 - 3 scale to indicate the degree of implementation within the organization to assess its strengths and weaknesses. After identifying its strengths and weaknesses, the organization may then prioritize areas to improve upon and begin to develop an action plan to improve these indicators to build a stronger, sustainable organization. The prioritization process involves an exercise to rate among the priorities the relative cost,

feasibility, importance, and time it will take to implement the task. These tasks are to be considered relative to the organization's resources and to the other identified indicators.

A four point scale is used for simplicity. There is not a "neutral" response on the scale because it is not needed. The indicator may be left out if felt not relevant, important, feasible or applicable to the organization. This also implies that not all indicators are necessary for success of the garden, and if a certain indicator is more of a cost to the organization, then it may be left out and not scored. On the other hand, this measure could be scored as it might be considered an important planning point as it is up to the community's discretion. This notion must be made clear to the organization that each indicator is not necessary for success, rather it is meant to guide a reflective process to encourage improvement within the organization. Additionally, it must be made clear that other items may be added and scored in the assessment.

The American Community Gardening Association provides several tools and resources to help develop the identified areas of longevity through workshops and presentations that are given by the community members to build on strengths. This assessment is meant to identify strengths and weaknesses, prioritize them, and develop a plan for improvement using these resources and tools to further mobilize strengths and improve upon weaknesses.

Indicators were identified based on the above literature about longevity and sustainability factors of community gardens, the indicators can be broken into separate categories. However, many of these constructs are interrelated. For example, community capacity is defined by Goodman et al. (1999) as "characteristics of communities that affect their ability to mobilize and address public health problems" (Goodman et al., 1999). The construct includes multiple dimensions ranging from leadership, skills, resources, articulation of values, and support networks (Goodman et al., 1999). Therefore, the proposed tool is an example of interrelated

indicators, constructs, and measures from social, environmental and economic constructs. The indicators are used to reference critical pieces found in community garden organizations related to longevity and sustainability. This list is used in the participatory process to ensure discussion of different constructs. The Results chapter synthesizes the literature into indicator concepts, applications, and example questions of measurement. The Results are outlined in Table 2. The full assessment is outlined in the Appendix.



Table 2 continued

		<b>Trust</b>	Community trust has been measured through a general social survey (Kawachi, Kennedy et al., 1997).
Community Capacity	Community members actively participate in identifying and solving problems to become better able to address future problems collaboratively (Glanz, Rimer, Viswanath, 2008).	<b>Assets-Based Community Development</b>	Skills and resources of community members, and partnering organizations have been identified.  The community has opportunities to develop valuable skills by working in the garden.
Empowerment	Community members expand their power to create desired change (Glanz, Rimer, Viswanath, 2008).	<b>Community Organizing/Building</b>	Measures are in place to report the sense of community since the project initiation (Goodman et al., 1999).  The garden provides education, projects, or programs to meet the needs of the community .  Cultural diversity and local cultural identities have been considered (Hugé and Hens, 2007).



Table 2 continued

<p>Leadership Development</p>	<p>Ability to identify certain leadership characteristics such as motivation, trust, vision, integrity and creativity and established leaders being able to lead effectively (The American Community Gardening Association Growing Communities Curriculum, 2006).</p>	<p><b>Leadership</b></p>	<p>Leadership development has been addressed within the organization.</p> <p>Opportunities have been sought to foster the development of leadership skills (The American Community Gardening Association Growing Communities Curriculum, 2006).</p>
<p>Organizational Aspects</p>	<p>Organizational planning, articulation of values, and Organizational development (The American Community Gardening Association Growing Communities Curriculum, 2006).</p>	<p><b>Vision</b></p> <p><b>Mission</b></p> <p><b>Effective Meetings</b></p> <p><b>Evaluation</b></p>	<p>Organization has a clearly established vision.</p> <p>Organization has a clearly defined mission.</p> <p>The organization has established regular meetings with effective results.</p> <p>A program evaluation plan is in place.</p>

Table 2 continued

<p>Community outreach</p>	<p>Effective outreach strategies to increase the visibility organization in the community The American Community Gardening Association Growing Communities Curriculum, 2006).</p>	<p><b>Outreach Planning</b></p>	<p>Organization has implemented outreach strategies to increase viability of organization (The American Community Gardening Association Growing Communities Curriculum, 2006).</p>
<p>Coalition Building</p>	<p>Organization has sought additional resources from outside organizations in order to effectively meet the goals of the organization The American Community Gardening Association Growing Communities Curriculum, 2006).</p>	<p><b>Support Networks</b></p>	<p>Organization has established effective relationships, networks, partnerships and/or collaborations to enhance effectiveness (The American Community Gardening Association Growing Communities Curriculum, 2006).</p> <p>There has been input from other local gardens (Hugé and Hens, 2007).</p>

Table 2 continued

			<p>There has been input from the private sector (Hugé and Hens, 2007).</p> <p>There has been input from the local government (Hugé and Hens, 2007).</p>
Health Assessment		<b>Health quality indicators</b>	The health status of the community has been assessed.

**Environmental Indicators**

<b>Concept</b>	<b>Application</b>	<b>Environmental Indicator</b>	<b>Example of question</b>
Land Sustainability	Secured land use	<b>Land Sustainability</b>	<p>Organization has established a land lease agreement of 3-5 years, or ownership of land (ACGA, 2006).</p> <p>Organization has considered property rights and access, management, and upkeep of land (Hugé and Hens, 2007).</p>

Table 2 continued

Soil Suitability	Soil is capable of maintaining plant life	<b>Soil Suitability</b>	Soil has been tested for metals such as lead (ACGA, 2006).
Water Consumption	Sustainable, cost-effective water use	<b>Water Consumption</b>	Organization has implemented water conservation tactics such as use of landscape, or rain barrel etc.
Chemical free maintenance	Maintenance of garden involved chemical-free methods	<b>Chemical free maintenance</b>	Organization utilizes natural fertilizers or pesticides.

**Economic Indicators**

<b>Concept</b>	<b>Application</b>	<b>Economic Indicator</b>	<b>Example of question</b>
Budget	A fundraising plan should be developed with strategies around an action plan, and objectives to reach budgetary goals (The American Community Gardening Association Growing Communities Curriculum, 2006).	<b>Fundraising</b>	Organization has a fundraising action plan in place.  Organization has an effective fundraising outreach plan.

Table 2 continued

	<p>Establishing a Board of Directors to handle budgeting as well as fundraising matters (The American Community Gardening Association Growing Communities Curriculum, 2006).</p>	<p><b>Board of Directors</b></p>	<p>Organization has developed a Board of Directors as an effective strategy for handling budgeting matters (The American Community Gardening Association Growing Communities Curriculum, 2006).</p>
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## 5.0 DISCUSSION

Ultimately, the assessment aims to overcome those challenges specific to SAM. For example, usability is streamlined through an assessment with designated indicators pulled from the literature. The assessment is meant to have a participatory approach to score each item to determine strengths and weaknesses within the organization. The appraisal of each assessment item is relative to a simple four point scale. The assessment is project-specific, and can be applied to small and large operations. The results will give useful suggestions for next steps as the tools necessary for future action planning are included in the assessment.

In SAM, an “expert” is needed to model and monetize indicators. This assessment proposes removal of the expert and giving more power to the organization, stakeholders, and community members. Values related to so many different contexts cannot be compared relatively, and sometimes values cannot even be assigned. Therefore, the indicators in this assessment do not have their own individual measures, but are scaled on a unified, simple scale ranging from 0 - 3 in order to indicate the level of implementation within the organization. Ultimately, the potential limitations of SAM are strengths of this garden assessment.

Once strengths and weaknesses are identified from the assessment, useful next steps are outlined with guidance for the planning and prioritization process. Resources to help action are recommended from the American Community Gardening Association. This organization provides free and cost-efficient resources to help with the planning and implementation process to improve garden strengths and weaknesses. The assessment is to identify these areas and encourage action by guiding to the appropriate resources to do so.

However, there are also limitations to this tool. The assessment is not all inclusive, but is not intended to be. One way to improve this is that the assessment allows the opportunity to add additional indicators that each organization sees fit. For example, perhaps during the process a major item that is of concern is brought to the table, that issue may be added into the assessment and scored. The assessment encourages this inclusion. The assessment also allows for deletion of indicators as each group sees appropriate.

Another potential limitation is the simplicity of the scaling and measurements which do not indicate actual value where detail is lost. However, I argue that the most important aspect is that strengths and weaknesses are measured to then implement action planning for improvement with the underlying theme of longevity. The actual measures are not as valuable with this end goal in mind. The relative cost is considered in the planning piece of the assessment along with feasibility, importance, and time it will take to implement the task. This is to be considered relative to the organization's resources and to the other identified indicators.

Additionally, validity and reliability of indicators are a challenge for SAM as well as this assessment as many components are hard to quantify. To speak to this challenge, indicators and measurement questions were extracted from the literature to increase both validity and reliability. Furthermore, a pilot would be useful to assess other potential limitations and to implement an evaluation of the assessment. Relevance to the community garden as well as opinion on importance would be valuable input to further develop this assessment. Using quantitative survey methods to rate relevance and importance of indicators linked to community garden organizations as well as longevity may prove useful. Also, qualitative in-depth interviews, or focus group methods may be helpful to further obtain opinions about included indicators or what is missing from the assessment. Another useful dimension of the pilot would be a designated

follow-up period. For example, the sample gardens may be permitted a one year period from the original assessment date to judge how much of the intended plan was implemented, and how or why the plan changed. Another interesting component of time would be to include gardens at different stages in their ‘life’. For example, perhaps the overall assessment is not very helpful to gardens that are more than 5 years old; or perhaps new gardens find some measures more useful than older gardens.

Typical limitations to the participatory process exist including, but not limited to: having a representative group to contribute, all members of the group contributing in a meaningful way, and general agreement on indicators. With lack of an expert role, the facilitator’s role is greatly important to the success of the group. It must be made clear that the purpose of the assessment is to identify strengths, weakness, and the importance of issues within the group to assist the planning and implementation process.

Beyond further research by conducting a pilot, other recommendations can be offered for further action. Perhaps community gardens could be used in policy decisions to better help with sustainability. For example, gardens could be better integrated into existing food systems such as schools, hospitals, and food banks. Other recommendations would be better integration of gardens into community and school education to build skills, social capital, and empowerment at the community level. This level of policy development is one indicator included on the assessment, but perhaps there should be a greater emphasis on policy influences. There is a need for evidence-based practices which outline how to implement these actions in practical ways for the local community garden.

The assessment design designates longevity issues as primary indicators which may not have been considered otherwise. Also, additional topics can be added from the group process as



a secondary focus lending some flexibility in the procedure. Therefore, the assessment will not be an all inclusive tool appropriate for every situation, but possibly a self-evaluation tool that can be tailored to many situations based on assessment indicator guidance, prioritization, planning, and group participation.

## 6.0 CONCLUSION

Community gardens host a variety of benefits and are worth supporting. However, many gardens have difficulties sustaining. The proposed assessment borrows tools and strategies from SAM studies to address a variety of social, environmental, and economic factors that influence organizational success. The assessment design is intended to improve programming outcomes and organizational aspects of community gardens using a collaborative participatory approach.

All measures need not be considered in order to attain success or longevity. It is not all inclusive, nor is it necessary for all gardens to have all components from the assessment to succeed. What is being proposed is that the assessment be used as a self-evaluation tool for the community garden. There should be a clear understanding that each item on the assessment does not need to be carried out for success, but perhaps serve as a talking point among members of the group.

Measures in the assessment are modeled after theoretical constructs and use a simple four-point scale. Stakeholder and community dialogue is valued as an important starting point for action. The assessment tool will initiate dialogue to identify strengths and weaknesses within the organization. The tool then prompts a planning and action process with planning resources provided to assist with progression.

It is not certain that longevity is sufficiently represented in the assessment; however, the implementation of a pilot would provide valuable feedback regarding the significance, usability, and accuracy of the assessment. Specifically, the pilot could speak to the importance of the indicators as well as address how useful the assessment was within the community. A small pilot

within the Pittsburgh community would provide invaluable input to help further develop and disseminate the assessment. The Community Garden Assessment is intended to assist in the vital role of sustaining community gardens and the benefit they have to offer.

“Gardens, scholars say, are the first sign of commitment to a community. When people plant corn they are saying, let's stay here. And by their connection to the land, they are connected to one another”.

- Anne Raver

## APPENDIX

### COMMUNITY GARDEN SUSTAINABILITY ASSESSMENT

#### Community Garden Social Indicators

**Instructions:**

1. Carefully read and discuss the assessment questions.
2. Circle the most appropriate score for each item.
3. Add the scores and calculate the overall score.
4. Proceed to the planning questions.

	<b>Fully in Place</b>	<b>Partially in Place</b>	<b>Under Development</b>	<b>Not in Place</b>
The organization encourages participation at the local level	3	2	1	0
The organization encourages participation at the policy level	3	2	1	0
There is a system in place to tack the number of hours volunteered each week to be stable or increasing	3	2	1	0
The number of volunteer hours are sufficient to meet organizational needs	3	2	1	0
Generally speaking, there is a large degree of trust within the organization	3	2	1	0
Community trust has been measured through a general social survey	3	2	1	0
Skills and resources of community members, and partnering organizations have been identified	3	2	1	0
The community has opportunities to develop valuable skills by working in the garden	3	2	1	0
(Continued on next page)				

The garden provides education, projects, or programs to meet the needs of the community	3	2	1	0
Cultural diversity and local cultural identities have been considered	3	2	1	0
Leadership development has been addressed within the organization	3	2	1	0
Opportunities have been sought to foster the development of leadership skills	3	2	1	0
An opinion survey has been developed to measure perceptions and suggestions for the project	3	2	1	0
Measures are in place to report the sense of community since the project initiation	3	2	1	0
Organization has a clearly established vision	3	2	1	0
Organization has a clearly defined mission	3	2	1	0
The organization has established regular meetings with effective results	3	2	1	0
A program evaluation plan is in place	3	2	1	0
Organization has implemented outreach strategies to increase viability of organization	3	2	1	0
Organization has established effective relationships, networks, partnerships and/or collaborations to enhance effectiveness	3	2	1	0
There has been input from other local gardens	3	2	1	0
There has been input from the private sector	3	2	1	0
There has been input from the local government	3	2	1	0
The health status of the community has been assessed	3	2	1	0
<b>Column Totals:</b> Add up the circled numbers from each column				

If you decide to add or leave out any of the questions, make sure you adjust the denominator (72) by 3 for each item.

**TOTAL POINTS:** Add the four sums above and enter the total to the right

**Social Score** = (Total points/72) X 100

# COMMUNITY GARDEN SUSTAINABILITY ASSESSMENT

## Community Garden Environment Indicators

**Instructions:**

1. Carefully read and discuss the assessment questions.
2. Circle the most appropriate score for each item.
3. Add the scores and calculate the overall score.
4. Proceed to the planning questions.

	<b>Fully in Place</b>	<b>Partially in Place</b>	<b>Under Development</b>	<b>Not in Place</b>
Organization has established a land lease agreement of 3 - 5 years, or ownership of land	3	2	1	0
Organization has considered property rights and access, management, and upkeep of land	3	2	1	0
Organization has implemented water conservation tactics such as use of landscape, or rain barrel etc.	3	2	1	0
Soil has been tested for metals such as lead	3	2	1	0
Organization utilizes natural fertilizers or pesticides	3	2	1	0
<b>Column Totals:</b> Add up the circled numbers from each column				
<b>TOTAL POINTS:</b> Add the four sums above and enter the total to the right				
If you decide to add or leave out any of the questions, make sure you adjust the denominator (15) by 3 for each item.				
$\text{Environment Score} = (\text{Total points}/15) \times 100$				

# COMMUNITY GARDEN SUSTAINABILITY ASSESSMENT

## Community Garden Economic Indicators

**Instructions:**

1. Carefully read and discuss the assessment questions.
2. Circle the most appropriate score for each item.
3. Add the scores and calculate the overall score.
4. Proceed to the planning questions.

	<b>Fully in Place</b>	<b>Partially in Place</b>	<b>Under Development</b>	<b>Not in Place</b>
Organization has a fundraising action plan in place	3	2	1	0
Organization has an effective fundraising outreach plan	3	2	1	0
Organization has developed a Board of Directors as an effective strategy for handling budgeting matters	3	2	1	0
<b>Column Totals:</b> Add up the circled numbers from each column				
<p>If you decide to add or leave out any of the questions, make sure you adjust the denominator (9) by 3 for each item.</p>	<p><b>TOTAL POINTS:</b> Add the four sums above and enter the total to the right</p>			
	<p><b>Economic Score = (Total points/9) X 100</b></p>			

## **Community Garden Assessment Planning Questions**

1. According to the assessment, list the identified strengths and weaknesses

2. For each weakness listed above, list several recommended actions to improve scores. Consult The American Community Gardening Association's Growing Communities curriculum (2006) for guidance.



3. List each of the items listed in question 2. Use the five point scale listed below. Add the points and use them to identify one or two priority actions to be implemented within a year. Please refer to the American Community Gardening Association’s Growing Communities curriculum (2006) for guidance.

<b>Importance</b>	How important is the action? <b>5 = very important 3= moderately important 1= not important</b>
<b>Cost</b>	How expensive would it be to plan and implement the action? <b>5= not expensive 3= moderately expensive 1 = very expensive</b>
<b>Time</b>	How much time and effort would it take to implement the action? <b>5= little or no time and effort 3= moderate time and effort 1= a great deal of time and effort</b>
<b>Feasibility</b>	How difficult would it be to accomplish the action? <b>5=not difficult 3= moderately difficult 1= very difficult</b>

<b>Action</b>	<b>Importance</b>	<b>Cost</b>	<b>Time</b>	<b>Feasibility</b>	<b>Total Points</b>	<b>Top Priority?</b>

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